ITEM 0221501

LOOP DETECTOR SAW CUT

DESCRIPTION

Work under this item shall consist of removing existing loop detectors and existing treadles (pressure sensitive detectors), providing loop detector saw cuts and furnishing and installing loop vehicle detectors as shown on plans and in conformity with these specifications and details.

REFERENCED ITEMS

Items 010400 and 010430

REQUIRED SUBMITTALS

Shop Drawings:

Submit 5 copies of shop drawings for loop detectors, sealant and accessories in accordance with the contract general requirements.

MATERIALS

1. **LOOP DETECTOR WIRE**

Loop Detector Wire shall meet the material requirements of Article M.16.12.2.A of The State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction (Form 816)

2. **PLASTIC COMPOUND**

The plastic compound shall be "3M DETECTOR LOOP SEALANT" or approved equal with a one-part urethane elastomeric compound requiring no mixing, measuring or application of heat prior to or during its installation.

3. **PLASTIC CONDUIT**

Plastic Conduit shall meet the material requirements of Article M.16.12.2.C of The State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction (Form 816)

CONSTRUCTION METHODS

The Contractor shall unplug the loop vehicle detector from the controller; place controller on recall for the phase served by the detector and disconnect the loop lead wiring. Remove the existing treadle at locations shown on plans. When an existing pressure sensitive treadle detector to be removed, the pavement shall be restored.

Loop detectors installed in new or resurfaced pavements shall have the slots saw cut in the pavement base course and the loop wires placed and sealed before the placing of the pavement wearing course.

No loop detector sawcut shall be placed over a patched trench of existing pavement without the approval of the Engineer. The Contractor shall remove the existing pavement and replace it with new pavement for installation of the loop detectors, at the direction of and within the limits prescribed by the Engineer, where the condition of the existing pavement is not suitable for installation. This work shall be completed and paid for in accordance with items #010400 and #010470. The existing pavement shall be milled to the depth as ordered by the engineer. The replaced pavement shall be overlaid to two equal courses as directed. The loop detector shall be installed in the first course of the new pavement, under the final course or overlay.

The size of the loop shall be as shown on the plans and shall be made using a power saw having an abrasive or diamond blade 3/8 inch wide. The depth of the slot shall be 1-3/4 inches to two inches and shall extend from the loop to the location shown on the plan. The cuts shall overlap at the corners of the loop and at any angles in the saw cut to the handhole to ensure full depth. The corners are to be rounded off by drilling a 1-1/4 inch diameter hole to eliminate kinking of the wire. When the cutting has been completed, the slot shall be cleaned of all cutting dust and grit with oil free compressed air. The slot shall be completely dry before inserting the wire. The entire loop and lead-in shall consist of one continuous #14 stranded wire encased in tubing, unless otherwise shown on the plans. The lead-in wires shall be twisted together with at least five turns per foot and taped at two-foot intervals beginning at a point where the wire leaves the saw cut and enters the plastic conduit to the terminals in the controller cabinet or, when spliced to a two-conductor lead-in cable. The twisted wire shall remain together and shall not be coiled at any point. Splices will not be permitted at any point of the loop or lead-in unless otherwise indicated on the plans or as directed by the Engineer.

Each loop detector shall enter the handhole in a separate flexible plastic conduit. The minimum distance between the end of each loop detector saw cut at the curb should be ten inches. This would facilitate future replacement of individual loops.

At the time of installing the loop wire, the ends of the tubing shall be sealed to prevent any entrance of moisture into the tubing. When splices are required in handholes or junction boxes, they shall be made in accordance with the installation details. The saw cuts on all lead-ins shall be as shown on the plans or as directed by the Engineer. The number of turns of wire for each loop shall be as shown on the plans. After installation, the wire shall be checked for slack or raised portions in the roadway slot.

A paint mix stick or similar blunt instrument shall be used to push the wire in the slot. The wire shall be held in the slot with wooden pegs or inserting wedges formed from one inch sections of the plastic tubing, folded before insertion.

The loop should be tested prior to sealing the saw cut. An unacceptable loop installation would consist of leakage to ground below 10 megohms or an open circuit. The saw cut shall then be filled with plastic compound to a level of approximately 1/16 inch below the roadway surface. In no case shall the plastic compound overflow the saw cut and all excess material shall be removed. The plastic compound shall be applied in accordance with the manufacturer's recommendations. The plastic compound shall adhere to the sides of the saw cut and not show a separation when pressure is applied by a blunt instrument.

Each pair of lead-in wires in the cabinet shall be tagged and identified to determine phase and geographical location of the loop in the roadway. Example - "Phase 4 - East Bound Bank St. - Right Lane." When required, the splice shall be made in handholes, junction boxes, or "c" fittings and in accordance with procedure noted in the following paragraphs or as required by the Engineer. All wiring shall conform to the appropriate requirements for the National Electric Code and shall be insulated for six hundred (600) volts. Wire splicing will not be permitted in conduit or outside of junction boxes, hand holes, poles or pedestals, unless otherwise indicated on the plans.

All splicing in junction boxes, handholes, poles and pedestals can be accomplished by one of the following methods:

1. Splices can be made by soldering with the pouring or dipping method.

2. Non-insulated butt-type pressured connectors shall be seamless and be UL approved for aluminum or copper wire. The butt-type pressure connector shall be connected to the wire with an installing tool that is designed for butt-type pressure connectors. After crimping, all detector cable splices shall also be soldered. Each butt-type connector shall be insulated separately by applying layers of thermoplastic electrical insulating tape. The thermoplastic tape shall extend 1/2 inch beyond the conductor insulation and be lapped at 1/4 inch intervals. The entire completed splice shall have an application of layers of 30 mil high voltage

rubber self-fusing tape well over and equal to the original insulation. The splice shall then be covered with layers of thermoplastic electrical insulation tape not over 0.007 inch thick conforming to MIL-7798 and a coating of flexible insulating paint approved by the Engineer.

At least one foot of slack shall be left for each conductor at each splice. An approved type of water-tight splicing box may be used in lieu of the aforementioned, providing the box has sufficient number of terminals to accommodate the number of conductors to be spliced in the box.

When conductor and cables are pulled into conduits, all ends of conductors and cables shall be taped to exclude moisture, and shall be so kept until the splices are made or terminal appliances attached.

METHOD OF MEASUREMENT

The quantity to be paid for under this item shall be the actual number of linear feet of saw cut, measured along the center of the cut, with #14 stranded wire encased in tubing completely installed, tested and accepted in place. #14 stranded wire encased in tubing shall not be measured for payment separately but shall be included in the measurement for saw cut.

BASIS OF PAYMENT

Loop detector saw cut will be paid for at the contract unit price per linear foot for "LOOP DETECTOR SAW CUT" complete in place which price shall include removal of existing treadle, restoration of pavement, saw cut, #14 TW stranded wire (including that to handholes, traffic control foundations or controller cabinets), sealant, necessary fittings, flexible conduit, plastic compound, duct sealing compound, splicing and connecting, equipment, labor, materials and work incidental thereto.

PAY ITEM	DESCRIPTION	PAY UNIT
0221501	Loop Detector Saw Cut	LF