SECTION 02742

LOOP DETECTORS

02742.01 GENERAL

A. Description

Loop detector installation shall include, but not necessarily be limited to, furnishing and installing loop detector wires and leads and flexible PVC tubing loop detectors, including saw cuts and sealer, within and alongside the roadway, between the detector location and the nearest terminal point as shown on the Plans and in accordance with the Contract Documents or as directed by the Engineer.

B. Related Work Included Elsewhere

1. General electrical work; Section 02730.

2. Electrical cable; Section 02735.

C. Quality Assurance

1. The Engineer will inspect all materials and work to ensure compliance with the Contract Documents.

2. All loops shall be tested for continuity by a method approved by the Engineer before sealing.

D. Submittals

1. Shop Drawings

   Shop drawings shall be submitted as specified in the "General Provisions" for all loop detector wire that shall include general product information and jacket thickness and all PVC tubing.

2. Certified Test Results

   Certified test results shall be submitted for the loop detector sealer showing that the material meets the requirements specified in Section 02742.02.

02742.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any materials for loop detectors.

B. Contractor's Options

None.

C. Detailed Material Requirements

1. Loop Wire Cable

   Loop wire cable to be used within a roadway saw cut to form an area of detection shall be single conductor No. 14 AWG, 19 stranded, and shall meet the requirements of Underwriter's Laboratories Type THHN.

2. PVC Tubing

   PVC tubing for loop detectors shall meet the following:

   UL rated: VW-1, 105°C
   Wall thickness: 0.031 inch ± 0.0003 inch
   Inner diameter: nominal 0.186 inch
   minimum 0.182 inch
   maximum 0.190 inch
   Dielectric strength: 900 V/MC
   Moisture absorption: less than 1%

3. Sealer for Loop Detector

   Sealer material for sealing saw cuts made for loop detector wires shall meet the following requirements:

Test and Method	Specification Limits
Viscosity, Cone and Plate Viscometer, CPS at 25°C, max.	1200
Pot Life at 25°C, minutes, min.	13
Cure, Time at 25°C, hr, no tackiness, min.	1
Hardness, Durometer Shore D, ASTM D 2240, min.	60
Tensile Elongation, ASTM D 638, % min.	100
Water Absorption, 24 hr, ASTM D 570, % max.	0.2
Oil Absorption, ASTM D 471, % max.	0.03
Volume Resistivity at 25°C, ASTM D 257, OHM-CM, min.	5.1 x 10 (1013)

   Sand to be mixed with the sealer shall meet the requirements of Section 02651.02.

02742.03 EXECUTION

A. Saw Cuts

The detector loop shall be installed in a sawed slot 3/8" Wide x 1-3/4" to 2" Deep cut in the roadway surface. A 1-1/4" diameter drilled hole shall be made in the pavement at each intersection of saw cuts to prevent sharp bends of the wire. The intersection of saw cut shall overlap so that the slots have full depth and a smooth bottom. When installing the detector loop, the weather shall be clear and dry and the sawed slot shall be completely clean of dust and debris and thoroughly dried. Saw cutting at curb shall not be permitted.

B. Loop Lead-In Wire

Loop lead-in wire shall consist of one continuous run with no splices.

Loop lead-in wires terminating in the controller or detector cabinet shall be twisted and uniquely identified by an insulated waterproof sleeve slipped over the wire before attachment of a lug connector.

The two wires from the loop saw cut, which form the lead-in wires, shall be twisted together with a minimum of one turn per foot from the end of the saw cut to the terminal point as shown.

Loop Lead-in wire shall be installed in conduit as shown on the Plans, between the roadway edge and the terminal point.

Loop wire shall be installed at the bottom of the saw slot. A blunt instrument shall be used to seat the loop wire at the bottom of the slot or channel. No sharp tools shall be used for this purpose. The wire shall have no kinks or curls and no straining or stretching of the insulation around the corner of the slot or in the handbox or pole base.

Wire with cuts, breaks, or nicks in the insulation will not be accepted. All loops shall be wound in a counterclockwise direction.

After placing the wire, it shall be rechecked for slack, raised portions, and tightness.

C. Sealer

The sealer shall be applied according to the manufacturer's directions and specifications.

The sealer shall be poured into clean, dry saw cuts when the temperature is at least 50°F. The sealer shall not be poured during precipitation of any kind or when the temperature can be expected to fall below 50°F within one hour after the sealer is poured.

In applying the sealer, the Contractor shall ensure that there is minimum spillover on the roadway along the saw cut.

When the sealer hardens, there shall be a smooth surface with no bulges or depressions.

The Contractor shall make certain that the sealer is hardened before allowing traffic to move over the area.

02742.04 METHOD OF MEASUREMENT

A. Loop Detector Cable

Measurement for loop detector cable will be made of the length installed.

B. Saw Cuts

Measurement for saw cuts will be made of the length of saw cut occupied by the loop detector cable.

02742.05 BASIS OF PAYMENT

A. General

1. Payment will be made at the unit prices bid. The prices bid shall include furnishing and installing all miscellaneous hardware for loop detector cable installation, and furnishing all labor, tools, equipment, and materials necessary to complete the work as shown and specified, in strict accordance with the Contract Documents and accepted by the Engineer.

2. Payment will be made for contingent items when ordered by the Engineer. Payment will be as specified in Sections 02951, 02952, 02953, 02954, 02955, 02956, and 02957.

B. Loop Detector Cable

Payment for loop detector cable will be made at the price bid per linear foot of loop detector wire actually installed.

C. Saw Cuts

Payment for saw cuts will be made at the price bid per linear foot of saw cut.