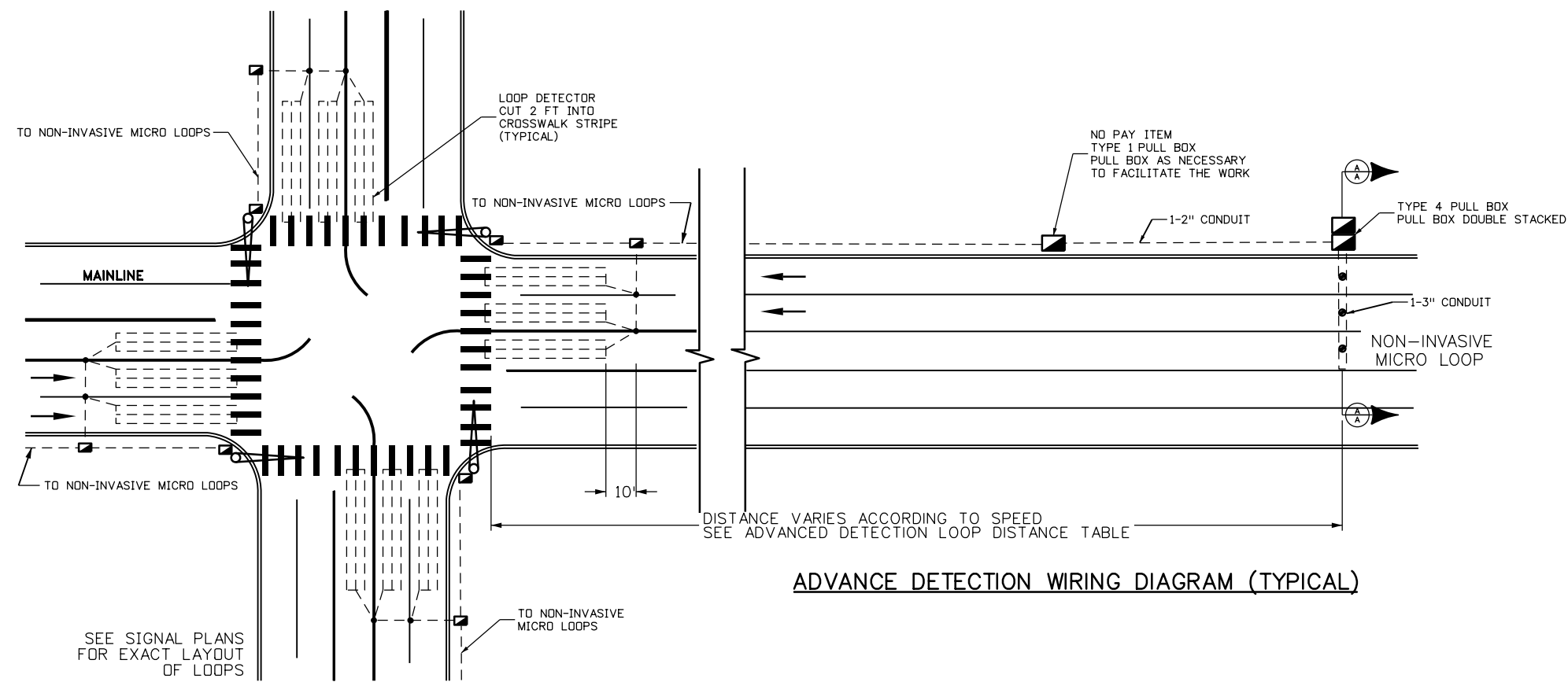


**ADVANCED DETECTION LOOP DISTANCE TABLE**

APPROACH SPEED		DISTANCE FROM INTERSECTION
MPH	KM/HR	FEET
35	56	254
40	64	284
45	72	327
50	80	353
55	88	386

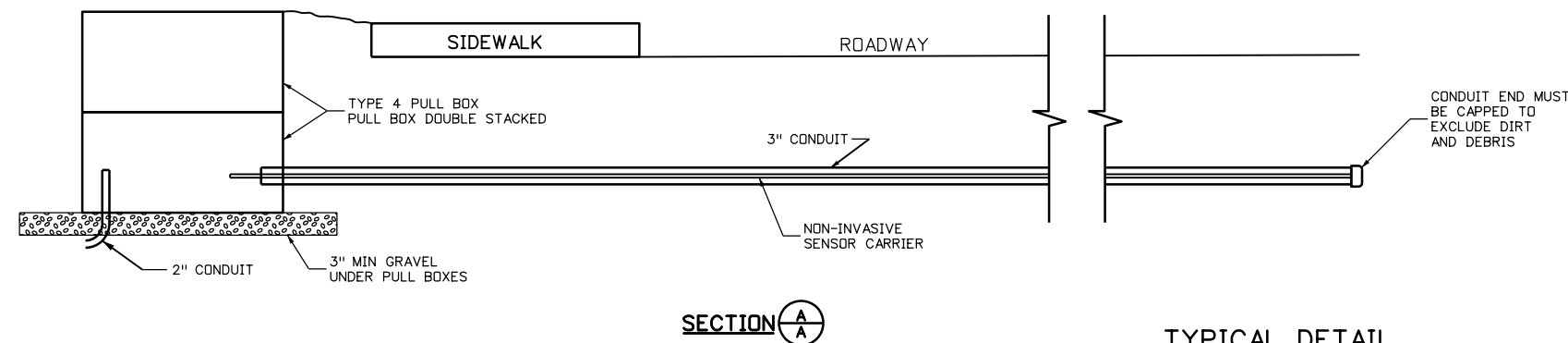
**LEGEND**

- CONTROLLER AND CABINET.....
- ELECTRICAL CONDUIT AND PULL BOX... - - -
- LOOP DETECTOR.....
- PULLBOX (SPECIAL).....
- MICRO DETECTOR.....



**ADVANCE DETECTION WIRING DIAGRAM (TYPICAL)**

**INTERSECTION DETECTOR WIRING DIAGRAM (TYPICAL)**  
(NOT TO SCALE)



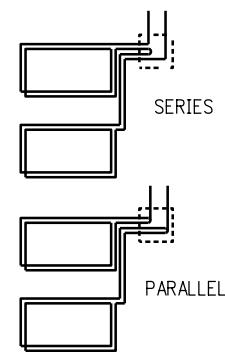
**TYPICAL DETAIL  
NON-INVASIVE MICRODETECTOR  
(DILEMMA ZONE)**

**NOTES**

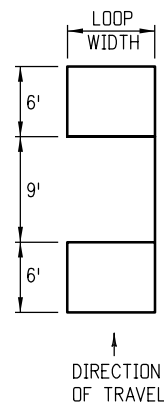
- ALL PULL BOXES ARE NOT TO BE PAID FOR SEPERATELY, BUT SHALL BE INCLUDED IN THE COST OF THE CONDUIT. EXCEPT FOR WHERE CALLED OUT IN THE PLANS.
- ALL PULL BOXES PLACED FOR THE "ADVANCED DETECTION WIRING" SHALL BE PLACED APPROXIMATELY EVERY 100 FEET AND SHALL BE INCLUDED IN THE COST OF THE CONDUIT.
- FOR LAYOUT OF LOOP DETECTORS AND CONDUIT, THE CONTRACTOR SHALL NOTIFY CDOT REGION TRAFFIC ENGINEERS, TWO WORKING DAYS IN ADVANCE.
- SEE PLANS FOR ACTUAL LANE CONFIGURATIONS.

<b>Computer File Information</b>	<b>Sheet Revisions</b>	<b>Colorado Department of Transportation</b>	<b>TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS</b>	<b>STANDARD PLAN NO.</b>
Creation Date: 07/31/19	Date: 04/04/24	 2829 W. Howard Pl. Denver, CO 80204 Phone: 303-757-9436 FAX: 303-757-9219	Issued By: Traffic & Safety Engineering Branch July 31, 2019	S-614-43
Created By: AVU	04/04/24			Standard Sheet No. 1 of 7
Last Modification Date: 04/04/24	04/04/24			Project Sheet Number:
Last Modified By: AVU	04/04/24			MKB
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	04/04/24	<b>Traffic &amp; Safety Engineering</b>		

**WIRE CONFIGURATION**



**LAYOUT**

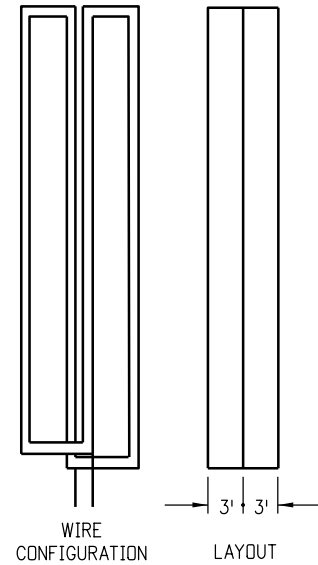


**STANDARD LOOP**

**STANDARD LOOP - WIRING AND CONNECTION TABLE**

NO. OF LOOPS	WIDTH OF LOOP (FEET)									
	6	8	10	12	14	16	18	20	24-36	40+
1	4	3	3	3	3	3	3	3	2	2
2	3S	3S	3S	3P	2S	2S	2S	2S	2S	2P
3	3S	3S	2S	2S	3SP	3SP	3SP	3SP	2SP	2P
4	3SP	3SP	3SP	2SP	3SP	3SP	3SP	2SP	2SP	2SP

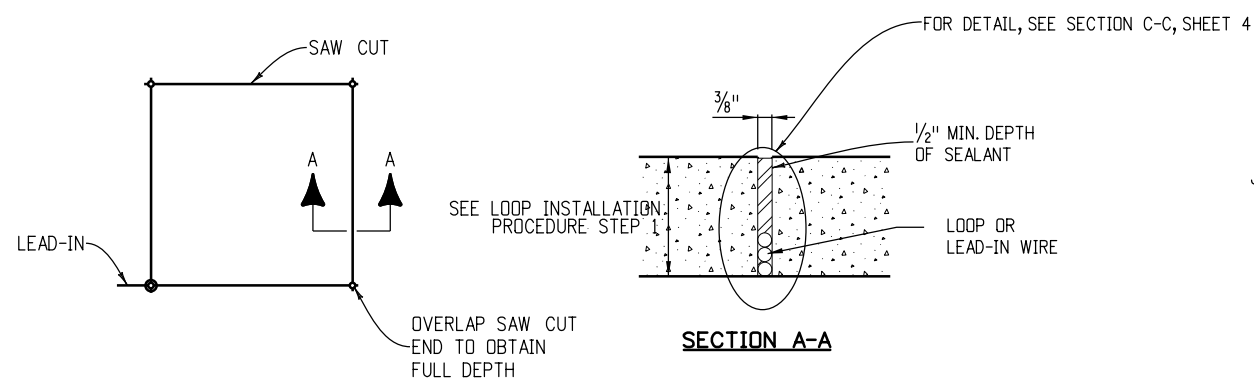
URNS PER LOOP AND TYPE CONNECTION  
(S = SERIES, P = PARALLEL)



**QUADRAPOLE LOOP**

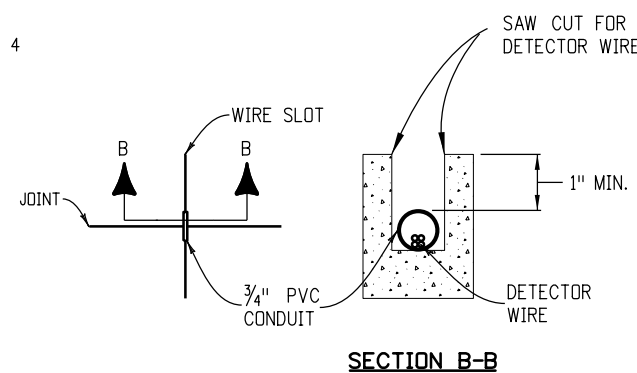
**LOOP INSTALLATION PROCEDURE**

1. CUT SLOTS IN PAVEMENT TO 3 INCH MINIMUM DEPTH (4 INCH MINIMUM FOR RAMP METERS).
2. CLEAN AND DRY SLOTS WITH OIL-FREE COMPRESSED AIR.
3. ONE CONTINUOUS LENGTH OF 14/IC, RHW, USE, XLPE, RHWN OR THWN WIRE SHALL BE USED FOR EACH LOOP FROM SIGNAL BASE OR PULL BOX AROUND THE LOOP WITH THE NUMBER OF TURNS SPECIFIED AND BACK TO THE SIGNAL BASE OR PULL BOX. LOOP WIRE SHALL BE DUCT TYPE.
4. SPLICE LEAD-IN IN FIRST PULL BOX ON THE SIDE OF THE ROADWAY.
5. USE A BLUNT, NON-METALLIC INSTRUMENT TO PUSH WIRE INTO SLOT. DO NOT COIL LEADS.
6. CONNECT DETECTOR AND TEST LOOP.
7. INSTALL LOOPS BEFORE FINAL LIF OF ASPHALT ON MILL AND FILL PROJECTS.
8. SEAL SLOTS AS SPECIFIED.



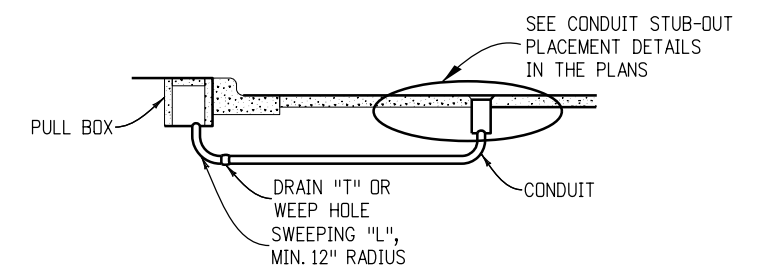
**VEHICLE DETECTOR LOOP SAW CUT DETAILS**

(FOR USE WITH VINYL TUBING ENCASED LOOP DETECTOR WIRE)



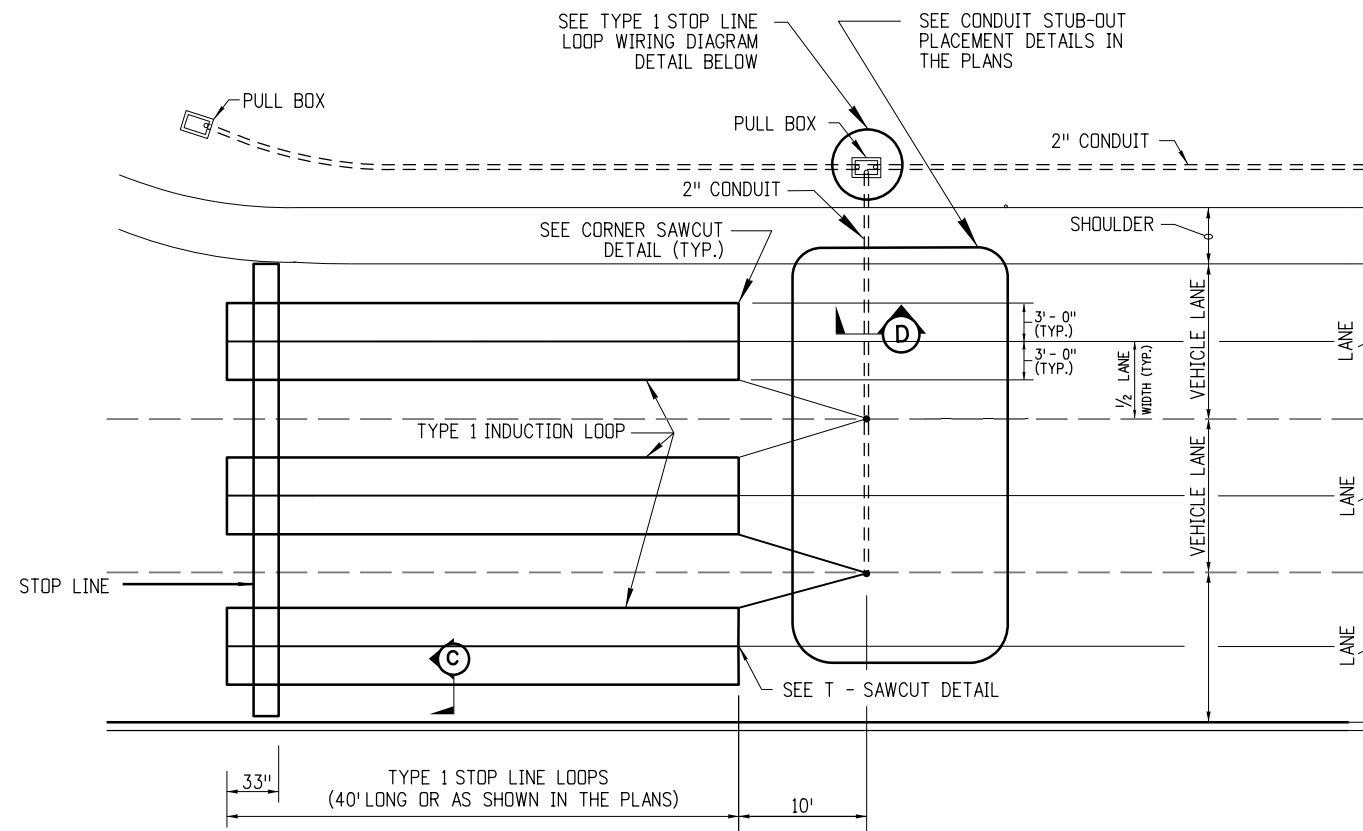
**DETECTOR WIRE ACROSS BRIDGE JOINTS**

QUADRAPOLE LOOPS SHALL BE OF THE SIZE SHOWN UNLESS OTHERWISE ON THE PLANS.

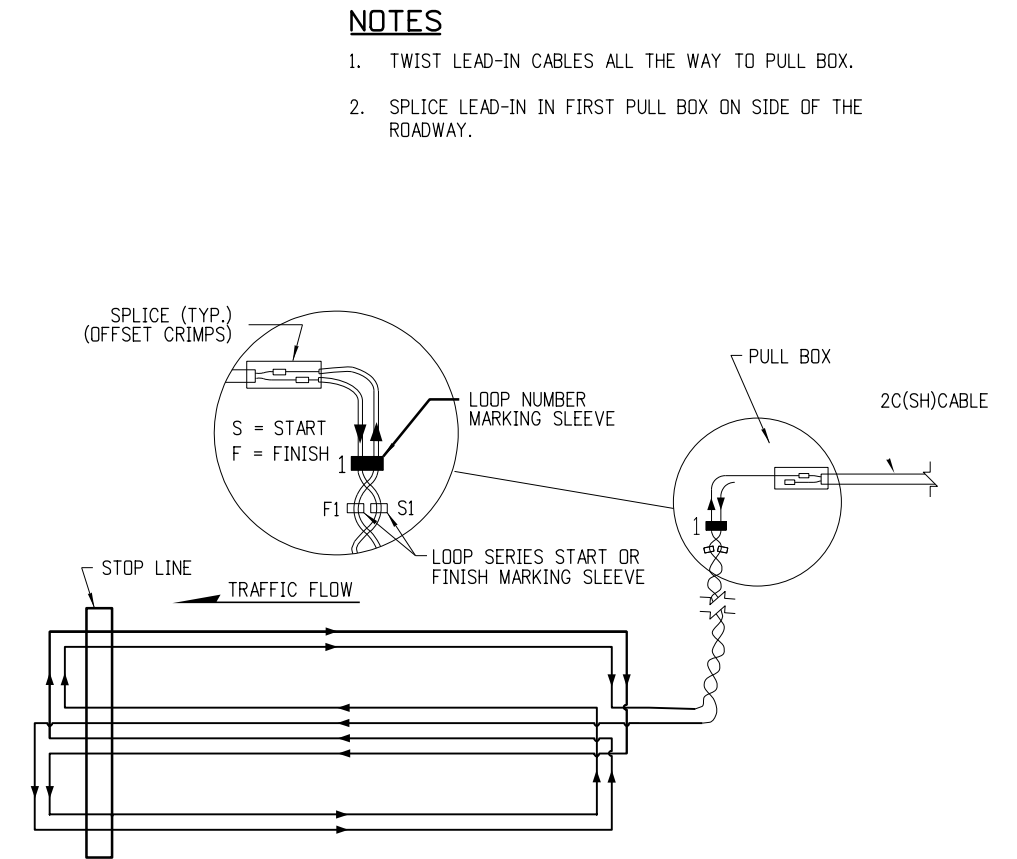


**LOOP DETECTOR LEAD-IN**

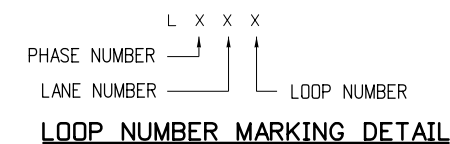
<b>Computer File Information</b>		<b>Sheet Revisions</b>		<p>Colorado Department of Transportation 2829 W. Howard Pl. Denver, CO 80204 Phone: 303-757-9436 FAX: 303-757-9219</p> <p><b>Traffic &amp; Safety Engineering</b>      <b>MKB</b></p>	<p><b>TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS</b></p> <p>Issued By: Traffic &amp; Safety Engineering Branch July 31, 2019</p>	<b>STANDARD PLAN NO.</b>	
Creation Date: 07/14/12		Date:	Comments			S-614-43	
Created By: KEN		04/04/24	UPDATED SHEET NUMBERING			Standard Sheet No. 2 of 7	
Last Modification Date: 04/04/24						Project Sheet Number:	
Last Modified By: AVU							
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English							



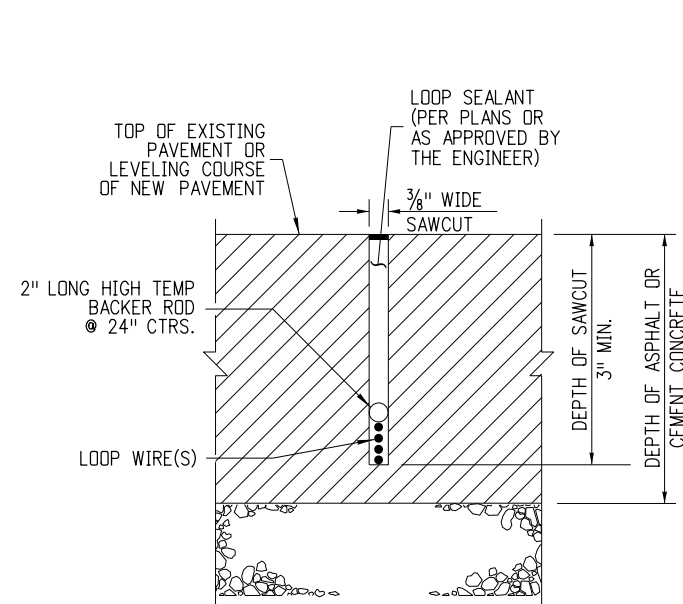
**TYPE 1 STOP LINE LOOPS - PLAN VIEW**



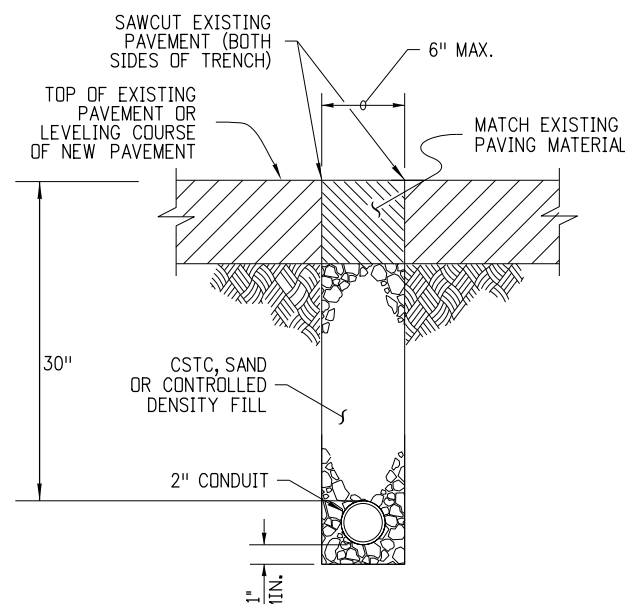
**TYPE 1 STOP LINE LOOP WIRING DIAGRAM**



**LOOP NUMBER MARKING DETAIL**

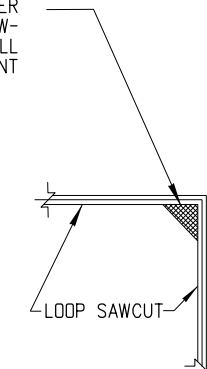


**SECTION C-C**



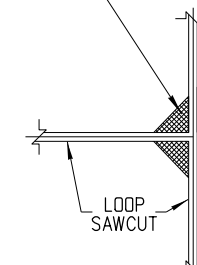
**SECTION D-D**

CHISEL OUT 1/8" TO 1/2" CORNER  
REMOVE PAVEMENT TO SAW-  
CUT DEPTH AND FILL  
WITH SEALANT



**CORNER SAWCUT DETAIL**

CHISEL OUT 1/8" TO 1/2" CORNER  
REMOVE PAVEMENT TO SAW-  
CUT DEPTH AND FILL  
WITH SEALANT (TYP.)




**T - SAWCUT DETAIL**

**TYPE 1 INDUCTION LOOP**

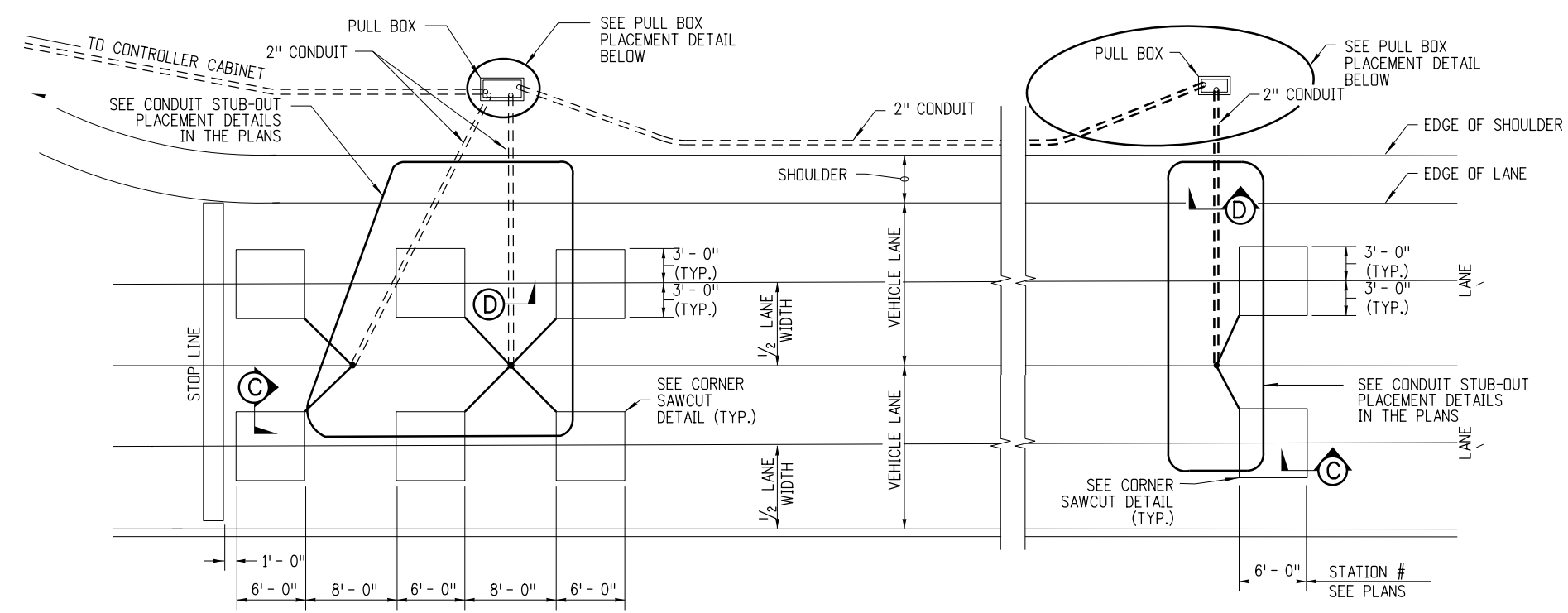
**NOTES**

1. TWIST LEAD-IN CABLES ALL THE WAY TO PULL BOX.
2. SPLICE LEAD-IN IN FIRST PULL BOX ON SIDE OF THE ROADWAY.

<b>Computer File Information</b>		<b>Sheet Revisions</b>		Colorado Department of Transportation  2829 W. Howard Pl. Denver, CO 80204 Phone: 303-757-9436 FAX: 303-757-9219 <b>Traffic &amp; Safety Engineering</b>	<b>TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS</b>	<b>STANDARD PLAN NO.</b>	
Creation Date: 07/14/12		Date:	Comments			S-614-43	
Created By: KEN		04/04/24	UPDATED SHEET NUMBERING			Standard Sheet No. 3 of 7	
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Last Modified By: AVU							
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English				MKB	Issued By: Traffic & Safety Engineering Branch July 31, 2019		

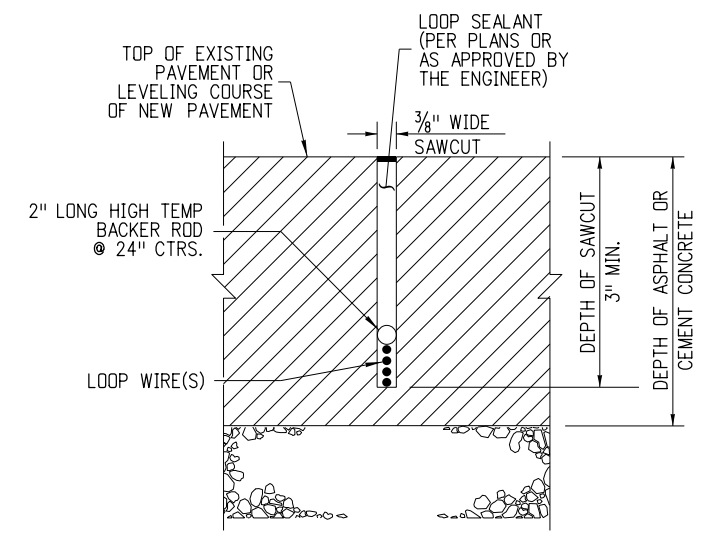
**NOTES**

1. ALL OF THE LOOP LEAD-IN WIRES SHALL RETURN TO THE PULL BOX.

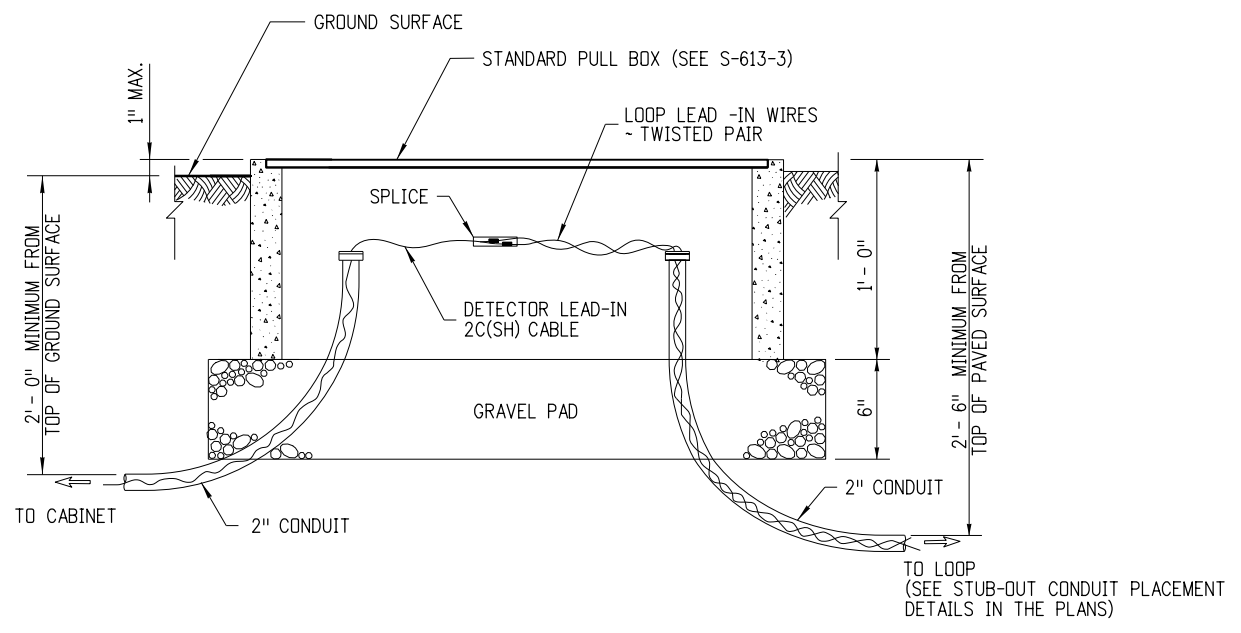


**TYPE 2 STOP LINE LOOPS**

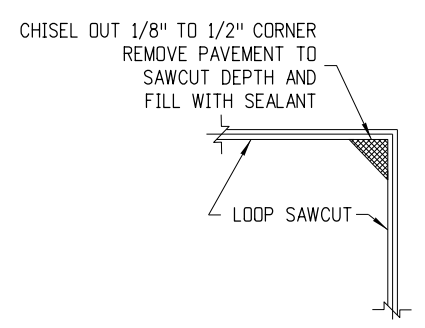
**TYPE 2 ADVANCE LOOPS**



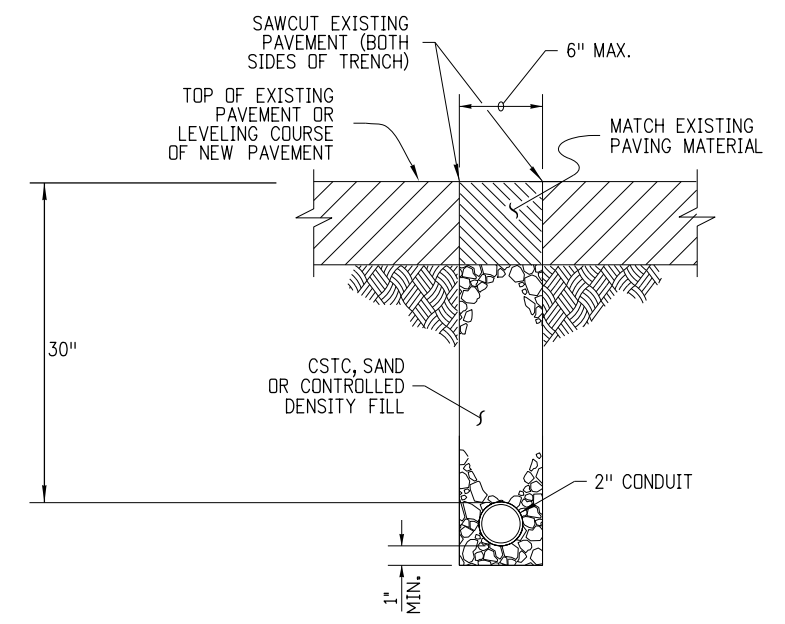
**SECTION C-C**



**PULL BOX PLACEMENT DETAIL**



**CORNER SAWCUT DETAIL**



**SECTION D-D**

**TYPE 2 INDUCTION LOOPS (FOR CONVENTIONAL HIGHWAYS)**

Computer File Information	
Creation Date:	07/14/12
Created By:	KEN
Last Modification Date:	04/04/24
Last Modified By:	AVU
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	

Sheet Revisions	
Date:	Comments
04/04/24	UPDATED PULL BOX PLACEMENT DETAIL
	REFERENCE TO STANDARD PULL BOX
04/04/24	UPDATED SHEET NUMBERING

Colorado Department of Transportation

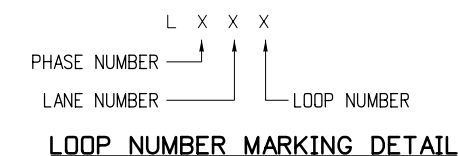
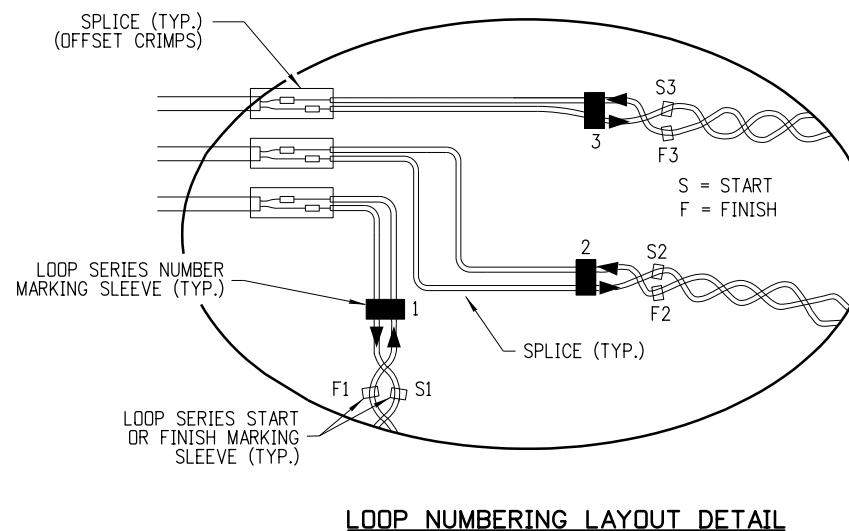
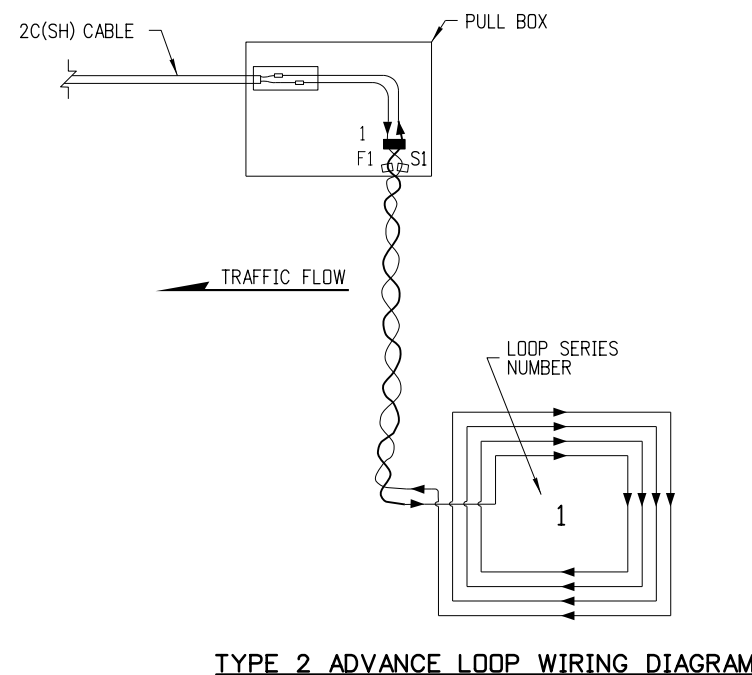
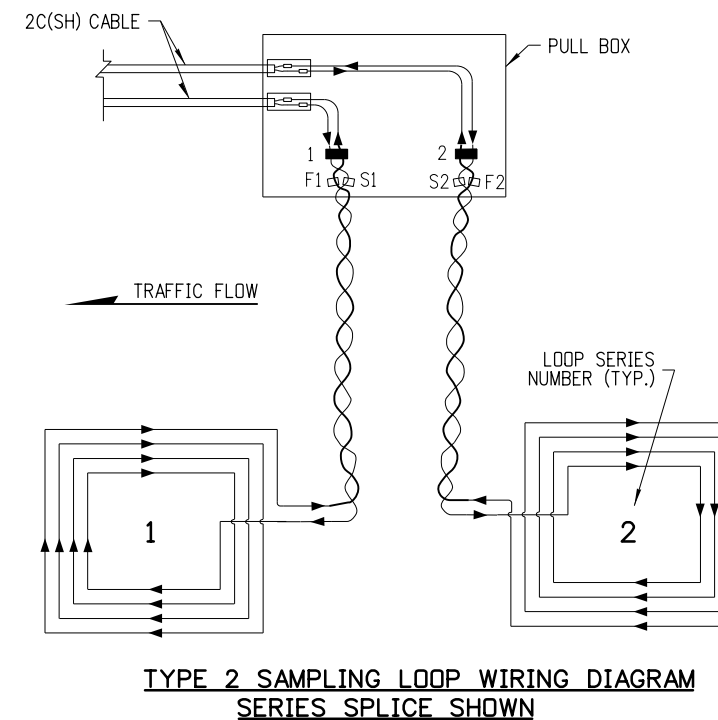
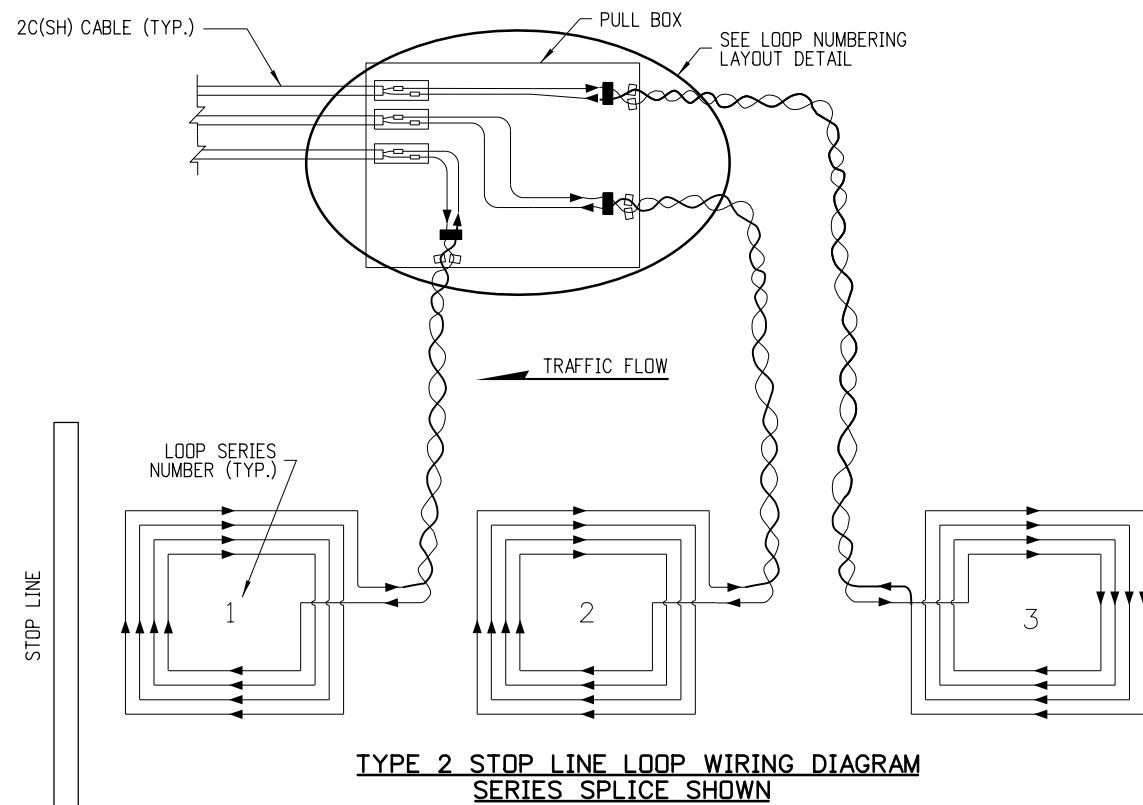
2829 W. Howard Pl.  
Denver, CO 80204  
Phone: 303-757-9436  
FAX: 303-757-9219

Traffic & Safety Engineering MKB

**TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS**

Issued By: Traffic & Safety Engineering Branch July 31, 2019

STANDARD PLAN NO.
S-614-43
Standard Sheet No. 4 of 7
Project Sheet Number:

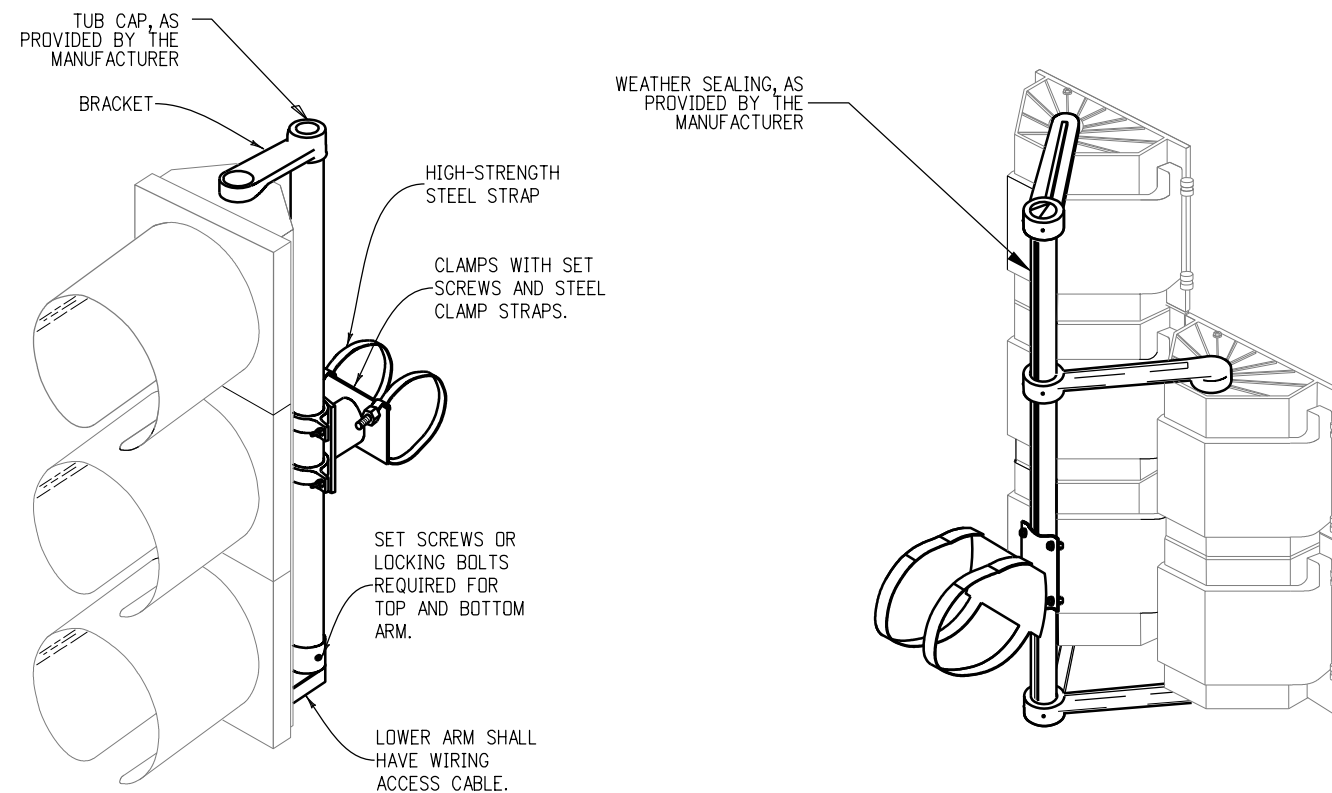


**NOTES**

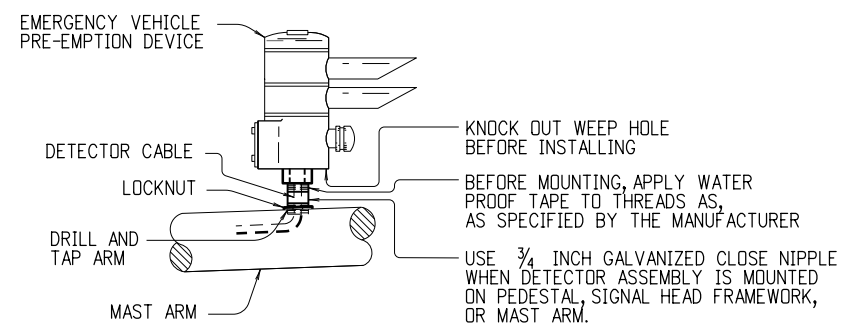
1. FOR WIRING AND CONDUIT LAYOUT, SEE CONDUIT STUB-OUT PLACEMENT DETAIL IN PLANS.
2. SPLICE LEAD-IN IN FIRST PULL BOX ON THE SIDE OF THE ROADWAY.

**TYPE 2 INDUCTION LOOP**

<b>Computer File Information</b>		<b>Sheet Revisions</b>		Colorado Department of Transportation  2829 W. Howard Pl. Denver, CO 80204 Phone: 303-757-9436 FAX: 303-757-9219 <b>Traffic &amp; Safety Engineering</b>	<b>TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS</b> Issued By: Traffic & Safety Engineering Branch July 31, 2019	<b>STANDARD PLAN NO.</b>	
Creation Date: 07/14/12		Date:	Comments			S-614-43	
Created By: KEN		04/04/24	UPDATED SHEET NUMBERING			Standard Sheet No. 5 of 7	
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Last Modified By: AVU							
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English				MKB			



**ASTRO-TYPE MOUNTING BRACKET**




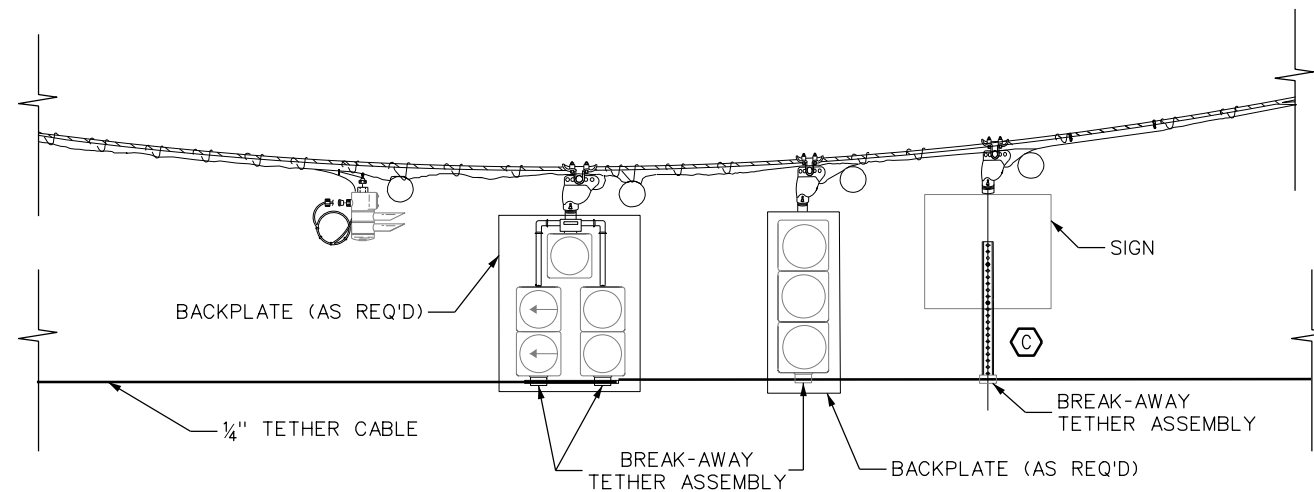
**EMERGENCY VEHICLE PRE-EMPTION DEVICE MOUNTING DETAIL**

**NOTES**

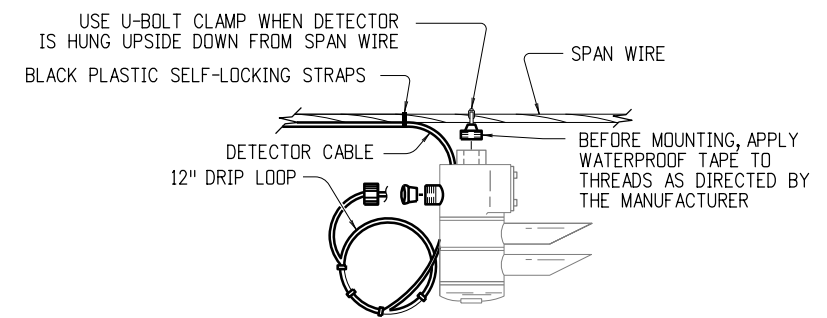
1. SIGNAL HEAD CONFIGURATIONS SHALL BE AS SHOWN ON PLANS.
2. INSTALL MOUNTING BRACKETS ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
3. USE ASTRO-TYPE MOUNTING BRACKETS FOR MOUNTING EXCEPT FOR LIGHTED SIGNS, ON MAST ARMS, SEE STANDARD PLAN 5-614-20, USING 3/4 INCH WIDE BANDING.
4. LIGHTED STREET NAME SIGNS SHALL UTILIZE ASTRO-TYPE DESIGNED FOR THE REQUIRED DESIGN LOADING AND BE FREE-SWINGING TO REDUCE WIND LOADING EFFECT.
5. THE GASKET INSIDE THE TOP HEAD MOUNT SHOULD BE INSIDE THE HEAD.
6. THE INSIDE OF THE VISOR IS TO BE POWDER COATED BLACK MOUNTING BRACKETS OVERHEAD SIGNS.
7. CABLE SUPPORT BRACKET AND SAFETY CABLE FROM MAST ARM TO HEAD SHALL BE PROVIDED.

**MAST-ARM MOUNTING BRACKETS**

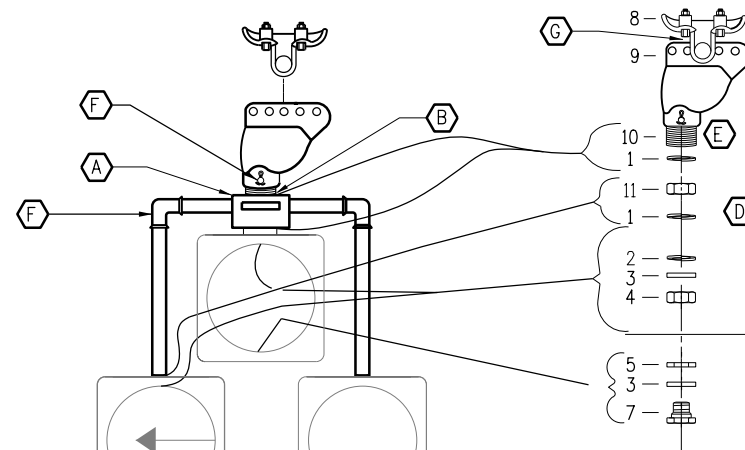
<b>Computer File Information</b>		<b>Sheet Revisions</b>		Colorado Department of Transportation  2829 W. Howard Pl. Denver, CO 80204 Phone: 303-757-9436 FAX: 303-757-9219 <b>Traffic &amp; Safety Engineering</b> <b>MKB</b>	<b>TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS</b>	<b>STANDARD PLAN NO.</b>
Creation Date: 07/14/12		Date:	Comments			S-614-43
Created By: KEN		04/04/24	UPDATED SHEET NUMBERING			Standard Sheet No. 6 of 7
Last Modification Date: 04/04/24					Project Sheet Number:	
Last Modified By: AVU						
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English					Issued By: Traffic & Safety Engineering Branch July 31, 2019	



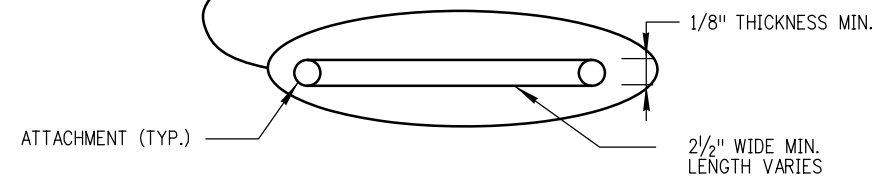
**SPAN WIRE HANGER  
ASSEMBLY DETAIL FOR  
TRAFFIC SIGNALS**



**SPAN WIRE MOUNTING DETAIL  
FOR EMERGENCY VEHICLE PRE-EMPTION DEVICE**



**DIRECT ASSEMBLY DETAIL**



**BREAK-AWAY TETHER  
ASSEMBLY DETAIL**


**LEGEND**

- (A) TOP BRACKET CENTER HUB SHALL BE MINIMUM 3.5 INCH SQUARE AND 3 INCHES DEEP OR EQUAL VOLUME. SERRATION CAST IN HUB, TABBED OR SERRATED LOCKRING, OPENINGS SHALL BE THREADED.
- (B) NIPPLE LENGTH DEPENDS ON SPAN HEIGHT.
- (C) SIGN SUPPORT BRACKET ASSEMBLY SHALL UTILIZE SPAN WIRE CLAMP ADJUSTMENT AND BE ADJUSTABLE TO ACCOMMODATE VARYING SPAN HEIGHT. TETHER SUPPORT BAR SHALL BE ATTACHED TO THE SIGN USING A MINIMUM OF TWO (2), 3/16 INCH BOLTS, SPACED A MINIMUM OF 6 INCHES APART.
- (D) APPLY SILICONE CAULK BETWEEN OR AROUND SERRATED LOCKRING AND HOUSING.
- (E) ALL THREAD
- (F) SETSCREW (SQUARE OR ALLEN) ON ALL FITTINGS.
- (G) INSTALL STAINLESS STEEL WASHER ON THE INSIDE OF THE COTTER PIN. COTTER PIN AND WASHER SHALL BE ON THE SIDE OF THE HANGER AWAY FROM THE SIGNAL CABLES.

**ITEM DESCRIPTION FOR ASSEMBLY DETAIL**

- 1 - SERRATED TABBED LOCKRING, ALUMINUM (TAB MUST BE FULL WIDTH OF RING)
- 2 - GASKET, NEOPRENE
- 3 - WASHER, STEEL
- 4 - HEX NUT, STEEL
- 5 - CONDUIT LOCKNUT, STEEL
- 6 - BUSHING PLASTIC (ONLY IN JUNCTION BOX OR NIPPLED DOWN TRAFFIC SIGNAL)
- 7 - OCTAGONAL CAP, ALUMINUM
- 8 - SPAN WIRE CLAMP
- 9 - WIRE OUTLET BODY, STEEL, FEMALE ONLY
- 10 - NIPPLE, STEEL
- 11 - HEX NUT, STEEL, NOTCHED WITH SETSCREWS

**SPAN WIRE MOUNTING BRACKET DETAILS**

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Created By: KEN		04/04/24	UPDATED SHEET NUMBERING			Standard Sheet No. 7 of 7	
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CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English							