

VEHICLE DETECTION**PART 1 - GENERAL****1.01 SECTION INCLUDES**

Pavement saw cutting, detector loop wire materials, placement, connection to lead-in, and loop sealant designated for installation of inductive loop detector in the project plans, or by the Engineer.

PART 2 - PRODUCTS**2.01 LOOP DETECTOR SEALANT**

- A. Sealant shall be rapid cure, high viscosity, liquid epoxy, or approved equal, formulated for use in sealing inductive wire loops and leads embedded in HMA and PCC. The sealant shall be usable on grades of 15% or less without excessive flow of material.
- B. Sealant shall be two component system which consists of a resin constituent identified as pourable, and a hardener identified as quick-setting. Approval of other sealants shall be based on specifications and/or test data regarding physical properties, performance properties and chemical resistance.
- C. Cured sealant shall be unaffected by oils, gasoline, grease, acids and most alkalis. The mixing of components and the filling of the cut shall be in accordance with the directions of the manufacturer.

2.02 SPLICE KIT

As an acceptable alternate, the Contractor may use a 3M Company Scotchcast Kit, "Cat's Eye's" mechanical splices, or approved equal, for splices.

PART 3 - EXECUTION**3.01 LOOP DETECTOR INSTALLATION**

- A. Obtain Engineer approval of loop locations prior to saw cutting.
- B. Saw shall be equipped with a depth gauge and horizontal guide to assure proper depth and alignment of the slot. Provide a clean, straight, well-defined saw cut without damage to adjacent areas. Overlap saw cuts to provide full depth at corners.
- C. Remove jagged edges or protrusions in the saw cuts before installing loop wire. The saw cuts must be cleaned to remove cutting dust, grit, oil, moisture or other contaminants. Flush saw cuts clean with a stream of water under pressure, and dry the slots using oil-free compressed air.
- D. Install detector loop wire in the bottom of the saw cut. If necessary, hold down by means of a material such as tape or doubled-over pieces of the plastic tubing.
- E. The field loop conductors and tubing shall be continuous from the terminating handhole or base with no splices permitted. At the time of placing the loop wire in the saw cuts, the ends of the tubing shall be sealed to prevent any entrance of moisture into the tubing. Loop wires and tubing that are not embedded in the pavement shall be twisted with at least five turns per foot.

3.01 LOOP DETECTOR INSTALLATION (Continued)

- F. Label each loop with durable tags corresponding to loop numbering as shown on the plans. Loops which are physically adjacent in an individual lane or adjacent lanes shall be wound with opposite rotation (i.e. #1 CW, #2 CCW, #3 CW, etc.). Rotation reversal can be accomplished by reversing leads at the handhole.
- G. Solder electrical splice between the detector lead-in cable and the loop wire using resin core solder. Provide a watertight protective covering for the spliced wire, the shielding on the detector lead-ins and the end of the tubing containing the loop wires. The use of open flame to heat the wire connection will not be permitted. The Contractor shall use a soldering iron, gun, or torch equipped with a soldering tip. The splice shall be made by the following method:
1. Remove lead-in cable coverings and expose 4 inches of insulated wire.
 2. Remove insulation from each conductor of detector lead-in cable and scrape both copper conductors with knife until bright.
 3. Remove the plastic tubing from the loop wires for 1 1/2 inches.
 4. Remove the insulation from the loop wires and scrape both copper conductors with knife until bright.
 5. Wash the exposed copper conductors with turpentine spirits to clean the conductors.
 6. Connect conductors by a soldered "Western Union" type splice, wrapped with waterproof tape and coated with a watertight protective covering.
 7. Cover the exposed shielding, ground wire and end of any unused loop lead-in where the sheathing was cut, with liquid silicone rubber. Apply Butyl Rubber Polymer Tape sealant between the wires and completely cover the silicone rubber.
- H. Meter the installed loops by test instruments capable of measuring electrical values of loop wires and lead-ins to measure induced AC voltage, inductance in microhenries, high-low "Q" indication, leakage resistance in megohms, and the resistance of the conductors in ohms. Provide the Engineer a report on company letterhead indicating the inductance and leakage to ground test values for each loop. An inductance and leakage to ground test shall also be conducted and reported for the total detector lead-in and loop system with the test being conducted at the controller cabinet. Before beginning the required test period, the Engineer may independently meter any or all loops. Should any loop be found unacceptable, the Contractor may be required to complete additional tests, as required, at his own expense. An acceptable loop installation shall be defined as follows:
1. Inductance: The inductance reading on the loop tester is approximately the calculated value.
 2. Leakage to Ground: Deflection of the pointer to above 100 megohms.
 3. Resistance: The resistance of the circuit is approximately the calculated value.
- Any loop not meeting the requirements for an acceptable loop installation shall be repaired or replaced. The Contractor shall bear all costs of replacing loop installations deemed unsatisfactory by the Engineer.

END OF SECTION