



**COMMONWEALTH OF KENTUCKY
TRANSPORTATION CABINET**

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

Matthew G. Bevin
Governor

Greg Thomas
Secretary

May 15, 2018

CALL NO. 103
CONTRACT ID NO. 181401
ADDENDUM # 1

Subject: BOONE COUNTY, STP 8124 (022)
Letting May 25, 2018

- (1) Revised - Wage Rates - Pages 183-192 of 201
- (2) Revised - Proposal Bid Items - Pages 197-201 of 201
- (3) Added - Special Notes - Pages 1-35 of 35

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

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

Sincerely,

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

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

RM:mr
Enclosures



An Equal Opportunity Employer M/F/D

General Decision Number: KY180101 05/04/2018 KY101

Superseded General Decision Number: KY20170101

State: Kentucky

Construction Type: Highway

Counties: Boone, Campbell, Kenton and Pendleton Counties in Kentucky.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.35 for calendar year 2018 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.35 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2018. The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/05/2018
1	02/16/2018
2	04/20/2018
3	05/04/2018

BRKY0002-005 06/01/2017

	Rates	Fringes
BRICKLAYER.....	\$ 27.81	13.01

BROH0001-005 06/01/2008

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 25.75	8.60

CARP0698-001 05/01/2014

BOONE, CAMPBELL, KENTON & PENDLETON COUNTIES:

	Rates	Fringes
Carpenter & Piledrivermen.....	\$ 27.27	14.59
Diver.....	\$ 40.58	9.69

ELEC0212-007 06/05/2017		

	Rates	Fringes
ELECTRICIAN.....	\$ 27.90	17.56

ELEC0212-013 11/27/2017		

	Rates	Fringes
Sound & Communication Technician.....	\$ 23.55	11.26

ENGI0018-013 05/01/2015		

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 33.34	14.25
GROUP 2.....	\$ 33.22	14.25
GROUP 3.....	\$ 32.18	14.25
GROUP 4.....	\$ 31.00	14.24
GROUP 5.....	\$ 25.54	14.25
GROUP 6.....	\$ 33.59	14.25
GROUP 7.....	\$ 33.84	14.25

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - Air Compressor on Steel Erection; Barrier Moving Machine; Boiler Operator on Compressor or Generator when mounted on a Rig; Cableway; Combination Concrete Mixer & Tower; Concrete Plant (over 4 yd. Capacity); Concrete Pump; Crane (All Types, Including Boom Truck, Cherry Picker); Crane-Compact, Track or Rubber over 4,000 lbs. capacity; Cranes-Self Erecting, Stationary, Track or Truck (All Configurations); Derrick; Dragline; Dredge (Dipper, Clam or Suction); Elevating Grader or Euclid Loader; Floating Equipment (All Types); Gradall; Helicopter Crew (Operator-Hoist or Winch); Hoe (all types); Hoisting Engine on Shaft or Tunnel Work; Hydraulic Gantry (Lifting System); Industrial-Type Tractor; Jet Engine Dryer (D8 or D9) Diesel Tractor; Locomotive (Standard Gauge); Maintenance Operator Class A; Mixer, Paving (Single or Double Drum); Mucking Machine; Multiple Scraper; Piledriving Machine (All Types); Power Shovel; Prentice Loader; Quad 9 (Double Pusher); Rail Tamper (with auto lifting & aligning device); Refrigerating Machine (Freezer Operation); Rotary Drill, on Caisson work; Rough Terrain Fork Lift with Winch/Hoist; Side-Boom; Slip-Form Paver;

Tower Derrick; Tree Shredder; Trench Machine (Over 24" wide); Truck Mounted Concrete Pump; Tug Boat; Tunnel Machine and/or Mining Machine; & Wheel Excavator

GROUP 2 - Asphalt Paver; Automatic Subgrader Machine, Self-Propelled (CMI Type); Bobcat Type and/or Skid Steer Loader with Hoe Attachment Greater than 7,000 lbs.; Boring Machine More than 48"; Bulldozer; Endloader; Hydro Milling Machine; Horizontal Directional Drill (over 500,000 ft. lbs. thrust); Kolman-type Loader (production type-Dirt); Lead Greaseman; Lighting & Traffic Signal Installation Equipment (includes all groups or classifications); Material Transfer Equipment (Shuttle Buggy) Asphalt; Pettibone-Rail Equipment; Power Grader; Power Scraper; Push Cat; Rotomill (all), Grinders & Planers of All types; Trench Machine (24" wide & under); & Vermeer type Concrete Saw

GROUP 3 - A-Frame; Air Compressor on Tunnel Work (low pressure); Asphalt Plant Engineer; Bobcat-type and/or Skid Steer Loader with or without Attachments; Highway Drills (all types); Locomotive (narrow gauge); Material Hoist/Elevator; Mixer, Concrete (more than one bag capacity); Mixer, one bag capacity (Side Loader); Power Boiler (Over 15 lbs. Pressure) Pump Operator installing & operating Well Points; Pump (4" & over discharge); Roller, Asphalt; Rotovator (lime soil stabilizer); Switch & Tie Tampers (without lifting & aligning device); Utility Operator (Small equipment); & Welding Machines

GROUP 4 - Backfiller; Ballast Re-locator; Bars, Joint & Mesh Installing Machine; Batch Plant; Boring Machine Operator (48" or less); Bull Floats; Burlap & Curing Machine; Concrete Plant (capacity 4 yd. & under); Concrete Saw (Multiple); Conveyor (Highway); Crusher; Deckhand; Farm-type Tractor with attachments (highway) except Masonry); Finishing Machine; Fireperson, Floating Equipment (all types); Fork Lift (highway); Form Trencher; Hydro Hammer; Hydro Seeder; Pavement Breaker; Plant Mixer; Post Driver; Post Hole Digger (Power Auger); Power Brush Burner; Power Form Handling Equipment; Road Widening Trencher; Roller (Brick, Grade & Macadam); Self-Propelled Power Spreader; Self-Propelled Power Subgrader; Steam Fireperson; Tractor (Pulling Sheepfoot, Roller or Grader); & Vibratory Compactor with Integral Power

GROUP 5 - Compressor (Portable, Sewer, Heavy & Highway); Drum Fireperson (Asphalt); Generator; Masonry Fork Lift; Inboard-Outboard Motor Boat Launch; Masonry Fork Lift; Oil Heater (asphalt plant); Oiler; Power Driven Heater; Power Sweeper & Scrubber; Pump (under 4" discharge); Signalperson; Tire Repairperson; & VAC/ALLS

GROUP 6 - Master Mechanic & Boom from 150 to 180

GROUP 7 - Boom from 180 and over

IRON0044-008 06/01/2017

	Rates	Fringes
Ironworkers:		
Fence Erector.....	\$ 25.62	19.15
Structural.....	\$ 27.60	20.10

IRON0044-018 06/01/2017

	Rates	Fringes
IRONWORKER, REINFORCING.....	\$ 27.60	20.10

LABO0189-004 07/01/2017

PENDLETON COUNTY:

	Rates	Fringes
LABORER		
GROUP 1.....	\$ 23.14	13.29
GROUP 2.....	\$ 23.39	13.29
GROUP 3.....	\$ 23.44	13.29
GROUP 4.....	\$ 24.04	13.29

LABORERS CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushhammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Side Rail Setter;

Rail Paved Ditches; Screw Operator; Tunnel (Free Air);
Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher;
Environmental - Nuclear, Radiation, Toxic & Hazardous Waste
- Levels A & B; Miner & Driller (Free Air); Tunnel Blaster;
& Tunnel Mucker (Free Air); Directional & Horizontal
Boring; Air Track Driller (All Types); Powderman & Blaster;
Troxler & Concrete Tester if Laborer is Utilized

* LABO0265-009 05/01/2018

BOONE, CAMPBELL & KENTON COUNTIES:

	Rates	Fringes
LABORER		
GROUP 1.....	\$ 30.62	10.95
GROUP 2.....	\$ 30.79	10.95
GROUP 3.....	\$ 31.12	10.95
GROUP 4.....	\$ 31.57	10.95

LABORER CLASSIFICATIONS

GROUP 1 - Asphalt Laborer; Carpenter Tender; Concrete Curing
Applicator; Dump Man (Batch Truck); Guardrail and Fence
Installer; Joint Setter; Laborer (Construction); Landscape
Laborer; Highway Lighting Worker; Signalization Worker;
Mesh Handlers & Placer; Right-of-way Laborer; Riprap
Laborer & Grouter; Scaffold Erector; Seal Coating; Surface
Treatment or Road Mix Laborer; Sign Installer; Slurry Seal;
Utility Man; Bridge Man; Handyman; Waterproofing Laborer;
Flagperson; Hazardous Waste (level D); Diver Tender; Zone
Person & Traffic Control

GROUP 2 - Skid Steer; Asphalt Raker; Concrete Puddler; Kettle
Man (Pipeline); Machine Driven Tools (Gas, Electric, Air);
Mason Tender; Brick Paver; Mortar Mixer; Power Buggy or
Power Wheelbarrow; Sheeting & Shoring Man; Surface Grinder
Man; Plastic Fusing Machine Operator; Pug Mill Operator; &
Vacuum Devices (wet or dry); Rodding Machine Operator;
Diver; Screwman or Paver; Screed Person; Water Blast, Hand
Held Wand; Pumps 4" & Under (Gas, Air or Electric) &
Hazardous Waste (level C); Air Track and Wagon Drill;
Bottom Person; Cofferdam (below 25 ft. deep); Concrete Saw
Person; Cutting with Burning Torch; Form Setter; Hand
Spiker (Railroad); Pipelayer; Tunnel Laborer (without air)
& Caisson; Underground Person (working in Sewer and
Waterline, Cleaning, Repairing & Reconditioning);
Sandblaster Nozzle Person; & Hazardous Waste (level B)

GROUP 3 - Blaster; Mucker; Powder Person; Top Lander;
Wrencher (Mechanical Joints & Utility Pipeline); Yarner;
Hazardous Waste (level A); Concrete Specialist; Concrete
Crew in Tunnels (With Air-pressurized - \$1.00 premium);
Curb Setter & Cutter; Grade Checker; Utility Pipeline

Tapper; Waterline; and Caulker

GROUP 4 - Miner; & Gunitite Nozzle Person

TUNNEL LABORER WITH AIR-PRESSURIZED ADD \$1.00 TO BASE RATE

SIGNAL PERSON WILL RECEIVE THE RATE EQUAL TO THE RATE PAID
THE LABORER CLASSIFICATION FOR WHICH HE OR SHE IS
SIGNALING.

PAIN0012-016 05/01/2015

	Rates	Fringes
PAINTER		
Bridge.....	\$ 24.39	9.06
Bridge Equipment Tender and Containment Builder.....	\$ 20.73	9.06
Brush & Roller.....	\$ 23.39	9.06
Sandblasting & Water Blasting.....	\$ 24.14	9.06
Spray.....	\$ 23.89	9.06

PLUM0392-008 06/01/2014

	Rates	Fringes
PLUMBER.....	\$ 29.80	17.79

SUKY2010-161 02/05/1996

	Rates	Fringes
Truck drivers:		
GROUP 1.....	\$ 15.85	4.60
GROUP 2.....	\$ 16.29	4.60

TRUCK DRIVER CLASSIFICATIONS

GROUP 1 - Driver

GROUP 2 - Euclid Wagon; End Dump; Lowboy; Heavy Duty
Equipment; Tractor-Trailer Combination; & Drag

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

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
for Federal Contractors applies to all contracts subject to the
Davis-Bacon Act for which the contract is awarded (and any
solicitation was issued) on or after January 1, 2017. If this
contract is covered by the EO, the contractor must provide

employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that

classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

Fringe benefit amounts are applicable for all hours worked except when otherwise noted.

No laborer, workman or mechanic shall be paid at a rate less than that of a Journeyman except those classified as bona fide apprentices.

Apprentices or trainees shall be permitted to work as such subject to Administrative Regulations adopted by the Commissioner of Workplace Standards. Copies of these regulations will be furnished upon request from any interested person.

Before using apprentices on the job the contractor shall present to the Contracting Officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U. S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U. S. Bureau of Apprenticeship and Training.

The contractor shall submit to the Contracting Officer, written evidence of the established apprenticeship-journeyman ratios and wage rates in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

TO: EMPLOYERS/EMPLOYEES

PREVAILING WAGE SCHEDULE:

The wages indicated on this wage schedule are the least permitted to be paid for the occupations indicated. When an employee works in more than one classification, the employer must record the number of hours worked in each classification at the prescribed hourly base rate.

OVERTIME:

Overtime is to be paid after an employee works eight (8) hours a day or forty (40) hours a week, whichever gives the employee the greater wages. At least time and one-half the base rate is required for all overtime. A laborer, workman or mechanic and an employer may enter into a written agreement or a collective bargaining agreement to work more than eight (8) hours a calendar day but not more than ten (10) hours a calendar day for the straight time hourly rate. Wage violations or questions should be directed to the designated Engineer or the undersigned.

Director
Division of Construction Procurement
Frankfort, Kentucky 40622
502-564-3500

PROPOSAL BID ITEMS

181401

Report Date 5/15/18

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00003		CRUSHED STONE BASE	3,135.00	TON		\$	
0020	00005		GEOGRID REINFORCEMENT FOR SUBGRADE	7,413.00	SQYD		\$	
0030	00071		CRUSHED AGGREGATE SIZE NO 57	368.00	TON		\$	
0040	00078		CRUSHED AGGREGATE SIZE NO 2	5,116.00	TON		\$	
0050	00214		CL3 ASPH BASE 1.00D PG64-22	2,534.00	TON		\$	
0060	00219		CL4 ASPH BASE 1.00D PG76-22	1,339.00	TON		\$	
0070	00342		CL4 ASPH SURF 0.38A PG76-22	1,930.00	TON		\$	
0080	00356		ASPHALT MATERIAL FOR TACK	3.00	TON		\$	
0090	02101		CEM CONC ENT PAVEMENT-8 IN	2,087.00	SQYD		\$	
0100	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		\$	
0110	02677		ASPHALT PAVE MILLING & TEXTURING	1,203.00	TON		\$	
0120	20550ND		SAWCUT PAVEMENT	2,407.00	LF		\$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0130	00078		CRUSHED AGGREGATE SIZE NO 2	528.00	TON		\$	
0140	01000		PERFORATED PIPE-4 IN	1,457.00	LF		\$	
0150	01010		NON-PERFORATED PIPE-4 IN	124.00	LF		\$	
0160	01024		PERF PIPE HEADWALL TY 2-4 IN	2.00	EACH		\$	
0170	01310		REMOVE PIPE	26.00	LF		\$	
0180	01585		REMOVE DROP BOX INLET	1.00	EACH		\$	
0190	01705		REMOVE CURB & GUTTER BOX INLET	1.00	EACH		\$	
0200	01810		STANDARD CURB AND GUTTER	3,534.00	LF		\$	
0210	01830		STANDARD INTEGRAL CURB	73.00	LF		\$	
0220	01840		LIP INTEGRAL CURB	638.00	LF		\$	
0230	01875		STANDARD HEADER CURB	194.00	LF		\$	
0240	01904		REMOVE CURB	700.00	LF		\$	
0250	01949		MOUNTABLE MEDIAN TYPE 6A	242.00	SQYD		\$	
0260	01982		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE	13.00	EACH		\$	
0270	01984		DELINEATOR FOR BARRIER - WHITE	24.00	EACH		\$	
0280	01992		INSTALL TEMP CONC MED BARR	1,200.00	LF		\$	
0290	02002		REMOVE TEMP CONC BARRIER WALL	1,200.00	LF		\$	
0300	02003		RELOCATE TEMP CONC BARRIER	600.00	LF		\$	
0310	02014		BARRICADE-TYPE III	8.00	EACH		\$	
0320	02015		CEMENT CONCRETE ISLAND	184.00	SQYD		\$	
0330	02091		REMOVE PAVEMENT	1,085.00	SQYD		\$	
0340	02159		TEMP DITCH	1,000.00	LF		\$	
0350	02160		CLEAN TEMP DITCH	1,000.00	LF		\$	
0360	02230		EMBANKMENT IN PLACE	32,835.00	CUYD		\$	
0370	02242		WATER	577.00	MGAL		\$	
0380	02351		GUARDRAIL-STEEL W BEAM-S FACE	670.00	LF		\$	
0390	02367		GUARDRAIL END TREATMENT TYPE 1	1.00	EACH		\$	
0400	02369		GUARDRAIL END TREATMENT TYPE 2A	3.00	EACH		\$	

PROPOSAL BID ITEMS

181401

Report Date 5/15/18

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0410	02381		REMOVE GUARDRAIL	1,242.00	LF		\$	
0420	02391		GUARDRAIL END TREATMENT TYPE 4A	1.00	EACH		\$	
0430	02429		RIGHT-OF-WAY MONUMENT TYPE 1	34.00	EACH		\$	
0440	02432		WITNESS POST	34.00	EACH		\$	
0450	02483		CHANNEL LINING CLASS II	33.00	TON		\$	
0460	02484		CHANNEL LINING CLASS III	23.00	TON		\$	
0470	02545		CLEARING AND GRUBBING (APPROXIMATELY 10.22 ACRES)	1.00	LS		\$	
0480	02562		TEMPORARY SIGNS	2,000.00	SQFT		\$	
0490	02585		EDGE KEY	1,180.00	LF		\$	
0500	02596		FABRIC-GEOTEXTILE TYPE I	83.00	SQYD		\$	
0510	02599		FABRIC-GEOTEXTILE TYPE IV	3,716.00	SQYD		\$	
0520	02625		REMOVE HEADWALL	2.00	EACH		\$	
0530	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0540	02690		SAFELOADING	20.00	CUYD		\$	
0550	02701		TEMP SILT FENCE	2,000.00	LF		\$	
0560	02703		SILT TRAP TYPE A	40.00	EACH		\$	
0570	02704		SILT TRAP TYPE B	40.00	EACH		\$	
0580	02705		SILT TRAP TYPE C	15.00	EACH		\$	
0590	02706		CLEAN SILT TRAP TYPE A	120.00	EACH		\$	
0600	02707		CLEAN SILT TRAP TYPE B	120.00	EACH		\$	
0610	02708		CLEAN SILT TRAP TYPE C	45.00	EACH		\$	
0620	02720		SIDEWALK-4 IN CONCRETE	2,290.00	SQYD		\$	
0630	02726		STAKING	1.00	LS		\$	
0640	02775		ARROW PANEL	2.00	EACH		\$	
0650	02900		INSTALL TEMP CRASH CUSHION	4.00	EACH		\$	
0660	03171		CONCRETE BARRIER WALL TYPE 9T	1,200.00	LF		\$	
0670	04936		MAINTAIN SIGNAL OPERATION	1.00	LS		\$	
0680	05950		EROSION CONTROL BLANKET	499.00	SQYD		\$	
0690	05952		TEMP MULCH	25,000.00	SQYD		\$	
0700	05953		TEMP SEEDING AND PROTECTION	25,000.00	SQYD		\$	
0710	05963		INITIAL FERTILIZER	.50	TON		\$	
0720	05964		20-10-10 FERTILIZER	.80	TON		\$	
0730	05985		SEEDING AND PROTECTION	13,972.00	SQYD		\$	
0740	05990		SODDING	2,007.00	SQYD		\$	
0750	05992		AGRICULTURAL LIMESTONE	6.00	TON		\$	
0760	06510		PAVE STRIPING-TEMP PAINT-4 IN	50,000.00	LF		\$	
0770	06514		PAVE STRIPING-PERM PAINT-4 IN	19,174.00	LF		\$	
0780	06530		PAVE STRIPING REMOVAL-4 IN	5,000.00	LF		\$	
0790	06533		PAVE STRIPING REMOVAL-12 IN	200.00	LF		\$	
0800	06550		PAVE STRIPING-TEMP REM TAPE-W	1,500.00	LF		\$	
0810	06551		PAVE STRIPING-TEMP REM TAPE-Y	1,000.00	LF		\$	
0820	06565		PAVE MARKING-THERMO X-WALK-6 IN	1,534.00	LF		\$	
0830	06567		PAVE MARKING-THERMO STOP BAR-12IN	329.00	LF		\$	
0840	06571		PAVE MARKING-PAINT PARKING LOT	140.00	LF		\$	
0850	06572		PAVE MARKING-DOTTED LANE EXTEN	80.00	LF		\$	
0860	06573		PAVE MARKING-THERMO STR ARROW	16.00	EACH		\$	
0870	06574		PAVE MARKING-THERMO CURV ARROW	50.00	EACH		\$	
0880	06575		PAVE MARKING-THERMO COMB ARROW	2.00	EACH		\$	
0890	06588		PAVEMENT MARKER TY IVA-BY TEMP	100.00	EACH		\$	

PROPOSAL BID ITEMS

REVISED ADDENDUM #1: 5-15-18

181401

Page 3 of 5

Report Date 5/15/18

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0900	06589		PAVEMENT MARKER TYPE V-MW	100.00	EACH		\$	
0910	06591		PAVEMENT MARKER TYPE V-BY	98.00	EACH		\$	
0920	06598		PAVEMENT MARKING REMOVAL	100.00	SQFT		\$	
0930	06600		REMOVE PAVEMENT MARKER TYPE V	80.00	EACH		\$	
0940	08901		CRASH CUSHION TY VI CLASS BT TL2	2.00	EACH		\$	
0950	10020NS		FUEL ADJUSTMENT	15,318.00	DOLL	\$1.00	\$	\$15,318.00
0960	10030NS		ASPHALT ADJUSTMENT	22,687.00	DOLL	\$1.00	\$	\$22,687.00
0970	20072ES805		GRANULAR EMBANKMENT	1,480.00	TON		\$	
0980	21373ND		REMOVE SIGN	1.00	EACH		\$	
0990	23158ES505		DETECTABLE WARNINGS	672.00	SQFT		\$	
1000	23275EN11F		TURF REINFORCEMENT MAT 2	883.00	SQYD		\$	
1010	23322EC		AGGREGATE SIZE NO. 57	170.00	CUYD		\$	
1020	24631EC		BARCODE SIGN INVENTORY	131.00	EACH		\$	
1030	24910EC		PAVE MARKING-THERMO NO LEFT TURN	4.00	EACH		\$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1040	00520		STORM SEWER PIPE-12 IN	42.00	LF		\$	
1050	00521		STORM SEWER PIPE-15 IN	603.00	LF		\$	
1060	00522		STORM SEWER PIPE-18 IN	564.00	LF		\$	
1070	00524		STORM SEWER PIPE-24 IN	24.00	LF		\$	
1080	00526		STORM SEWER PIPE-30 IN	303.00	LF		\$	
1090	00556		STORM SEWER PIPE-30 IN EQUIV	4.00	LF		\$	
1100	01200		PIPE CULVERT HEADWALL-12 IN	1.00	EACH		\$	
1110	01202		PIPE CULVERT HEADWALL-15 IN	2.00	EACH		\$	
1120	01204		PIPE CULVERT HEADWALL-18 IN	2.00	EACH		\$	
1130	01210		PIPE CULVERT HEADWALL-30 IN	2.00	EACH		\$	
1140	01450		S & F BOX INLET-OUTLET-18 IN	1.00	EACH		\$	
1150	01456		CURB BOX INLET TYPE A	12.00	EACH		\$	
1160	01480		CURB BOX INLET TYPE B	1.00	EACH		\$	
1170	01496		DROP BOX INLET TYPE 3	1.00	EACH		\$	
1180	01529		DROP BOX INLET TYPE 6D	3.00	EACH		\$	
1190	01544		DROP BOX INLET TYPE 11	1.00	EACH		\$	
1200	01580		DROP BOX INLET TYPE 15	2.00	EACH		\$	
1210	01719		ADJUST INLET	1.00	EACH		\$	
1220	01740		CORED HOLE DRAINAGE BOX CON-4 IN	3.00	EACH		\$	
1230	01743		CORED HOLE DRAINAGE BOX CON-12 IN	1.00	EACH		\$	
1240	01756		MANHOLE TYPE A	4.00	EACH		\$	
1250	01767		MANHOLE TYPE C	6.00	EACH		\$	
1260	02600		FABRIC GEOTEXTILE TY IV FOR PIPE	2,326.00	SQYD	\$2.00	\$	\$4,652.00
1270	23822EC		CORED HOLE DRAINAGE BOX CON-15 IN	2.00	EACH		\$	
1280	24814EC		PIPELINE INSPECTION	1,540.00	LF		\$	

Section: 0004 - SEWER

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
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PROPOSAL BID ITEMS

181401

Report Date 5/15/18

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1290	15000		S BYPASS PUMPING	1.00	EACH		\$	
1300	15086		S LATERAL CLEANOUT	5.00	EACH		\$	
1310	15090		S LATERAL SHORT SIDE 06 INCH	5.00	EACH		\$	
1320	15092		S MANHOLE	6.00	EACH		\$	
1330	15093		S MANHOLE ABANDON/REMOVE	1.00	EACH		\$	
1340	15095		S MANHOLE CASTING STANDARD	5.00	EACH		\$	
1350	15096		S MANHOLE CASTING WATERTIGHT	1.00	EACH		\$	
1360	15104		S PIPE DUCTILE IRON 08 INCH	633.00	LF		\$	

Section: 0005 - SIGNING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1370	06406		SBM ALUM SHEET SIGNS .080 IN	381.00	SQFT		\$	
1380	06407		SBM ALUM SHEET SIGNS .125 IN	146.00	SQFT		\$	
1390	06410		STEEL POST TYPE 1	831.00	LF		\$	

Section: 0006 - SIGNALIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1400	04792		CONDUIT-1 IN	75.00	LF		\$	
1402	04793		CONDUIT-1 1/4 IN (PLANNING LOOPS) (ADDED: 5-15-18)	10.00	LF		\$	
1404	04795		CONDUIT-2 IN (PLANNING LOOPS) (ADDED: 5-15-18)	10.00	LF		\$	
1410	04811		ELECTRICAL JUNCTION BOX TYPE B	5.00	EACH		\$	
1411	04811		ELECTRICAL JUNCTION BOX TYPE B (PLANNING LOOPS) (ADDED: 5-15-18)	1.00	EACH		\$	
1420	04820		TRENCHING AND BACKFILLING	245.00	LF		\$	
1421	04820		TRENCHING AND BACKFILLING (PLANNING LOOPS) (ADDED: 5-15-18)	15.00	LF		\$	
1430	04830		LOOP WIRE	3,840.00	LF		\$	
1431	04830		LOOP WIRE (PLANNING LOOPS) (ADDED: 5-15-18)	1,000.00	LF		\$	
1440	04844		CABLE-NO. 14/5C	3,513.00	LF		\$	
1450	04845		CABLE-NO. 14/7C	709.00	LF		\$	
1460	04850		CABLE-NO. 14/1 PAIR	2,549.00	LF		\$	
1470	04885		MESSENGER-10800 LB	575.00	LF		\$	
1480	04895		LOOP SAW SLOT AND FILL	1,320.00	LF		\$	
1481	04895		LOOP SAW SLOT AND FILL (PLANNING LOOPS) (ADDED: 5-15-18)	185.00	LF		\$	
1490	04931		INSTALL CONTROLLER TYPE 170	2.00	EACH		\$	
1500	04932		INSTALL STEEL STRAIN POLE	8.00	EACH		\$	
1510	06472		INSTALL SPAN MOUNTED SIGN	4.00	EACH		\$	
1520	20093NS835		INSTALL PEDESTRIAN HEAD-LED	12.00	EACH		\$	

PROPOSAL BID ITEMS

181401

Report Date 5/15/18

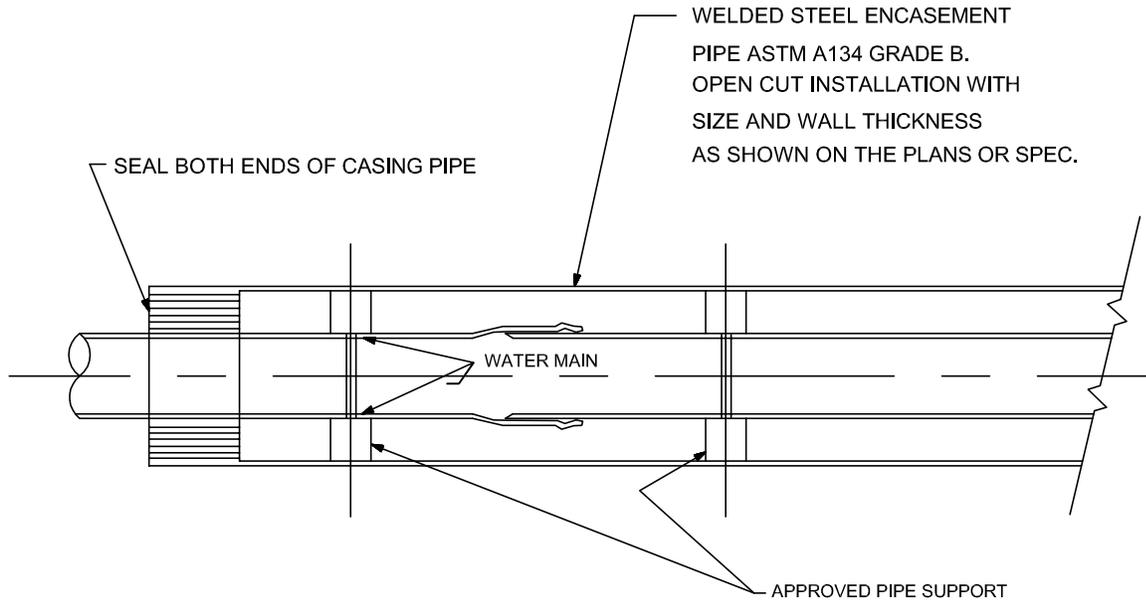
LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1530	20094ES835		TEMP RELOCATION OF SIGNAL HEAD	24.00	EACH		\$	
1540	20188NS835		INSTALL LED SIGNAL-3 SECTION	8.00	EACH		\$	
1550	20189NS835		INSTALL LED SIGNAL-5 SECTION	4.00	EACH		\$	
1560	20266ES835		INSTALL LED SIGNAL- 4 SECTION	3.00	EACH		\$	
1565	20360ES818		WOOD POST (PLANNING LOOPS) (ADDED: 5-15-18)	1.00	EACH		\$	
1570	20390NS835		INSTALL COORDINATING UNIT	3.00	EACH		\$	
1575	20468EC		ELECTRICAL JUNCTION BOX-10 X 8 X 4 (PLANNING LOOPS) (ADDED: 5-15-18)	1.00	EACH		\$	
1580	21743NN		INSTALL PEDESTRIAN DETECTOR	12.00	EACH		\$	
1590	23157EN		TRAFFIC SIGNAL POLE BASE	32.44	CUYD		\$	
1600	23222EC		INSTALL SIGNAL PEDESTAL	6.00	EACH		\$	
1610	24900EC		PVC CONDUIT-1 1/4 IN-SCHEDULE 80	285.00	LF		\$	
1620	24901EC		PVC CONDUIT-2 IN-SCHEDULE 80	105.00	LF		\$	
1630	24955ED		REMOVE SIGNAL EQUIPMENT	1.00	EACH		\$	

Section: 0007 - WATERLINE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1640	14008		W ENCASMENT STEEL BORED RANGE 3	43.00	LF		\$	
1650	14010		W ENCASMENT STEEL BORED RANGE 5	67.00	LF		\$	
1660	14019		W FIRE HYDRANT ASSEMBLY	1.00	EACH		\$	
1670	14020		W FIRE HYDRANT RELOCATE	4.00	EACH		\$	
1680	14030		W METER RELOCATE	1.00	EACH		\$	
1690	14036		W PIPE DUCTILE IRON 06 INCH	115.00	LF		\$	
1700	14039		W PIPE DUCTILE IRON 12 INCH	1,394.00	LF		\$	
1710	14074		W PLUG EXISTING MAIN	2.00	EACH		\$	
1720	14090		W TAPPING SLEEVE AND VALVE SIZE 2	2.00	EACH		\$	
1730	14094		W TIE-IN 06 INCH	1.00	EACH		\$	
1740	14097		W TIE-IN 12 INCH	1.00	EACH		\$	
1750	14105		W VALVE 06 INCH	2.00	EACH		\$	
1760	14108		W VALVE 12 INCH	3.00	EACH		\$	
1770	14113		W VALVE BOX ADJUST	5.00	EACH		\$	
1780	14120		W VALVE CUT-IN 12 INCH	1.00	EACH		\$	
1790	14149		W SERV COPPER SHORT SIDE 1 IN	1.00	EACH		\$	
1800	15094		S MANHOLE ADJUST TO GRADE	3.00	EACH		\$	

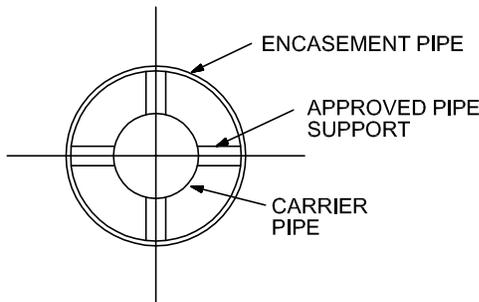
Section: 0008 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1810	02568		MOBILIZATION	1.00	LS		\$	
1820	02569		DEMOBILIZATION	1.00	LS		\$	



1. ALL CARRIER PIPE PLACED IN STEEL CASING PIPE SHALL BE A MINIMUM CLASS 50 DUCTILE IRON PIPE AND CONFORM TO THE LATEST EDITION OF AWWA C151.
2. CARRIER PIPE GASKETS SHALL DEVELOP A WEDGING ACTION BETWEEN PAIRS OF HIGH STRENGTH STAINLESS STEEL ELEMENTS SPACED AROUND THE GASKET (FIELD LOK, FASTGRIP, OR APPROVED EQUAL GASKETS).

NOTE: CASING PIPE JOINTS SHALL BE SEAM WELDED SO THAT CASING IS WATER TIGHT FROM END TO END.

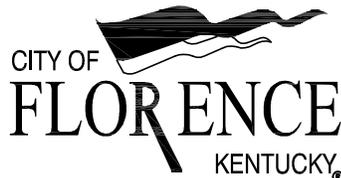


Nominal Diameter Casing Pipe	Normal Wall Thickness
Under 350 mm (14")	0.251"
350 & 400 mm(14"&16")	0.282"
450 mm (18")	0.313"
500 mm (20")	0.344"
550 mm (22")	0.375"
600 mm (24")	0.407"
650 mm (26")	0.438"
700 & 750 mm(28"&30")	0.469"
800 mm (32")	0.501"
850 & 900 mm(34"&36")	0.532"
950 - 1050mm(38,40&42")	0.563"
1200 mm (48")	0.626"

ENCASEMENT PIPE DETAIL

N.T.S.

REVISION	BY	DATE

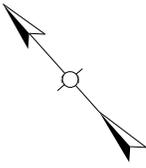


CITY OF FLORENCE
8100 EWING BLVD.
FLORENCE, KENTUCKY 41042
Ph: (859) 647-5416
Fax: (859) 647-5438

DATE: 2014
STANDARD DRAWING NO: 114

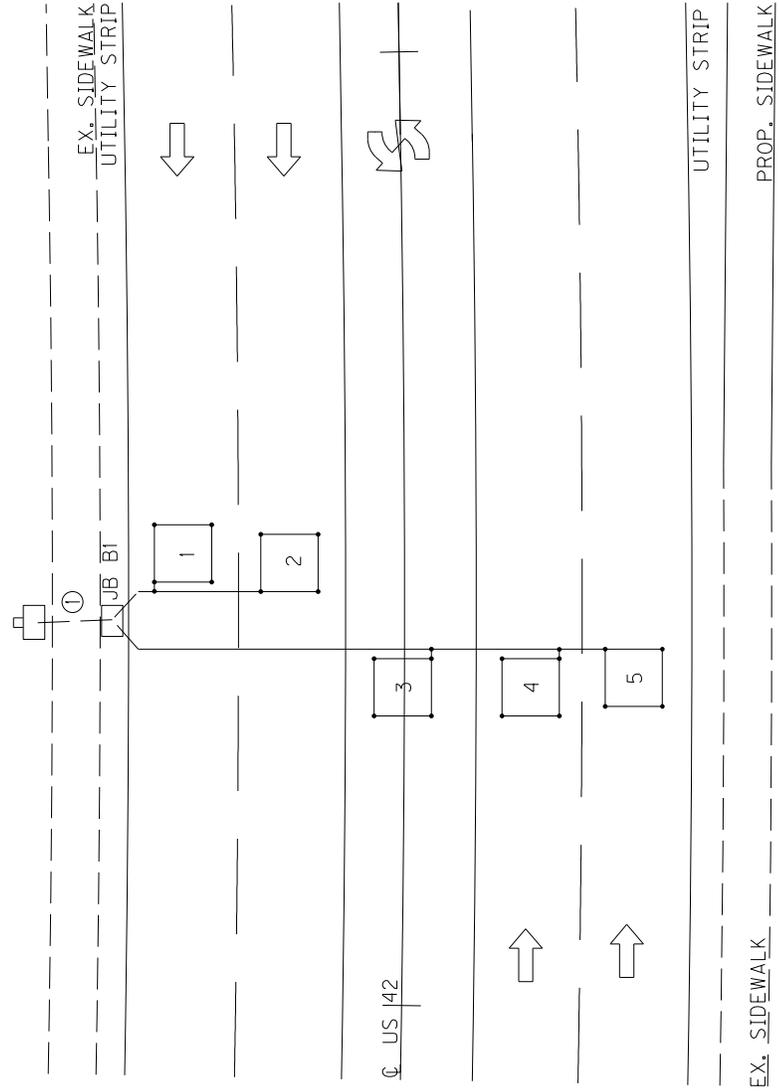
BOONE CO. US 42 m.p. 12.77
~LAT/LONG N 38.97565, W 84.65945
STATION B88

BOONE COUNTY
STP 8124 (022)



463+00

464+00



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 CENTERED IN THEIR RESPECTIVE LANE. LOOPS SHALL BE INSTALLED SPLICE-FREE TO THE CABINET. A MINIMUM OF 2' OF WIRE FOR EACH SENSOR SHALL BE COILED INSIDE THE JUNCTION BOX AND CABINET. ALL LOOPS SHALL BE LABELED IN THE JUNCTION BOX AND CABINET. DIVISION OF PLANNING PERSONNEL WILL CONNECT THE LOOPS INSIDE THE CABINET.

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

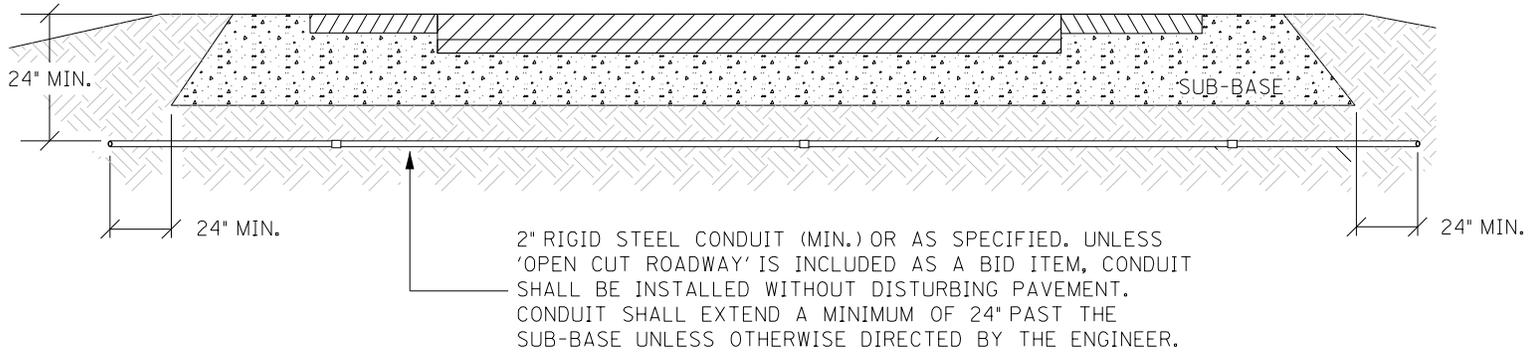
INSTALL TWO (1) TYPE B JUNCTION BOX (B1).

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

CODED NOTE:

- ① INSTALL ONE (1) 2" CONDUIT.

REMOVE ALL EX. TRAFFIC DATA COLLECTION EQUIPMENT (CABINETS, WOOD POSTS, JUNCTION BOXES, WIRE, CONDUIT) NOT TO BE REUSED AND DISPOSE OF OFF THE PROJECT.

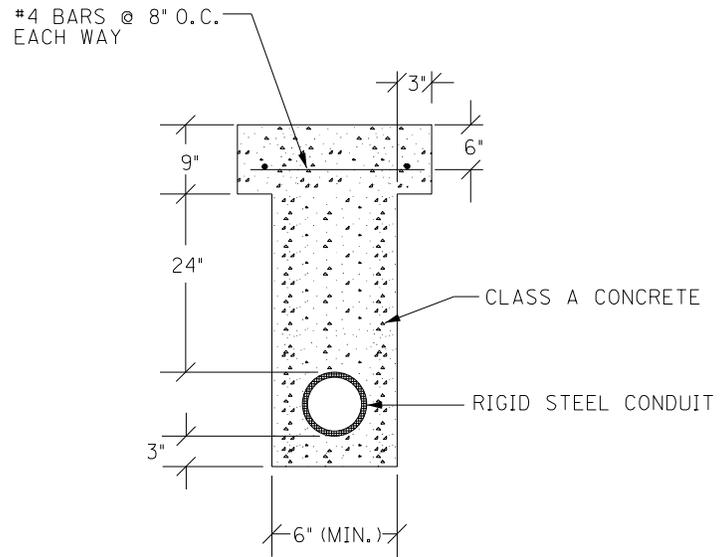
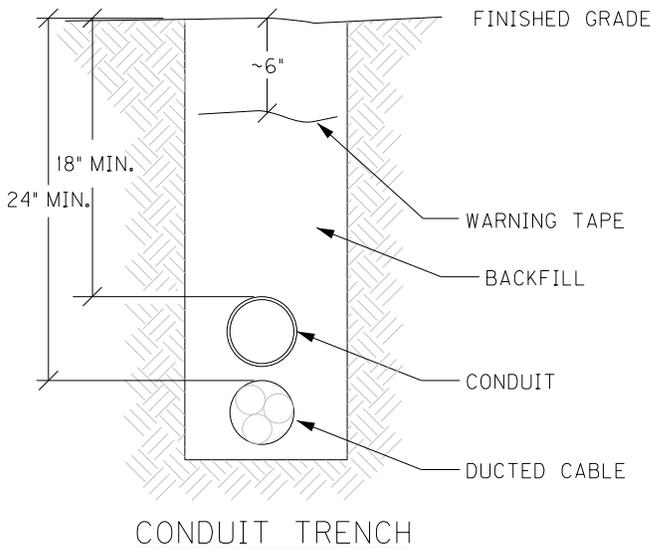


CONDUIT UNDER PAVEMENT

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.

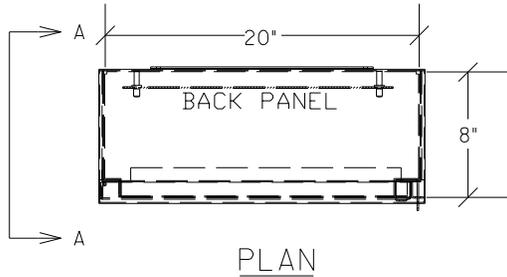
CONTRACTOR SHALL PLACE BACKFILL IN LIFTS (9" MAX.) COMPACT BACKFILL, AND RESTORE DISTURBED AREA TO THE SATISFACTION OF THE ENGINEER

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

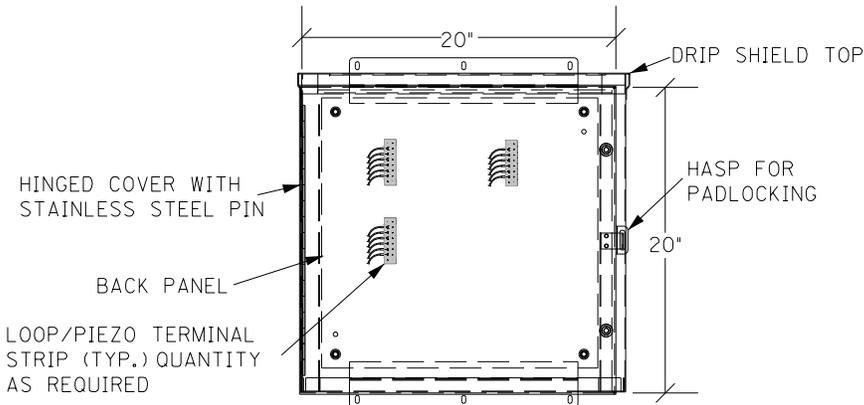
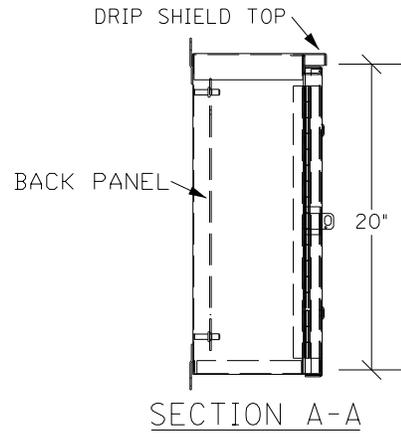


OPEN CUT PAVEMENT DETAIL

CONDUIT INSTALLATION

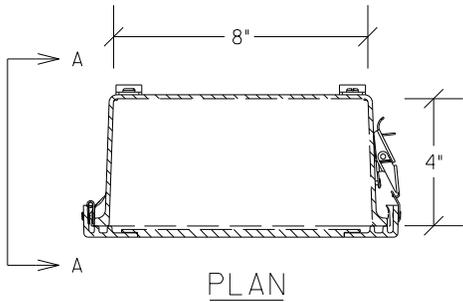


PLAN

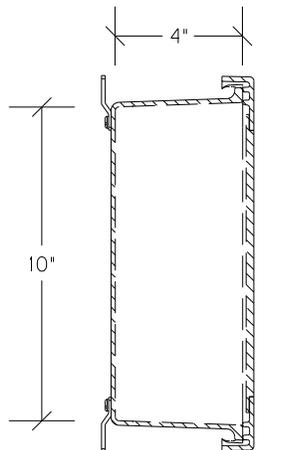


ELEVATION

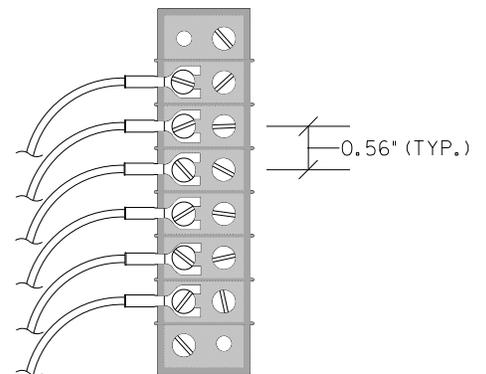
GALVANIZED STEEL CABINET



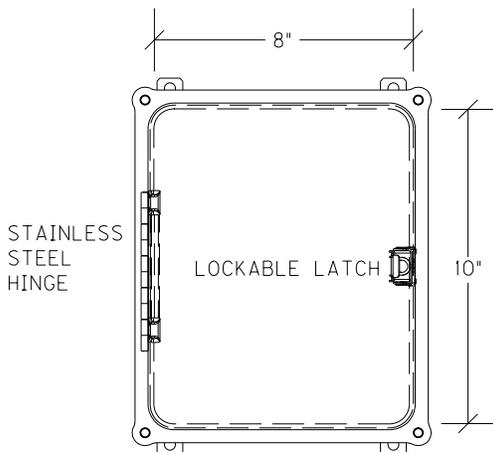
PLAN



SECTION A-A



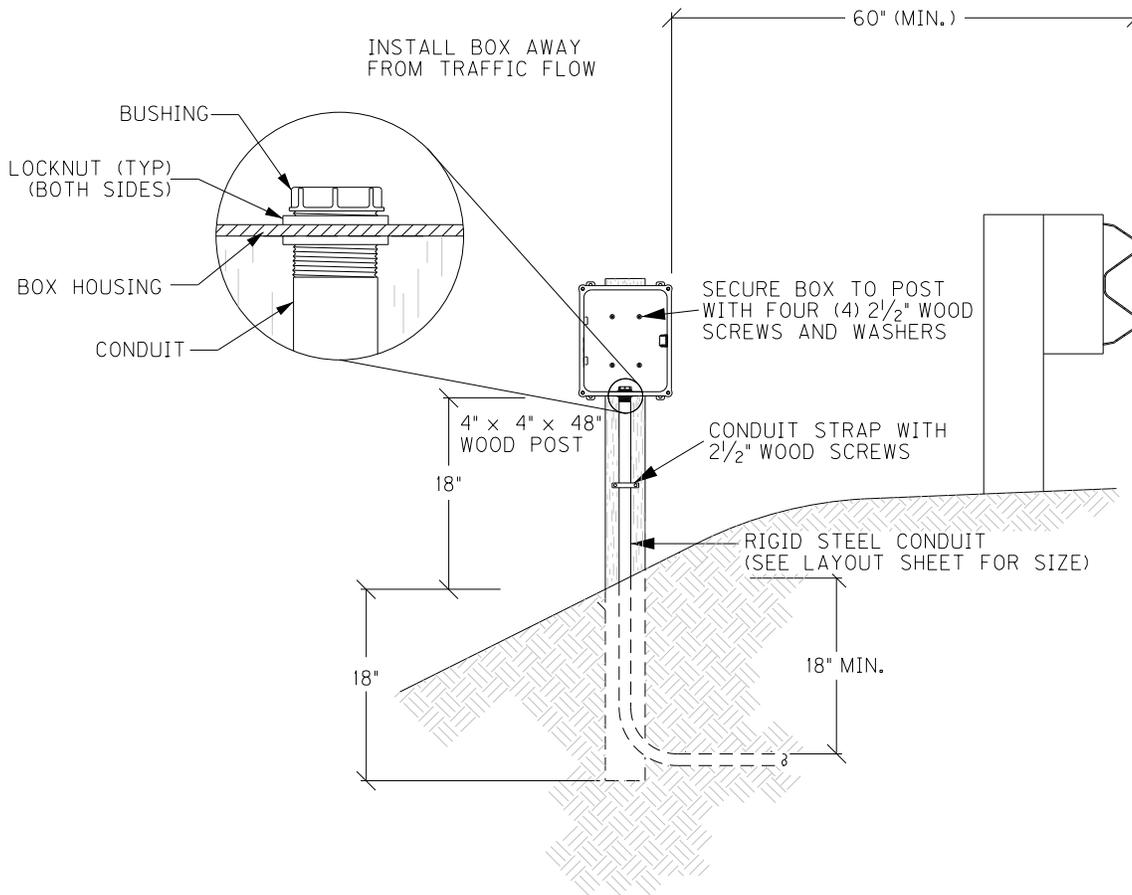
TERMINAL STRIP (TYP.)



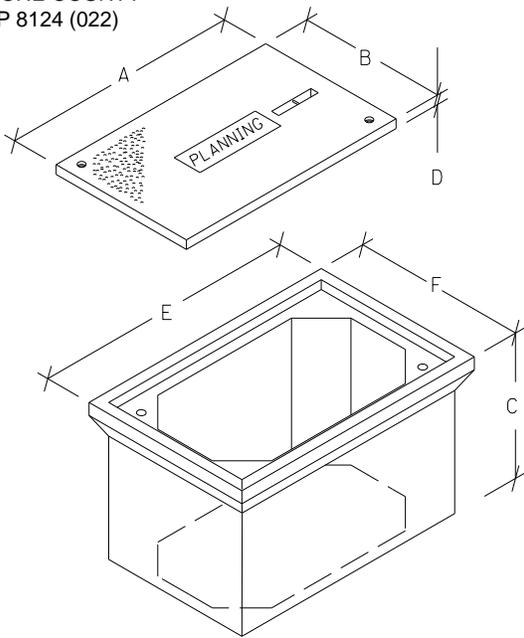
ELEVATION

JUNCTION BOX 10"X8"X4"

JUNCTION BOX/POST ASSEMBLY LOCATED BEHIND
GUARDRAIL SHALL BE A MINIMUM OF 60" FROM
THE FACE OF THE GUARDRAIL

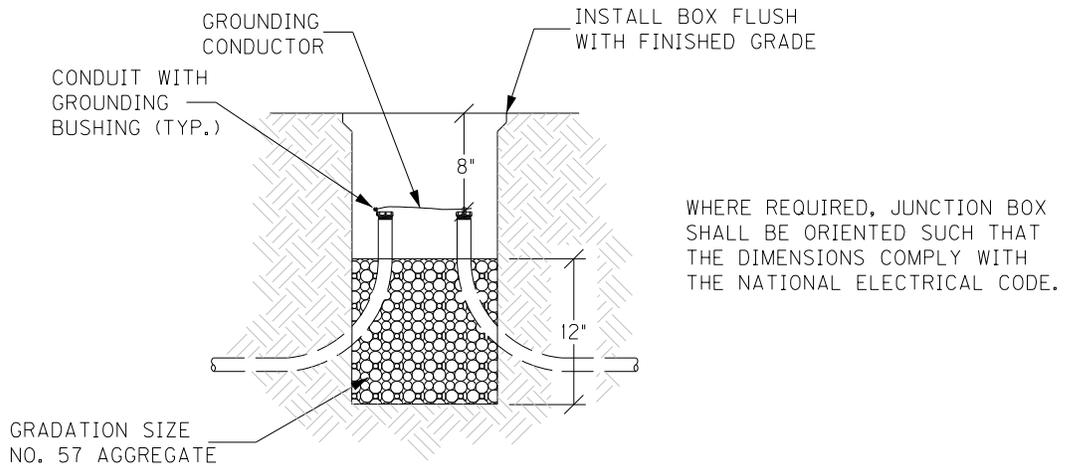


JUNCTION BOX 10" x 8" x 4"
AND POST ASSEMBLY



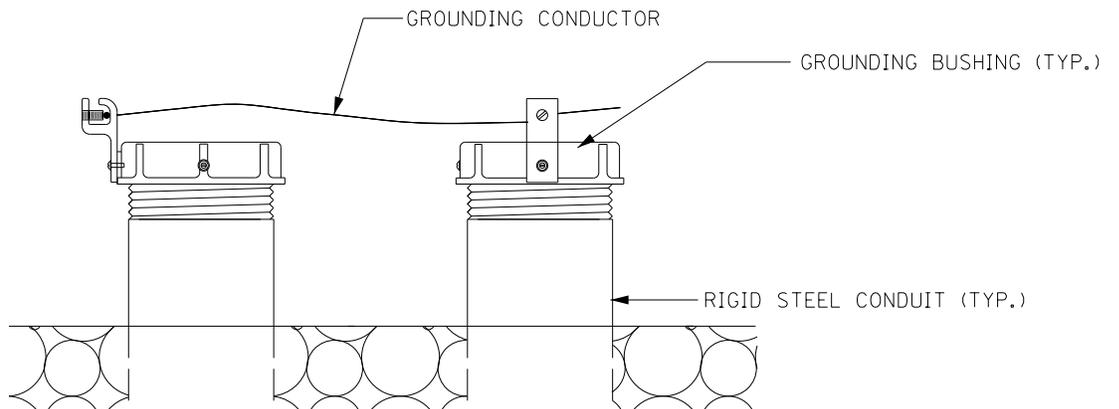
JUNCTION BOX DIMENSIONS (NOMINAL)						
	A	B	C	D*	E	F
TYPE A	23"	14"	18"	2"	25"	16"
TYPE B	18"	11"	12"	1¾"	20"	13"
TYPE C	36"	24"	30"	3"	38"	26"

* MINIMUM
STACKABLE BOXES ARE PERMITTED



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

ELEVATION

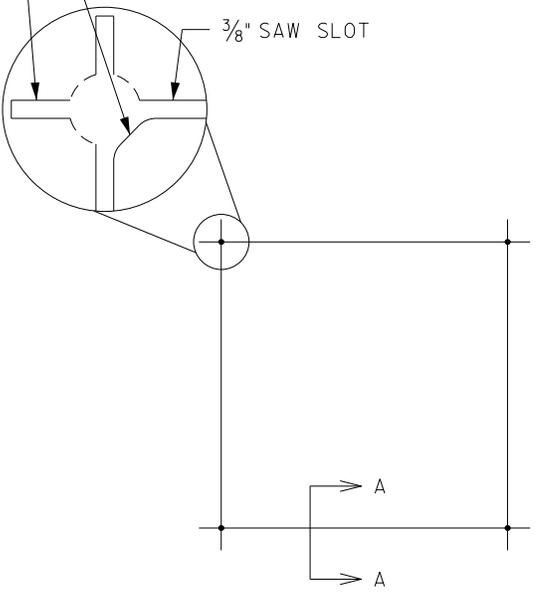


GROUNDING DETAIL

JUNCTION BOX - TYPE A, TYPE B, TYPE C

BOONE COUNTY
STP 8124 (022)

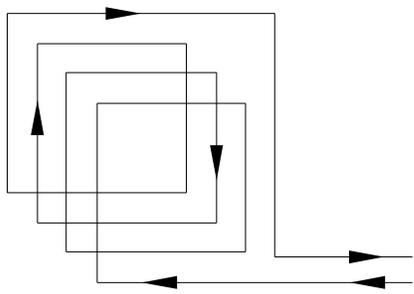
EXTEND CUT BEYOND CORNER
TO ACHIEVE FULL DEPTH
CORE DRILL 1 1/2" HOLE AND/OR
CHISEL CORNER TO SLOT DEPTH
TO ELIMINATE SHARP EDGES



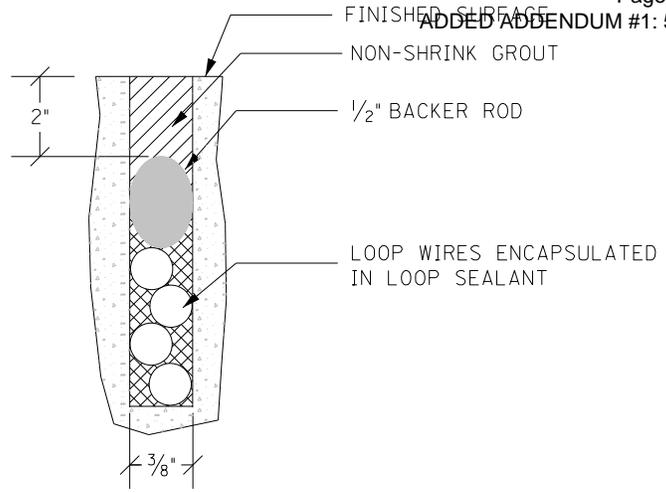
SAW CUT PLAN

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

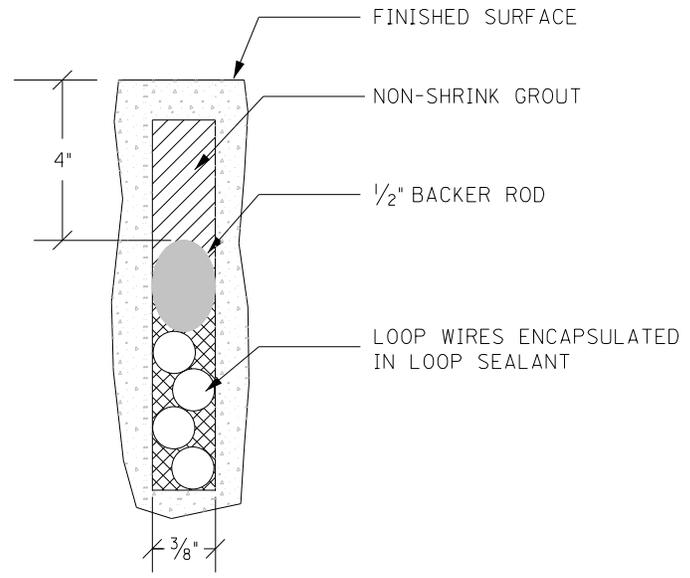
ADJACENT SAW SLOTS SHALL BE A MINIMUM OF 12" APART.



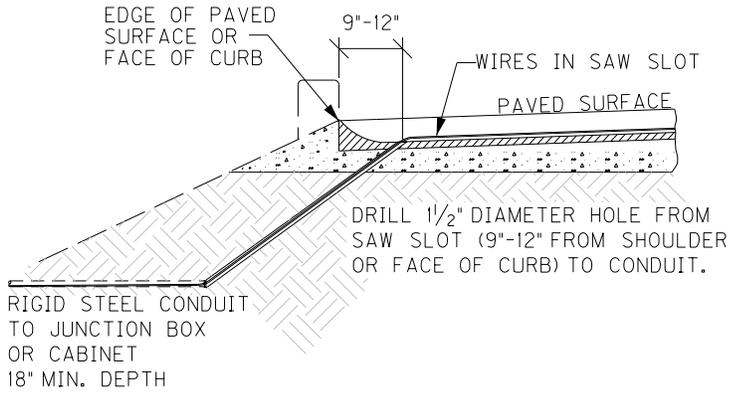
WIRING PLAN



SECTION A-A (CONCRETE)



SECTION A-A (ASPHALT)



SAW SLOT EDGE OF PAVEMENT TRANSITION

INDUCTIVE LOOP DETECTOR

Permanent Traffic Data Acquisition Station
Estimate Of Quantities**PERMANENT TRAFFIC DATA ACQUISITION STATIONS
ESTIMATE OF QUANTITIES**

Bid Item Code	Description	Unit	Quantity
2562	SIGNS	SQ FT	
2650	MAINTAIN AND CONTROL TRAFFIC	LP SUM	
2775	FLASHING ARROW	EACH	
4791	CONDUIT ¾ INCH	LIN FT	
4793	CONDUIT 1 ¼ INCH	LIN FT	10
4795	CONDUIT 2 INCH	LIN FT	10
4810	JUNCTION BOX	EACH	
4811	JUNCTION BOX TYPE B	EACH	1
4820	TRENCHING AND BACKFILLING	LIN FT	15
4821	OPEN CUT ROADWAY	LIN FT	
4829	PIEZOELECTRIC SENSOR	EACH	
4830	LOOP WIRE	LIN FT	1000
4850	CABLE NO. 14/1 PAIR	LIN FT	
4871	POLE – 35’ WOODEN	EACH	
4895	LOOP SAW SLOT AND FILL	LIN FT	185
4899	ELECTRICAL SERVICE	EACH	
20213EC	INSTALL PAD MOUNT ENCLOSURE	EACH	
20359EC	GALV STEEL CABINET	EACH	
20360ES818	WOOD POST	EACH	1
20391ES835	JUNCTION BOX TYPE A	EACH	
20392ES835	JUNCTION BOX TYPE C	EACH	
20468EC	JUNCTION BOX 10x8x4	EACH	1
21543EN	BORE AND JACK PIPE – 2 IN	LIN FT	
23206EC	INSTALL CONTROLLER CABINET	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.

Material, Installation, and Bid Item Notes for
Permanent Traffic Data Acquisition Stations

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 0.38C 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/m ³ ; 6 lbs/ft ³ |
| • 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 ¾ inch side and end knockouts and a 1½ inches deep, single-receptacle cover to house the GFCI receptacle. Box and cover shall be hot rolled, galvanized steel with a minimum thickness of 0.62 inches.

2.12. Grounding**2.12.1. Ground Rod**

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

2.12.2. Ground Rod Clamp

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

2.13. Grout**2.13.1. Grout for Inductive Loop Installation**

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

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

2.13.2. Grout for Piezoelectric Sensor Installation

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

2.14. Hardware

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

2.14.1. Conduit Strap

Conduit strap shall be double-hole, stainless steel, and sized to support specified conduit. Conduit strap shall attach to wood pole or post with two 2 1/4 inch wood screws.

2.14.2. Mounting Strap for Pole Mount Cabinet

Mounting strap for pole mount cabinet shall be 3/4 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 stainless steel screws, hinge(s) and pin(s) and shall be equipped with a stainless steel 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 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 connectors 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 from 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 at least 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. Loops – Existing

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 +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. This item shall include concrete, asphalt or approved replacement material for sidewalks, curbs, roadways, etc. (if required).

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'
Pad Mount Cabinet (332)	8'
Pole Mount Cabinet (336)	4'
Junction Box Type 10x8x4	2'
Junction Box Type A, B, or C	2'

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.

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.