



Peek Corporation
2511 Corporate Way
Palmetto, FL 34221
Tel: (941) 365-8771
Fax: (941) 925-0937

Sarasota

StreeterAmet Loop Installation Instructions

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LOOP INSTALLATION

I. Introduction

A vehicle sensing loop is a coil of wire embedded in the roadbed of a traffic lane with two lead-in wires routed to a vehicle loop amplifier.

The size and number of loops required depends upon the type of application in traffic monitoring. Each application, whether it be volume counting, direction, velocity, length or type classification, must be individually considered. Careful study should be given when selecting sites and loop schemes for more complex systems such as multilane classification program and combinations of various programs.

Loops are normally imbedded in the roadway by cutting slots in concrete or asphalt. See detailed description in the sections that follow.

An alternate method is to use prefabricated loops on a roadway which is in the process of being resurfaced with asphalt. The loop is taped down and secured before the resurfacing machine approaches. See details under the Section IV. Installation of Loops.

II. Loop Characteristics

For proper loop inductance, the number of turns per loop is proportionate to the loop size. For example, a 6' x 8' loop requires three turns involving 84' of wire need to construct this loop, not counting the lead-in. Lead-ins may affect the loop performance (see Section V. Lead-In Wires). StreeterAmet recommends the three-turn 6' x 8' loops for its traffic counting and classification programs. It is recommended to use either 12 AWG or 14 AWG stranded wire with moisture and heat resistant plastic insulation (see local codes). In conditions where other than the standard 6' x 8' loop is required, the following table shows the number of turns used:

<u>Loop Perimeter (Feet)</u>	<u>Number of Turns</u>
12 - 20	4
20 - 40	3
40 - 160	2
160+	1

III. Loop Location

The best location for loops is a straight and level section of one or two miles where vehicles tend to approach the loops in a straight line path. Since this may not always be possible, a study of traffic flow may be necessary to determine an acceptable location. In general, avoid situations where vehicle maneuvers could cause erratic counting such as at turns or junction with two or four way stop signals.

The road surface should be smooth and free of cracks. Good drainage is essential since moisture seepage into the loop or lead-in wires can change the required high resistance to ground which should exceed five megohms.

In conjunction with loop location, considerations must be given to the locations of the 241 and the availability of AC power. This must depend on whether the 241 is located in permanent housing or is portable.

Consideration must also be given to access and parking area for the safety and convenience of the operator when collecting traffic data or servicing the recording equipment. A location with an adjacent frontage road is most practical on state highways.

IV. Installation of Loops

Installation of the loops should be planned well in advance so that necessary materials, tools, equipment and manpower are on hand when needed.

The loop size recommended is six feet by eight feet with three turns of insulated twelve gauge wire. Six foot minimum spacing between loops on twelve foot wide lanes is required. The number of loops required depends upon the type of traffic application or classification programs. Sixteen feet leading edge to leading edge is recommended.

Slot cutting in concrete or asphalt is the accepted method for installing loops. Before cutting the slots, the pavement should be marked with chalk or other suitable marking material to assure correct dimensions and placement of loops. The width and depth of the slot is determined by the diameter of the wire used.

On sites requiring a lead-in of one hundred fifty feet or less with separately run lead-in for each loop, run a continuous length of wire from the detector location to the loop. Install a continuous run of wire in the slots prepared in the roadbed, going in the same direction to form the three loop turns. Use a wood tool (do not use metal tools such as a screwdriver) to position each turn of wire all the way down into the slot, taking care that the insulation is not damaged.

After the loop has been pressed down into the slots, fill the slots with joint sealer. Run the other lead back to the detector. Now there is a continuous run of wire from the detector to the loop slots, around the loop forming the correct turn ratio and back to the detector location.

Twist the lead-in together approximately three turns per foot and keep as straight as possible. Do not let lead-in coil up between loop and detector. The lead-in should be kept underground for the complete width of the shoulder to prevent damage from grading or ditching.

V. Lead-In Wires

Loop lead-ins should be kept as short as possible. It is desirable to make loop and lead-in wire with one continuous wire, eliminating the need for splices.

However, if the lead-in of a single loop is more than one hundred fifty feet or if many loops are going to be run together to a detector, then splicing is necessary. In this case the splicing should be done in a suitable enclosure such as a pull box or handhold. Each pair of loop wires must be spliced to a cable such as 12 AWG or 14 AWG THWN.

The splices must be insulated from moisture with potting compound such as SCOTCH CAST. Do not make a coil of wire in the pull box. This would create another loop and reduce sensitivity of the road loop.

VI. Loop Installation During Resurfacing

This method eliminates the task of slot cutting in asphalt roadways. Prefabricated loops may be used when a road way is in the process of being resurfaced with asphalt.

Tape down the loop in desired position and secure before the resurfacing machine approaches.

NOTE: Insure that the insulation of the loop wire being used can withstand the 400°F approximate temperature of the freshly poured asphalt.

VII. Maintenance After Installation

All loop installations should be inspected monthly for hairline cracks and damaged seals. Any indication of a break should be sealed immediately to prevent moisture from making contact with the wire.

It is recommended that all loops be sealed at least twice a year, preferably in late fall and early spring.

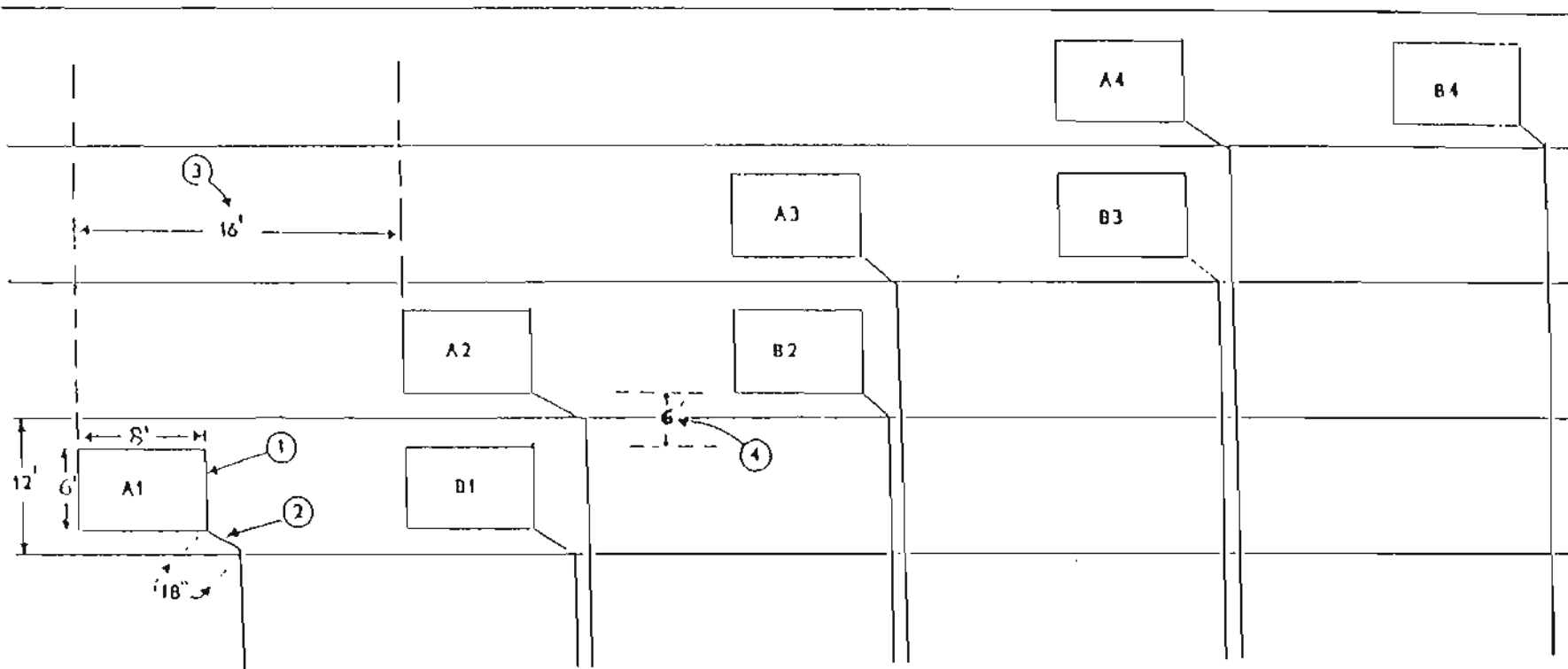


Figure 1: 1-4 Lane Loop Placement for Vehicle Velocity, Length of Counting

1. All loops 6' x 8' three turns, Wire - THHN 14. Position loops in center of lane.
2. Lead-In approximately 45° angle for 18' length.
3. Space loops 16' from leading edge to leading edge of each other ± 1".
4. 6' minimum spacing for 12' wide lanes.

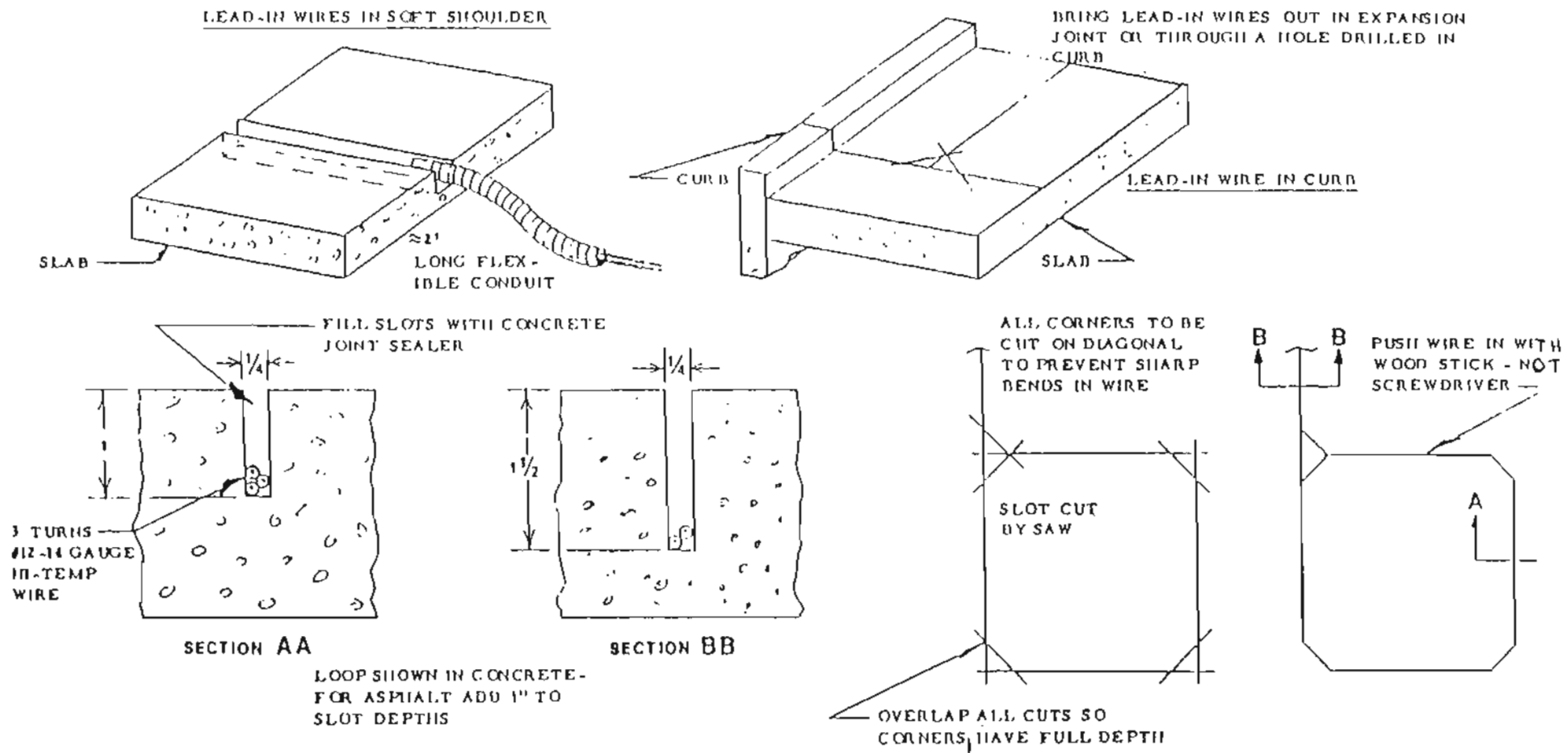
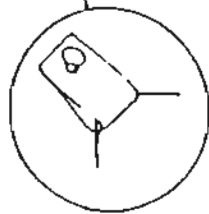
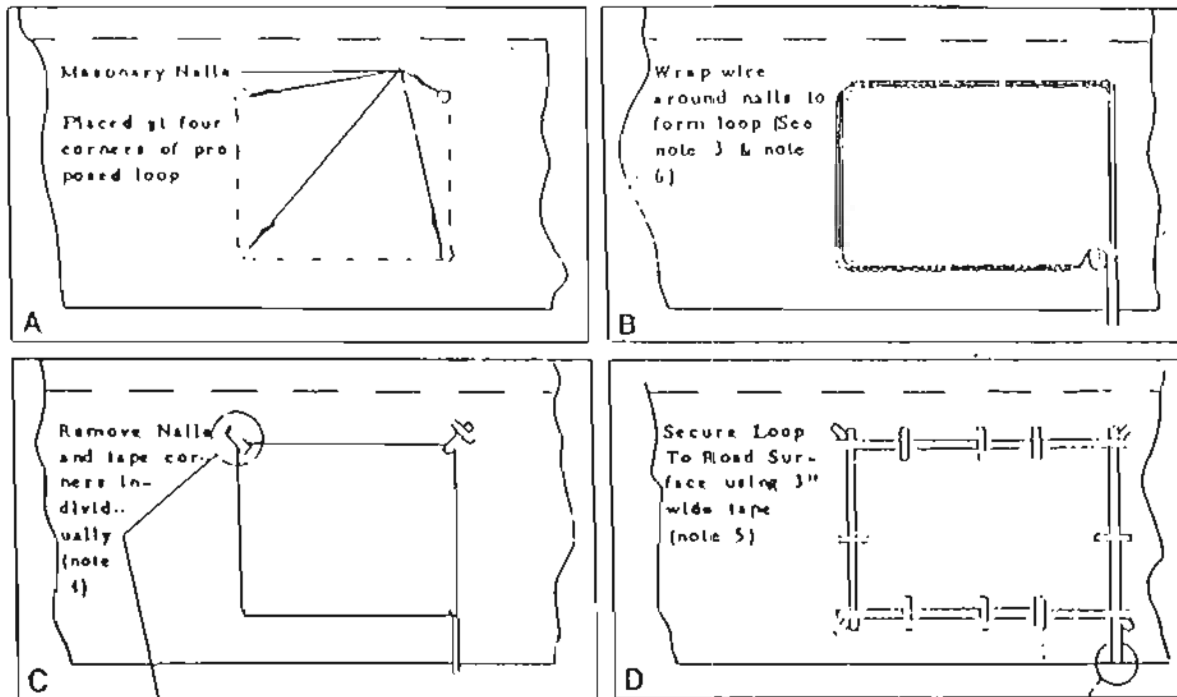
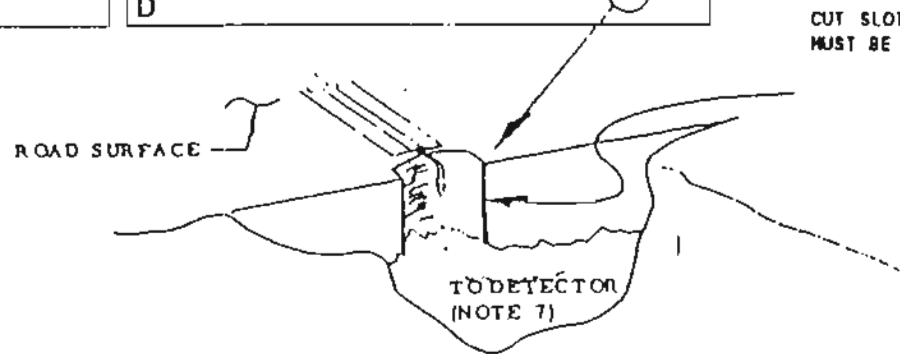


Figure 2: Loop Installation in Existing Roadways



CORNER TAPES MAY BE SECURED TO ROAD SURFACE WITH MASONRY NAIL



1. BE CERTAIN THAT AREA IS FREE OF LOOSE DIRT OR OIL BEFORE TAPING.
2. THE SAME INSTALLATION PROCEDURE WILL APPLY REGARDLESS OF LOOP SIZE.
3. WRAP WIRE AROUND FIRST MASONRY NAIL BEFORE ENCIRCLING OTHERS TO FORM LOOP. THIS WILL AID IN HOLDING WIRE IN PLACE WHILE LOOP IS FORMED.
4. REMOVE ONE NAIL, PULL WIRES TIGHT AND TAPE CORNER; PROCEED WITH NEXT CORNER.
5. PLACE A SMALL AMOUNT OF RESURFACING MATERIAL OVER LOOPS TO PROTECT AGAINST DAMAGE BY MOVING TRAFFIC. CHECK EXPOSED LOOP PRIOR TO FINAL COVERING BY RESURFACING MACHINE.
6. LOOP TURNS MUST BE AS CLOSE TOGETHER AS POSSIBLE.
7. TWIST LEAD-IN WIRE TOGETHER.

CUT SLOT IN ROAD EDGE FOR LOOP LEADS. SLOT MUST BE FULL DEPTH OF ROAD.

Figure 3: Loop Installation in Resurfacing Roadways