

SECTION 16688

PEDESTRIAN DETECTORS AND VEHICLE LOOP DETECTORS

PART 1 DESCRIPTION

- A. Furnish and install traffic signal detectors.

PART 2 MATERIALS

- A. Furnish and construct materials in accordance with the following:
 - 1. Item 16618, "Conduit"
 - 2. Item 16624, "Ground Boxes"
 - 3. Item 16682, "Vehicle and Pedestrian Signal Heads"
 - 4. Item 16684, "Traffic Signal Cables."
- B. Furnish all new materials.

2.01 PEDESTRIAN DETECTORS

- A. Ensure the push-button assembly is weather-tight and tamper-proof, is designed to prevent an electrical shock under any weather condition, has provisions for grounding in accordance with the NEC, and is in compliance with the Americans with Disabilities Act (ADA).
- B. Supply a sturdy 2 piece cast-aluminum housing unit consisting of a base housing and a removable cover. Ensure the internal components provide a push button with normal open contacts, and include all electrical and mechanical parts required for operation. Supply housing or an adapter (saddle) that conforms to the pole shape, fitting flush to ensure a rigid installation. Supply adapters of the same material and construction as the housing. Provide threaded holes for 0.5 in. conduit in the housing for any necessary conduit attachment. Close unused openings with a weather-tight closure painted to match the housing. Provide a 0.75 in. hole with an insulating bushing through the back of the housing.
- C. Meet the paint requirements of Item 16682, "Vehicle and Pedestrian Signal Heads," for the complete body of the housing.
- D. Ensure the manufacturer's name or trademark is located on the housing.

- E. Supply push-button switches that have single-pole, single-throw contacts and screw-type terminals and have a design life of at least 1 million operations.
- F. Use sheet aluminum having a minimum thickness of 0.080 in. for information signs for push buttons.

2.02 VEHICLE LOOP DETECTORS

- A. Unless otherwise shown on the plans, use stranded copper No. 14 AWG XHHW cross-linked-thermosetting-polyethylene insulated conductor rated for 600 volts AC for vehicle detector loop wire. Ensure each length of wire shows the name or trademark of the manufacturer, the insulation voltage rating, the wire gauge, and the insulation type at approximate 2 ft. intervals on the insulation surface.
- B. When shown on the plans, use flexible vinyl or polyethylene tubing with 0.184 in. minimum I.D., 0.031 in. minimum wall thickness, 0.26 in. maximum O.D., and a smooth bore. Use tubing that does not adhere to the loop wire in any way and is capable of resisting deterioration from oils, solvents, and temperatures up to 212°F. Use tubing that is abrasion-resistant and remains flexible from -22°F to 212°F. Unless otherwise shown on the plans, use orange or red tubing.

PART 3 CONSTRUCTION

3.01 PEDESTRIAN DETECTORS

- A. Wire the push button to the nearest splicing point or terminal strip using stranded No. 12 AWG XHHW wire with 600 volt insulation. Do not use terminal connections or splice wire leads except in the hand holes located in the signal pole shaft, in the signal pole base, or at locations approved by the Engineer. All allowed splices must be watertight.
- B. Attach wires to terminal posts with solderless terminals. Attach terminals to the wires with a ratchet-type compression crimping tool properly sized to the wire.
- C. Mount a pedestrian push button sign near each push button as shown on the plans.

3.02 VEHICLE LOOP DETECTORS

- A. Provide the loop location, configuration, wire color, and number of turns shown on the plans. Loops may be adjusted by the Owner's Representative to fit field conditions.
 - 1. Saw Cuts
 - a. Cut the pavement with a concrete saw to form neat lines. Do not exceed 1 in. in depth on concrete bridge slab saw cuts. Cut all other

saw cuts deep enough to provide a minimum of 1 in. depth of sealant over the wire. Unless otherwise shown on the plans, cut a separate saw cut from each loop to the edge of the pavement. Ensure the cut is clean and dry when the wire and sealant are placed.

2. Conduit

- a. Place conduit between the pavement and ground box as shown on the plans.

3. Loop Wire Color

- a. Unless otherwise shown on the plans, use the following color code. Use white for the first loop on the right followed by black, orange, green, brown, and blue. Use the same color for all loops in the same lane. Loops installed in multi-lanes will have the same color code in the order the loops are installed. When facing the same direction that traffic flows, the color code will read from right to left for all lanes carrying traffic in that direction. If traffic moves in 2 directions, the color code will be repeated for the other direction of traffic.

4. Loop Wire Installation

- a. When shown on the plans place the loop wire in a flexible vinyl or polyethylene tubing in accordance with 16688.2, "Materials." The loop wire color requirements do not apply to wires in tubing.
- b. Twist the wire from the loop to the ground box a minimum of 5 turns per foot. When only 1 pair of wires is in a saw cut, it need not be twisted while in the saw cut. Do not splice loop wire in the loop or in the run to the ground box.
- c. Hold the loop wire in place every 2 ft. with strips of rubber, neoprene flexible tubing, or polyethylene foam sealant approximately 1 in. long. Leave these strips in place, and fill the slot with loop sealant.
- d. Splice the loop lead-in cable and loop detector wires only in the ground box near the loop it is serving. Use non-corrosive solder for splices, and ensure that the splice is watertight. Ground the drain wire of the loop lead-in cable to earth ground only at the controller or detector cabinet. Ensure the resistance from the drain wire to the ground rod is less than 1 ohm.

- A. This Item will be measured by the foot of saw cut containing loop wire and by each pedestrian push button.
- B. This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal. Additional measurements or calculations will be made if adjustments of quantities are required.

PART 5 PAYMENT

- A. 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 "Vehicle Loop Detectors" of the type specified or "Pedestrian Detectors" of the type specified. This price is full compensation for furnishing, installing, and testing the detectors; saw-cutting, excavation, backfill, sealant, and sealant placement; pavement repair associated with saw-cutting; and equipment, materials, labor, tools, and incidentals, except as follows.
- B. The conduit and loop wire from the edge of pavement to the ground box used for the vehicle loop detectors will not be measured or paid for directly, but will be subsidiary to this Item.
- C. New ground boxes will be paid for under Item 16624, "Ground Boxes." New loop lead-in cable will be paid for under Item 16684, "Traffic Signal Cables."

END OF SECTION