

DATE					
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DESCRIPTION OF REVISIONS					
NO	3	4			
DATE	03/10	12/12			
MADE BY	C. COLE	C.C./L.L.			
DESCRIPTION OF REVISIONS					
NO	1	2			
DESCRIPTION OF REVISIONS	2010 EDITION	REVISED & ADDED NOTES.			

**NOTES CONTINUED:**

21. All loops in ACP pavement shall be sealed with an approved crack filler sealant. All loops in concrete pavement or finish AC course pavement shall be sealed with an approved hot rubber sealant or a two-part epoxy or similar sealant. Sealants shall be used in a manner that is consistent with the manufacturer's instructions, these drawings and the specifications. The sealant shall seal the loop wire and fill the slot accordingly without gaps or voids and to the specified minimum cover.
22. Loop sealants and piezo grout shall be handled in a safe manner. This includes the use of personal protection equipment such as safety glasses, gloves, and respirators if and as necessary. Excessive or waste materials shall be handled and disposed of in an approved fashion.
23. Loops or piezos shall not be installed when the weather does not conform with conditions recommended by the sealant manufacturer.
24. Loops shall be protected from traffic until the sealant has sufficient time to dry, cool or cure so no tracking of sealant is possible.
25. Once the loops and lead-in wires have been installed, the contractor shall perform the following tests on each loop in the presence of the Engineer before and after the sealant has been placed.
  - Insulation Resistance-to-Ground (or Insulation Resistance): The insulation resistance to ground for each loop shall be measured with a megohm meter connected to either loop lead in and to the nearest reliable electrical ground, such as a metal light pole or fire hydrant, or to a metal rod driven three feet into the ground between the roadway and the pull box. The insulation resistance to ground shall not measure less than 50 megohms at 500 volts DC. A high resistance of greater than 100 megohms is desired.
  - Series Resistance: The series resistance of each six by nine foot loop, measured by an ohmmeter, shall be between 0.1 and 0.5 ohm and the maximum resistance of any size loop, including lead-ins, shall typically be less than 5 ohms but not more than 100 ohms.
26. Before and after the piezo sensors have been installed and the grout has cured, the Contractor shall perform the following tests on each piezo sensor in the presence of the Engineer or his designee.
  - Capacitance: The capacitance of the sensor shall be measured from the ends of the attached lead-in cable. The measured reading should be within 20% of the value given in the sensor's data sheet provided by the manufacturer. The meter should typically be set on a 20nF range. The red probe shall be connected to the center conductor of the cable and the black probe shall be connected to the outer braid. During the measurement, hands shall not hold or contact across the two connections.
  - Resistance: The resistance shall be measured across the sensor. The meter should be set on the 20M0hm setting. The meter should read in excess of 20Mohms.

27. The loop lead-in cable from the pull box back to the controller cabinet shall conform to the applicable requirements of IMSA Specification 50-2 with the exception that the cable can include up to 4 twisted pairs, not just one. The wire size shall be #14 copper stranded. The cable drain wire and the lead-in cable shall be grounded at only one end (in the controller cabinet). The loop lead-in cable shall run continuously between the pull box and the controller cabinet without splices.
28. Lead-in cable to loop detector connections shall be soldered using an appropriate resin core solder. The solder connection shall then be made completely liquid-tight with an approved heat shrink connection kit that is specifically applicable to loop detector applications. Care shall be taken to heat the connection kit to the correct temperature without damaging the loop wire or lead-in wire insulation. Other types of connection are allowable if approved by the Engineer.
29. The lead-in access hole shall be backfilled and patched according to the detail shown on sheet 4. The contractor shall patch the existing pavement with an approved patch material (UPM or approved equal) in an acceptable manner. Core shall be taken not to damage loop wires. The patch shall be at least 1/4-inch (but not more than 1/2-inch) higher than existing pavement or it can be compacted flush if approved by the Engineer.
30. The contractor shall leave no less than 36 inches and no more than 48 inches of loop lead-in cable and piezo lead-in cable in the cabinet. The contractor shall label each lead-in cable (loop and piezo) with the lane number and the orientation (leading or lagging). Lane numbers shall be assigned in ascending order starting in the cardinal direction (North or East) beginning from the slow lane towards the median/centerline. Lane numbers in the non-cardinal direction (South or West) shall continue in the ascending order starting in the slow lane towards the median/centerline. The contractor shall install crimped spade terminals to the end of all lead-in cable terminated in the cabinet. The contractor shall use a #16 - #14 AWG (600V) vinyl insulated spade for all loop lead-in wire and all outer braid of the piezo lead-in wire. The contractor shall use a #22 - #16 AWG (600V) vinyl insulated spade for all center conductor wire of the piezo lead-in cable. The contractor shall be sure not to damage the outer braid of the piezo lead-in cable when separating it from the center conductor.

NOT TO SCALE

DESIGN APPROVED	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION TRAFFIC SIGNALS AND LIGHTING STANDARD DRAWINGS	REVISION 12/12
<b>SIGNATURE</b>		DRAWING NO. T.S. 6-4
APPROVED FOR DISTRIBUTION	DETECTOR LOOPS AND PIEZOELECTRIC SENSOR DETAILS	SHEET NO. 2 OF 5
<b>ON FILE</b>		