

SECTION 13591

TRAFFIC MONITORING DETECTOR LOOP

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Furnish, install, and test detector loop and detector cable. Connect detector loop to control cabinet and provide complete functioning detection capability for loops.

1.2 RELATED SECTIONS

- A. Section 02892: Traffic Signal.
- B. Section 13552: Ramp Meter Signals and Signing
- C. Section 13553: ATMS Conduit
- D. Section 13554: Polymer Concrete Junction Box
- E. Section 13555: ATMS Cabinet

1.3 REFERENCES

- A. International Municipal Signal Association (IMSA).
- B. National Electric Code (NEC).

1.4 SUBMITTALS

- A. Certified test report of detector lead-in cable compliance as specified. IMSA 50-2.
- B. Samples of materials for approval when requested.
- C. Two copies of the following within fifteen days after receiving a Notice to Proceed:

1. List of equipment and materials (name of manufacturer, size, and identification number.)
2. Manufacturers' warranties, guarantees, instruction sheets, installation details, and parts lists.

D. Detector Loop Circuit Test and Shield Isolation Test to Engineer for acceptance.

1.5 ACCEPTANCE TESTING

- A. Detector Loop Circuit Test: Follow Section 02892, Part 1, Article: Acceptance Testing.
- B. Perform Shield Isolation Test after the loop wire is connected to the detector lead-in wire to test the continuity of the detector lead-in wire shield.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Use electrical components as listed and defined by the National Electric Code (NEC).
- B. Follow Section 02892, Part 2, Article, "Detector Circuit," Paragraphs A and B, Wire and Traffic Loop Embedding Sealant.

PART 3 EXECUTION

3.1 PREPARATION

- A. The number of loops and number of lanes varies based on location shown in plans.
- B. Conform to the National Electric Code (NEC).

3.2 SAWCUT

- A. Maximize the area and width of any pavement sections that are created by the sawcuts.

- B. Do not saw cut across a transverse joint in the travelled way.
- C. Saw cut is allowed across a transverse joint in a shoulder slab. To maximize the pavement slabs created, position the cut approximately halfway along the joint.
- D. Maximum allowable distance between saw-cut and transverse joints, or between adjacent sawcuts: 1 1/2 ft.
- E. Loop Spacing: 21 1/2 ft between leading edges.
Maximum tolerance: 1 inch.
- F. Do not install loops in cracked or spalled pavement.
- G. Avoid water in active traffic during installation.
- H. Shape: Refer to Standard Drawing SL13.

3.3 LOOP WIRE AND LEAD IN CABLE INSTALLATION

- A. Section 02892, Part 3, Article, "Install Detector Loops," Paragraphs B through E.
- B. Section 02892, Part 3, Article, "Install Wiring," Paragraphs C through E.
- C. Loops: 4 turns per loop, placed counter clockwise, center all loops in lane.
- D. Use blunt wood sticks to push wire into saw cut. Do not use metal tools.
- E. Tag each loop within the junction box at the termination of the loop wire and within the cabinet at the termination of the detector loop cable (DLC).
- F. Immediately upon installation:
 - 1. Seal loop wire ends with waterproof coating, coil neatly, place in a junction box or a sealed plastic bag, and bury.
 - 2. Install a plywood shield above all buried wire ends.
 - 3. Do not allow loop wire ends be left exposed to the weather.

G. Install Loop Sealant

1. Fill and encapsulate loop wires and home runs a minimum depth of 1 5/8 inch from the pavement surface.
2. Install embedding loop sealant in saw cuts \pm 1/4 inch from the top of the pavement after curing is complete.
3. Allow sealant adequate time to cure under ambient environmental conditions before lane is re-opened to traffic, or cover loop sealant with sand or cement dust to minimize tire tracking.
4. Refer to manufacturer's specifications regarding expansion of sealant during curing period.

H. Install detector lead-in cable to from loop wire to cabinet. Connect cable to input file in cabinet to make loop detection fully functional at cabinet controller location.

I. Maximum detector lead in cable length allowed: 660 ft.

J. Pavement Exit

1. Drill 2 inch diameter hole at 45 degree angle at pavement edge.
2. Install conduit originating from splicing junction box to the pavement edge. Extend conduit 3 inch into drilled hole.
3. After loop wires are installed, seal conduit, fill the hole within 1 1/2 inch of road surface with silica sand.
4. Seal remaining hole in the road surface with loop sealant.

K. Conduit Connection to Junction Box

1. Conduit to be sealed with waterproof bushings or acceptable caulking compound.
2. Fill voids resulting from entrance of conduit into junction box with duct seal or hydraulic cement grout.
3. Field locate junction box to avoid drainage areas and steep slopes.

L. Splicing in junction box

1. No splices allowed between the loop wire and controller cabinet.

2. The only splice allowed is the transition from the loop wire to the detector lead-in cable.
 3. Carry the shield over the splice.
 4. Splice detector lead-in cable to loop wire in junction box with approved splice encapsulation kit.
- M. Notify Engineer at least 72 hours prior to any installation or testing. Allow the Engineer to witness installation and testing on all equipment. Work is not complete without acceptance by the Engineer.

END OF SECTION