



Reno A & E
4655 Aircenter Circle
Reno, NV 89502-5948 USA
Telephone: (775) 826-2020
Fax: (775) 826-9191
Website: www.renoae.com
E-mail: contact@renoae.com



Engineering Excellence!

Saw Cut Loop Installations

The saw cut slots must be cut to the proper depth (1-1/2 to 3 inches) and be clean, with no sharp corners which could damage the loop wire during installation. The greater depth should be used in softer pavement materials to better protect the loop wire insulation for a longer period of time against damage from surface erosion and wear. Care should be taken to avoid cutting all the way through the pavement material. If possible, the saw cut depth should not exceed one half the thickness of the pavement material.

The loop wire must be held securely in the bottom of the slot by means of a plastic foam type material called backer rod. The recommended method of securing the loop wire in the slot is to use a series of one (1) inch long pieces of backer rod spaced approximately one (1) foot apart along the entire length of the saw cut. Make certain to press the backer rod tightly into the slot. Use a wooden stick or other blunt instrument to avoid potential damage to the loop wire. If the backer rod is not pressed tightly into the slot, the loop wires will be loose in the slot. Loose wires can cause false calls due to vibration or sudden movement.

Choose a sealant carefully to match the application and the pavement type. Hard setting epoxies should not be used with asphalt. Caution should be observed when using hot sealants, as high temperatures can damage or destroy wire insulation.

When properly applied, the sealant should completely cover the loop wire(s) and backer rod. Since the sealant forms a barrier between the wire and the environment, it is essential that the wire(s) are completely covered. There must be no voids which might allow water to collect within the slot. The water will freeze and expand during freezing conditions. Freeze/thaw cycling will eventually push the loop wires up and out of the slot, resulting in a loop failure.

The wire used in the loop should have an insulation rated for direct burial. Since moisture can cause significant changes in the dielectric constant of the wire insulation, which results in excessive loop (frequency) drift, choose a wire with an insulation which is impervious to moisture. Wires with Polyvinyl chloride (PVC) insulation (i.e. those labeled TFFN, THHN, and THHN-THWN) should not be used since they tend to absorb moisture and crack easily. Cross linked polyethylene (XLPE) or polyester insulated wire is very resistant to moisture absorption and provides good abrasion resistance.

In most cases, the saw cut will end at the edge of the pavement or at a stub out for a conduit. Where the wires leave the saw cut they must be twisted together with a minimum of six (6) twists per foot.

The feeder or "home-run" cable used to extend the lead-in to the cabinet should consist of a shielded twisted pair of wires with a high density polyethylene insulation. The shield should be floated (left unconnected and insulated) at the splice point between the loop wires and the feeder cable and should be grounded to earth ground at the cabinet end only. Any other grounding arrangement can lead to ground loops and cause erratic system operation.

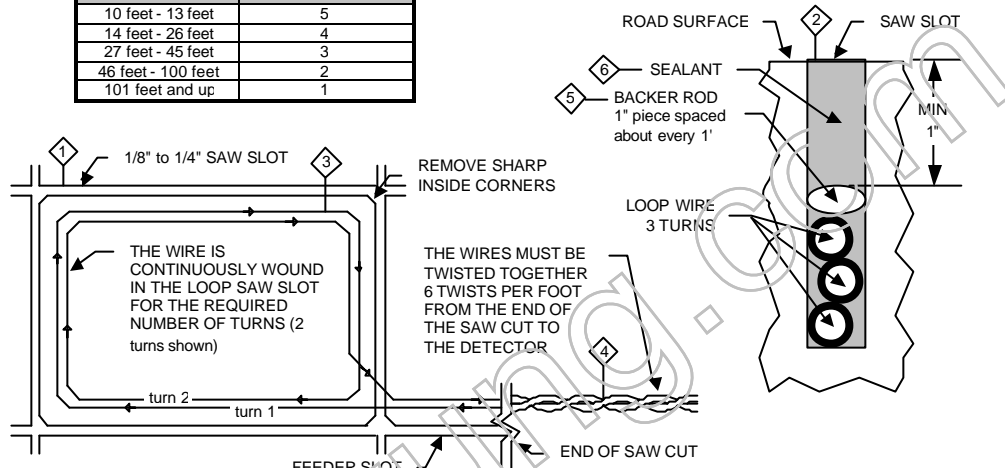
All splices must be soldered, even when initially formed with crimp type splices. **CAUTION:** when soldering, use only enough localized heat to adequately flow the solder through the connection without melting or burning the surrounding insulation. Each splice point must be protected with a moisture proof seal. **Failure to observe these two precautions are the two most common causes of loop related problems in this type of system.**

Another common problem is caused by loose connections at the terminal strip in the cabinet. Crimp type terminals should be soldered in the crimp sleeve and the screws securing the terminals to the terminal strip securely tightened down. Adding lock washers is a further deterrent to the screws loosening up due to vibration or the passage of time.

Loop Installation - Saw Cut Type

- 1 Mark the loop layout on the pavement. Be aware that sharp inside corners can damage the loop wire insulation.
- 2 Set the saw to cut to a depth (typically 1.5" to 3") that insures a minimum of 1" from the top of the wire to pavement surface. The saw cut width should be larger than the wire diameter to avoid damage to the wire insulation when placed in the saw slot. Cut the loop and feeder slots. Remove sharp inside corners. Remove all debris from the saw slot with compressed air. Check that the bottom of the slot is smooth.
- 3 It is highly recommended that a continuous length of wire be used to form the loop and feeder to the detector. Loop wire is typically 14, 16, 18, or 20 AWG with cross-linked polyethylene insulation. Use a wood stick or roller to insert the wire to the bottom of the saw slot (do not use sharp objects). Wrap the wire in the loop saw slot until the desired number of turns is reached. Each turn of wire must lay flat on top of the previous turn.
- 4 The wire must be twisted together a minimum of 6 twists per foot from the end of the saw slot to the detector.
- 5 The wire must be held firmly in the slot with 1" pieces of backer rod every 1 to 2 feet. This prevents the wire from floating when the loop sealant is applied.
- 6 Apply the sealant. The sealant selected should have good adhering properties with contraction and expansion characteristics similar to those of the pavement material.

LOOP PERIMETER	NUMBER OF TURNS
10 feet - 13 feet	5
14 feet - 26 feet	4
27 feet - 45 feet	3
46 feet - 100 feet	2
101 feet and up	1



Recommended Loop Wire: Reno LW-120 for 1/8" slots
 Reno LW-116-S for 1/4" slots