



Standard Practice for the Installation of Inductive Loop Detectors¹

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1. Scope

1.1 This practice describes the recommended procedure for installing inductive loop detectors in sawed slots in roadway pavement for use as a traffic monitoring device or to actuate traffic control devices such as a traffic signal. Although the practice is not intended for installing preformed loops, the practice does contain information of value for this type of loop such as recommendations for the number of turns of loop wire, number and direction of twists in the lead-in wire and cable, splice location (if needed), and grounding options.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.*

2. Terminology

2.1 Definitions of Terms Specific to This Standard:

2.1.1 *electronics unit, n*—a card or free-standing module that transmits energy into the wire loops typically at frequencies between 20 kHz and 100 kHz; special applications such as vehicle classification may use electronics units that transmit at frequencies above 100 kHz; electronics units allow control of sensitivity, frequency, pulse or presence operation, and timing features (that is, delay and extension) in some models and indicate system failures.

2.1.2 *inductance, n*—property of an electric circuit or of two neighboring circuits that generates an electromotive force in one circuit when the current changes in that circuit or in the neighboring circuit; expressed in units of Henrys (H).

2.1.3 *inductive loop detector, n*—those parts of an inductive loop detector system that consist of the wire loops, lead-in wires, and lead-in cable and which responds to the passage or presence of a vehicle with a decrease in inductance of the wire loop.

2.1.4 *inductive loop detector system, n*—a sensor to detect vehicles and their traffic flow properties, whose major components are: (1) one or more turns of insulated loop wire wound in a slot sawed in the pavement, (2) lead-in wires extending from the loop wire to a curbside or shoulder pull box (3) lead-in cable spliced to the lead-in wires that extends from the pull box to the controller cabinet, and (4) electronics unit housed in the controller cabinet.

2.1.5 *insulation resistance, n*—the resistance measured with a megohmmeter between a conductor and the outer insulating jacket of a wire or cable.

2.1.6 *lead-in cable, n*—shielded wire that is spliced to the lead-in wires in the pull box and which extends from the pull box to the controller cabinet, where it is connected to the electronics unit; also known as home-run cable, transmission line, or feeder cable.

2.1.7 *lead-in wires, n*—a continuation of the loop wire that runs from the physical edge of the loop to the pull box; usually twisted together to form a wire pair.

2.1.8 *loop system sensitivity, n*—smallest change of inductance at the electronics unit terminals that will result in a signal that indicates the passage or presence of a vehicle.

2.1.9 *loop wire, n*—one-conductor insulated wire used for both the wire loop and the lead-in wire; may be jacketed or encased in tube.

2.1.10 *pull box, n*—a container that encloses the splices between the lead-in wires and the lead-in cable; when installed underground, the removable cover is aligned flush with the ground surface; also known as a handhole, splice box, or junction box.

2.1.11 *quadrupole loop, n*—typically a rectangular wire loop configuration with a longitudinal slot extending along the center of the loop so that the wire can be installed in a

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