

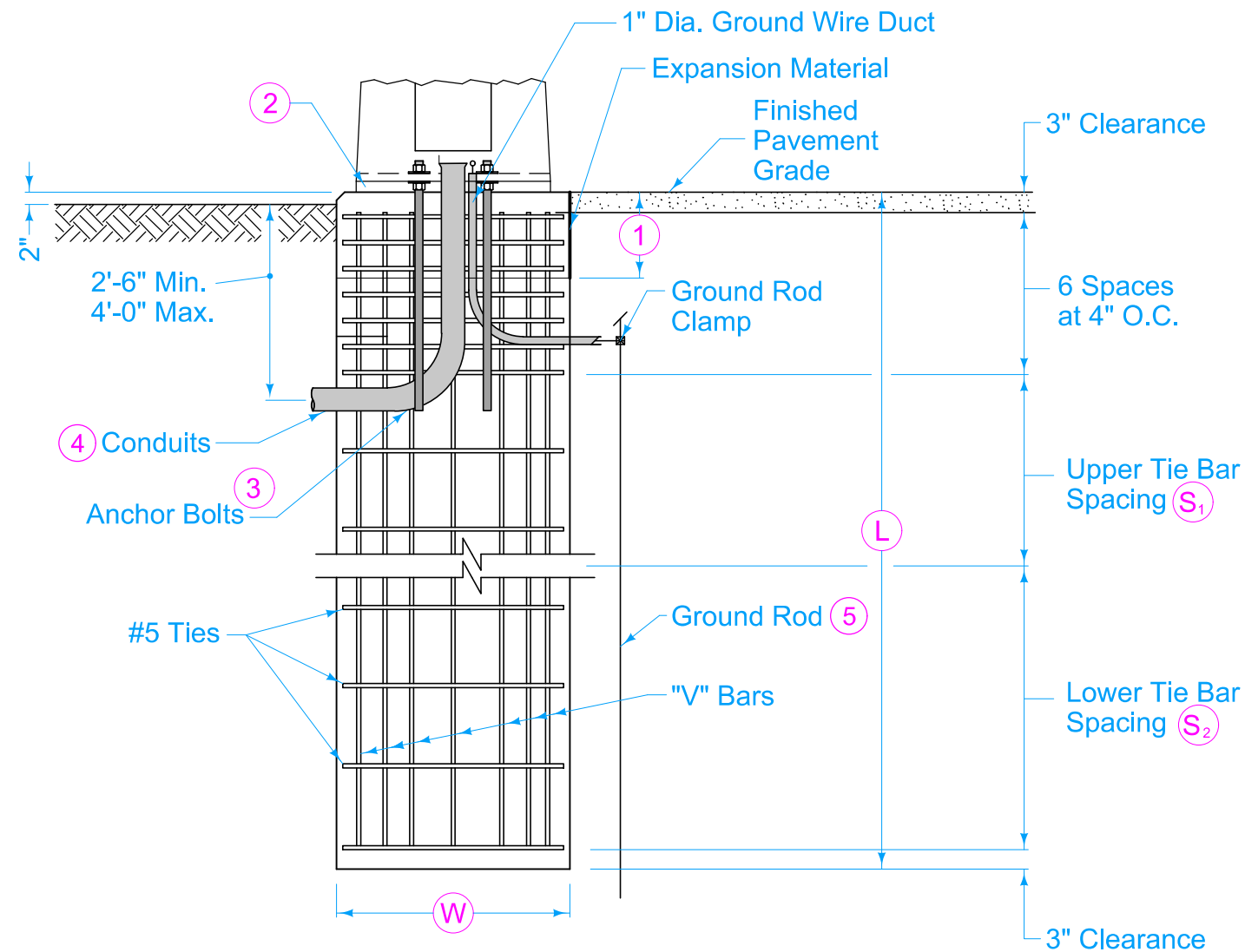
# Traffic Signals

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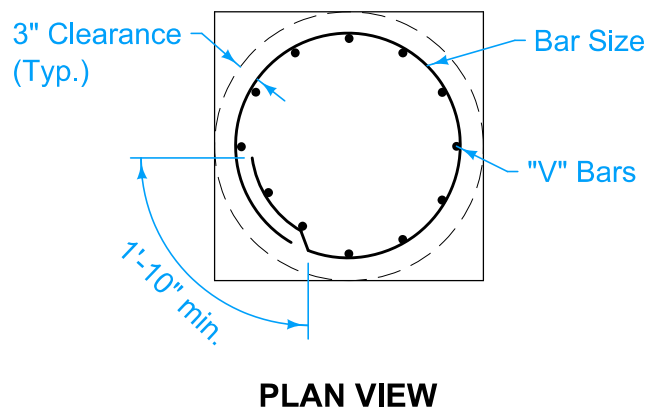
SECTION

# TS

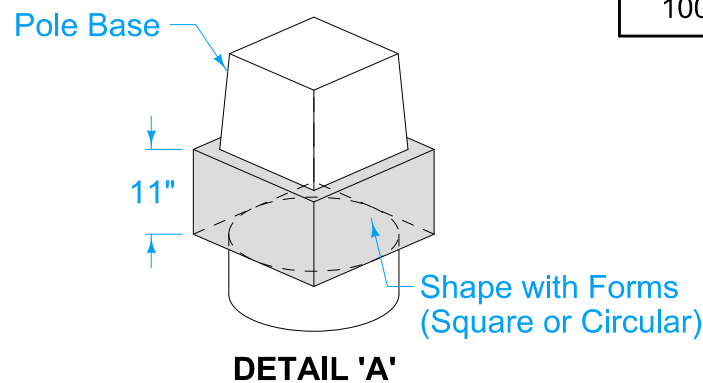
NO.	DATE	TITLE
TS-102	04-19-22	Traffic Signal Pole Foundation



**MAST ARM POLE FOUNDATION IN SOIL TYPE A FOUNDATION**



**PLAN VIEW**



**DETAIL 'A'**

The Type A Foundation is the normally required foundation construction. Where rock is encountered, the Engineer may approve the use of the Type B or C Foundation. Prior to installing a foundation in rock, obtain a subsurface investigation certified by a geotechnical engineer licensed in the State of Iowa.

- ① Shape top 11 inches with forms. See Detail 'A'.
- ② Install rodent guard or non-shrink grout with weep hole.
- ③ Furnish nut, nut and plate, or nut and anchor bolt assembly ring plate on embedded end.
- ④ Provide conduits as per plans.
- ⑤ Install ground rod adjacent to foundation or in adjacent handhole.

Max. Mast Arm Length	Foundation		"V" Bars			Tie Bars				
	W	L	Count	Size	Length	Count	Upper Spacing		Lower Spacing	
							# Spaces	S <sub>1</sub>	# Spaces	S <sub>2</sub>
35'-0"	3'-0"	12'-0"	12	#8	11'-6"	17	9	12"	N/A	N/A
45'-0"	3'-0"	14'-0"	12	#8	13'-6"	19	11	12"	N/A	N/A
55'-0"	3'-0"	16'-0"	12	#8	15'-6"	25	12	8"	5	12"
60'-0"	3'-0"	18'-0"	13	#8	17'-6"	28	15	8"	5	12"
70'-0"	3'-6"	18'-0"	12	#10	17'-6"	28	15	8"	5	12"
80'-0"	3'-6"	21'-0"	14	#10	20'-6"	40	28	6"	4	12"
90'-0"	4'-0"	22'-0"	16	#10	21'-6"	42	24	6"	10	8"
100'-0"	4'-0"	24'-0"	18	#10	23'-6"	47	32	6"	7	8"

SUDAS IOWA DOT <b>FIGURE 8010.102</b> <b>STANDARD ROAD PLAN</b>	REVISION 5    04-19-22 <b>TS-102</b> SHEET 1 of 4	
	REVISIONS:    Removed hooks from foundation reinforcing. Updated notes for conduit installation. Clarified placement of ground rod.	

 SUDAS DIRECTOR	 DESIGN METHODS ENGINEER
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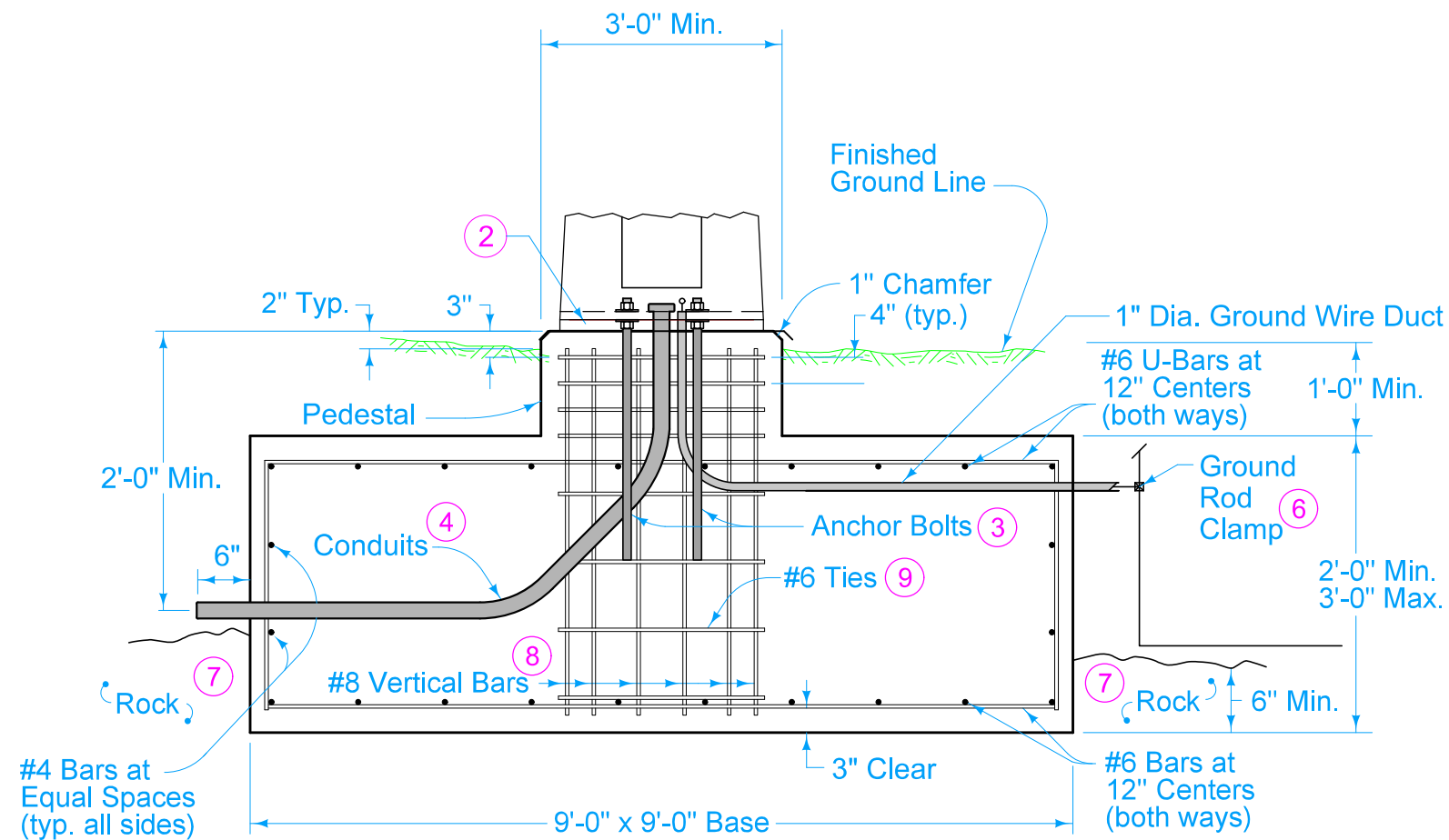
**TRAFFIC SIGNAL POLE FOUNDATION**

Type B Foundation is applicable for traffic signal poles with mast arm lengths up to 60 feet.

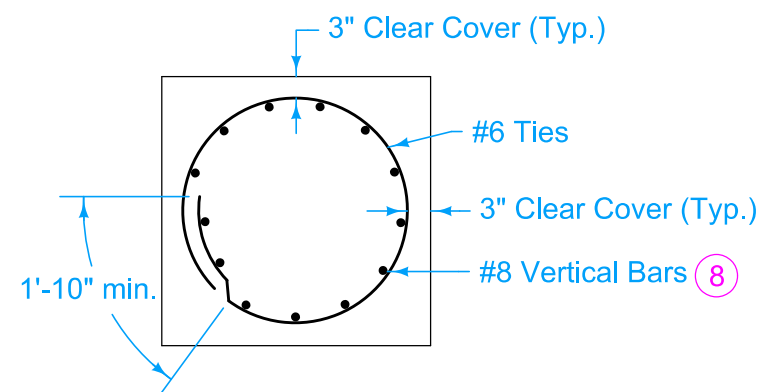
If the excavation for a Type B Foundation is left open for more than 1 calendar day, install temporary barrier rail if any part of the excavation is located within the clear zone. Temporary barrier rail layout requires the Engineer's approval.

Competent rock has an average unconfined compressive strength ( $q_u$ ) of at least 2.0 ksi and rock quality designation of at least 90%. Conditions not meeting minimum requirements will require either:

- A site specific design, or
- Using the parameters for Mast Arm Pole Foundation in Soil.



**MAST ARM POLE FOUNDATION IN ROCK  
TYPE B FOUNDATION**



**PLAN VIEW**

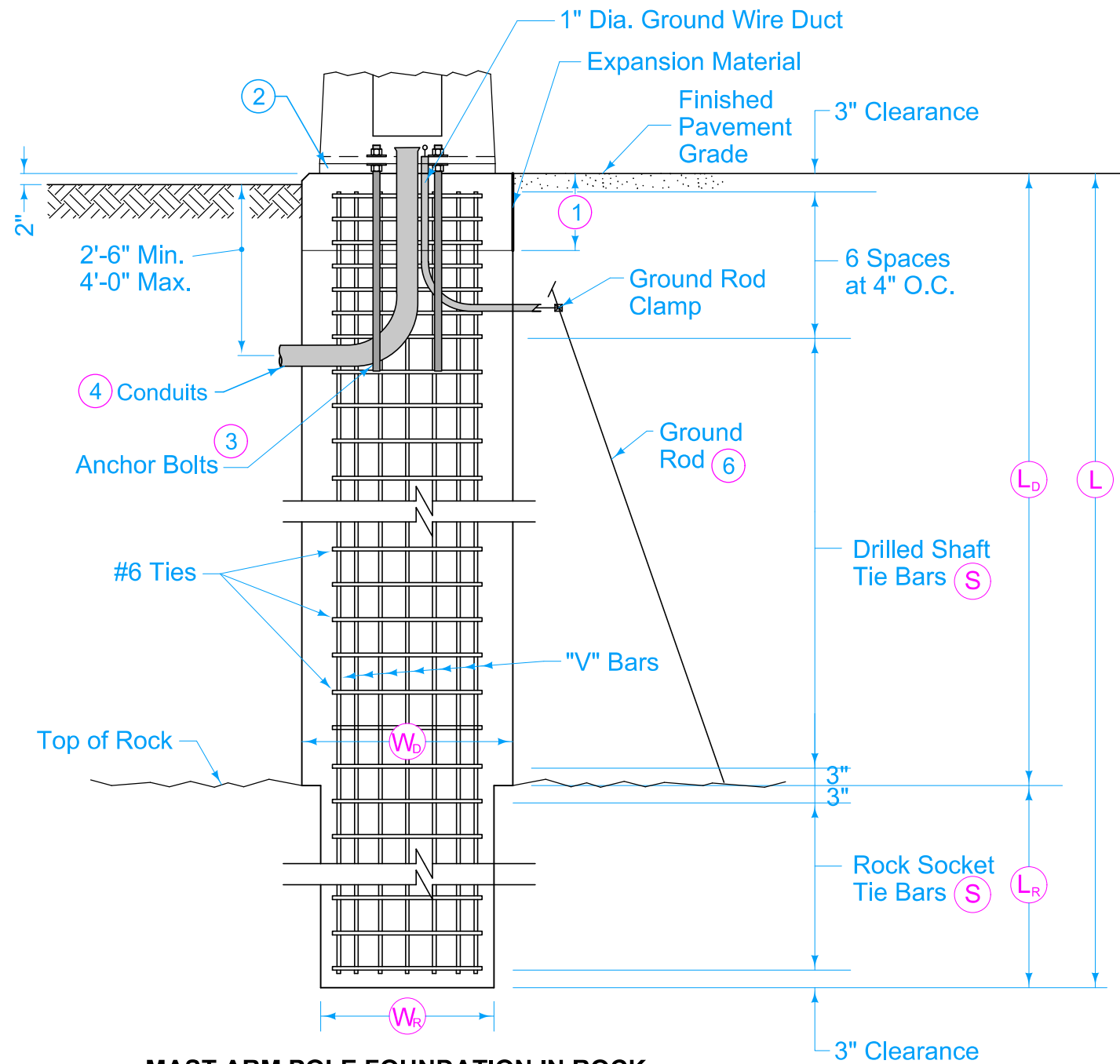
- ② Install rodent guard or non-shrink grout with weep hole.
- ③ Furnish nut, nut and plate, or nut and anchor bolt assembly ring plate on embedded end.
- ④ Provide conduits as per plans.
- ⑥ When in contact with rock, place ground rods as specified in National Electrical Code, current edition, adjacent to foundation or in adjacent handhole.
- ⑦ Cast foundation concrete against competent rock. If foundation is formed, place backfill with concrete cast against rock.
- ⑧ Place 13 equally spaced #8 vertical bars.
- ⑨ #6 bars spaced at 8 inch maximum. Ties may be welded to vertical bars.

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<b>FIGURE 8010.102</b>	<b>STANDARD ROAD PLAN</b>	<b>TS-102</b>	
		SHEET 2 of 4	

REVISIONS: Removed hooks from foundation reinforcing. Updated notes for conduit installation. Clarified placement of ground rod.

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- ① Shape top 11 inches with forms. See Detail 'A'.
- ② Install rodent guard or non-shrink grout with weep hole.
- ③ Furnish nut, nut and plate, or nut and anchor bolt assembly ring plate on embedded end.
- ④ Provide conduits as per plans.
- ⑥ When in contact with rock, place ground rods as specified in National Electrical Code, current edition, adjacent to foundation or in adjacent handhole.

Max. Mast Arm Length	Foundation						"V" Bars			Tie Bars
	$W_D$	$W_R$	$L^{***}$	$L_D$	$L_R^{****}$		Count	Size	Length	$S$
	Min.	Min.	Max.		Broken Rock*	Competent Rock**				
35'-0"	3'-0"	2'-6"	12'-0"	VARIES $L_D = (L - L_R)$	4'-6"	3'-0"	13	#8	L - 6"	6"
45'-0"	3'-0"	2'-6"	14'-0"		4'-6"	3'-0"	13	#8	L - 6"	6"
55'-0"	3'-0"	2'-6"	16'-0"		4'-6"	3'-0"	13	#8	L - 6"	6"
60'-0"	3'-0"	2'-6"	18'-0"		4'-6"	3'-0"	13	#8	L - 6"	6"
70'-0"	3'-6"	3'-0"	18'-0"		5'-6"	3'-6"	14	#9	L - 6"	5½"
80'-0"	3'-6"	3'-0"	21'-0"		5'-6"	3'-6"	14	#9	L - 6"	5½"
90'-0"	4'-0"	3'-6"	22'-0"		6'-0"	4'-0"	15	#10	L - 6"	5½"
100'-0"	4'-0"	3'-6"	24'-0"		6'-0"	4'-0"	15	#10	L - 6"	5½"

\*Broken rock has an average unconfined compressive strength ( $q_u$ ) of at least 1.0 ksi and rock quality designation of at least 20%.

\*\*Competent rock has an average unconfined compressive strength ( $q_u$ ) of at least 2.0 ksi and rock quality designation of at least 90%.

\*\*\*Total foundation length  $L$  must be sufficient to provide a 3 inch clearance between the bottom of the traffic signal pole anchor bolts and the bottom of the rock socket.

\*\*\*\*The Rock Socket Length  $L_R$  can be decreased if the total length of the shaft is  $L$  long as shown in the table.

Conditions not meeting minimum requirements will require site specific designs or shall use the Type A Foundation Soil parameters.

**MAST ARM POLE FOUNDATION IN ROCK  
TYPE C FOUNDATION**

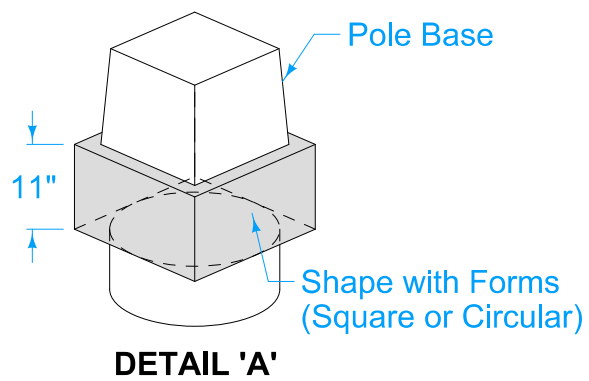
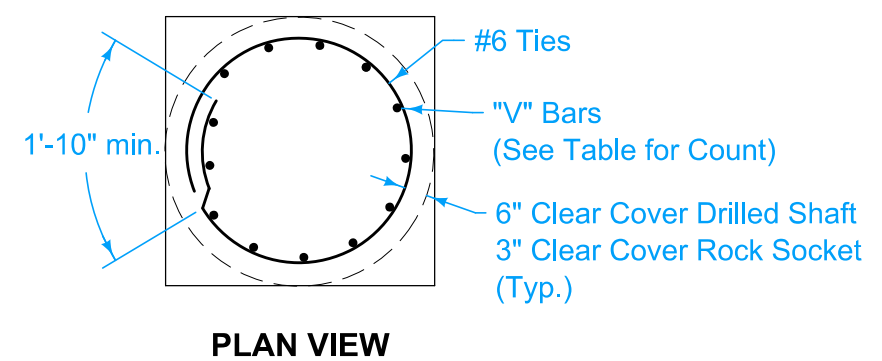
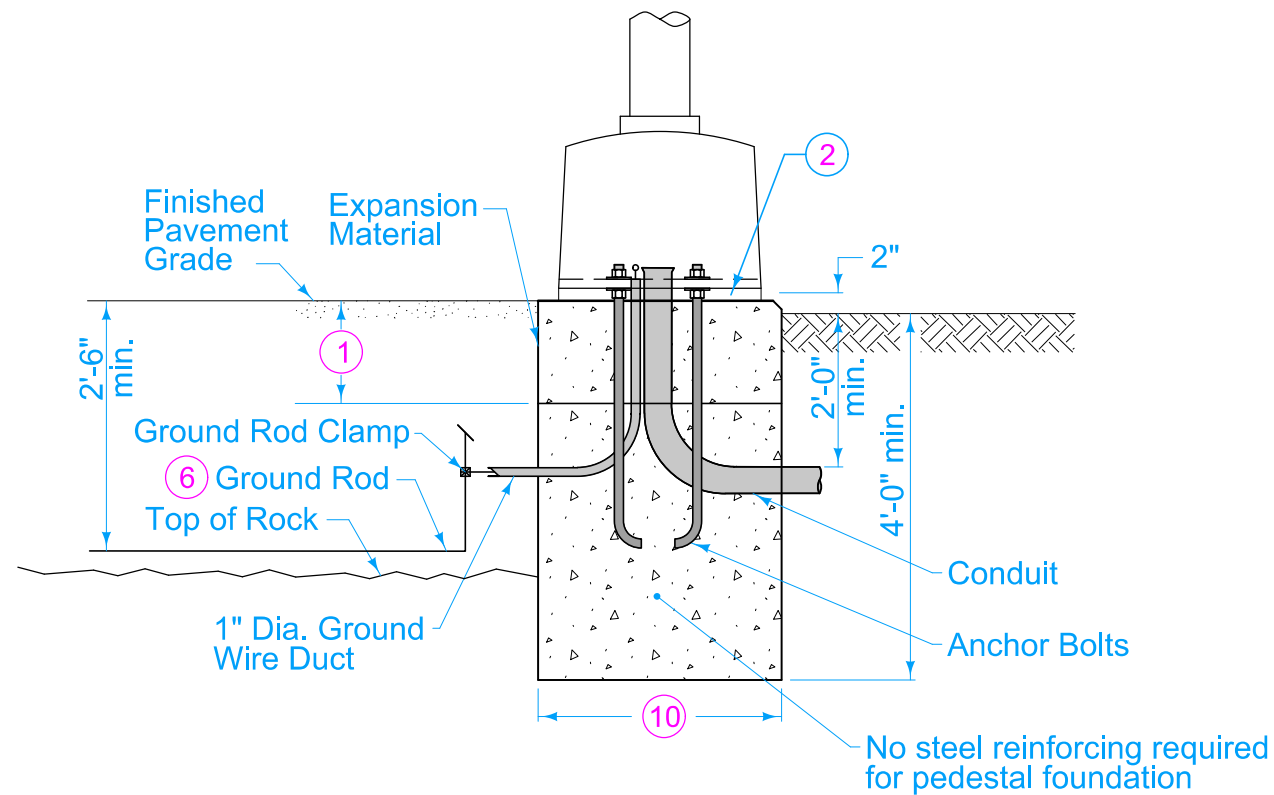
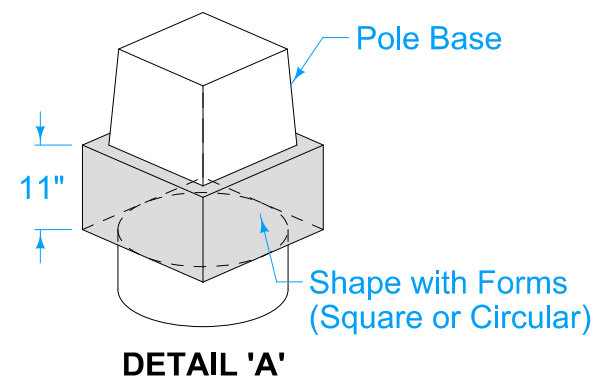


FIGURE 8010.102 SHEET 3 OF 4

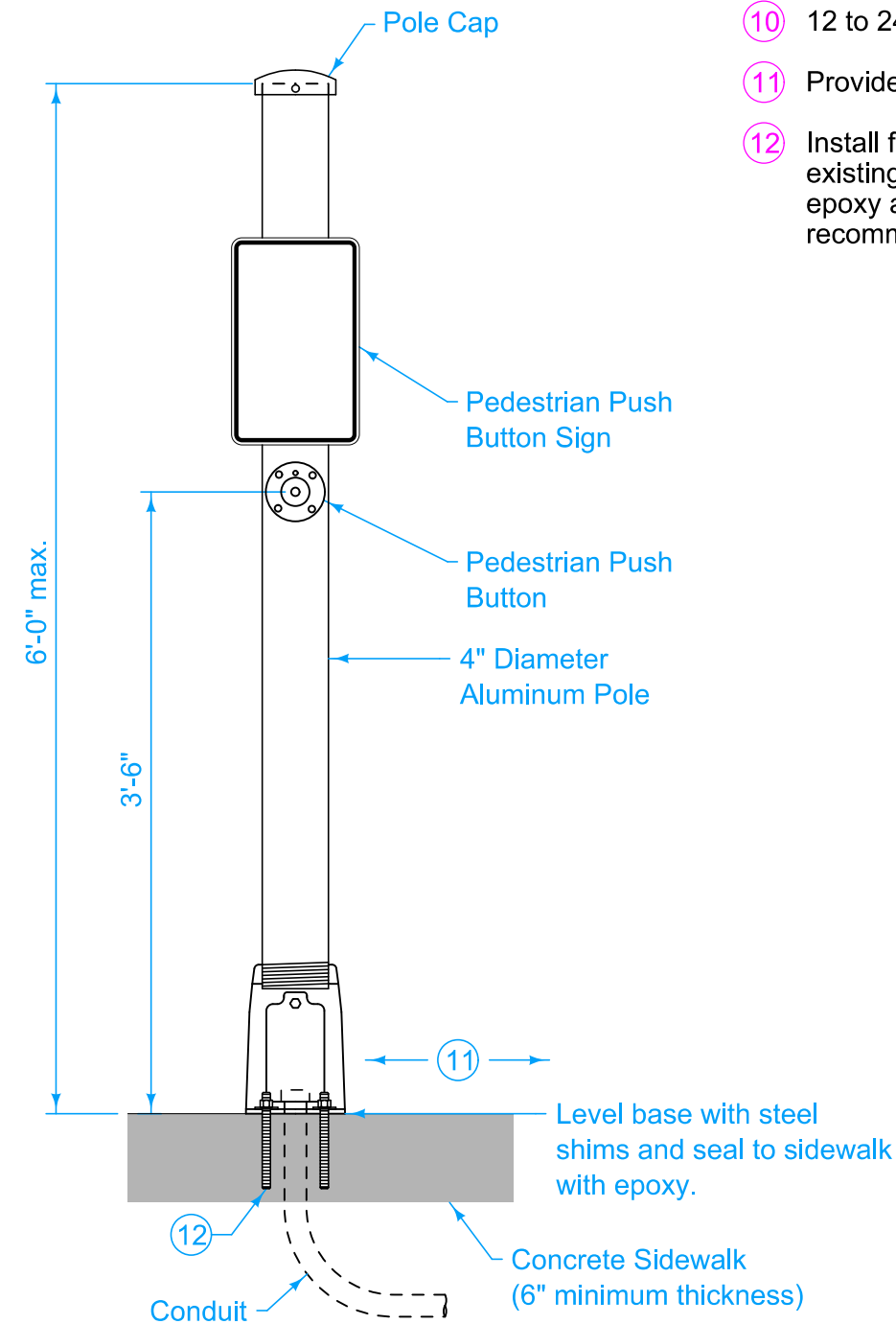
SUDAS IOWA DOT	REVISION 5 04-19-22
	<b>TS-102</b> SHEET 3 of 4
REVISIONS: Removed hooks from foundation reinforcing. Updated notes for conduit installation. Clarified placement of ground rod.	
<i>Paul D. Wrigand</i> SUDAS DIRECTOR	<i>Shawn Miller</i> DESIGN METHODS ENGINEER
<b>TRAFFIC SIGNAL POLE FOUNDATION</b>	



PEDESTAL POLE FOUNDATION IN SOIL OR ROCK



DETAIL 'A'



ALTERNATE PUSH BUTTON POLE SIDEWALK MOUNTING

- ① Shape top 11 inches with forms. See Detail 'A'.
- ② Install rodent guard or non-shrink grout with weep hole.
- ⑥ When in contact with rock, place ground rods as specified in National Electrical Code, current edition, adjacent to foundation or in adjacent handhole.
- ⑩ 12 to 24 inch diameter as shown in contract documents.
- ⑪ Provide 4 foot accessible path adjacent to push button pole.
- ⑫ Install four anchor bolts, washers, and nuts in new or existing concrete sidewalk by drilling and anchoring with epoxy adhesive. Provide bolts according to manufacturer's recommendations.

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FIGURE 8010.102	STANDARD ROAD PLAN	<b>TS-102</b> SHEET 4 of 4	

REVISIONS: Removed hooks from foundation reinforcing. Updated notes for conduit installation. Clarified placement of ground rod.

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