
Special Specification 6107

Loop Detector



1. DESCRIPTION

Repair and/or replacement of various components of detector loops and wiring in accordance with this Item and as shown on the plans.

2. MATERIALS

All materials that are to become part of the final work will be furnished by the Department unless otherwise specified in the General Notes and Specification Data Sheet(s). A list of required materials must be submitted to the Department at least 24 hr. in advance of the requested pickup date between the hours of 8:00 A.M. and 4:00 P.M., at sites designated in the General Notes and Specification Data Sheet(s).

The Contractor must not use any materials furnished by the Department on any work which is not required by and which does not constitute a part of the contract. Materials not used will be returned undamaged to the location from which the materials were obtained upon completion of the work.

Any unused or removed material deemed salvageable by the Engineer will remain the property of the Department and must be delivered to the location from which the materials were obtained upon completion of the work. Any material deemed not salvageable by the Engineer must be disposed of by the Contractor at a site(s) to be provided by the Contractor outside the highway right of way. The disposal site(s) will be approved by the Engineer.

3. WORK METHODS

For this Item the Contractor must install the following:

- 3.1. **Vehicle Detector Inductance Loop (Detector Loops).** For this Item, except fabricated loops, the Contractor must saw cut a groove from 5/16 in. to 3/8 in. wide to 2 in. deep for the loop and lead in conductor to the edge of the pavement. Pulse loops must be 6 ft. along the travel lane and 6 ft. wide. Presence loops must extend from 6 ft. to 150 ft. along the travel lane and 6 ft. wide. All loops are to be centered in the lane. After saw cutting the groove, the Contractor must place the loop conductor as shown on the plans.

If there is an existing loop in the concrete pavement to be replaced, the Contractor must rout out the loop, clean the existing saw cut to the satisfaction of the Engineer, then place the new loops in the existing saw cut.

If, in the opinion of the Engineer, the pavement is unsuitable for placing exposed conductor loops, the Contractor must install fabricated loops as directed by the Engineer.

Where existing conduit cannot be located, or where, in the opinion of the Engineer, the existing conduit is unusable, the Contractor must install new 1 in. conduit from the edge of the pavement to the nearest signal pole or pull box.

The Contractor, after installation of the loop, must check for continuity at the controller cabinet. Detection will be tested by using a simulation unit as described in the attached sheets.

- 3.2. **Installation of Detector Loop Wiring in Conduit.** This Item must include the placement of conduit. All conductors must be in conduit, except when in metal poles, unless otherwise shown on the plans.

Conduit terminating in posts or pedestal bases must extend vertically, 2 in. to 6 in. above the concrete foundation.

Each length of galvanized metal conduit, where used, must be reamed and threaded on each end and fittings must be made water tight. No reducer fittings must be used unless specifically shown on the plans. Where conduit is threaded in the field, a standard conduit cutting die with a 3/4 in. taper per foot will be used.

All conduit and fittings must have burrs and rough places smoothed and must be clean and free of obstructions before the conductor is installed. Ends of conduits must be capped or plugged until starting of wiring. The Contractor must draw a full size metal brush, attached by swivel joints to a pull tape, through metal conduit to insure that the conduit is clean and free of obstructions. The conduits must be placed as shown on the plans or as directed by the Engineer. Unless otherwise shown on the plans conduit placed in an open trench must be placed at least 18 in. deep.

Metal conduit to be placed under existing pavement, sidewalks, and driveways must be placed by jacking or boring.

If it is determined by the Engineer that it is impractical to place the conduit as outlined above due to unforeseen obstructions, written permission will be granted by the Engineer for the Contractor to cut the existing pavement.

The open end of all conduit or condulets terminated at the roadway edge, in pull boxes or beneath ground level, must be sealed with a sealant supplied by the Department. Sealant must be applied in accordance with the National Electrical Code.

Where conduit is to be placed under existing asphaltic pavement the jacking method is to be used unless written approval is given by the Engineer for placement of conduit by boring.

- 3.3. **Wiring.** Loop conductor must be continuous, without splices, except in the transformer base, handhole, nearest metal pole, or to the terminal points to the controller. Splices will be allowed in existing ground boxes only if there is a splice already in the ground box. Splices at points other than as stated above may be made only with the permission of the Engineer. All splices must be water tight.

The ends of all wires which are to be attached to terminal posts must be provided with solderless pressure connectors that meet the requirements of the National Electrical Code.

- 3.4. **Wire Splices.** Splices will not be permitted except as shown on the plans, unless the Engineer approves each individual splice. All allowed splices must be water tight. Splices must be insulated using thermosetting compound, heavy duty heat shrinkable tubing and sealant, or heavy duty heat shrinkable cable.

- 3.5. **Pull Boxes.** New pull boxes must be no more than 25 ft. from the edge of the pavement and set in such a manner that the existing conduit can be cut and terminated in the pull box. The cut conduit shall be bent upward in the pull box as shown on the plans. Splices will not be allowed in new pull boxes unless otherwise approved by the Engineer.

- 3.6. **Jacking and Boring.** Pits for jacking or boring must not be closer than 2 ft. to the back of the curb or the outside edge of the shoulder unless otherwise directed by the Engineer. The jacking and boring method used must not interfere with the operation of the street, highway, or other facility; and must not weaken or damage any embankment, structure, or pavement. Heavy jacks are to be used for jacking. Boring is to be done by mechanical means providing a maximum 1 in. overcut for the conduit to be placed. The use of water or other fluids in connection with the boring operation will be permitted only to the extent needed to lubricate cuttings. Water jetting will not be permitted.

- 3.7. **Preservation of Sod, Shrubby and Trees.** The Contractor will assume full responsibility for the preservation of all sod, shrubby and trees at the site during the installation. When it is necessary to remove any sod, shrubby or tree branches, the Contractor must obtain permission from the owner.

- 3.8. **Removal and Replacement of Curbs and Walks.** The Contractor must secure permission from the proper authority and the approval of the Engineer before cutting into or removing any walks or curbs, which might be required in making the installation.

After the work is completed the Contractor must restore any curbs or walks which have been removed to the equivalent of their original condition and to the satisfaction of the Engineer.

4. MEASUREMENT

This Item will be measured as follows:

- 4.1. **Saw Cut.** "Saw Cut" in pavement including installation of loop detector wire shall be measured by the foot of groove (new and existing) in the pavement.
- 4.2. **Installation of Loop Detector Wire in Conduit.** Will be measured by the ft. of cable (not conduit) installed.
- 4.3. **Wire Splices.** Will be measured by the each, regardless of the number of conductors in a cable it will be measured as one splice.
- 4.4. **Installation of Pull Boxes.** Will be measured by the each.
- 4.5. **Loop Lead-in Cable.** Installed along span wire will be measured by the ft. of loop cable used.
- 4.6. **Jacking and Boring.** Will be measured by the ft. for the distance bored and jacked underneath the pavement or driveways from pit to pit.
- 4.7. **Trenching and Installation of Conduit.** Will be measured by the foot.

5. PAYMENT

The work performed and materials furnished, in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Saw Cuts" of the type specified, "Installation of Loop Detector Wire in Conduit," "Wire Splices," "Installation of Pull Boxes," of the type specified, "Loop Lead-In Cable," "Jacking and Boring," and "Trenching and Installation of Conduit," of the size specified.

Digging of the bore or jack pit will be considered subsidiary to "Jacking and Boring."

Removal and replacement of curbs and walks will not be paid for directly but will be considered subsidiary to the installation of the loops.

These prices shall be full compensation for ordering, collecting, and hauling materials; and furnishing labor, equipment, supplies and incidentals.