

LOOP SPECIFICATIONS

- THE BURIED LOOP MUST BE MADE FROM BELDEN #9436 LOOP WIRE. BELDEN #9436 IS THE ONLY WIRE APPROVED BY METTLER TOLEDO FOR TRAFFIC LOOPS.
- SLOT SEALER: THE APPROVED SLOT SEALERS ARE DOW 888, DOW 888-SL, AND DOW 890-SL.
- CLOSED CELL PLASTIC FOAM BACKER ROD IS USED TO HOLD THE WIRE FIRMLY IN THE BOTTOM OF THE SLOT, AND TO MAINTAIN THE PROPER SEALANT THICKNESS. SEALANT THICKNESS IS CRITICAL TO INSURE PROPER CURING. IF THE SEALANT IS APPLIED THICKER THAN DIRECTED, IT WILL NEVER CURE! SEE THE ESTIMATING REQUIREMENTS TABLE.
- DOW 888 SHOULD BE TOOLED SO THAT THE SURFACE IS CONCAVE. DOW 888-SL AND DOW 890-SL ARE SELF LEVELING AND SHOULD BE KEPT 3mm TO 8mm BELOW THE SURFACE.

TABLE OF ALTERNATE LOOP CONFIGURATIONS

SLOT SIZE (L x W)	1 TURN/SPACING	2 TURNS/SPACING	3 TURNS/SPACING	4 TURNS/SPACING	5 TURNS/SPACING
1.83M x 1.83M	4/120	5/180	6/202	7/231	8/232
1.83M x 2.13M	4/130	5/195	6/215	7/244	8/244
1.83M x 2.44M	4/140	5/210	6/234	7/263	8/264
1.83M x 2.74M	4/150	5/225	6/249	7/278	8/280
1.83M x 3.05M	4/160	5/240	6/264	7/294	8/296
1.83M x 3.35M	3/100	4/170	5/225	6/267	7/276
1.83M x 3.66M	3/108	4/180	5/270	6/318	7/304
1.83M x 3.96M	3/114	4/190	5/285	6/339	7/332
1.83M x 4.27M	3/120	4/200	5/300	6/360	7/360
1.83M x 4.57M	3/126	4/210	5/315	6/441	7/386

THE INDUCTANCE OF A LOOP SHOULD BE GREATER THAN OR EQUAL TO THE INDUCTANCE OF THE LEAD-IN CABLE. OTHERWISE, THE CHANGE IN INDUCTANCE SEEN BY THE DETECTOR ELECTRONICS WHEN A VEHICLE PASSES OVER THE LOOP BECOMES TOO SMALL TO DETECT. LEAD-IN CABLE TYPICALLY HAS AN INDUCTANCE OF 0.722 MICRO-HENRYS PER METER.

THE FORMULA FOR CALCULATING THE INDUCTANCE OF THE LOOP IS:

$$L = \frac{3.28083 \times 10^{-7} \times (N^2 \times \pi \times N)}{4}$$

L = LOOP INDUCTANCE IN MICRO-HENRYS
P = PERIMETER OF LOOP IN METERS
N = NUMBER OF TURNS OF WIRE IN THE LOOP.

THIS FORMULA WAS USED TO GENERATE THE EXAMPLES SHOWN IN THE TABLE BELOW.

LOOP SIZE (M x M)	NUMBER OF TURNS	PERIMETER (M)	INDUCTANCE (MH)	LEAD-IN SIZE (M)	INDUCTANCE (MH)		
30M	22	4	120	4	140	4	160
61M	44	4	120	4	140	4	180
91M	66	4	120	4	140	4	180
122M	88	4	120	4	140	4	180
152M	110	4	120	4	140	4	180
183M	132	4	180	4	140	4	180
213M	154	4	180	5	210	4	180
244M	176	4	180	5	210	4	180
274M	198	5	252	5	210	5	270
305M	220	5	252	6	284	5	270
335M	242	5	252	6	284	5	270
366M	264	6	336	6	284	5	270
396M	286	6	336	6	284	5	270
427M	308	6	336	7	362	6	378
457M	330	7	336	7	362	6	378
488M	352	6	432	7	362	6	378
518M	374	6	432	7	362	6	378
549M	396	6	432	8	504	7	504
579M	418	6	432	8	504	7	504
610M	440	6	432	8	504	7	504

THE COMBINATIONS LISTED ABOVE KEEP THE LOOP INDUCTANCE GREATER THAN OR EQUAL TO THE LEAD-IN INDUCTANCE.

LOOP INSTALLATION INSTRUCTIONS

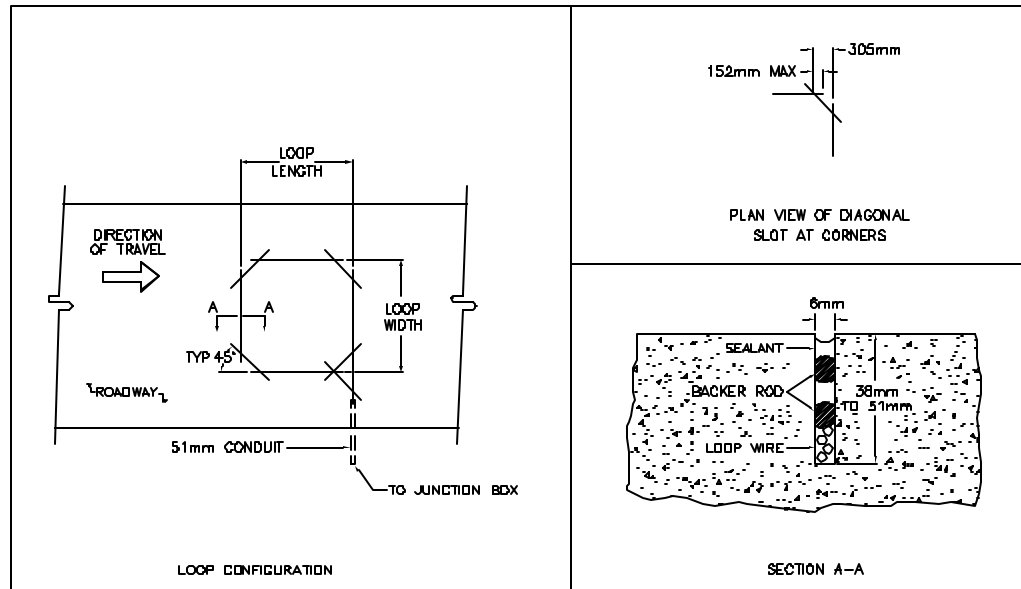
- CUT A RECTANGULAR SLOT 5mm WIDE BY 35mm TO 81mm DEEP (SECTION A-A). THE LOOP WIDTH SHOULD BE CENTERED IN THE WIDTH OF THE LANE (SEE LOOP CONFIGURATION). THE SIDES OF THE RECTANGLE SHOULD BE CUT AT 45 DEGREE ANGLES (SEE PLAN VIEW OF DIAGONAL SLOT CORNERS) OR CORE DRILLED TO AVOID UNLAME STRESS ON THE WIRE.
- IF THE LOOP CROSSES A JOINT IN THE PAVEMENT WHERE HORIZONTAL MOVEMENT OF SLABS MAY OCCUR, THE JOINT SHOULD BE CORE DRILLED TO AVOID STRESS ON THE LOOP WIRE. IF ONLY VERTICAL MOVEMENT MAY OCCUR, THEN THE SLOT SHOULD BE CUT DEEPER AT THE JOINT. IN EITHER CASE, A SHORT SLACK SECTION OF WIRE SHOULD BE INCLUDED AT THE JOINT.
- CUT A SLOT FOR THE LEAD-IN (10mm WIDE BY 25mm TO 75mm DEEP). IF MORE THAN ONE LEAD-IN IS TO BE PLACED IN THE SLOT, ADD 5mm TO THE MINIMUM SLOT DEPTH FOR EACH ADDITIONAL LEAD-IN.
- SLOTS MUST BE WASHED, BLOWN OUT, AND THOROUGHLY DRIED BEFORE INSTALLING THE LOOP WIRE. SLOTS MUST BE CLEAN OR THE SEALANT WILL NOT ADHERE.
- INSTALL THE LOOP WIRE IN THE SLOT AS SHOWN IN SECTION A-A. ALLOW SUFFICIENT WIRE FOR THE LEAD-IN.
- NO SPLICES ARE ALLOWED IN THE PAVEMENT. SPLICES IN A JUNCTION BOX MUST BE WATER TIGHT.
- TIGHTLY TWIST THE LEAD-IN WIRES 18 TO 33 TURNS PER METER AND INSTALL IN THE SLOT AND CONDUIT TO THE NEAREST JUNCTION BOX (SEE LOOP CONFIGURATION).
- IDENTIFY AND TAG LOOP CIRCUIT PAIRS IN THE LOOP CONTROLLER ENCLOSURE.
- TEST EACH LOOP BEFORE APPLYING SEALANT. CHECK THE LOOPS FOR CONTINUITY (THE LOOP CIRCUIT RESISTANCE SHOULD NOT EXCEED 0.5 OHMS PER 100 METERS OF LEAD-IN). CHECK THE LOOP FOR SHORTS TO GROUND (THE MINIMUM ACCEPTABLE INSULATION RESISTANCE IS 100 MEGOHMS).
- COVER THE SLOT WITH SEALER (SEE LOOP SPECIFICATION NOTES 2 & 3) FOLLOWING THE MANUFACTURER'S RECOMMENDATIONS.
- CONNECT THE LOOP LEAD-IN WIRING TO THE LOOP CONTROLLER IN ACCORDANCE WITH THE SYSTEM SCHEMATIC AND EXTERNAL WIRING DIAGRAM.
- THE DISTANCE BETWEEN THE SIDE OF A LOOP AND A LEAD-IN SAW CUT FROM ADJACENT DETECTORS SHALL BE 610mm MINIMUM. THE DISTANCE BETWEEN ADJACENT LEAD-IN SAW CUTS SHALL BE 182mm MINIMUM.

NOTE: EXTREME CAUTION MUST BE USED WHEN INSTALLING THE LOOP WIRE. ANY NICK OR CUT IN THE INSULATION COULD RENDER THE LOOP USELESS. INSTALLATION DAMAGE TO THE LOOP WIRE IS THE NUMBER ONE CAUSE OF LOOP FAILURES!

DOW SEALER ESTIMATING REQUIREMENTS FOR DOW 888, 888-SL, & 890-SL

LOOP SIZE (M x M)	SEALANT SIZE (mm)	SEALANT JOINT SIZE (mm)	SEALANT JOINT SPACING (mm)	SEALANT JOINT LENGTH (mm)	SEALANT JOINT WIDTH (mm)	ESTIMATED SEALANT VOLUME (LITERS)
8mm	8mm	25mm	10mm	13mm	19.5/18.8	22.1/18.0
10mm	8mm	31mm	13mm	13mm	12.0/10.1	14.9/12.6
13mm	8mm	31mm	16mm	13mm	8.3/7.0	11.3/9.6

NOTE: MAINTAIN LISTED BEAD THICKNESS. IF BEAD IS TOO THICK, IT WILL NEVER CURE!



REFERENCE DRAWING KC583,388 FOR U.S. UNITS

METTLER TOLEDO

905773R