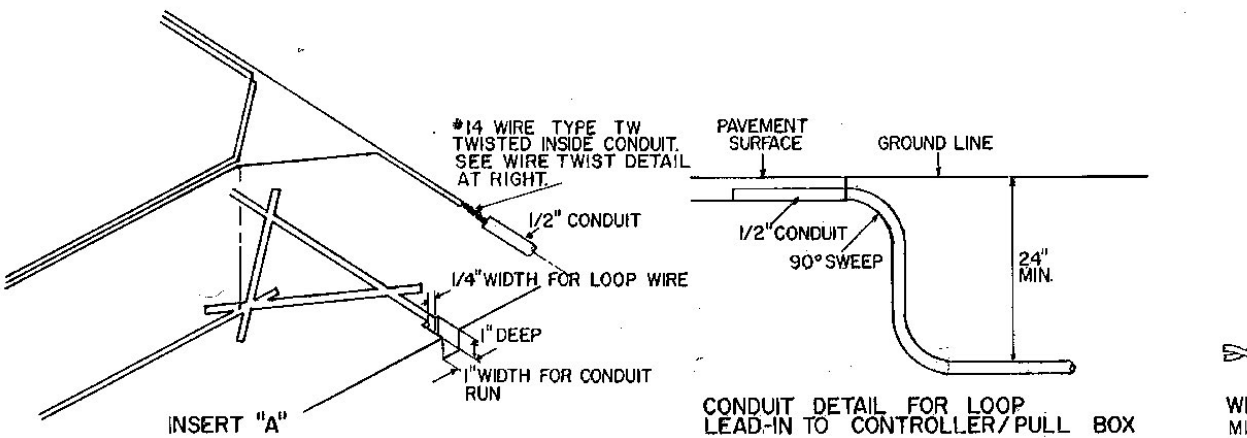


**RECTANGULAR LOOPS
VEHICLE DETECTOR LOOP INDUCTANCE DESIGN TABLE**

LARGER LOOP DIM. (FT.)	SHORTER DIMENSION OF LOOP				LOOP PERIMETER (FT.)	LOOP INDUCTANCE (MICROHENRIES)			
	6 FEET		8 FEET			10 FEET		12 FEET	
	LARGER LOOP DIM. (FT.)	AREA (SQ.FT.)	LARGER LOOP DIM. (FT.)	AREA (SQ.FT.)		LARGER LOOP DIM. (FT.)	AREA (SQ.FT.)	LARGER LOOP DIM. (FT.)	AREA (SQ.FT.)
6	36	—	—	—	24	11	40	82	138
8	48	—	—	—	28	13	47	96	161
10	60	8	64	—	—	32	14	54	109
12	72	10	80	—	—	36	16	60	123
14	84	12	96	10	100	—	—	18	67
16	96	14	112	12	120	—	—	20	74
18	108	16	128	14	140	12	144	48	22
20	120	18	144	16	160	14	168	52	23
22	132	20	160	18	180	16	192	56	25
24	144	22	176	20	200	18	216	60	27
26	156	24	192	22	220	20	240	64	29
28	168	26	208	24	240	22	264	68	31
30	180	28	224	26	260	24	288	72	32
32	192	30	240	28	280	26	312	76	34
34	204	32	256	30	300	28	336	80	37
36	216	34	272	32	320	30	360	84	38
38	228	36	288	34	340	32	384	88	41
40	240	38	304	36	360	34	408	92	41
42	252	40	320	38	380	36	432	96	44
44	264	42	336	40	400	38	456	100	46
46	276	44	352	42	420	40	480	104	48
48	288	46	368	44	440	42	504	108	50
50	300	48	384	46	460	44	528	112	52
52	312	50	400	48	480	46	552	116	54
54	324	52	416	50	500	48	576	120	56
56	336	54	432	52	520	50	600	124	58
58	348	56	448	54	540	52	624	128	60
60	360	58	464	56	560	54	648	132	62
70	420	68	544	—	—	68	256	520	—
80	480	—	—	—	—	77	289	568	—
90	540	—	—	—	—	88	323	616	—
100	600	—	—	—	—	99	358	664	—

- VEHICLE DETECTOR LOOP NOTES**
- 1) THE TERM "VEHICLE DETECTOR LOOP" SHALL REFER TO THE SENSOR ELEMENT IMBEDDED IN THE PAVEMENT WHICH SENSES VEHICLE PASSAGE OR PRESENCE. THE TERM "CABINET AMPLIFIER" SHALL REFER TO THE ELECTRICAL OR ELECTRONIC DEVICE LOCATED IN THE CONTROL CABINET WHICH RESPONDS DIRECTLY TO A VEHICLE ACTUATION AND INTERFACES WITH THE CONTROLLER.
 - 2) WHEN THE DISTANCE FROM THE VEHICLE DETECTOR LOOP TO THE CONTROLLER EXCEEDS 250 FEET, 12 AWG WIRE SHALL BE USED FOR THE FEEDER WIRE. BELDEN SHIELDED CABLE SHALL BE USED TO EXTEND LOOP LEAD-INS TO THE CONTROLLER CABINET.
 - 3) THE VEHICLE DETECTOR LOOPS SHALL BE INSTALLED IN SUCH A WAY AS TO MAXIMIZE SENSITIVITY AND SHALL BE CAPABLE OF DETECTING MOTORCYCLES AND BICYCLES. WHILE ELIMINATING FALSE CALLS FROM VEHICLES IN ADJACENT LANES. LOOPS ARE DESIGNED SO THAT THE LOOPS AND FEEDER LINES TOTAL INDUCTANCE THAT EXISTS AT THE AMPLIFIER IS AT THE CENTER OF RANGE WITH REGARD TO INDUCTANCE (DESIGN VALUE OF 350 MICROHENRIES, ASSUMED). INDUCTANCE AND CAPACITANCE MEASUREMENTS SHALL BE TAKEN AND RECORDED PRIOR TO AND AFTER THE SAW SLOTS ARE SEALED.
 - 4) THE LOOPS ARE CENTERED IN THEIR RESPECTIVE LANE, UNLESS OTHERWISE NOTED.



WIRE TWIST DETAIL
MINIMUM 2 TO 5 TWISTS PER FOOT.
CLOCKWISE & COUNTERCLOCKWISE
TWISTS ALTERNATING ARE ACCEPTABLE.

DESIGN VALUES

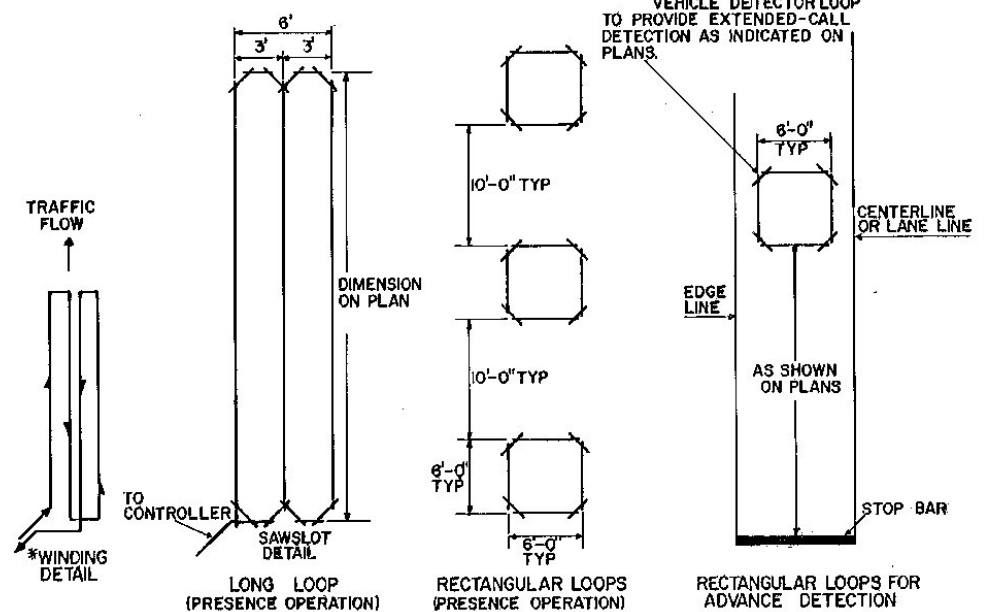
AVAILABLE CONDUIT AREA		CONDUCTOR SIZE TABLE	
SIZE	*26% FILL (IN ²)	TYPE	*SECTION AREA (IN ²)
1"	0.23	#14	0.020
1 1/4"	0.39	#12	0.025
1 1/2"	0.53	#10	0.031
2"	0.87	#8	0.060
2 1/2"	1.24	#6	0.082
3"	1.92		
3 1/2"	2.57		

*1978 NATIONAL ELECTRICAL CODES INDICATES 40% FILL

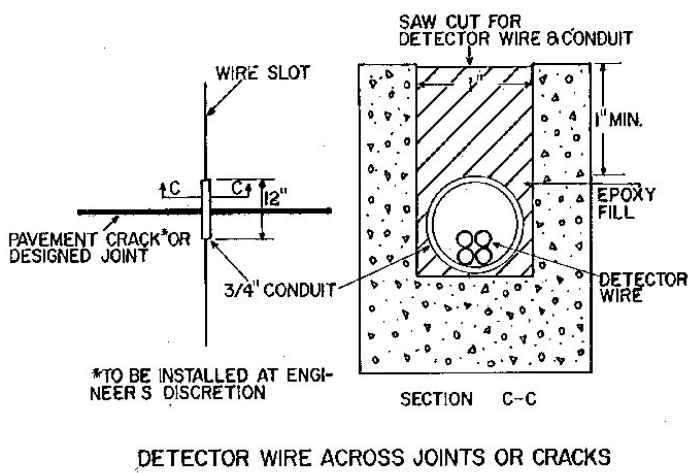
**LONG LOOPS
VEHICLE DETECTOR LOOP INDUCTANCE DESIGN TABLE**

LARGER LOOP DIMENSION	SHORTER LOOP DIMENSION					
	4 FEET		6 FEET		8 FEET	
	1 TURN	2 TURNS	1 TURN	2 TURNS	1 TURN	2 TURNS
10	29	32	31	38	33	104
15	41	43	43	58	45	144
20	54	58	58	78	58	184
24	69	74	61	104	63	200
26	74	80	66	112	68	216
28	79	86	71	120	73	232
30	84	92	76	128	78	248
32	89	98	81	136	83	264
34	94	104	86	144	88	280
36	99	110	91	152	93	296
40	104	116	96	160	98	312
45	116	129	106	174	108	344
50	129	142	116	188	118	376
55	141	155	126	202	128	408
60	154	168	136	216	138	440
65	166	181	146	230	148	472
70	179	194	156	244	158	504
80	204	—	176	272	178	544
90	229	—	196	300	198	584
100	254	—	216	328	218	624

NOTE: 1. SAME AS #1 FOR RECTANGULAR LOOPS.
2. THE ABOVE INDUCTANCES ARE ESTIMATED QUANTITIES USING THE FOLLOWING EQUATIONS.
1 TURN = (PERIMETER X 0.5) + (LARGER DIMENSION X 1.5)
2 TURNS = (PERIMETER X 1.5) + (LARGER DIMENSION X 5.0)
3. SAME AS #3 FOR RECTANGULAR LOOPS.



TYPICAL LOOP DESIGNS



DETECTOR WIRE ACROSS JOINTS OR CRACKS

- INSTALLATION NOTES**
- 1) NO WIRE SPLICING EXCEPT IN PULL BOXES. SPLICES SHALL BE SOLDERED (ROBIN CORE) AND WRAPPED WITH PLASTIC TAPE AND COATED WITH A SEALANT USED FOR SUCH PURPOSES.
 - 2) BEFORE LAYING IN THE LOOP WIRE, A ONE-QUARTER INCH OF SEALANT SHALL BE PLACED IN THE SAW SLOT AND ALLOWED TO SET UP SUFFICIENTLY TO GIVE THE WIRE SOME SUPPORT. EACH WIRE SHALL BE PLACED IN THE SAW SLOT WITH A BLUNT WOODEN STICK AND SEALED BEFORE PLACING THE NEXT WIRE ON TOP UNTIL THE REQUIRED NUMBER OF TURNS IS COMPLETE.
 - 3) VEHICLE DETECTOR LOOPS SHALL NOT BE PLACED ON THE BASE COURSE AND PAVED OVER. SAW-CUTS SHALL BE MADE IN THE FINAL PAVEMENT COURSE AND THE LOOPS INSTALLED IN THEM.
 - 4) LOOP LEAD-INS FROM ADJACENT LOOPS SHALL BE IN SEPARATE SAWSLOTS TO THE CURB PULL BOX.
 - 5) LOOP FEEDERS SHALL BE AT LEAST ONE FOOT AWAY FROM POWER WIRING.

REVISIONS AND CORRECTIONS.
DATE: 10/21/81 LONG LOOP INDUCTANCE TABLE ADDED.
8/23/82 NOTES 4 & 5 ADDED

APPROVED:
JULY 28, 1981
DATE
S. J. Gage, P.E.
DIRECTOR OF ENGINEERING AND CONSTRUCTION
Arthur J. Gage
CHIEF OF DESIGN
Shirley D. Gage
TRANSPORTATION DESIGN ENGINEER

VEHICLE DETECTOR LOOP DETAILS



**STANDARD
E-36**