

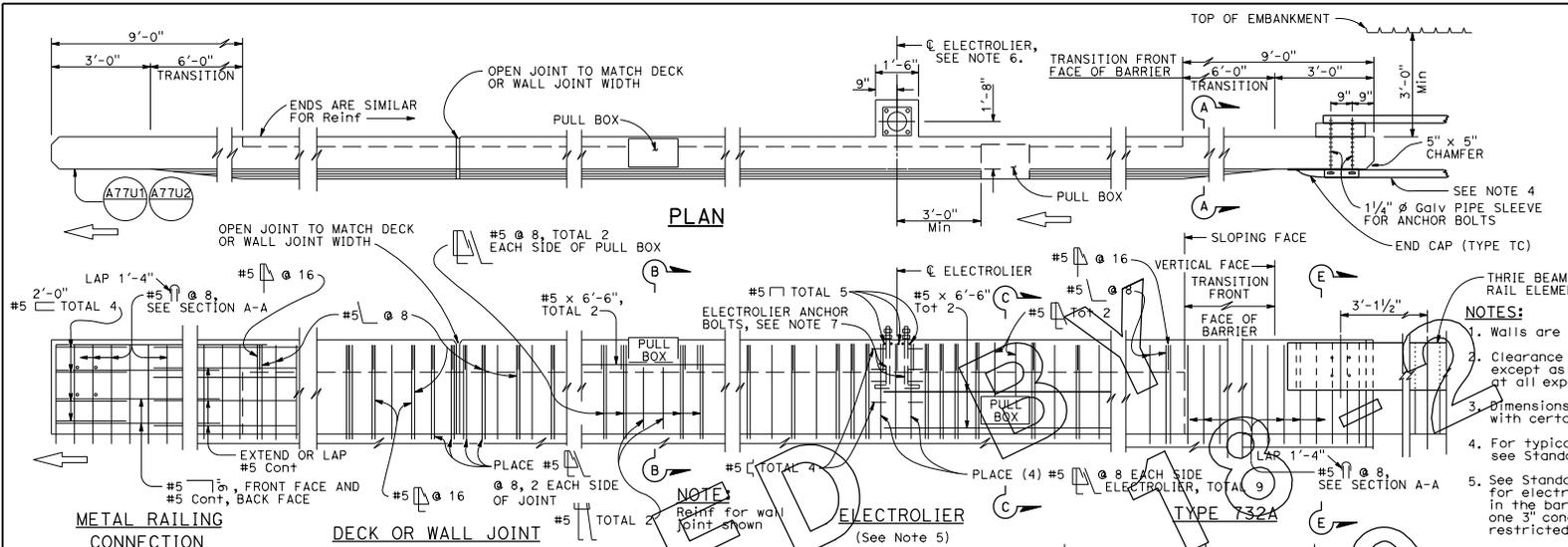
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

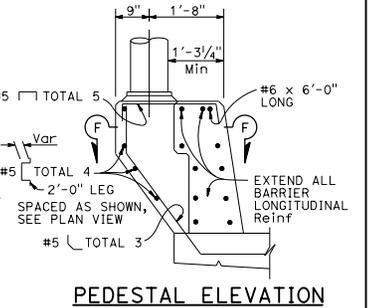
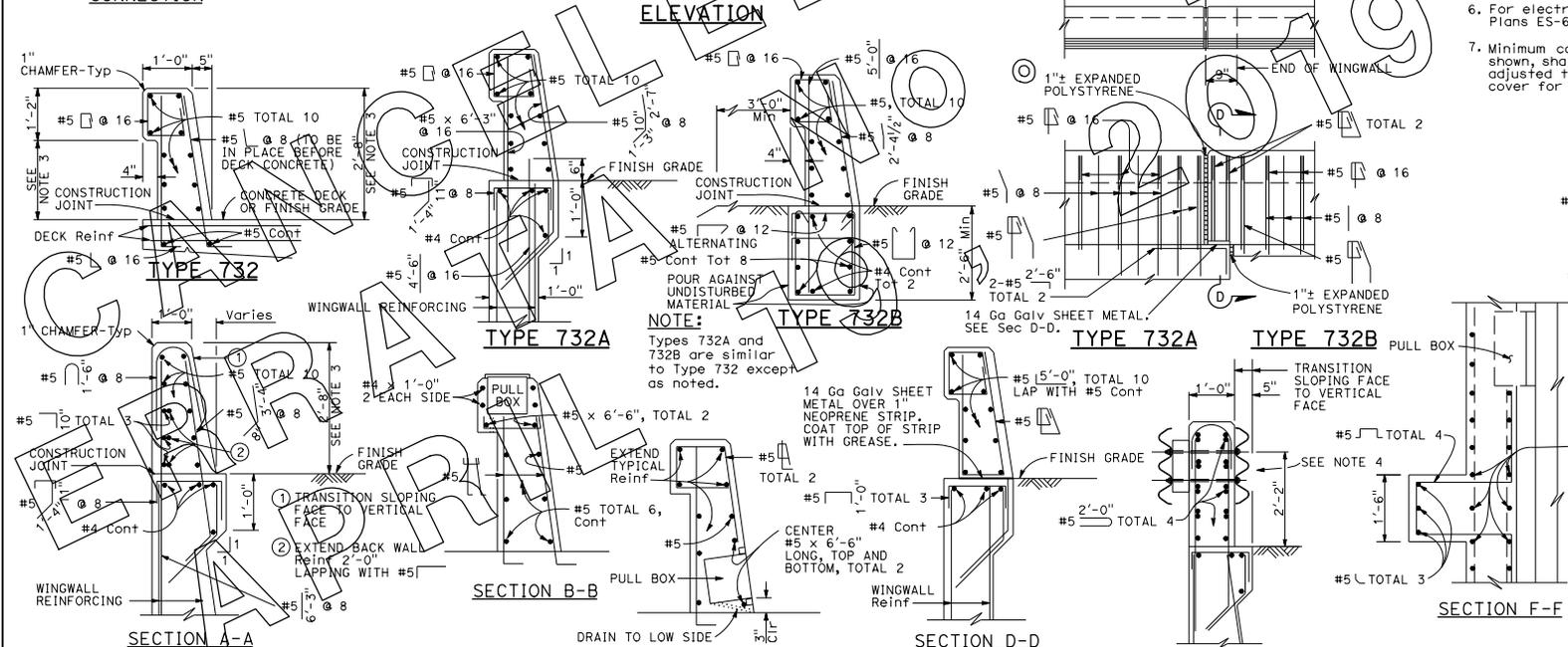
REGISTERED CIVIL ENGINEER	
Tillot Satter	
No. C42892	
Exp. 3-31-20	
CIVIL	
STATE OF CALIFORNIA	

May 31, 2018  
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



- NOTES:**
1. Walls are to be backfilled before barrier is placed.
  2. Clearance to reinforcing steel in barrier to be 1", except as noted. Longitudinal reinforcement to stop at all expansion joints.
  3. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See Project Plans.
  4. For typical metal railing connection details not shown, see Standard Plans A77U1 and A77U2.
  5. See Standard Plans ES-9A, ES-9B, ES-9C, ES-9D and ES-9E for electrical details. The maximum number of conduits in the barrier is limited to two 2" conduits along with one 3" conduit. When a 3" conduit is used, it is restricted to the base of the barrier.
  6. For electrolier mounting details, See Standard Plans ES-6A and ES-6B.
  7. Minimum concrete edge distance, to the reinforcing shown, shall be maintained. Edge distance may be adjusted to accommodate increase in concrete cover for architectural treatment.



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CONCRETE BARRIER  
TYPE 732**  
NO SCALE

**B11-55**

362

2018 STANDARD PLAN B11-55

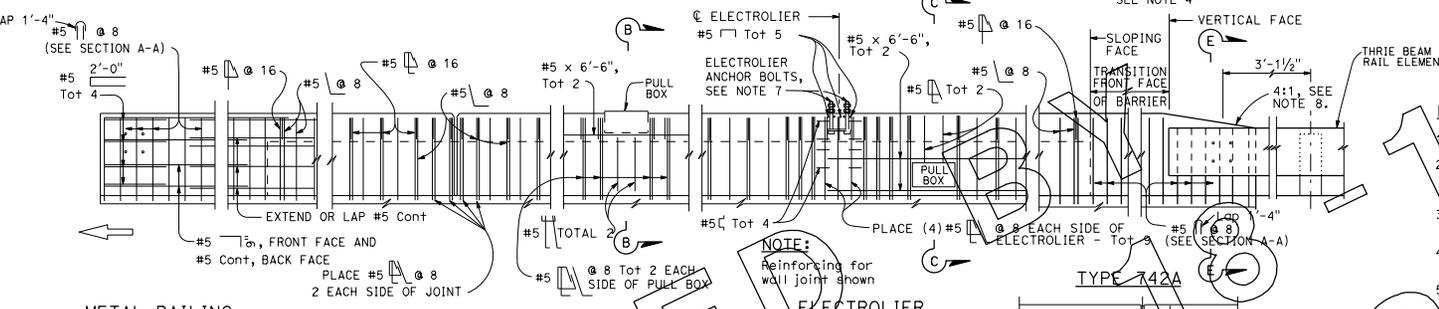
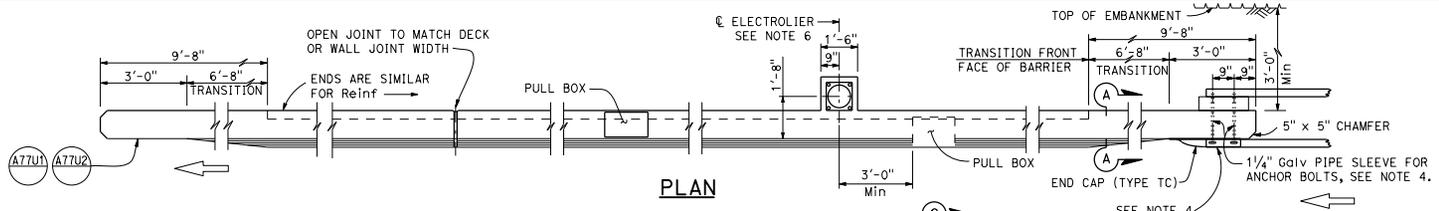
Details shown for barrier anchorage to Type 732A. Anchorage for barrier Types 732 and 732A are similar to their respective details.



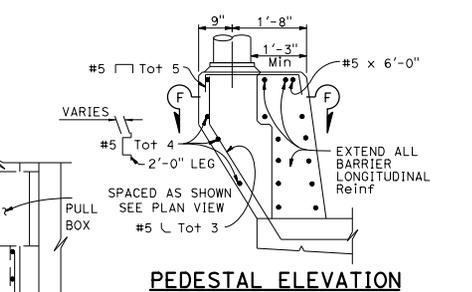
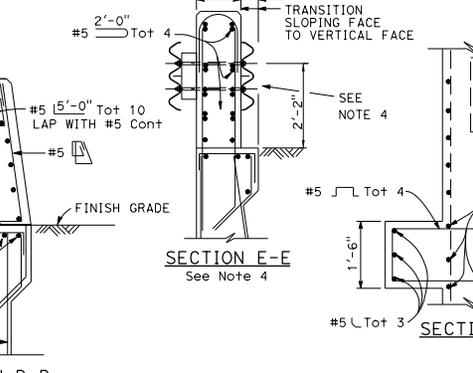
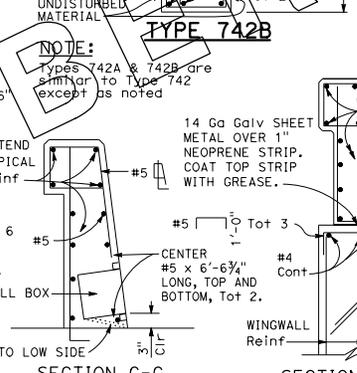
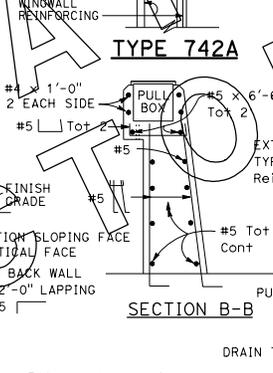
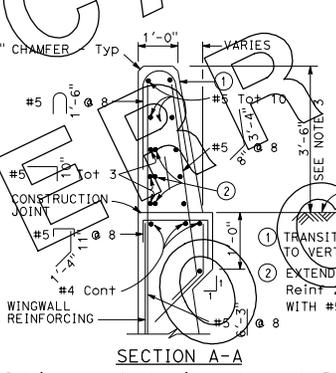
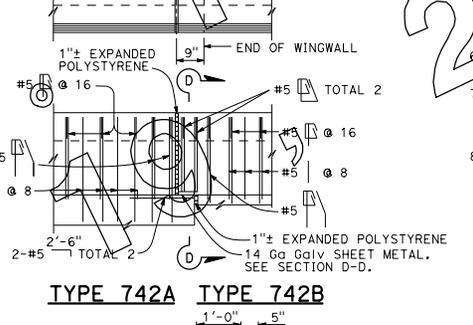
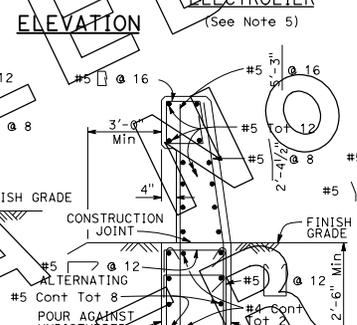
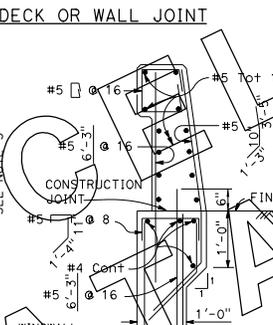
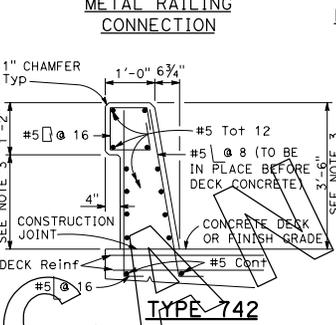
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

REGISTERED CIVIL ENGINEER	
May 31, 2018	
PLANS APPROVAL DATE	
Tillett Satter	
No. C42892	
Exp. 3-31-20	
CIVIL	
STATE OF CALIFORNIA	



- NOTES:**
1. Walls are to be backfilled before barrier is placed.
  2. Clearance to reinforcing steel in barrier to be 1", except as noted. Longitudinal reinforcement to stop at all expansion joints.
  3. Dimensions may vary with roadway cross slope and with certain thickness of supporting. See Project Plans.
  4. For typical metal railing connection details not shown, see Standard Plans 477U1 and 477U2.
  5. See Standard Plans ES-9A, ES-9B, ES-9C, ES-9D and ES-9E for electrical details. The maximum number of conduits in the barrier is limited to two 2" conduits along with one 3" conduit. When a 3" conduit is used, it is restricted to the base of the barrier.
  6. For electrolier mounting details, see Standard Plans ES-6A and ES-6B.
  7. Minimum concrete edge distance, to the reinforcing shown, shall be maintained. Edge distance may be adjusted to accommodate increase in concrete cover for architectural treatment.
  8. Taper the top of the end of the bridge railing at 4:1 to match the top elevation of the three beam rail element.



Details shown for barrier anchorage to Type 742A. Anchorage for barrier Types 742 and 742A are similar to their respective details.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CONCRETE BARRIER  
TYPE 742**  
NO SCALE

**B11-57**

2018 STANDARD PLAN B11-57

**LEGEND:**

-  10" x 6" x 1'-0" FILLER BLOCK ALIGNED AGAINST HEADER.
-  10" x 6" STRETCHERS
- LC1 = LOADING CASE I
- LC2 = LOADING CASE II
- y = 4 AND 6 FOR BATTERED FOR TYPES A, B, AND C

MAXIMUM WALL HEIGHTS						
BATTER	TYPE A		TYPE B		TYPE C	
	LC1	LC2	LC1	LC2	LC1	LC2
VERTICAL	24'-0"	11'-0"	27'-0"	20'-0"	31'-0"	27'-0"
1:6	31'-0"	13'-0"	36'-0"	23'-0"	36'-0"	33'-0"
1:4	33'-0"	15'-0"	36'-0"	25'-0"	36'-0"	36'-0"

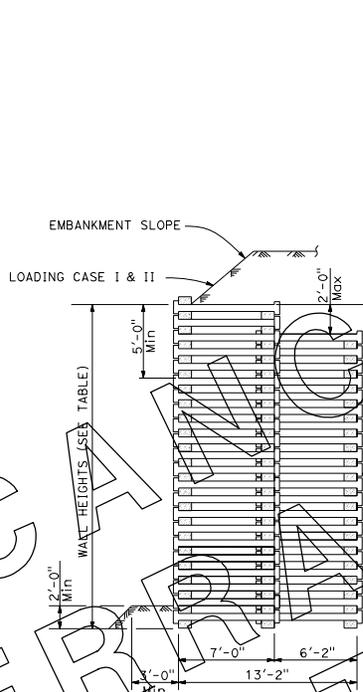
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Kathryn Orlowell*  
REGISTERED CIVIL ENGINEER

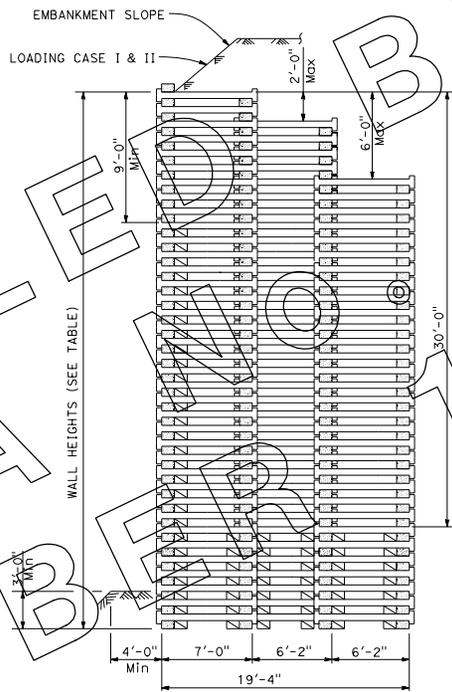
May 31, 2018  
PLANS APPROVAL DATE

*Kathryn Orlowell*  
No. C55599  
Exp. 12-31-18  
REGISTERED PROFESSIONAL ENGINEER  
CIVIL  
STATE OF CALIFORNIA

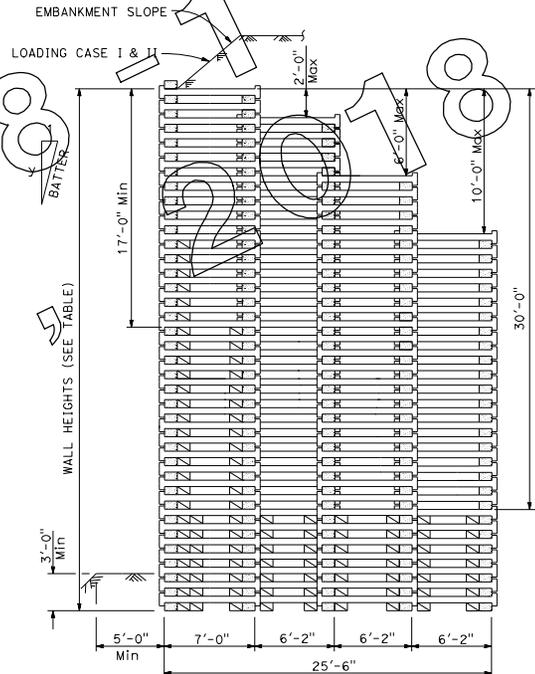
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**TYPE A**



**TYPE B**



**TYPE C**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**REINFORCED CONCRETE CRIB WALL  
TYPES A, B AND C**

NO SCALE

**C7A**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

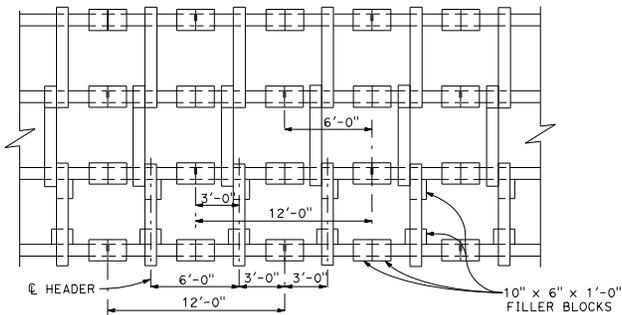
*Kathryn Orlewil*  
REGISTERED CIVIL ENGINEER

May 31, 2018  
PLANS APPROVAL DATE

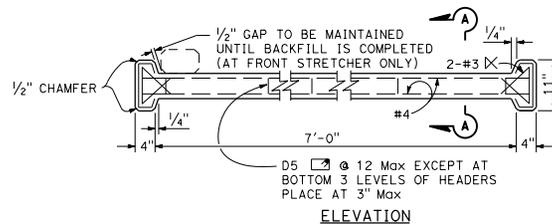
No. C55599  
Exp. 12-31-18  
CIVIL

STATE OF CALIFORNIA  
REGISTERED PROFESSIONAL ENGINEER

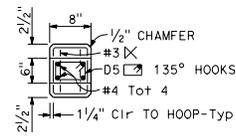
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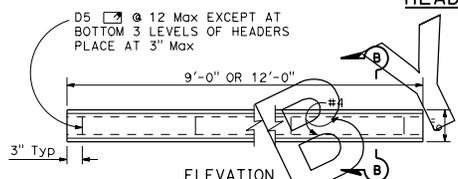
**PARTIAL PLAN AT BASE**  
Type "B" shown, others similar



**ELEVATION**

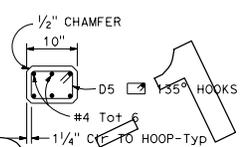


**SECTION A-A**



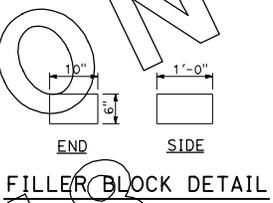
**ELEVATION**

**HEADER DETAIL**



**SECTION B-B**

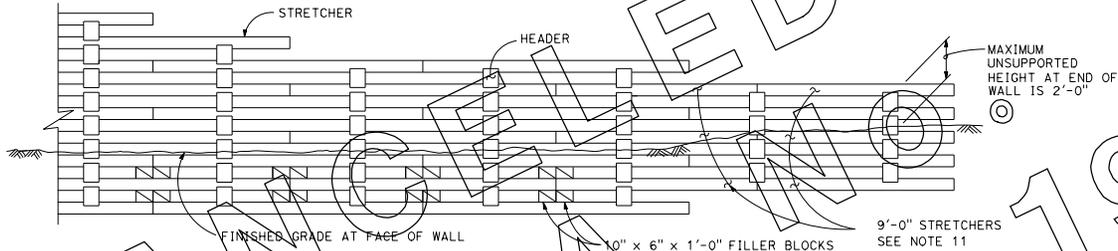
**STRETCHER DETAIL**



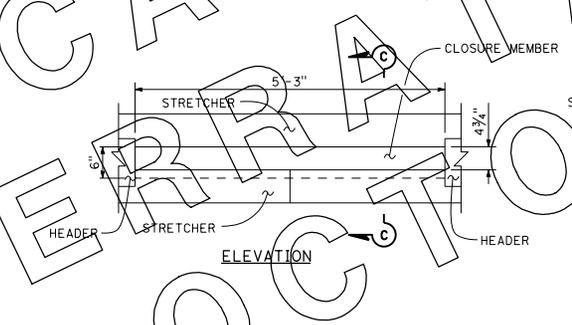
**FILLER BLOCK DETAIL**

**NOTES:**

- Design: AASHTO LRFD Bridge Design Specifications, 4th edition with the California Amendments.
- Reinforced Concrete:  $f'_c = 60$  ksi,  $f_y = 36$  ksi
- Soil Parameters:  $\phi = 34^\circ$ ,  $\delta = 25.5^\circ$ ,  $\lambda = 120$  pcf,  $A = 0.2g$ . Lateral earth pressure determined by Coulomb's theory.
- Concrete to concrete bearing surfaces shall be finished to a smooth plane. The gap between bearing surfaces shall not exceed  $1/8$  inch. Where a gap of  $1/16$  inch to  $1/8$  inch exists, a  $1/16$  inch pad of asphalt felt or sheet neoprene shall be placed between the bearing surfaces. For wall Types B and C, a  $1/16$  inch asphalt felt pad or sheet neoprene shall be placed between all concrete bearing surfaces below the 29'-10" level.
- All members may be manufactured to dimensions  $1/8$  inch greater in thickness and stretchers  $1/2$  inch less in length.
- Where an opening is specified in the face of a wall, special length stretchers and additional headers may be required.
- For non-tangent wall alignment, special length stretchers may be required.
- For non-tangent wall alignment and at locations where filler blocks are required, special length front face closure members may be required.
- The thickness of the lowest step for each wall type shall not be less than the dimension shown on these plans.
- Use "Front Face Closure Member" only when specified on project plans or in the Special Provisions.
- All stretchers are 12'-0" except as noted.
- Place 2 filler blocks midspan between stretchers in the bottom 2 levels of walls 9' high and higher.

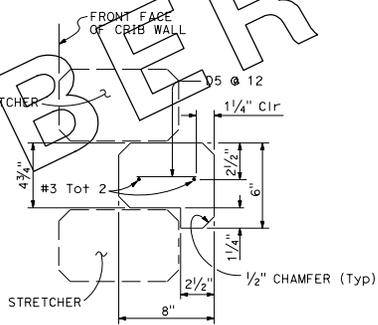


**PARTIAL ELEVATION**



**ELEVATION**

**FRONT FACE CLOSURE MEMBER**



**SECTION C-C**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**REINFORCED CONCRETE CRIB WALL  
TYPES A, B, AND C  
HEADER AND STRETCHER DETAILS**

NO SCALE

**C7B**

192

2018 STANDARD PLAN C7B

1-29-18

TYPE	CASE	BEARING AND B' (ksf)	VERTICAL WALL HEIGHT																																			
			5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	31'	32'	33'	34'	35'	36'				
A	I	qu	1.4	1.6	1.8	2.0	2.1	2.4	2.6	2.9	3.2	3.5	3.8	4.1	4.4	4.8	5.2	5.6	6.1	6.6	7.1	7.7]																
		B'	13.2	13.2	13.2	13.2	13.1	12.9	12.7	12.4	12.1	11.9	11.6	11.4	11.1	10.8	10.5	10.2	9.9	9.6	9.3	9.0																
	II	qu	1.8	1.9	2.1	2.3	2.5	2.7	2.9]																													
		B'	13.2	13.2	13.2	13.2	13.2	13.2	13.1																													
B	I	qu					2.2	2.4	2.5	2.7	2.9	3.2	3.4	3.6	3.9	4.1	4.4	4.7	5.0	5.3	5.6	5.9	6.3	6.6	7.0]													
		B'					19.3	19.3	19.3	19.3	19.2	19.0	18.8	18.6	18.4	18.2	18.0	17.8	17.6	17.4	17.2	16.9	16.7	16.5	16.2													
	II	qu					3.0	3.1	3.3	3.5	3.6	3.9	4.1	4.3	4.5	4.8	5.1	5.5]																				
		B'					19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.1	18.8	18.4																			
C	I	qu													3.7	3.9	4.1	4.4	4.6	4.9	5.2	5.4	5.7	6.0	6.3	6.6	6.9	7.2	7.5]									
		B'														25.2	25.1	25.0	24.8	24.7	24.5	24.4	24.2	24.0	23.9	23.7	23.5	23.3	23.1	22.9								
	II	qu														5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.5	6.8	7.2	7.5]												
		B'														25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.4	25.1	24.8	24.5											

TYPE	CASE	BEARING AND B' (ksf)	1:6 BATTERED WALL HEIGHT																																				
			5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	31'	32'	33'	34'	35'	36'					
A	I	qu	1.4	1.5	1.7	1.9	2.1	2.3	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.1	4.3	4.6	4.9	5.2	5.5	5.8	6.1	6.4	6.8	7.1	7.6	8.2]										
		B'	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.0	12.9	12.8	12.6	12.5	12.3	12.1	11.9	11.8	11.6	11.4	11.2	10.8	10.2	9.8	9.4	9.0	8.2					
	II	qu	1.8	1.9	2.1	2.2	2.4	2.6	2.8	3.0	3.2]																												
		B'	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2																													
B	I	qu					2.0	2.2	2.4	2.6	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.2	5.4	5.6]														
		B'					19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.2	19.0	18.9	18.8	18.7	18.5				
	II	qu					2.9	3.0	3.2	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.2	5.4	5.6]																		
		B'					19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3
C	I	qu													3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.1	5.3	5.5	5.7	5.9	6.2	6.4	6.6	6.9	7.1	7.3	7.5]					
		B'														25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5		
	II	qu														4.7	4.9	5.1	5.3	5.5	5.7	5.9	6.1	6.3	6.6	6.8	7.0	7.3	7.5	7.7	8.0	8.3]							
		B'														25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	

TYPE	CASE	BEARING AND B' (ksf)	1:4 BATTERED WALL HEIGHT																																					
			5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	31'	32'	33'	34'	35'	36'						
A	I	qu	1.8	1.9	2.1	2.2	2.4	2.6	2.8	3.0	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.5	5.7	5.9	6.2	6.5	6.7	7.0]											
		B'	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2		
	II	qu	1.9	1.9	2.1	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6]																											
		B'	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2																											
B	I	qu					2.0	2.1	2.3	2.5	2.7	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6]														
		B'					19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3
	II	qu					2.8	2.9	3.1	3.3	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.9]																	
		B'					19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3
C	I	qu													3.5	3.6	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.6	5.8	6.0	6.2	6.4	6.6	6.9	7.1	7.3]						
		B'														25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5		
	II	qu														4.5	4.7	4.9	5.1	5.3	5.5	5.7	5.9	6.1	6.3	6.5	6.8	7.0	7.2	7.4	7.7	7.9	8.1	8.4	8.6]					
		B'														25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5		

**DESIGN FOOTNOTE:**

1. Nominal soil bearing resistance, design lateral loads, settlement and overall slope stability shall be determined by analysis based on a foundation site investigation. Walls shall not be founded on unimproved original ground with nominal bearing resistance less than 3 ksf.

**LEGEND:**

- B' - EFFECTIVE FOOTING WIDTH (ft)
- qu - GROSS FACTORED BEARING STRESS (ksf)
- ] - INDICATES MAXIMUM ALLOWABLE WALL HEIGHT FOR PARTICULAR WALL TYPE AND PARTICULAR LOADING CASE.
- y = 4 AND 6 FOR BATTERED

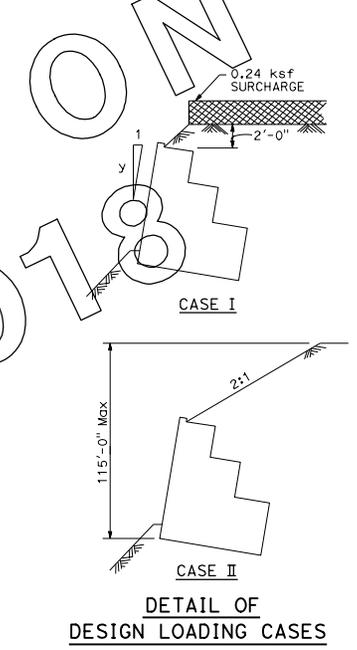
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

Kathryn Orlewll  
REGISTERED/CIVIL ENGINEER

May 31, 2018  
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

Kathryn Orlewll  
No. C55599  
Exp. 12-31-18  
CIVIL  
STATE OF CALIFORNIA



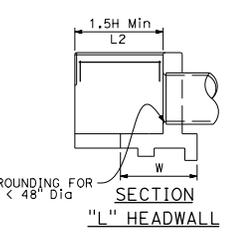
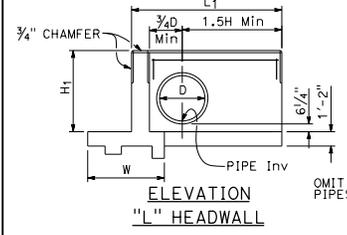
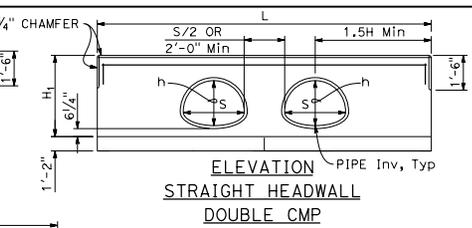
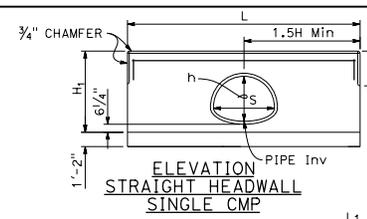
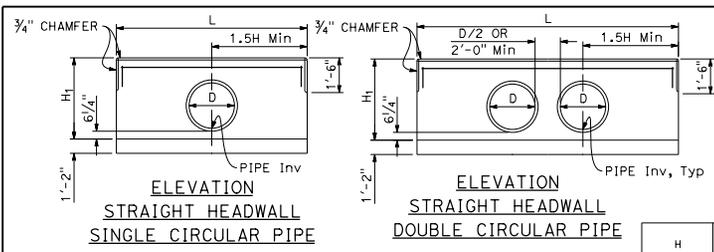
**DETAIL OF DESIGN LOADING CASES**

**REINFORCED CONCRETE CRIB WALL FOUNDATION PRESSURE**

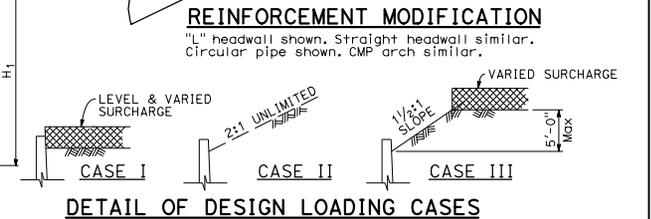
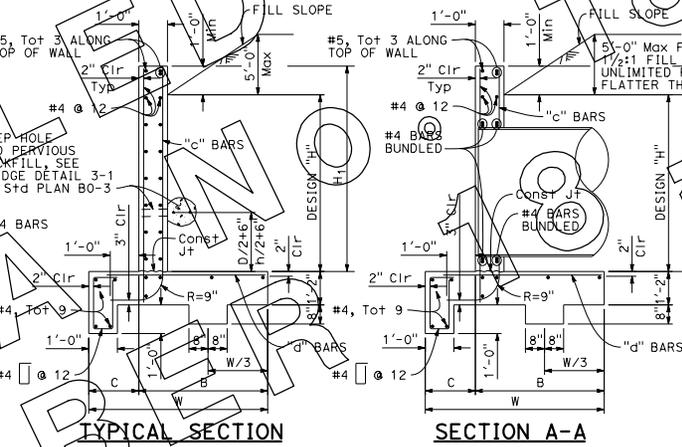
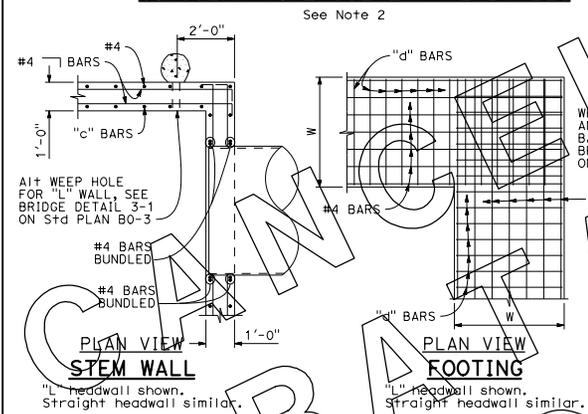
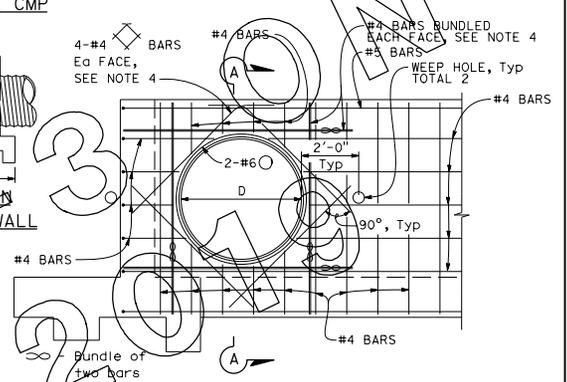
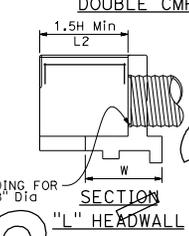
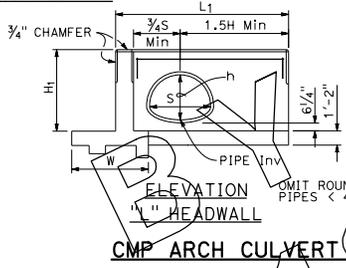
NO SCALE

**C7C**

2018 STANDARD PLAN C7C



H	CIRCULAR PIPE SIZE D	CMP ARCH SIZE S x h
2'-8"	12"	-
2'-11"	15"	21" x 15"
3'-2"	18"	24" x 18"
3'-5"	21"	28" x 20"
3'-8"	24"	35" x 24"
3'-11"	27"	-
4'-2"	30"	42" x 29"
4'-5"	33"	49" x 33"
4'-8"	36"	-
4'-11"	39"	57" x 38"
5'-2"	42"	64" x 43"
5'-5"	45"	-
5'-8"	48"	71" x 47"
5'-11"	51"	-
6'-2"	54"	-



H	2'-8"	2'-11"	3'-2"	3'-5"	3'-8"	3'-11"	4'-2"	4'-5"	4'-8"	4'-11"	5'-2"	5'-5"	5'-8"	5'-11"	6'-2"
W	4'-7"	4'-9"	4'-10"	5'-0"	5'-7"	5'-2"	5'-8"	5'-6"	5'-6"	5'-7"	5'-9"	5'-9"	5'-11"	6'-0"	6'-3"
C	4'-2"	4'-2"	4'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-4"	1'-4"	1'-4"	1'-5"	1'-5"	1'-6"	1'-6"	1'-9"
B	3'-5"	3'-7"	3'-8"	3'-8"	3'-9"	3'-10"	3'-11"	4'-1"	4'-2"	4'-3"	4'-4"	4'-4"	4'-5"	4'-6"	4'-6"
"c" BARS	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12
"d" BARS	#4 @ 12	#4 @ 8	#4 @ 8	#4 @ 8	#4 @ 8	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 8	#4 @ 8	#4 @ 8	#4 @ 8	#4 @ 8	#4 @ 8
* Conc CY/LF	0.404	0.412	0.415	0.423	0.426	0.430	0.433	0.440	0.444	0.448	0.451	0.455	0.462	0.466	0.477
* Reinf LB/LF	23	24	24	25	25	26	27	27	28	28	29	29	30	31	32
Ser (a'o, B')	0.79, 4.66	0.83, 4.57	0.88, 4.58	0.89, 4.73	0.93, 4.74	0.93, 4.75	1.02, 4.75	1.02, 4.92	1.07, 4.93	1.11, 4.94	1.12, 4.98	1.16, 4.99	1.17, 5.16	1.21, 5.18	1.15, 5.53
Extr (a'o, B')	1.48, 1.75	1.53, 1.80	1.65, 1.76	1.64, 1.88	1.76, 1.85	1.89, 1.83	2.02, 1.80	1.97, 1.95	2.08, 1.94	2.20, 1.93	2.28, 1.92	2.39, 1.92	2.31, 2.08	2.41, 2.09	2.17, 2.41
Ser (a'o, B')	0.65, 4.76	0.68, 4.72	0.72, 4.73	0.74, 4.44	0.78, 4.46	0.82, 4.47	0.86, 4.47	0.87, 4.63	0.92, 4.63	0.96, 4.64	0.98, 4.69	1.03, 4.69	1.04, 4.84	1.09, 4.84	1.05, 5.18
Extr (a'o, B')	0.21, 4.52	0.44, 4.67	0.48, 4.75	0.51, 4.90	0.55, 4.95	0.59, 5.00	0.63, 5.04	0.65, 5.21	0.70, 5.26	0.74, 5.30	0.77, 5.37	0.81, 5.40	0.83, 5.58	0.88, 5.61	0.86, 5.96
Ser (a'o, B')	1.05, 4.40	1.10, 4.84	1.15, 4.69	1.19, 4.86	1.24, 4.90	1.30, 4.94	1.36, 4.98	1.39, 5.15	1.46, 5.18	1.52, 5.22	1.56, 5.28	1.62, 5.31	1.62, 5.48	1.72, 5.51	1.69, 5.85
Extr (a'o, B')	0.98, 3.90	1.03, 4.00	1.07, 4.01	1.13, 4.15	1.19, 4.15	1.26, 4.15	1.33, 4.14	1.37, 4.28	1.44, 4.27	1.52, 4.26	1.57, 4.29	1.65, 4.28	1.69, 4.41	1.77, 4.40	1.72, 4.71
Ser (a'o, B')	0.81, 4.53	0.84, 4.73	0.88, 4.76	0.90, 4.91	0.94, 4.91	0.97, 4.94	0.83, 4.93	0.85, 5.08	1.17, 4.03	1.23, 4.03	1.27, 4.06	1.34, 4.02	1.36, 4.15	1.43, 4.11	1.36, 4.45
Extr (a'o, B')	0.99, 4.22	1.04, 4.67	1.10, 4.69	1.13, 4.83	1.19, 4.82	1.25, 4.83	1.32, 4.82	1.35, 4.95	2.02, 2.66	2.16, 2.62	2.25, 2.59	2.44, 2.48	2.49, 2.54	2.70, 2.44	2.50, 2.72
Extr (a'o, B')	0.80, 3.88	0.95, 3.93	1.01, 3.91	1.04, 4.02	1.11, 3.97	1.18, 3.92	1.25, 3.90	1.28, 4.00	1.35, 3.94	1.43, 3.92	1.11, 5.14	1.55, 3.87	1.58, 3.97	1.67, 3.91	1.60, 4.22

**REINFORCED CONCRETE HEADWALL**  
 Quantities do not include added diagonals and do not consider pipe occupancy.  
 NOTE: Reinforced Concrete: f<sub>y</sub> = 60,000 psi  
 Earth Density: 120 pcf  
 Equivalent Fluid Pressure: 36 pcf

**PIPE CULVERT HEADWALLS STRAIGHT AND "L"**  
 NO SCALE

**D89**

D16 COUNTY ROUTE POST MILES TOTAL PROJECT SHEET TOTAL  
 No. 05976  
 May 31, 2018  
 PLANS APPROVAL DATE  
 REGISTERED CIVIL ENGINEER  
 STATE OF CALIFORNIA  
 CIVIL  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

237

2018 STANDARD PLAN D89

1-29-18

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

H.R.F.  
REGISTERED ELECTRICAL ENGINEER

May 31, 2018  
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
Hamid Zolfaghari  
No. E15636  
Exp. 12-31-19  
ELECTRICAL  
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTES:

1. The plan shows the approximate location of devices within the enclosure. Components may be rearranged, however, the "working" clearances within the service equipment enclosure shall be maintained.
2. In unpaved areas a raised portland cement concrete pad 2'-0" x 4" x width of foundation shall be constructed in front of new service equipment enclosure installation. Pad shall be set to elevation of foundation.
3. Plug-in circuit breakers may be mounted in the vertical or horizontal position. Cable-in/cable-out circuit breakers shall be mounted in the vertical position.
4. Type III-AF and Type III-BF service equipment enclosures shall have the meter viewing windows located on the front side of the service equipment enclosures.
5. Type III-AR and Type III-BR service equipment enclosure shall be similarly constructed as Type III-AF and Type III-BF respectively, except the meter viewing windows shall be located on the back side of the service equipment enclosures.

CANCELLED BY 19-10-18  
 ERRATA NO. 19-10-18  
 OCTOBER 19, 2018

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

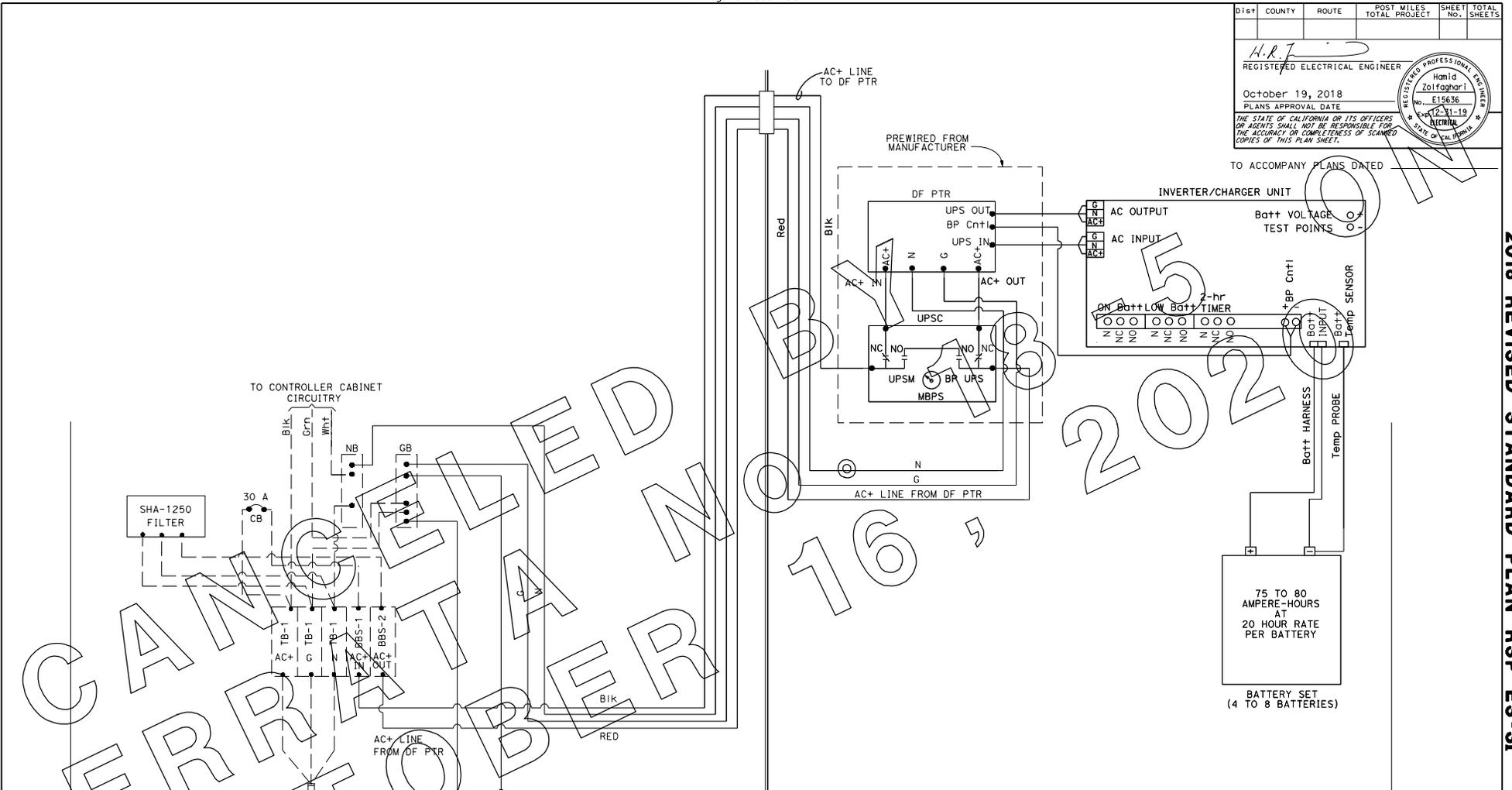
**ELECTRICAL SYSTEMS  
(SERVICE EQUIPMENT ENCLOSURE  
NOTES TYPE III SERIES)**

NO SCALE

**ES-2C**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*H.R.F.*  
 REGISTERED ELECTRICAL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.  
 REGISTERED PROFESSIONAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 STATE OF CALIFORNIA



CANCELLED  
 OCTOBER 16, 2020

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(ELECTRONICS ASSEMBLY CONNECTION**  
**DIAGRAM, WITH BYPASS CONTROL LINE)**  
 NO SCALE

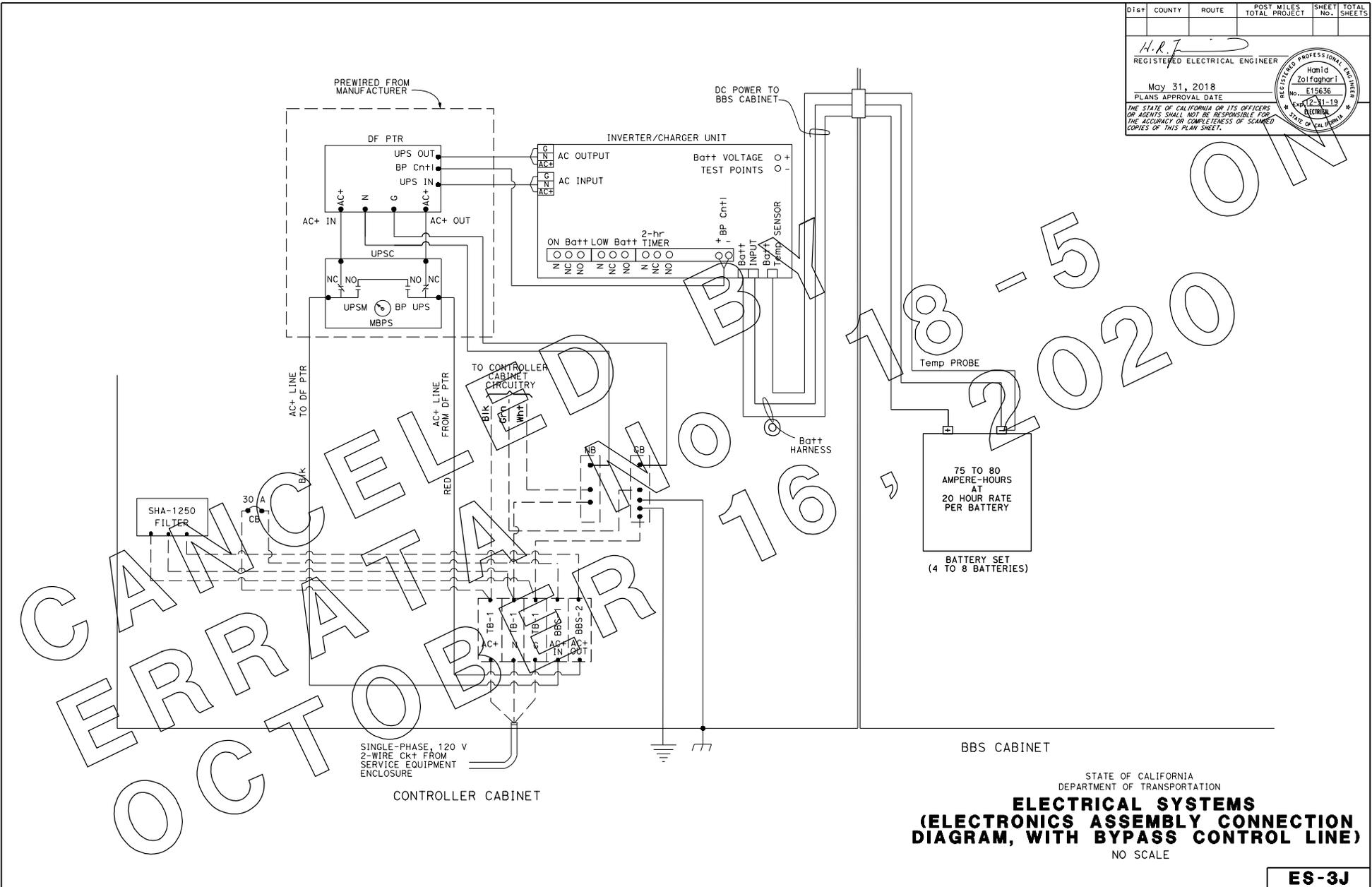
RSP ES-31 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-31  
 DATED MAY 31, 2018 - PAGE 495 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP ES-31**

2018 REVISED STANDARD PLAN RSP ES-31

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

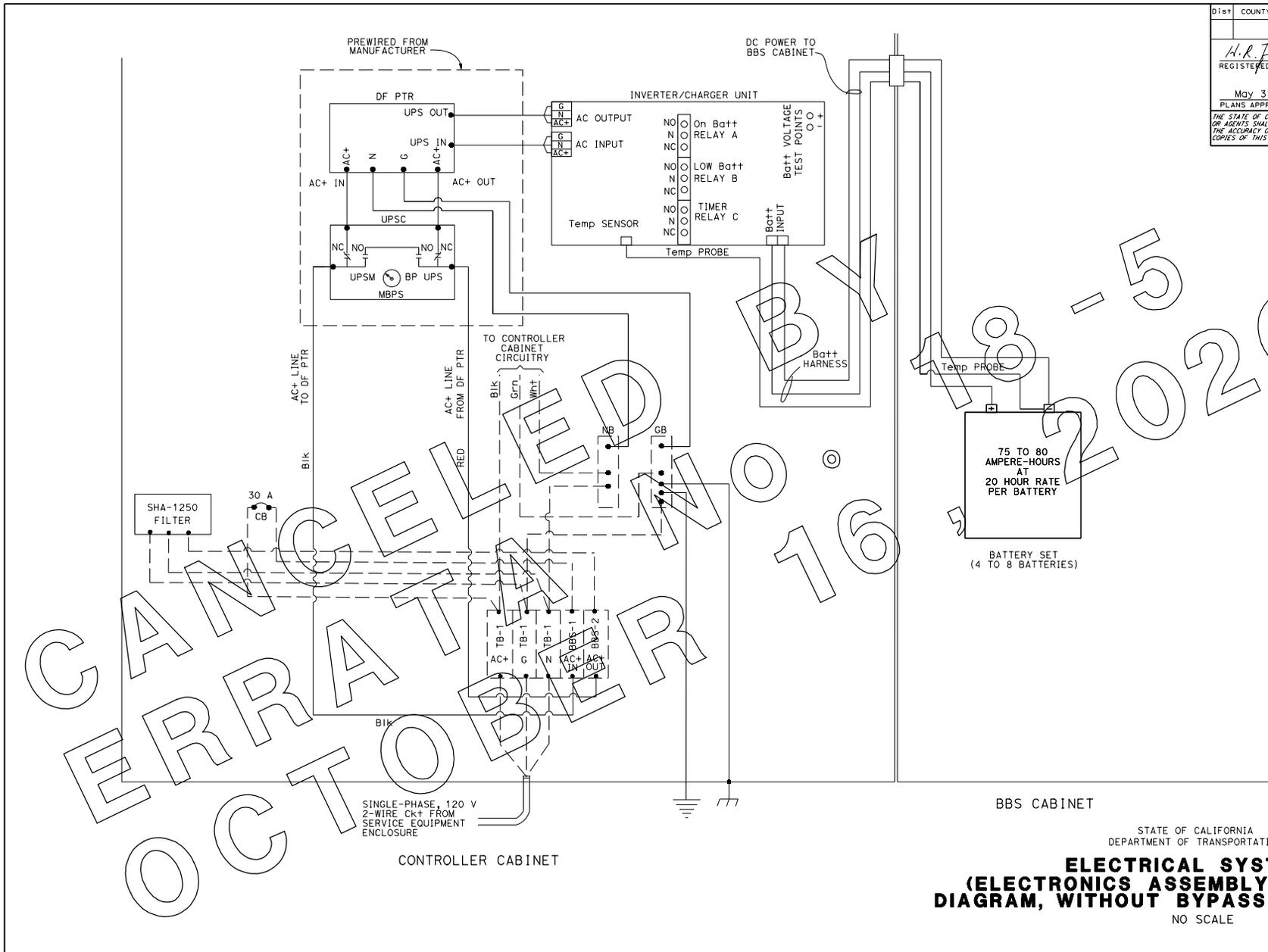
H.R.F.  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 STATE OF CALIFORNIA  
 REGISTERED PROFESSIONAL ENGINEER

May 31, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



CANCELLED  
 OCTOBER 16 2020

2018 STANDARD PLAN ES-3J



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED ELECTRICAL ENGINEER

PLANS APPROVAL DATE

May 31, 2018

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CANCELED

ERRATA

OCTOBER

NOVEMBER

16

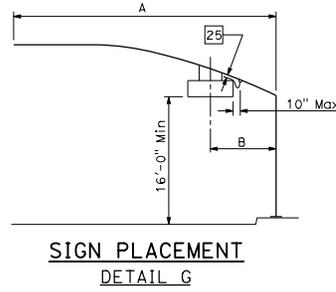
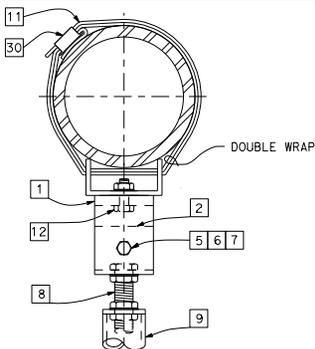
18-5

2020

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

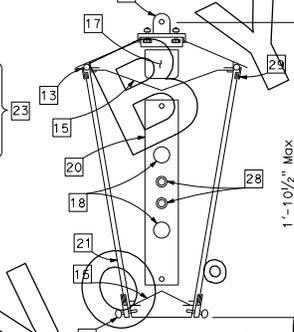
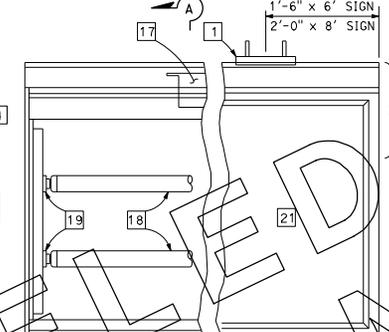
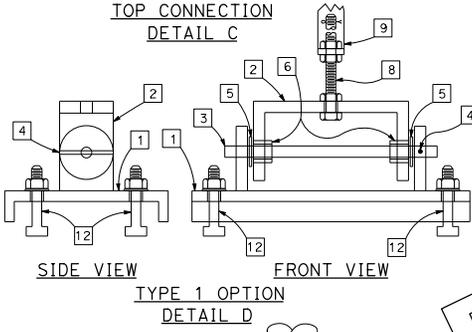
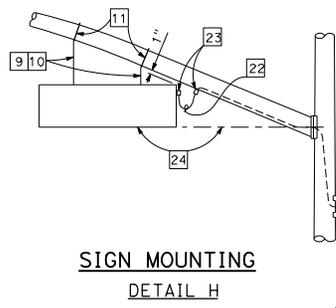
**ELECTRICAL SYSTEMS  
(ELECTRONICS ASSEMBLY CONNECTION  
DIAGRAM, WITHOUT BYPASS CONTROL LINE)**

NO SCALE



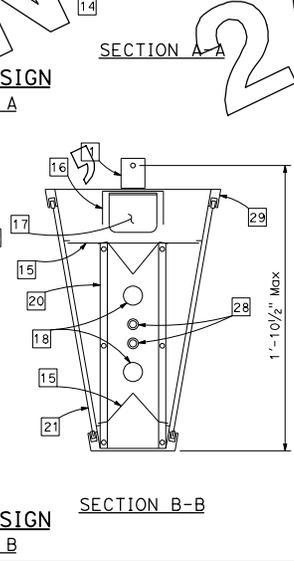
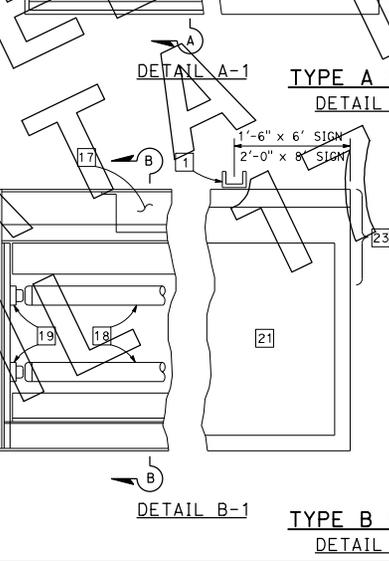
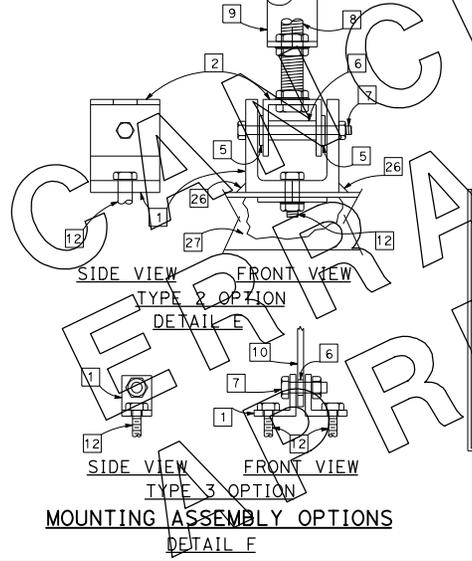
SIGN PLACEMENT

A	B	B
PROJECTED LENGTH	6'-0" SIGN	8'-0" SIGN
20'-0"	7'-10"	8'-10"
25'-0"	9'-2"	10'-2"
30'-0"	9'-6"	10'-6"
35'-0"	10'-6"	11'-6"
40'-0"		
45'-0"		
50'-0"	12'-6"	13'-6"
55'-0"		
60'-0"		
65'-0"		



LEGEND:

- 1 LOWER MOUNTING ASSEMBLY WITH GASKET.
- 2 UPPER MOUNTING ASSEMBLY.
- 3 ROD, 1/2" Ø, STAINLESS STEEL.
- 4 LOCKING PIN, STEEL.
- 5 FLAT WASHER, STAINLESS STEEL.
- 6 BUSHING, BRONZE.
- 7 BOLT, 1/4" Ø STAINLESS STEEL, WITH SELF-LOCKING NUT.
- 8 BOLT, 1/2" Ø STAINLESS STEEL, WITH THREE NUTS, AND COTTER KEY. LENGTH AS REQUIRED FOR PROPER MOUNTING OF SIGN.
- 9 BRACKET, 1/4" X 1 1/2" MINIMUM LENGTH VARIABLE.
- 10 BRACKET, 2-PIECE ADJUSTABLE. 1/4" X 1 1/2" MINIMUM. TWO 1/2" Ø HEXAGON HEAD BOLTS WITH NUTS AND LOCKWASHERS.
- 11 3/4" X 0.020" MINIMUM ROUNDED EDGE STAINLESS STEEL STRAP WITH 2" LONG BEND UNDER BUCKLE. IF ATTACHING TO A MULTISIDED SECTION BEND UNDER SECTION SHALL BE LONG ENOUGH TO CONTACT AT LEAST 3 CORNERS.
- 12 MOUNTING BOLT, 1/4" Ø MINIMUM, WITH NUT AND LOCKWASHER, OR SELF-LOCKING NUT AND COTTER KEY.
- 13 CONTINUOUS HINGE.
- 14 THUMB SCREW, 5/8" Ø MINIMUM TWO PER SIDE ON 4'-0" CENTERS.
- 15 REFLECTOR, 0.040" MINIMUM THICKNESS.
- 16 ALUMINUM STIFFENER.
- 17 FLUORESCENT BALLAST (2 REQUIRED).
- 18 LAMP, F72T12CW FOR 6'-0" SIGN F96T12CW FOR 8'-0" SIGN
- 19 LAMP HOLDER.
- 20 LAMP HOLDER TURRET.
- 21 SIGN PANEL, 1'-3" MINIMUM HEIGHT. MESSAGE IS SHOWN ELSEWHERE.
- 22 CORD, 16/3 TYPE SJT. CONTINUOUS FROM SIGN TERMINAL BLOCK TO SIGNAL HEAD MOUNTING TERMINAL COMPARTMENT. FORM A 1'-0" DRIP LOOP BETWEEN SIGN AND SIGNAL MAST ARM.
- 23 CORD CONNECTOR, 90° ANGLE CONNECTOR AT THE SIGN LOCATED IN UPPER 1/3 OF THE SIGN AND STRAIGHT CONNECTOR AT THE SIGNAL MAST ARM. DRILL AND TAP BOTTOM OF THE SIGNAL MAST ARM.
- 24 ADJUST FIXTURE LEVEL NO LOWER THAN CENTER OF SIGNAL MAST ARM CONNECTION.
- 25 APPROXIMATE CLEARANCE, 1".
- 26 1/4" FILLET WELD, 1/4" LONG.
- 27 SIGN FRAME.
- 28 FUSE HOLDER AND FUSE.
- 29 CLOSE CELL NEOPRENE GASKET (CONTINUOUS).
- 30 STAINLESS STEEL STRAP BUCKLE.



D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
------	--------	-------	--------------------------	-----------	--------------

Stanley P. Johnson  
REGISTERED CIVIL ENGINEER

May 31, 2018  
PLANS APPROVAL DATE

Stanley P. Johnson  
No. C6795  
Exp. 3-31-20  
CIVIL  
STATE OF CALIFORNIA

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STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(INTERNALLY ILLUMINATED  
STREET NAME SIGN)**

NO SCALE

ES-7P

2018 STANDARD PLAN ES-7P





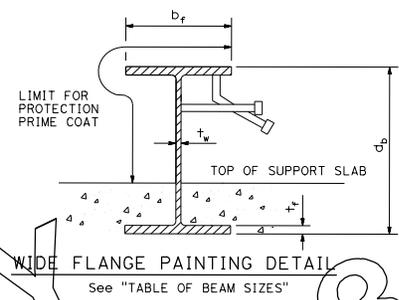
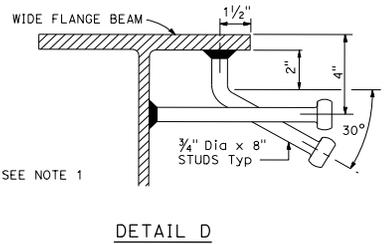
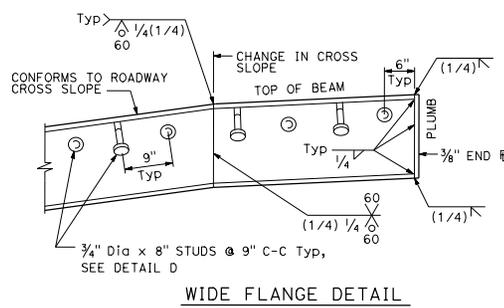
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Dulce Rufino Feldman*  
REGISTERED CIVIL ENGINEER

May 31, 2018  
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER  
Dulce Rufino Feldman  
No. 081459  
Exp. 9-30-19  
CIVIL  
STATE OF CALIFORNIA

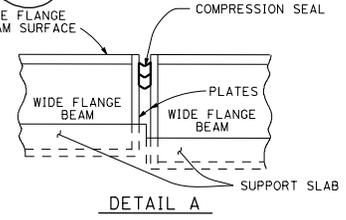
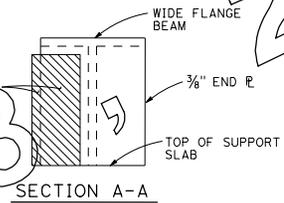
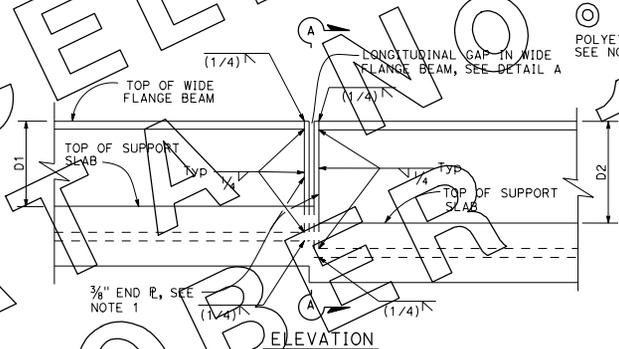
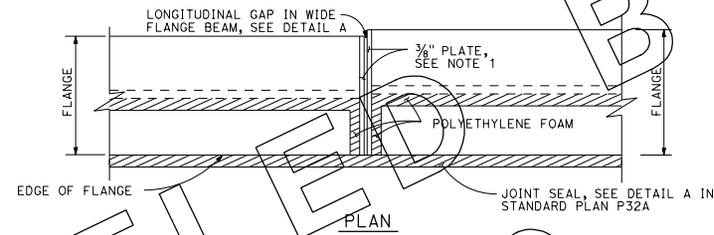
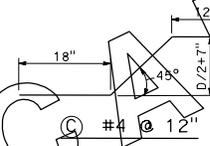
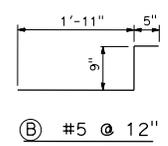
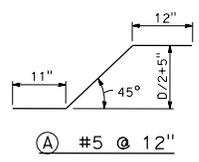


**LEGEND:**

b<sub>f</sub> - FLANGE WIDTH  
t<sub>f</sub> - FLANGE THICKNESS  
t<sub>w</sub> - WEB THICKNESS  
d<sub>b</sub> - BEAM DEPTH  
D1 - PAVEMENT THICKNESSES  
D2 - PAVEMENT THICKNESSES

**NOTES:**

- Weld 3/8" plate to each end of wide flange beam at pavement edges only. End plate covers the entire wide flange beam.
- Extend polyethylene foam to the sides and edges of the front part of the plate.



**CONCRETE AND STEEL QUANTITIES**

ITEM	PAVEMENT THICKNESS							
	.75'	.80'	.85'	.90'	.95'	1.00'	1.05'	1.10'
WIDE FLANGE BEAM	CONCRETE	4.8 CY	4.8 CY	4.8 CY	4.8 CY	4.8 CY	4.8 CY	4.8 CY
TERMINAL SLAB	REINFORCING STEEL	552.0 LBS	552.2 LBS	552.4 LBS	552.6 LBS	552.8 LBS	553.0 LBS	553.3 LBS
Exp JOINT TYPE	CONCRETE	1.1 CY	1.1 CY	1.1 CY	1.1 CY	1.1 CY	1.1 CY	1.1 CY
	REINFORCING STEEL	89.9 LBS	99.9 LBS	100.2 LBS	100.5 LBS	100.8 LBS	101.1 LBS	101.6 LBS
WIDE FLANGE SUPPORT SLAB	STEEL BEAM (WEIGHT OF WIDE FLANGE BEAM AND STUDS)	43.0 LBS/LF +2 PLATES @ 14.9 LBS EA	69.51 LBS/LF +2 PLATES @ 14.9 LBS EA	90.51 LBS/LF +2 PLATES @ 18.5 LBS EA	90.51 LBS/LF +2 PLATES @ 18.5 LBS EA	98.51 LBS/LF +2 PLATES @ 22.0 LBS EA	98.51 LBS/LF +2 PLATES @ 22.0 LBS EA	98.51 LBS/LF +2 PLATES @ 22.0 LBS EA

**TABLE OF BEAM SIZES**

PAVEMENT THICKNESS	WIDE FLANGE BEAM DESIGNATION	d <sub>b</sub>	b <sub>f</sub>	t <sub>f</sub>	t <sub>w</sub>
.75'	W14 x 43	13.70"	8.00"	0.53"	0.31"
.80'	W14 x 68	14.04"	10.04"	0.72"	0.42"
.85'	W16 x 89	16.75"	10.37"	0.88"	0.53"
.90'	W16 x 89	16.75"	10.37"	0.88"	0.53"
.95'	W18 x 97	18.59"	11.15"	0.87"	0.54"
1.00'	W18 x 97	18.59"	11.15"	0.87"	0.54"
1.05'	W18 x 97	18.59"	11.15"	0.87"	0.54"
1.10'	W18 x 97	18.59"	11.15"	0.87"	0.54"

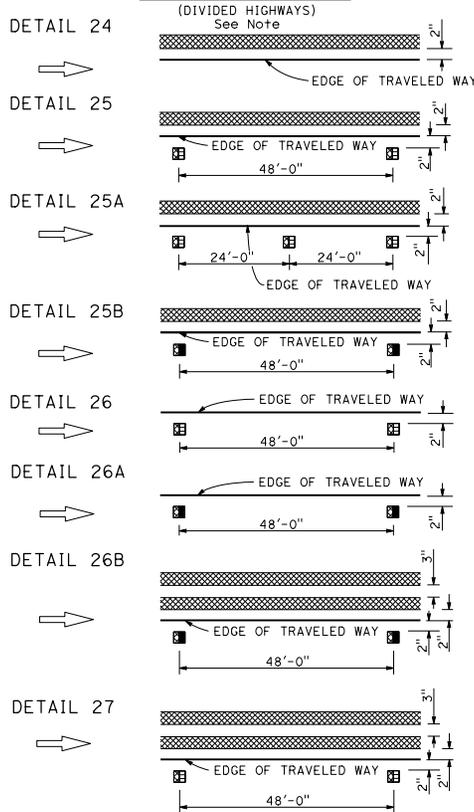
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**CONTINUOUSLY REINFORCED  
CONCRETE PAVEMENT  
WIDE FLANGE BEAM TERMINALS**

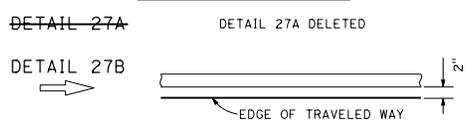
NO SCALE

**P32B**

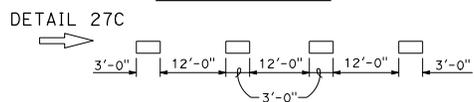
**LEFT EDGE LINES**



**RIGHT EDGE LINES**

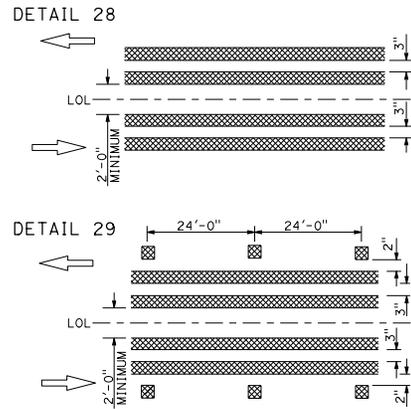


**RIGHT EDGE LINE EXTENSION THROUGH INTERSECTIONS**

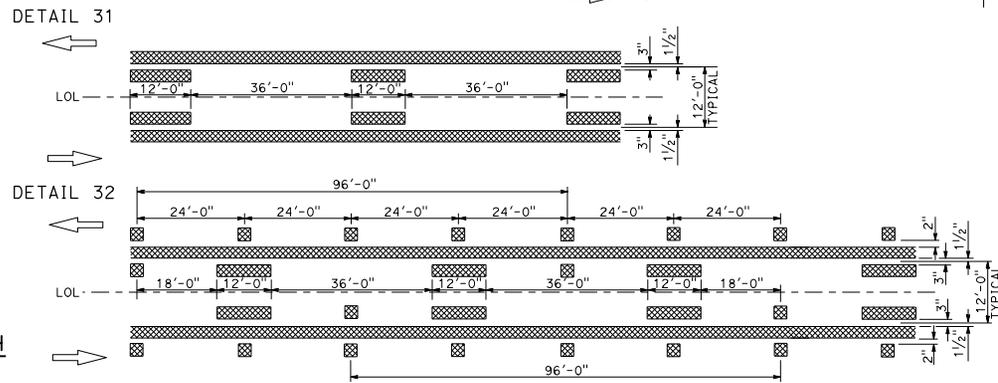


LEFT EDGE LINES NOTE:  
On freeways use traffic stripe details with Type RY markers.

**MEDIAN ISLANDS**



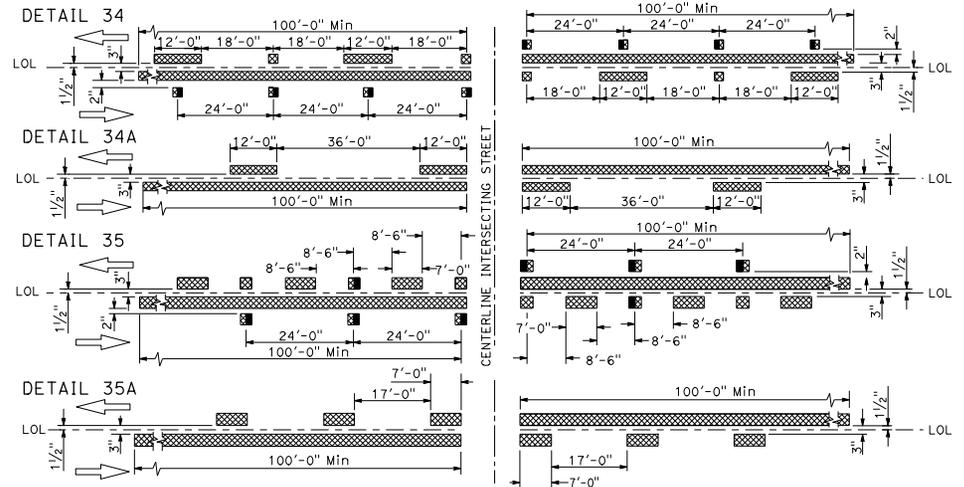
**TWO-WAY LEFT TURN LANES**



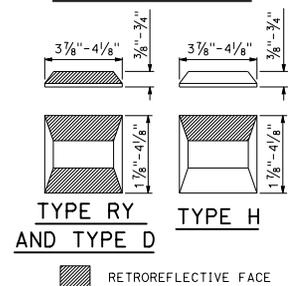
**LEGEND**

- MARKERS**
- ☒ TYPE D TWO-WAY YELLOW RETROREFLECTIVE
  - ☒ TYPE H ONE-WAY YELLOW RETROREFLECTIVE
  - ☒ TYPE RY RED-YELLOW RETROREFLECTIVE
- LINES**
- ▭ 6" WHITE
  - ▨ 6" YELLOW

**INTERSECTION TREATMENTS**



**MARKER DETAILS**



**PAVEMENT MARKERS AND TRAFFIC LINES TYPICAL DETAILS**  
NO SCALE

RSP A20B DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN A20B  
DATED MAY 31, 2018 - PAGE 13 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A20B**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

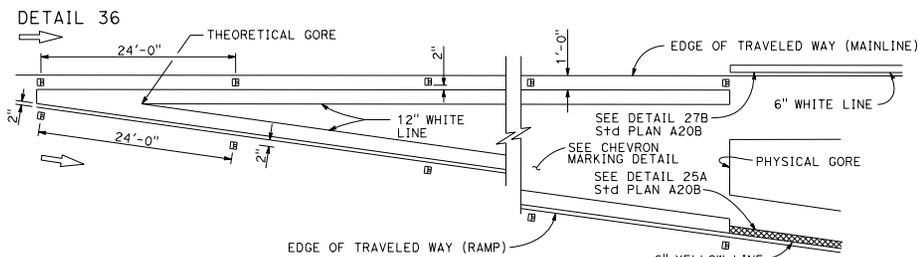
Atifa Ferouz  
REGISTERED CIVIL ENGINEER  
No. C80402  
EXP. 3-31-21  
CIVIL

APR 19 2019  
PLANS APPROVAL DATE

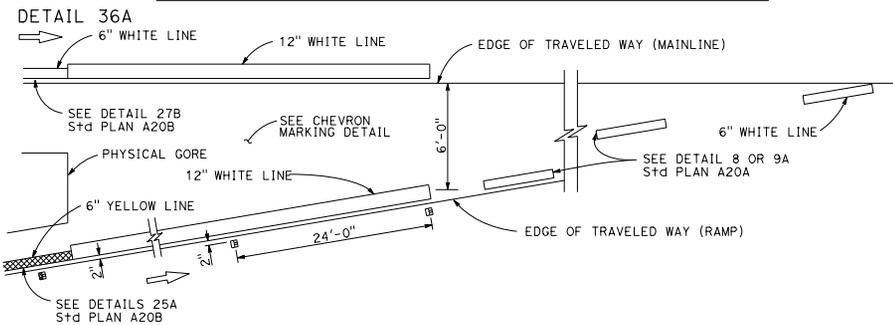
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2018 REVISED STANDARD PLAN RSP A20B

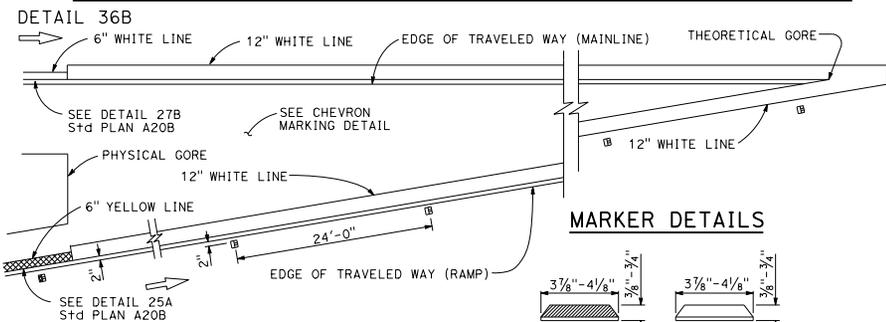
### EXIT RAMP NEUTRAL AREA (GORE) TREATMENT



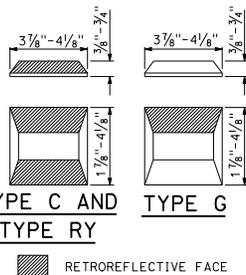
### ENTRANCE RAMP NEUTRAL AREA (MERGE) TREATMENT



### ENTRANCE RAMP NEUTRAL AREA (ACCELERATION LANE) TREATMENT



#### MARKER DETAILS



#### LEGEND:

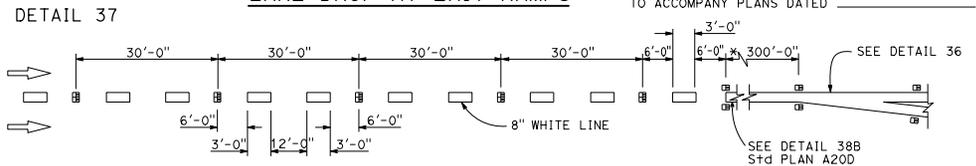
- MARKERS**
- ▣ TYPE C RED-CLEAR RETROREFLECTIVE
  - TYPE G ONE-WAY CLEAR RETROREFLECTIVE
  - ▣ TYPE RY RED-YELLOW RETROREFLECTIVE

#### NOTES:

Install a minimum of 1 chevron in the gore area. If at least 1 chevron will not fit into the gore area, do not install chevrons. Terminate chevron markings at physical gore.

Gore area chevron pavement markings shown. For Exit and Entrance Ramp channelizing lines details, see Details 36, 36A, and 36B.

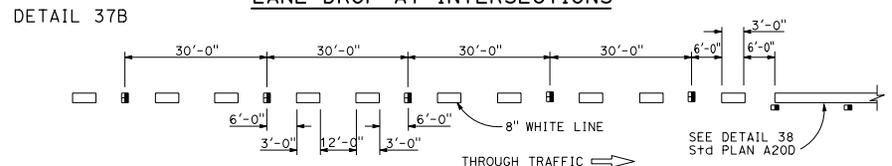
### LANE DROP AT EXIT RAMP



\* The solid channelizing line shown may be omitted on short auxiliary lanes where weaving length is critical.

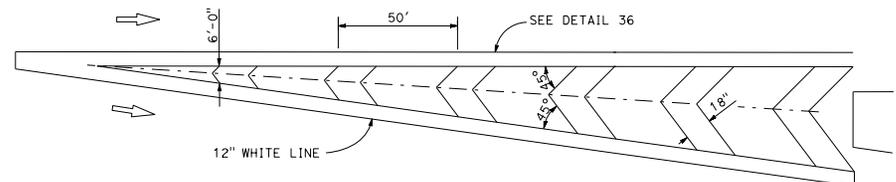
~~DETAIL 37A~~ DETAIL 37A DELETED

### LANE DROP AT INTERSECTIONS

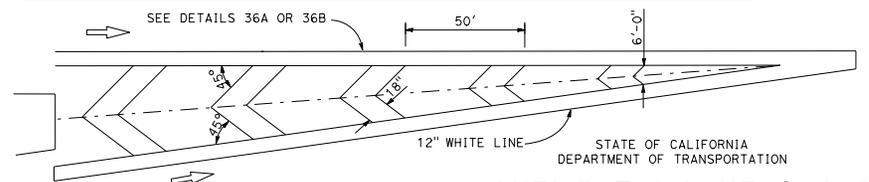


~~DETAIL 37C~~ DETAIL 37C DELETED

### CHEVRON PAVEMENT MARKINGS AT EXIT RAMP GORE AREA



### CHEVRON PAVEMENT MARKINGS AT ENTRANCE RAMP GORE AREA



## PAVEMENT MARKERS AND TRAFFIC LINES TYPICAL DETAILS

NO SCALE

RSP A20C DATED APRIL 17, 2020 SUPERSEDES RSP A20C DATED OCTOBER 19, 2018 AND STANDARD PLAN A20C DATED MAY 31, 2018 - PAGE 14 OF THE STANDARD PLANS BOOK DATED 2018.

## REVISED STANDARD PLAN RSP A20C

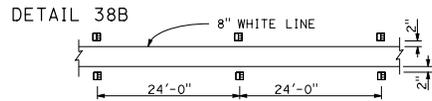
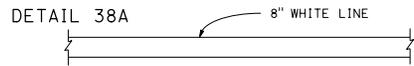
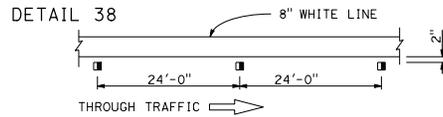
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

*Atifa Ferouz*  
 REGISTERED CIVIL ENGINEER  
 No. C80402  
 Exp. 3-31-21  
 CIVIL  
 STATE OF CALIFORNIA

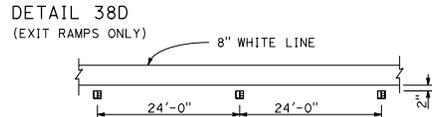
APRIL 17, 2020  
 PLANS APPROVAL DATE  
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2018 REVISED STANDARD PLAN RSP A20C

**CHANNELIZING LINE**



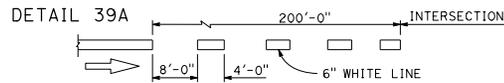
DETAIL 38C DELETED



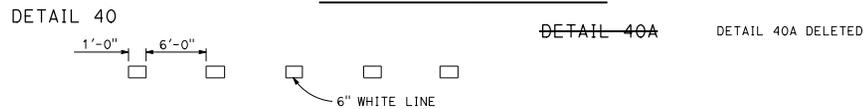
**BIKE LANE LINE**



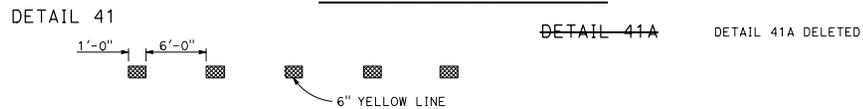
**INTERSECTION LINE BIKE LANE**



**LANE LINE EXTENSIONS THROUGH INTERSECTIONS**



**CENTER LINE EXTENSIONS THROUGH INTERSECTIONS**

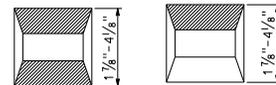
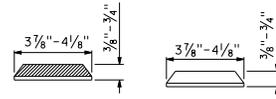


**LEGEND**

**MARKERS**

- TYPE C RED-CLEAR RETROREFLECTIVE
- TYPE G ONE-WAY CLEAR RETROREFLECTIVE
- 6" YELLOW LINE

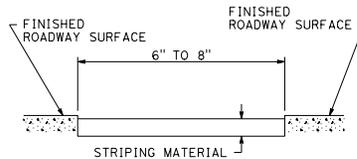
**MARKER DETAILS**



**TYPE C**

**TYPE G**

RETROREFLECTIVE FACE



**DETAIL FOR RECESSED TRAFFIC STRIPE**

See Notes A and B.

**RECESSED NOTES:**

- A. See typical traffic line details for pavement marking patterns.
- B. See standard specifications for recess depth and recess striping material thickness.

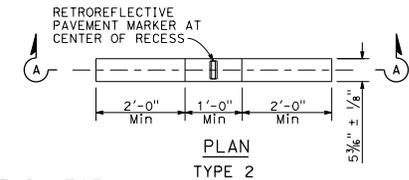
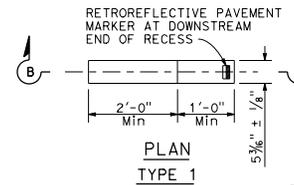
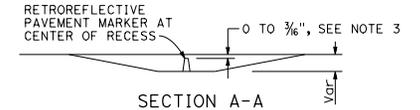
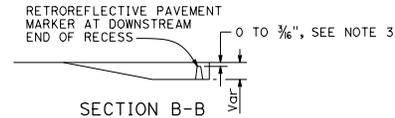
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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Atifa Ferouz  
REGISTERED CIVIL ENGINEER  
No. C80402  
EXP. 3-31-19  
CIVIL

October 19, 2018  
PLANS APPROVAL DATE

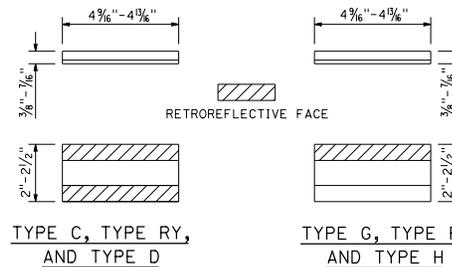
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TO ACCOMPANY PLANS DATED \_\_\_\_\_



**RECESS DETAIL FOR RETROREFLECTIVE PAVEMENT MARKER**

See Note 4



**RECESSED MARKER NOTES:**

1. See typical traffic line details for marker patterns to be used with recessed pavement markers.
2. The retroreflective pavement markers shown for recessed installations are not to be used for non-recessed installations.
3. The top of pavement markers installed in recesses shall be 0 to 3/16" below the pavement surface.
4. Use Type 1 recess for pavement markers with one-way retroreflective face. Use Type 2 recess for pavement markers with two-way retroreflective face.

**RETROREFLECTIVE PAVEMENT MARKER FOR RECESSED INSTALLATION**

See Notes 1 and 2.

**STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION  
PAVEMENT MARKERS AND TRAFFIC LINES  
TYPICAL DETAILS**

NO SCALE

RSP A200 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN A200 DATED MAY 31, 2018 - PAGE 15 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP A200**

2018 REVISED STANDARD PLAN RSP A200

**NOTE:**

1. See Standard Plans A20A, A20B, A20C, A20D, and A20F for pavement markers and traffic lines typical details.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Atifa Ferouz*  
REGISTERED CIVIL ENGINEER

April 19, 2019  
PLANS APPROVAL DATE

Atifa Ferouz  
No. C80402  
EXP. 3-31-21  
CIVIL  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_



TYPICAL LANE LINE OR RIGHT EDGE LINE CONTRAST DETAIL

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**PAVEMENT MARKERS  
AND TRAFFIC LINES**

**TYPICAL DETAIL FOR CONTRAST STRIPING**

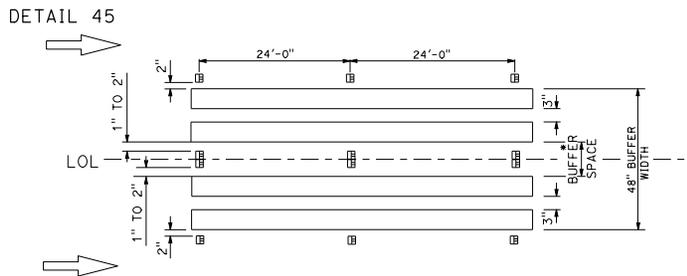
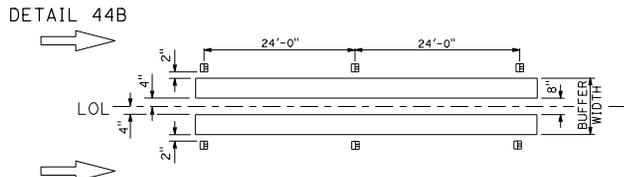
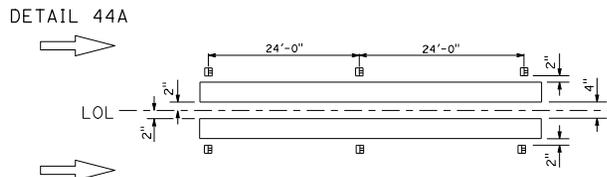
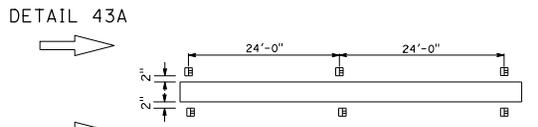
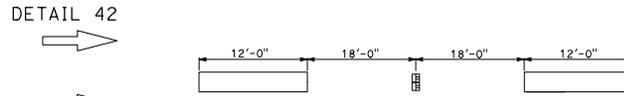
NO SCALE

RSP A20E DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN A20E  
DATED MAY 31, 2018 - PAGE 16 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A20E**

2018 REVISED STANDARD PLAN RSP A20E

**PREFERENTIAL LANE LINES**



\* If buffer space is wider than 4 feet use chevron markings.

**LEGEND**

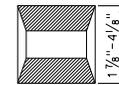
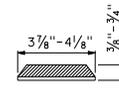
**MARKERS**

☐ TYPE C RED-CLEAR RETROREFLECTIVE

**LINES**

▭ 8" WHITE LINE

**MARKER DETAILS**



**TYPE C**

▨ RETROREFLECTIVE FACE

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

Atifa Ferouz  
REGISTERED CIVIL ENGINEER

April 19, 2019  
PLANS APPROVAL DATE

Atifa Ferouz  
REGISTERED PROFESSIONAL ENGINEER  
No. C80402  
EXP. 3-31-21  
CIVIL  
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

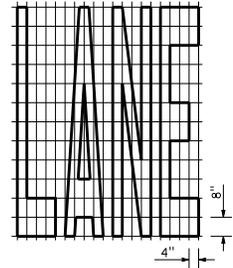
2018 REVISED STANDARD PLAN RSP A20F

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**PAVEMENT MARKERS  
AND TRAFFIC LINES  
TYPICAL DETAILS**

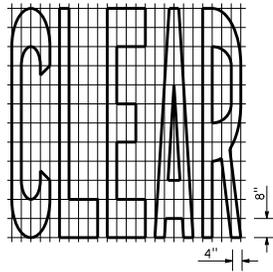
NO SCALE

RSP A20F DATED APRIL 19, 2019 SUPERSEDES RSP A20F  
DATED OCTOBER 19, 2018 THAT SUPPLEMENTS TO THE STANDARD PLANS BOOK DATED 2018.

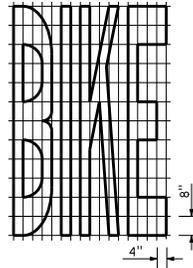
**REVISED STANDARD PLAN RSP A20F**



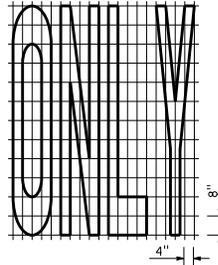
A=24 f+2



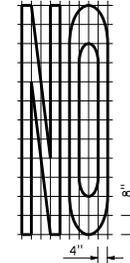
A=27 f+2



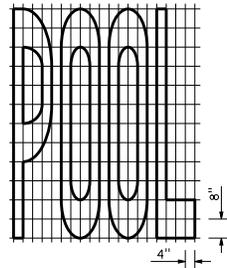
A=21 f+2



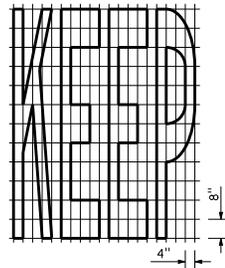
A=22 f+2



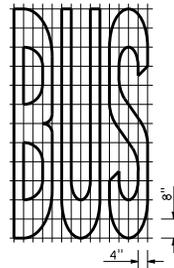
A=14 f+2



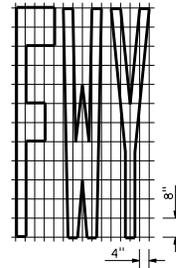
A=23 f+2



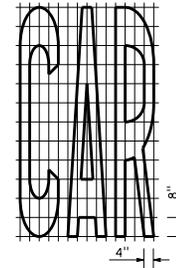
A=24 f+2



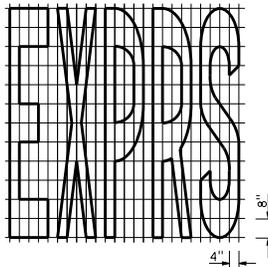
A=20 f+2



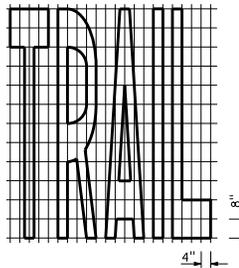
A=16 f+2



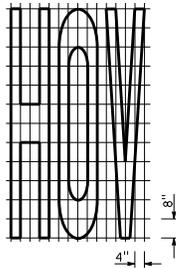
A=17 f+2



A=30 f+2



A=23 f+2



A=18 f+2



A=2 f+2

See Notes 5 and 6

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

Atifa Ferouz  
REGISTERED CIVIL ENGINEER

October 19, 2018  
PLANS APPROVAL DATE

Atifa Ferouz  
No. C80402  
Exp. 3-31-19  
REGISTERED PROFESSIONAL ENGINEER  
CIVIL  
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

WORD MARKINGS			
ITEM	f+2	ITEM	f+2
LANE	24	NO	14
POOL	23	BIKE	21
CAR	17	BUS	20
CLEAR	27	ONLY	22
KEEP	24	FWY	16
HOV	18	EXPRS	30
TRAIL	23		

**NOTES:**

- If a message consists of more than one word, it must read "UP", i.e., the first word must be nearest the driver.
- The space between words must be at least four times the height of the characters for low speed roads, but not more than ten times the height of the characters. The space may be reduced appropriately where there is limited space because of local conditions.
- Minor variations in dimensions may be accepted by the Engineer.
- Portions of a letter, number or symbol may be separated by connecting segments not to exceed 2" in width.
- The words "NO PARKING" pavement marking is to be used for parking facilities. For typical locations of markings, see Standard Plans A90A and A90B.
- The words "NO PARKING" shall be painted in white letters no less than 1'-0" high on a contrasting background and located so that it is visible to traffic enforcement officials.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**PAVEMENT MARKINGS  
WORDS**

NO SCALE

RSP A24E DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN A24E  
DATED MAY 31, 2018 - PAGE 21 OF THE STANDARD PLANS BOOK DATED 2018.

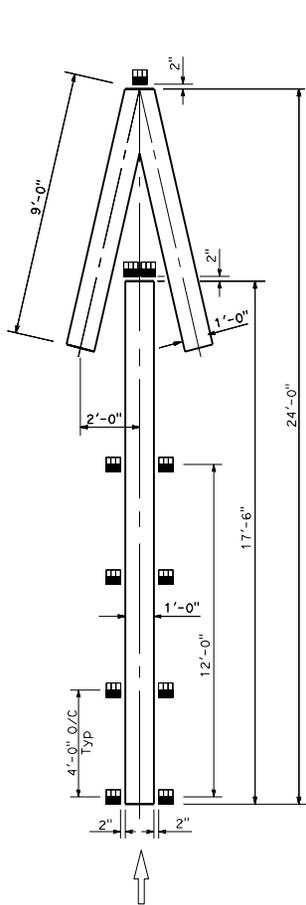
**REVISED STANDARD PLAN RSP A24E**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Atifa Ferouz*  
 REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
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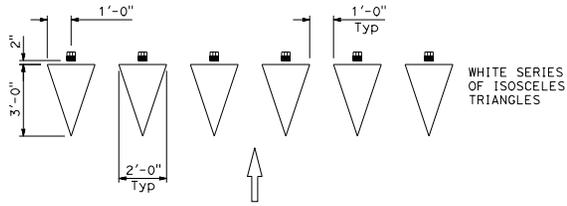
Atifa Ferouz  
 No. C80402  
 Exp. 3-31-19  
 CIVIL  
 STATE OF CALIFORNIA

2018 REVISED STANDARD PLAN RSP A24G



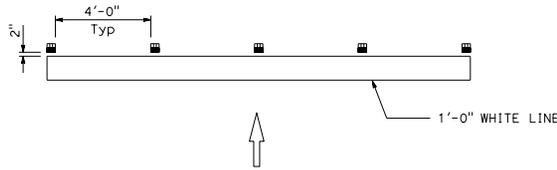
A=33 ft<sup>2</sup>

**TYPE V ARROW AT EXIT RAMP**



WHITE SERIES OF ISOSCELES TRIANGLES

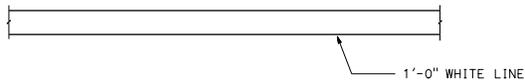
**YIELD LINE AT EXIT RAMP**



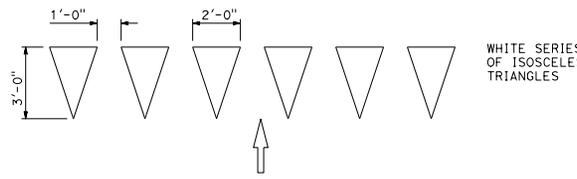
**LIMIT LINE (STOP LINE) AT EXIT RAMP**

NOTE:

1. If there is crosswalk at the end of the exit ramp, place Type R markers in front of the first line for wrong way vehicle that travels up the ramp with the red reflective side facing the intersection.



**LIMIT LINE (STOP LINE)**



WHITE SERIES OF ISOSCELES TRIANGLES

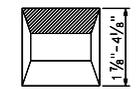
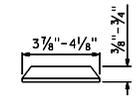
**YIELD LINE**

**LEGEND**

**MARKERS**

- TYPE R ONE-WAY RED RETROREFLECTIVE

**MARKER DETAILS**



**TYPE R**

- RETROREFLECTIVE FACE ON BACKSIDE

TO ACCOMPANY PLANS DATED \_\_\_\_\_

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**PAVEMENT MARKINGS  
YIELD LINES, LIMIT LINES,  
AND WRONG WAY DETAILS**

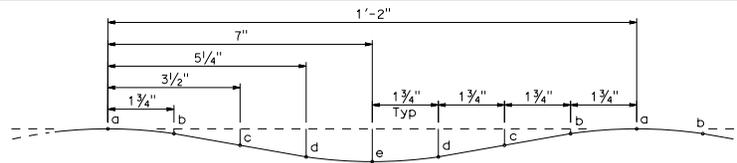
NO SCALE

RSP A24G DATED OCTOBER 19, 2018 SUPPLEMENT TO THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A24G**

**NOTES:**

1. For shoulder, edge line, and center line rumble strip details, see Standard Plans A40B, A40C, and A40D.
2. See Project Plans and Standard Plan A20A and Revised Standard Plan RSP A20B for pavement markers and traffic lines typical details.



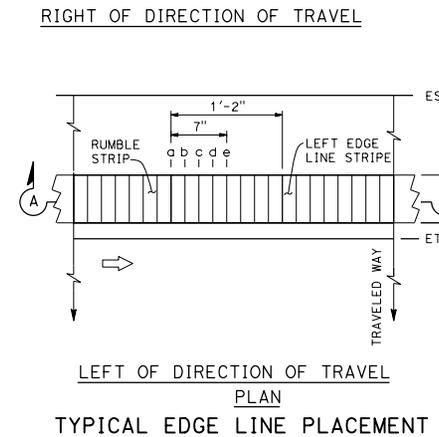
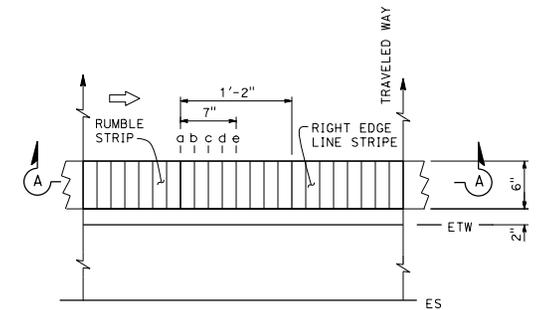
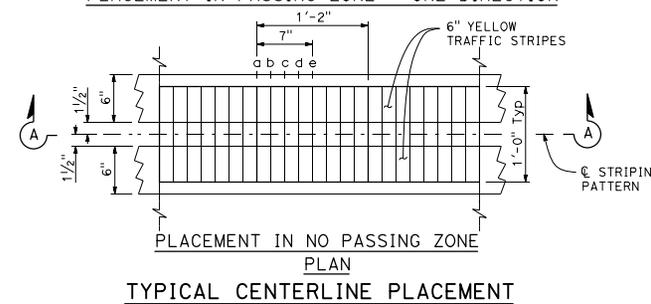
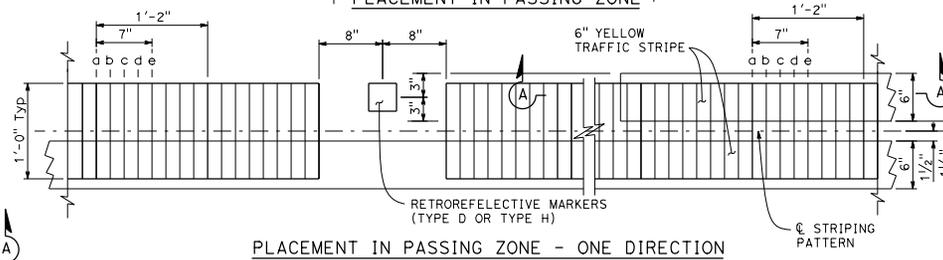
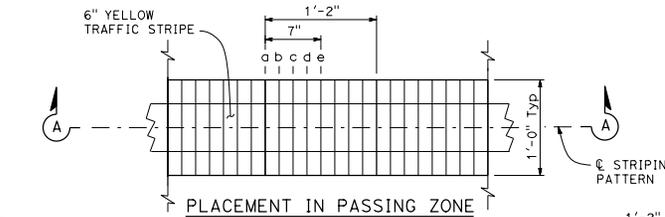
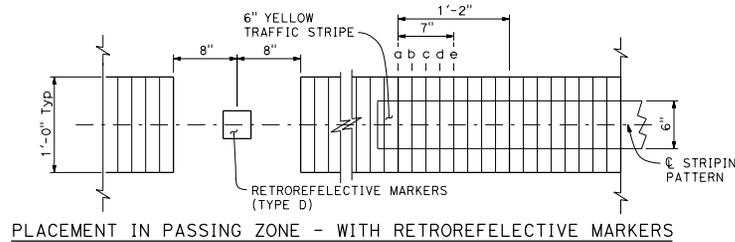
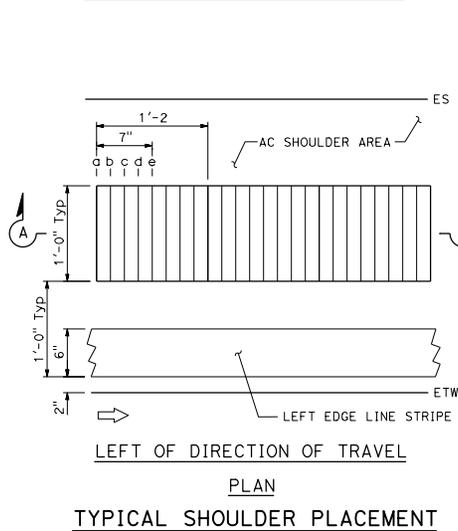
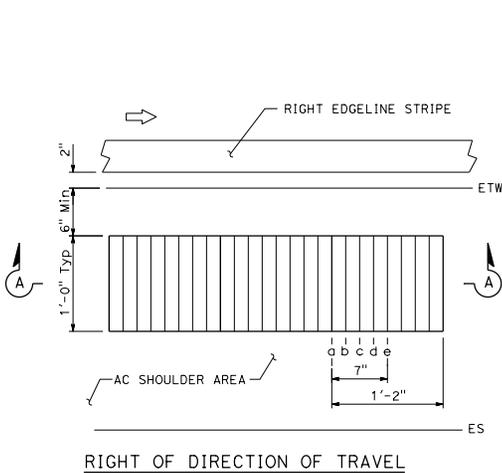
**ELEVATIONS  
SECTION A-A**

LOCATION	SHOULDER DEPTH INCHES
a	0
b	1/16
c	3/2
d	3/4
e	5/16

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Atifa Ferouz**  
 REGISTERED CIVIL ENGINEER  
 October 16, 2020  
 PLANS APPROVAL DATE  
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TO ACCOMPANY PLANS DATED \_\_\_\_\_



**SINUSOIDAL RUMBLE STRIP DETAILS  
GROUND-IN INDENTATIONS**

NO SCALE

RSP A40G DATED OCTOBER 16, 2020 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A40G**

2018 REVISED STANDARD PLAN RSP A40G

**NOTE:**

For shoulder and edge line rumble strip details, see Standard Plans A40B and A40C.

**LEGEND:**

||||| RUMBLE STRIPS (GROUND-IN)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

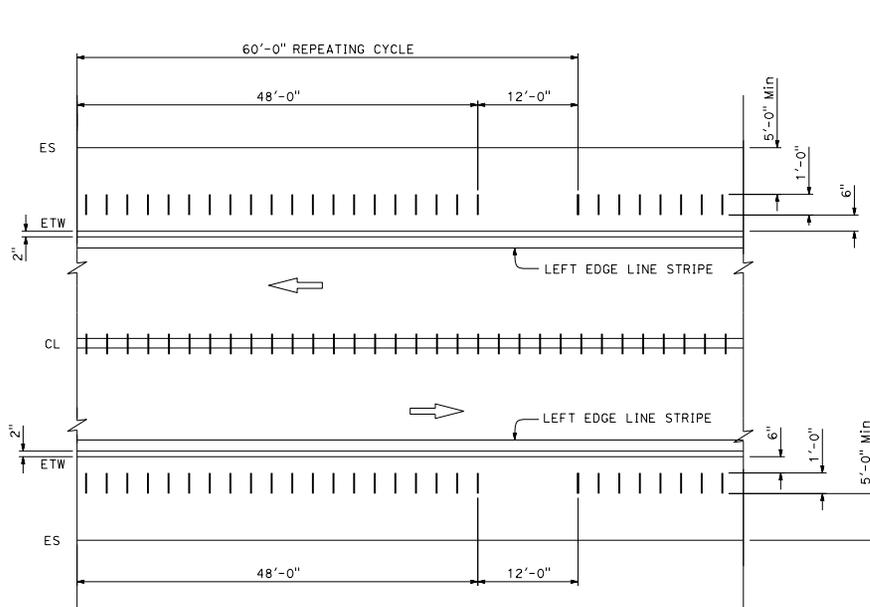
Atifa Ferouz  
REGISTERED CIVIL ENGINEER

October 16, 2020  
PLANS APPROVAL DATE

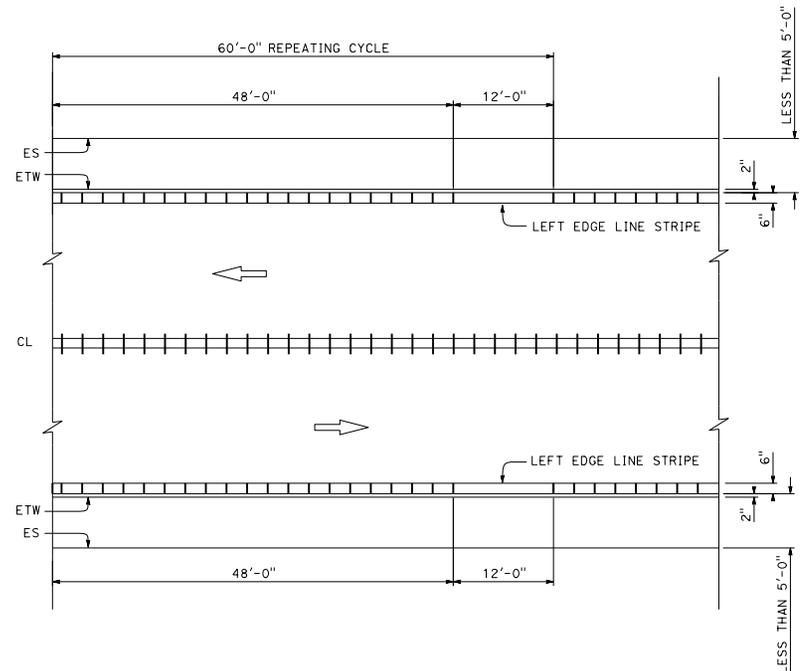
Atifa Ferouz  
No. C80402  
EXP. 3-31-21  
CIVIL ENGINEER  
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_



SHOULDER RUMBLE STRIPS WITH GAPS FOR BICYCLE  
WHERE BICYCLES ARE PERMITTED AND CLEAR  
SHOULDER WIDTH IS 5 FEET OR GREATER



EDGE LINE RUMBLE STRIPS WITH GAPS FOR BICYCLE  
WHERE BICYCLES ARE PERMITTED AND CLEAR  
SHOULDER WIDTH IS LESS THAN 5 FEET

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**RUMBLE STRIP PLACEMENT**  
**WITH GAPS FOR BICYCLES**  
NO SCALE

RSP A40H DATED OCTOBER 16, 2020 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A40H**

2018 REVISED STANDARD PLAN RSP A40H

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS


  
 REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
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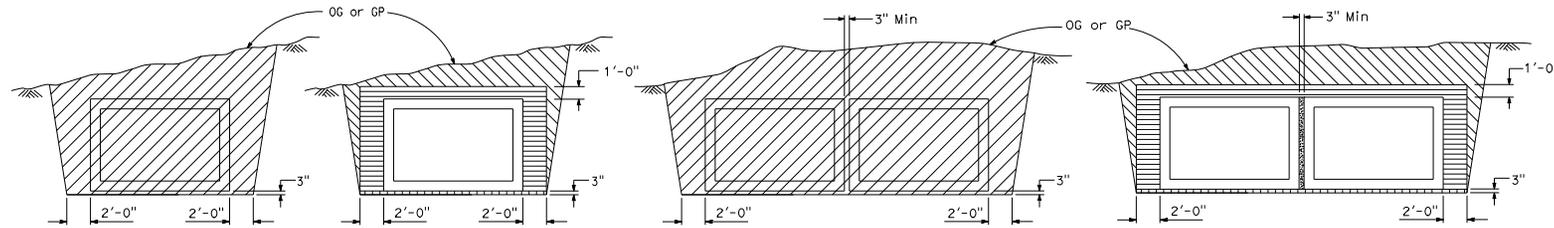
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**LEGEND:**

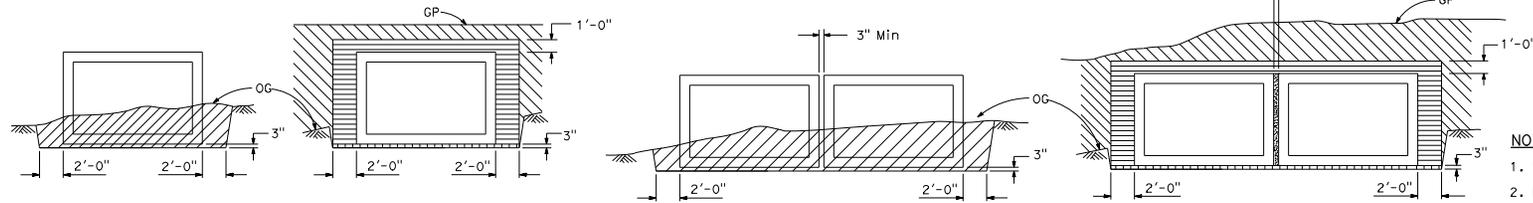
-  STRUCTURE EXCAVATION (CULVERT)
-  STRUCTURE BACKFILL (CULVERT)  
95% RELATIVE COMPACTION
-  ROADWAY EMBANKMENT
-  SLURRY CEMENT BACKFILL
-  SAND BEDDING (CULVERT)
-  ROADWAY PAVEMENT STRUCTURE

**NOTES:**

1. Slope or shore excavation sides as necessary.
2. Dimensions shown are minimum.
3. Method 2 and 3 for single or multiple boxes requires an approved external sealing band. See Revised Standard Plan RSP D83A.
4. Construction of Roadway Pavement Structure in Method 2 or Method 3 shall not disturb the external sealing band installation.

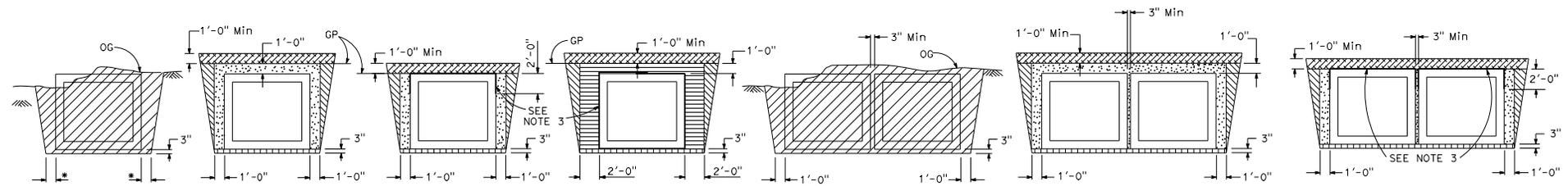


**EXCAVATION IN TRENCH**      **BACKFILL IN TRENCH**



**EXCAVATION IN EMBANKMENT**      **BACKFILL IN EMBANKMENT**

**FILL HEIGHT GREATER THAN 2'-0"**



**EXCAVATION**      **METHOD 1**      **METHOD 2**      **METHOD 3**      **EXCAVATION**      **METHOD 1**      **METHOD 2**

**BACKFILL**

**FILL HEIGHT 2'-0" OR LESS**

\* 1'-0" Where Method 1 or 2 Backfill is used.  
2'-0" Where Method 3 Backfill is used.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**EXCAVATION AND BACKFILL PRECAST  
 REINFORCED CONCRETE BOX CULVERT**  
 NO SCALE

RSP A62G DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN A62G  
 DATED MAY 31, 2018 - PAGE 35 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP A62G**

2018 REVISED STANDARD PLAN RSP A62G



**NOTES:**

1. See Standard Plan A76G for Concrete Barrier Type 60MSA and Type 60MSA.
2. Footing monolithic or doweled with 2-#8 x 8" @ 2'-0". The footing is required at concrete barrier ends and at interruptions in concrete barrier.
3. 10" concrete barrier footing extends 10' back from structure.
4. See Standard Plan A78I for transition to Thrie Beam Barrier.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

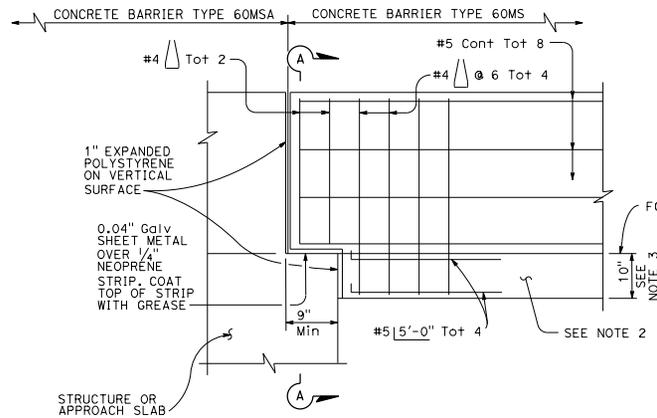
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

October 16, 2020  
PLANS APPROVAL DATE

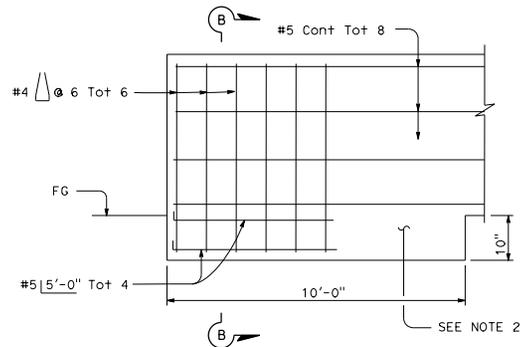
No. C60200  
Exp. 6-30-21  
CIVIL  
STATE OF CALIFORNIA

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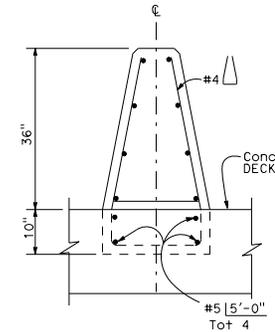
TO ACCOMPANY PLANS DATED \_\_\_\_\_



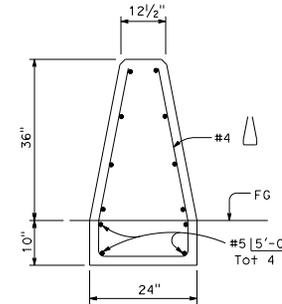
**CONCRETE BARRIER TYPE 60MS  
CONNECTION TO STRUCTURE**



**CONCRETE BARRIER TYPE 60MS  
END ANCHORAGE**



**SECTION A-A**



**SECTION B-B**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CONCRETE BARRIER TYPE 60MS**

NO SCALE

RSP A76H DATED OCTOBER 16, 2020 SUPERSEDES STANDARD PLAN A76H  
DATED MAY 31, 2018 - PAGE 52 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A76H**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

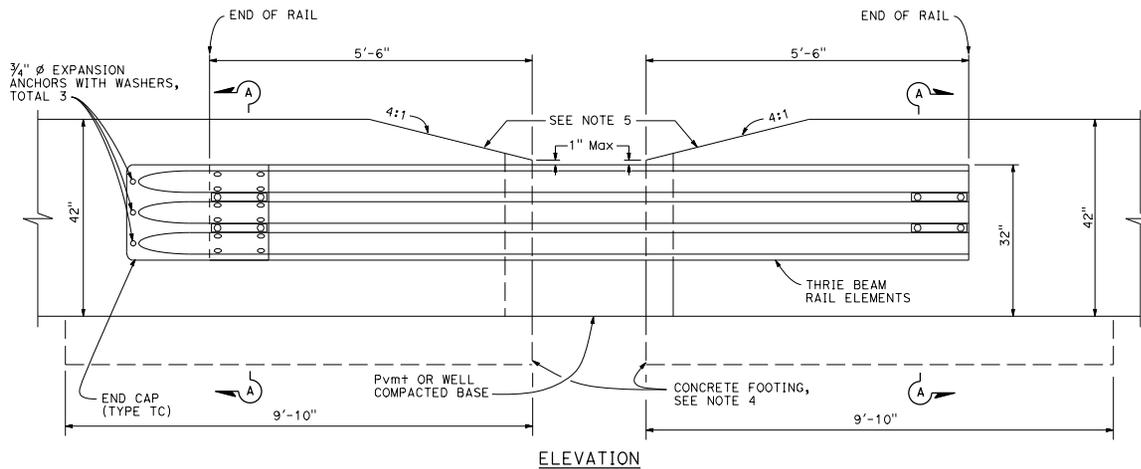
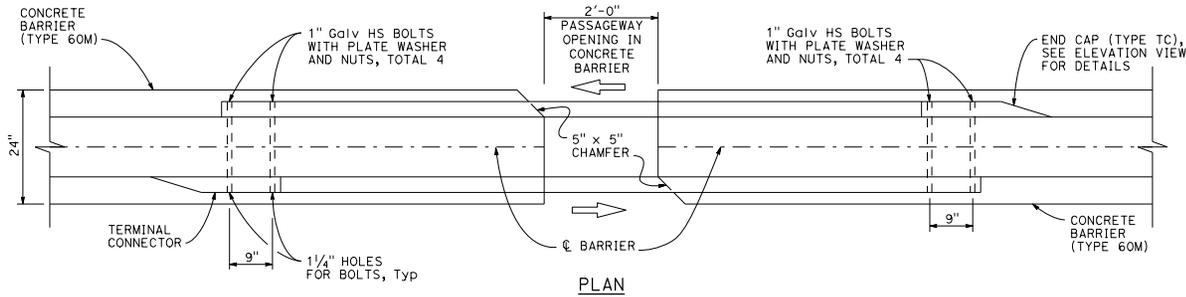
**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

**Randell D. Hiatt**  
REGISTERED PROFESSIONAL ENGINEER  
No. C60200  
Exp. 6-30-21  
CIVIL  
STATE OF CALIFORNIA

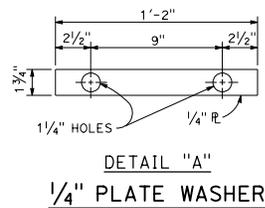
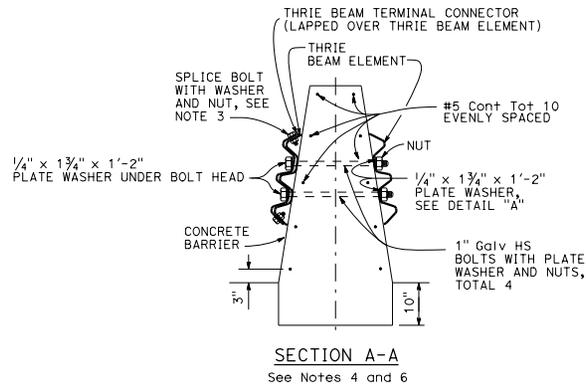
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TO ACCOMPANY PLANS DATED \_\_\_\_\_



**NOTES:**

1. Type MM Passageway typically used for crossing of medium size animals.
2. For details of the thrie beam element and hardware, see the A78 series of the Standard Plans. For details of Concrete Barrier Type 60, see the A76 series of the Standard Plans.
3. The end cap, and the thrie beam element, may be spliced together prior to bolting the elements to the concrete barrier. All 8 splice bolts to connect the end cap to the rail element are not required. The 2 top and the 2 bottom splice bolts with washers and nuts shall be used.
4. Barrier end anchorage shall be constructed as shown in Section A-A of this plan or as shown on Standard Plan A76B.
5. Taper the top of the end of the concrete barrier at 4:1 to match the top elevation of the thrie beam rail element.
6. For details not shown, see Standard Plan A76A.



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**CONCRETE BARRIER  
WILDLIFE PASSAGEWAY  
(TYPE MM)**

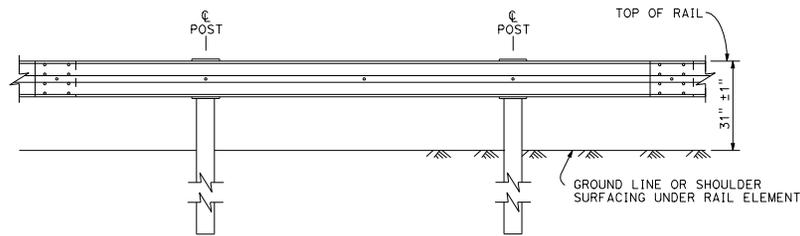
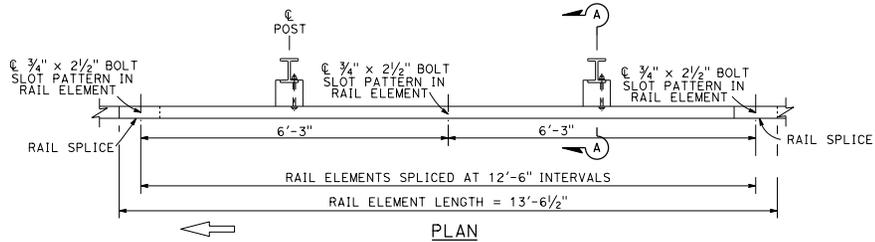
NO SCALE

RSP A76K DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN A76K  
DATED MAY 31, 2018 - PAGE 55 OF THE STANDARD PLANS BOOK DATED 2018.

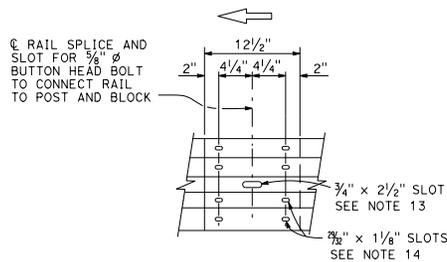
**REVISED STANDARD PLAN RSP A76K**

2018 REVISED STANDARD PLAN RSP A76K





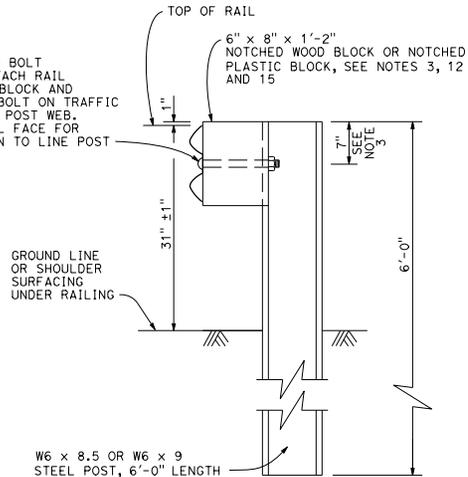
**MIDWEST GUARDRAIL SYSTEM WITH STEEL POSTS  
AND NOTCHED WOOD OR NOTCHED RECYCLED PLASTIC BLOCKS**



**RAIL ELEMENT SPLICE DETAIL**

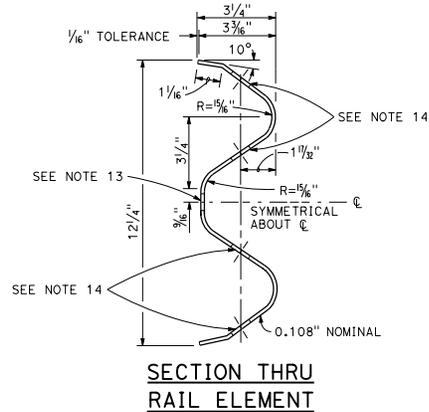
- Connect the overlapped end of the rail elements with  $\frac{5}{8}$ "  $\phi$  x  $1\frac{1}{4}$ " button head oval shoulder splice bolts inserted into the  $\frac{3}{8}$ " x  $1\frac{1}{8}$ " slots and bolted together with  $\frac{5}{8}$ "  $\phi$  recessed hex nuts. Recess of hex nut points toward rail element. A total of 8 bolts and nuts are to be used at each rail splice connection.
- The ends of the rail elements are to be overlapped in the direction of traffic (see details).
- Where end cap is to be attached to the end of a rail element, a total of 4 of the above described splice bolts and nuts are to be used.

$\frac{5}{8}$ "  $\phi$  BUTTON HEAD BOLT WITH HEX NUT. ATTACH RAIL ELEMENT TO WOOD BLOCK AND STEEL POST WITH BOLT ON TRAFFIC APPROACH SIDE OF POST WEB. NO WASHER ON RAIL FACE FOR BOLTED CONNECTION TO LINE POST.



**SECTION A-A  
TYPICAL STEEL LINE  
POST INSTALLATION**

See Note 4



**NOTES:**

- For details of wood post installations, see Revised Standard Plan RSP A77L1.
- For details of standard hardware used to construct MGS, see Revised Standard Plan RSP A77M1.
- For details of steel posts and notched wood blocks used to construct MGS, see Standard Plan A77N2.
- For additional installation details, see Standard Plan A77N3.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- For MGS typical layouts, see the A77P, A77Q and A77R Series of Standard Plans.
- If railing is connected to terminal system end treatment, use 31" height terminal system end treatment.
- For MGS end anchor details, see Standard Plans A77S1 and A77T2.
- For details of MGS transition to bridge railing, see Revised Standard Plan RSP A77U4.
- For additional details of MGS connection to bridge railings, see Standard Plans A77U1, A77U2 and A77V1.
- For dike positioning and MGS delineation details, see Revised Standard Plan RSP A77N4.
- Notched face of block faces steel post.
- Slotted hole for bolted connection of rail element to block and post.
- Slotted holes for splice bolts to overlap ends of rail element.
- 6" x 12" x 1'-2" block must be used with 6" dike.
- Install posts in soil.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

October 16, 2020  
PLANS APPROVAL DATE

*Randell D. Hiatt*  
No. CS0200  
Exp. 6-30-21  
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STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
STANDARD RAILING SECTION  
(STEEL POST WITH NOTCHED  
WOOD OR NOTCHED  
RECYCLED PLASTIC BLOCK)**

NO SCALE

RSP A77L2 DATED OCTOBER 16, 2020 SUPERSEDES RSP A77L2 DATED OCTOBER 18, 2019,  
RSP A77L2 DATED APRIL 13, 2019 AND STANDARD PLAN A77L2 DATED MAY 31, 2018 - PAGE 58  
OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77L2**

2018 REVISED STANDARD PLAN RSP A77L2

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

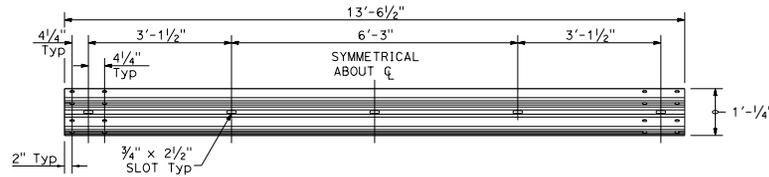
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

October 16, 2020  
PLANS APPROVAL DATE

*Randell D. Hiatt*  
REGISTERED PROFESSIONAL ENGINEER  
No. C50200  
EXP. 6-30-21  
CIVIL  
STATE OF CALIFORNIA

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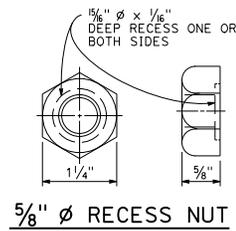
TO ACCOMPANY PLANS DATED \_\_\_\_\_



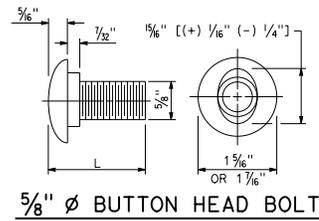
TYPICAL RAIL ELEMENT

**NOTE:**

1. Slotted holes for splice bolts to overlap ends of rail element.



5/8" Ø RECESS NUT

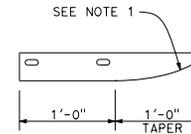


5/8" Ø BUTTON HEAD BOLT

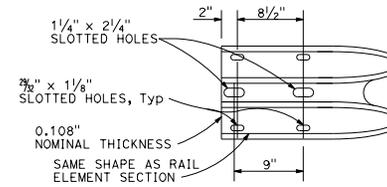
**BUTTON HEAD BOLT**

L	THREAD LENGTH
1 1/4"	FULL THREAD LENGTH
2"	FULL THREAD LENGTH
10"	4" Min THREAD LENGTH
18"	4" Min THREAD LENGTH
20"	4" Min THREAD LENGTH
22"	4" Min THREAD LENGTH
26"	4" Min THREAD LENGTH
36"	4" Min THREAD LENGTH
** 2 3/4"	2" Min THREAD LENGTH
** 19"	4" Min THREAD LENGTH

\*\* For nested rail applications.



PLAN



ELEVATION

END CAP

(TYPE A)

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
STANDARD HARDWARE**

NO SCALE

RSP A77M1 DATED OCTOBER 16, 2020 SUPERSEDES STANDARD PLAN A77M1  
DATED MAY 31, 2018 - PAGE 60 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77M1**

2018 REVISED STANDARD PLAN RSP A77M1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

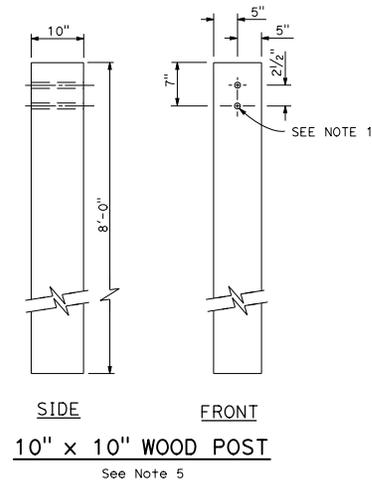
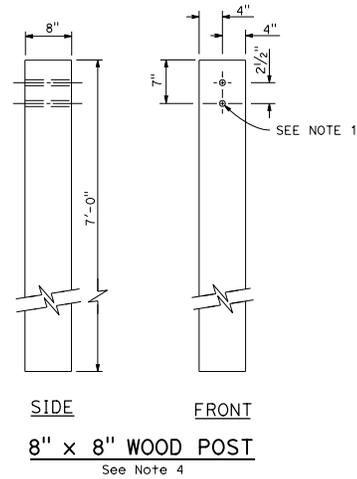
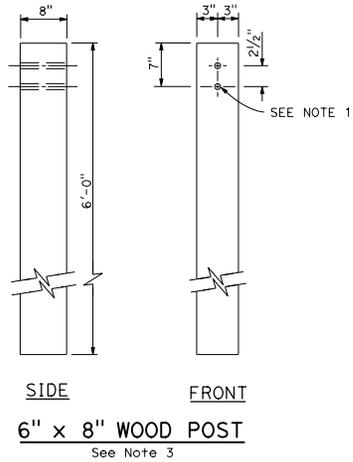
October 18, 2019  
PLANS APPROVAL DATE

*Randell D. Hiatt*  
No. C50200  
Exp. 6-30-21  
CIVIL  
STATE OF CALIFORNIA

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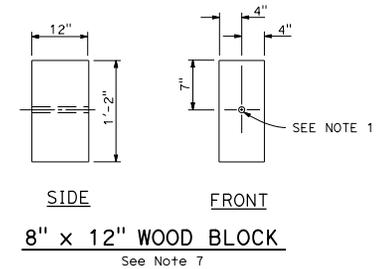
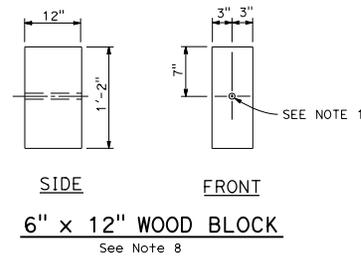
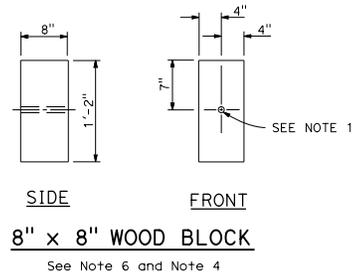
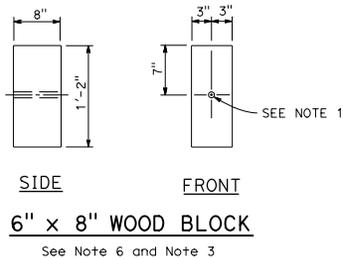
TO ACCOMPANY PLANS DATED \_\_\_\_\_

2018 REVISED STANDARD PLAN RSP A77N1



**NOTES:**

1. All holes in wood posts and blocks shall be  $\frac{3}{4}$ " Dia  $\pm$   $\frac{1}{16}$ ".
2. Dimensions shown for wood post are nominal.
3. This post and block combination used for standard line post sections of MGS.
4. This post and 8" x 8" block combination used for line post sections of MGS on narrow roadways.
5. This post and 8" x 8" block combination is typically used where strengthened line post sections of MGS are warranted to shield fixed objects.
6. See Standard Plan A77L3 for use of 6" x 8" and 8" x 8" wood blocks.
7. To be used with 8" x 8" x 7'-0" wood post if installed with 6" height dike.
8. To be used with 6" x 8" x 6'-0" wood post if installed with 6" height dike.



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
WOOD POST AND  
WOOD BLOCK DETAILS**

NO SCALE

RSP A77N1 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN A77N1  
DATED MAY 31, 2018 - PAGE 61 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77N1**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

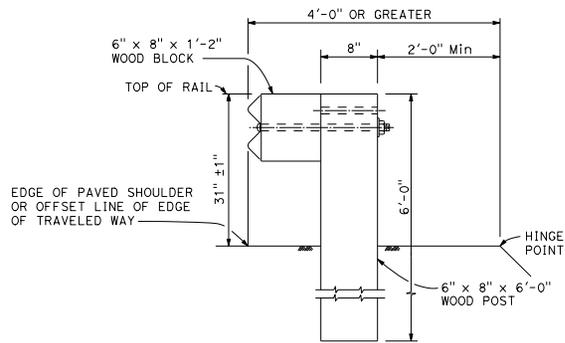
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

October 19, 2018  
PLANS APPROVAL DATE

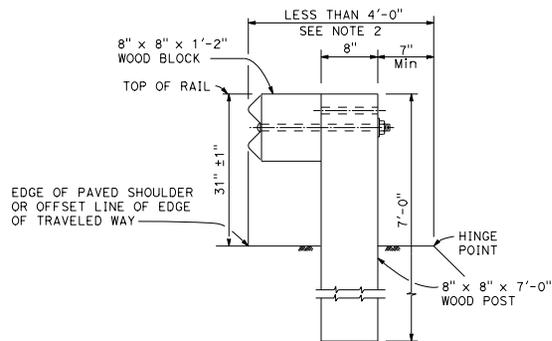
*Randell D. Hiatt*  
No. CS0200  
Exp. 6-30-19  
CIVIL  
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

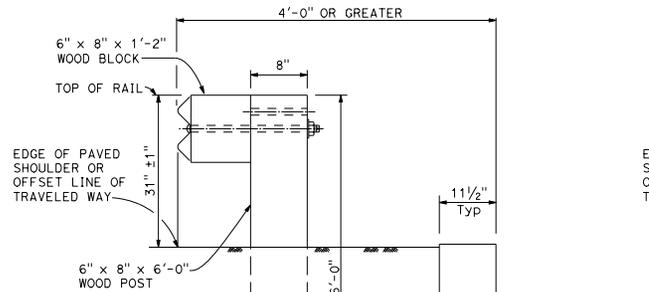


**DETAIL A**  
**TYPICAL ROADWAY**  
**INSTALLATION**  
See Note 1



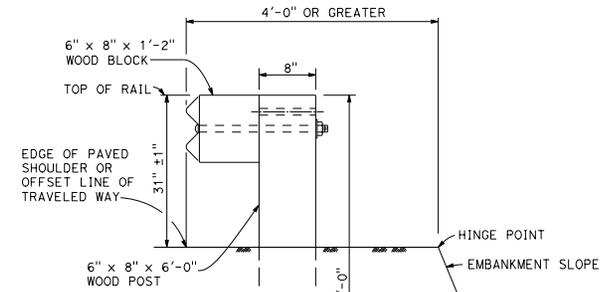
**DETAIL B**  
**NARROW ROADWAY**  
**INSTALLATION**  
See Note 1

**POST EMBEDMENT**



**DETAIL C**

**INSTALLATION AT EARTH RETAINING WALLS**



**DETAIL D**

**NOTES:**

1. These installation details also applicable to steel line post installations. For Detail A, C, and D, where steel line post installations are constructed, W6 x 8.5 or W6 x 9 steel post, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks are to be used in place of the size of wood post and wood block shown. For Detail B, where steel line post installations are constructed, W6 x 8.5 or W6 x 9 steel post, 8'-0" in length, with 8" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks are to be used in place of the size of wood post and wood block shown. For additional installation details, see Standard Plans A77L1 and A77L2.
2. Where the distance between the back of the post and the hinge point is less than 7", see the Project Plans for special details.
3. For dike positioning with MGS installations, see Standard Plan A77N4.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM**  
**TYPICAL LINE POST**  
**EMBEDMENT AND**  
**HINGE POINT OFFSET DETAILS**  
NO SCALE

RSP A77N3 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN A77N3  
DATED MAY 31, 2018 - PAGE 63 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77N3**

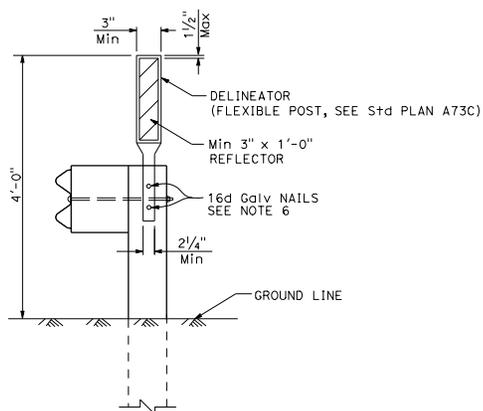
2018 REVISED STANDARD PLAN RSP A77N3

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
<b>Randell D. Hiatt</b> REGISTERED CIVIL ENGINEER					
April 19, 2019 PLANS APPROVAL DATE					
No. C60200 Exp. 6-30-19 CIVIL					
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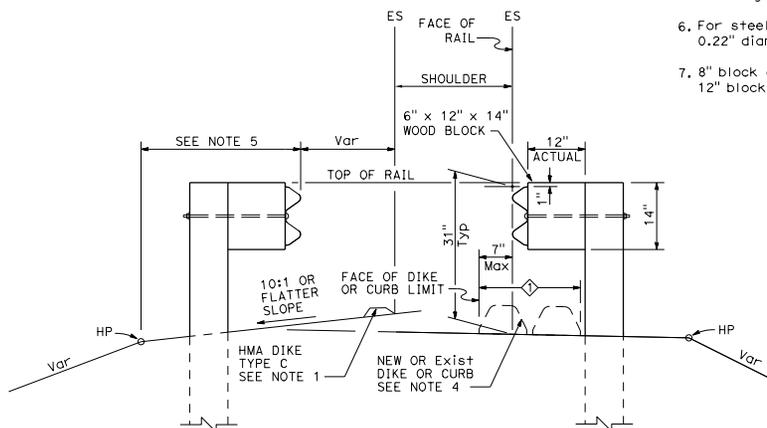
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

- When necessary to place dike more than 7" in front of face of MGS, only Type C dike may be used. For dike details, see Standard Plan A87B.
- For standard railing post embedment, see Standard Plan A77N3.
- MGS delineation to be used where shown on the Project Plans.
- When dike or curb is placed under MGS, the maximum height of the dike or curb shall be 6". Mountable dike should not be used. For dike and curb details, see Standard Plans A87A and A87B.
- For details of typical distance between the face of rail and hinge point, see Standard Plan A77N3.
- For steel line posts, use 1/4" - 20 self-tapping screws in 0.22" diameter holes or 1/4" bolts in 3/8" diameter holes.
- 8" block can be used with 4" or lower dike, or no dike. 12" block can be used with 6" or lower dike, or no dike.



**MGS DELINEATION**  
See Note 3



**DIKE POSITIONING**  
See Note 1

◇ PERMISSIBLE DIKE OR CURB  
PLACEMENT AREA

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL RAILING DELINEATION  
AND DIKE POSITIONING DETAILS**

NO SCALE

RSP A77N4 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN A77N4  
DATED MAY 31, 2018 - PAGE 64 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77N4**

2018 REVISED STANDARD PLAN RSP A77N4

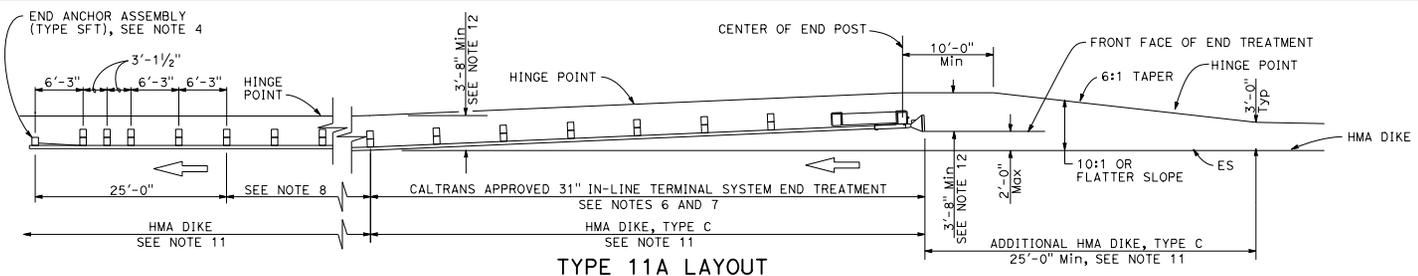
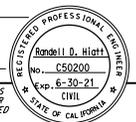
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

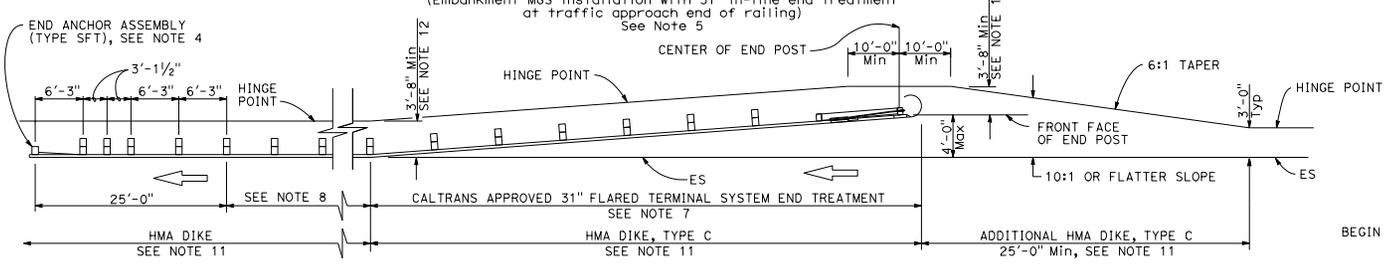
October 18, 2019  
PLANS APPROVAL DATE

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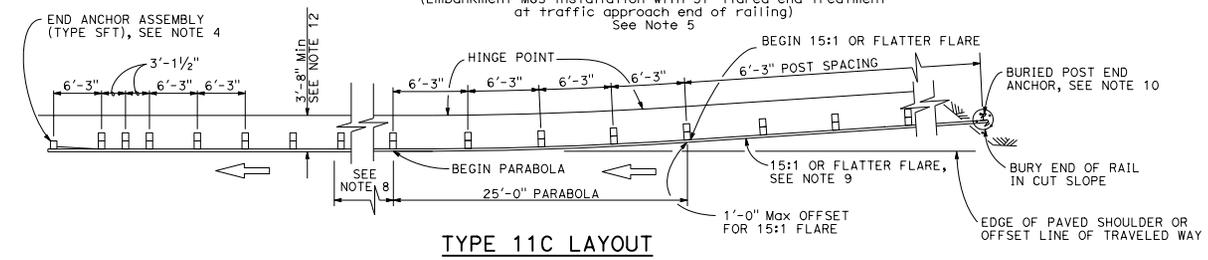
TO ACCOMPANY PLANS DATED \_\_\_\_\_



**TYPE 11A LAYOUT**  
(Embankment MGS installation with 31" in-line end treatment at traffic approach end of railing)  
See Note 5

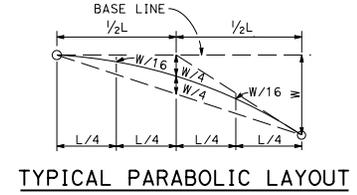


**TYPE 11B LAYOUT**  
(Embankment MGS installation with 31" flared end treatment at traffic approach end of railing)  
See Note 5

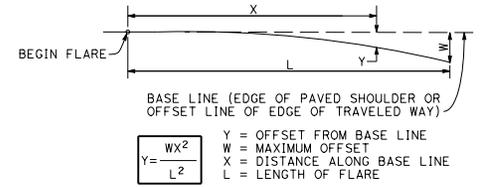


**TYPE 11C LAYOUT**  
(Embankment MGS installation with buried end anchor treatment at traffic approach end of railing)  
See Notes 5 and 11

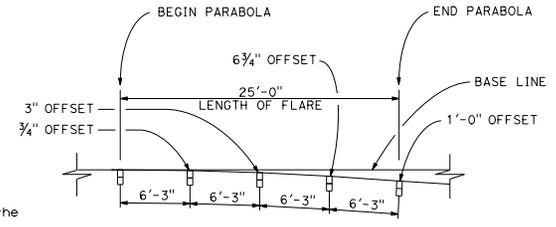
- NOTES:**
- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
  - MGS post spacing to be 6'-3" center to center, except as otherwise noted.
  - Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or recycled plastic blocks may be used for 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
  - For End Anchor Assembly (Type SFT) details, see Standard Plan A77S1.
  - Layout Types 11A, 11B or 11C are typically used where MGS is recommended to shield embankment slopes and a crashworthy end treatment is required for only one direction of traffic.
  - 31" in-line terminal system end treatments are used where site conditions will not accommodate a flared end treatment.
  - The type of 31" terminal system end treatment to be used will be shown on the Project Plans.
  - Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
  - The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of edge of the traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
  - For details of the buried post end anchor used with Type 11C Layout, see Standard Plan A77T2.
  - Where placement of dike is required with MGS installations, see Standard Plan A77N4 for dike positioning details.
  - Use this offset for 8-inch block. For 12-inch block, use 4'-0" Min offset.



**TYPICAL PARABOLIC LAYOUT**



**PARABOLIC FLARE OFFSETS**



**TYPICAL FLARE OFFSETS FOR 1 FOOT Max END OFFSET**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**

NO SCALE

RSP A77P1 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN A77P1 DATED MAY 31, 2018 - PAGE 80 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77P1**

2018 REVISED STANDARD PLAN RSP A77P1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

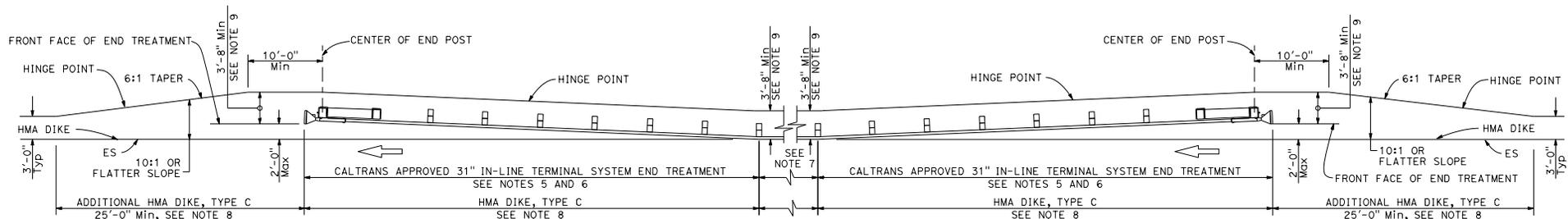
**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

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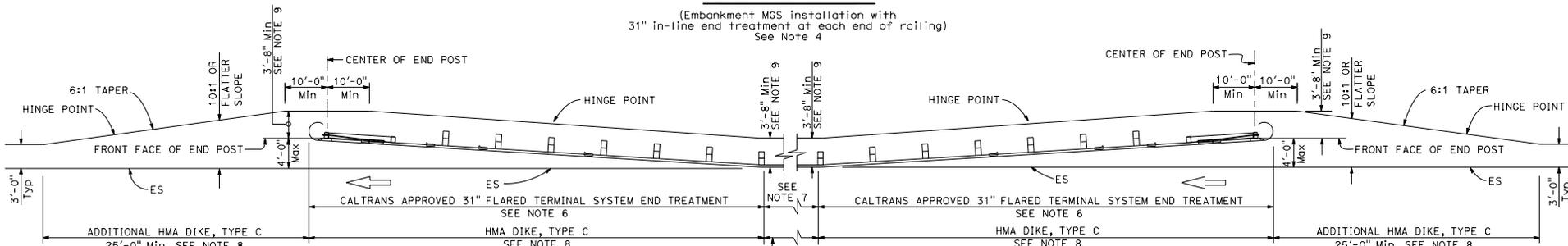
TO ACCOMPANY PLANS DATED \_\_\_\_\_

2018 REVISED STANDARD PLAN RSP A77P2



**TYPE 11D LAYOUT**

(Embankment MGS installation with 31" in-line end treatment at each end of railing)  
See Note 4



**TYPE 11E LAYOUT**

(Embankment MGS installation with 31" flared end treatment at each end of railing)  
See Note 4

- NOTES:**
- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
  - MGS post spacing to be 6'-3" center to center, except as otherwise noted.
  - Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
  - Layout Types 11D through 11L, shown on the A77P Series of Standard Plans, are typically used where MGS is recommended to shield embankment slopes and a crashworthy 31" end treatment is required for both directions of traffic.
  - 31" in-line terminal system end treatments are used where site conditions will not accommodate a flared end treatment.
  - The type of 31" terminal system end treatment to be used will be shown on the Project Plans.
  - Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
  - Where placement of dike is required with MGS installations, see Standard Plan A77N4 for dike positioning details.
  - Use this offset for 8-inch block. For 12-inch block, use 4'-0" Min offset.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**

NO SCALE

RSP A77P2 DATED APRIL 17, 2020 SUPERSEDES RSP A77P2 DATED OCTOBER 18, 2019 AND STANDARD PLAN A77P2 DATED MAY 31, 2018 - PAGE 81 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77P2**

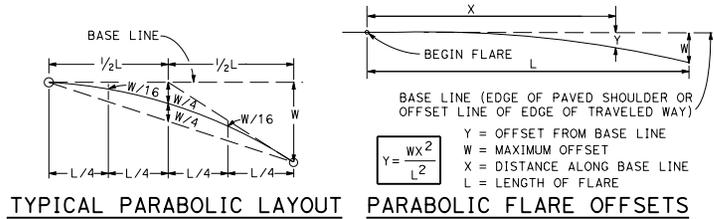
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

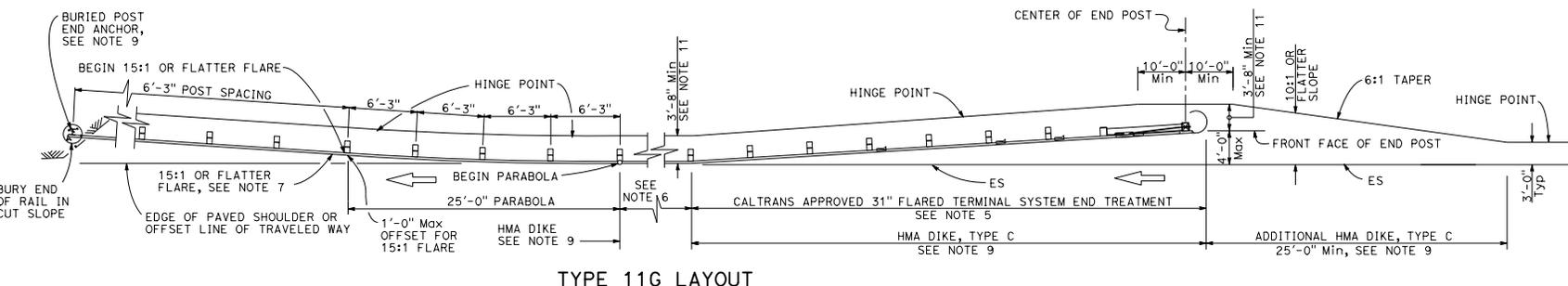
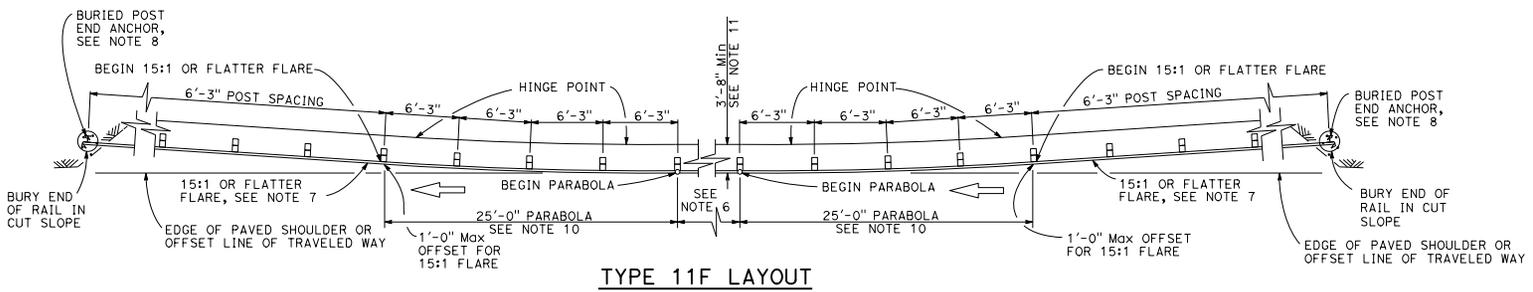
October 18, 2019  
PLANS APPROVAL DATE

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NOVEMBER PROFESSIONAL ENGINEER  
Randell D. Hiatt  
No. C50200  
Exp. 6-30-21  
CIVIL  
STATE OF CALIFORNIA



TO ACCOMPANY PLANS DATED \_\_\_\_\_



- NOTES:**
- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
  - MGS post spacing to be 6'-3" center to center, except as otherwise noted.
  - Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks, W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
  - Layout Types 11D through 11L, shown on the A77P Series of Standard Plans, are typically used where MGS is recommended to shield embankment slopes and a crashworthy 31" end treatment is required for both directions of traffic.
  - The type of 31" terminal system end treatment to be used will be shown on the Project Plans.

- Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
- The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of edge of the traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
- For details of the buried post end anchor used with Type 11F and 11G Layouts, see Standard Plan A77I2.
- Where placement of dike is required with MGS installations, see Standard Plan A77N4 for dike positioning details.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P1.
- Use this offset for 8-inch block. For 12-inch block, use 4'-0" Min offset.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**

NO SCALE

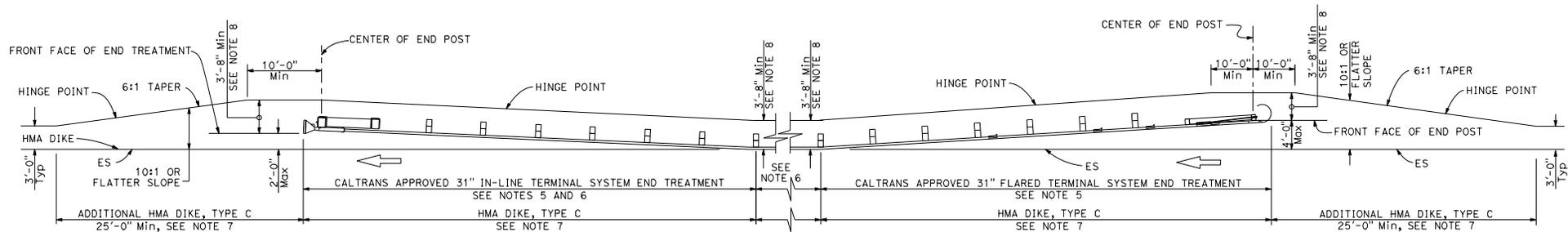
RSP A77P3 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN A77P3  
DATED MAY 31, 2018 - PAGE 82 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77P3**

2018 REVISED STANDARD PLAN RSP A77P3

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
<b>Randell D. Hiatt</b> REGISTERED CIVIL ENGINEER					
October 18, 2019 PLANS APPROVAL DATE					
No. C50200 Exp. 6-30-21 CIVIL					
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TO ACCOMPANY PLANS DATED \_\_\_\_\_



**TYPE 11H LAYOUT**

(Embankment MGS installation with 31" flared end treatment and 31" in-line end treatment at the ends of railing)  
See Notes 4 and 7

**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks, W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or plastic blocks. May be used for 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- Layout Types 11D through 11L, shown on the A77P Series of Standard Plans, are typically used where MGS is recommended to shield embankment slopes and a crashworthy 31" end treatment is required for both directions of traffic.
- The type of 31" terminal system end treatment to be used will be shown on the Project Plans.
- Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
- Where placement of dike is required with MGS installations, see Standard Plan A77N4 for dike positioning details.
- Use this offset for 8-inch block. For 12-inch block, use 4'-0" Min offset.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**

NO SCALE

RSP A77P4 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN A77P4  
DATED MAY 31, 2018 - PAGE 83 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77P4**

**2018 REVISED STANDARD PLAN RSP A77P4**

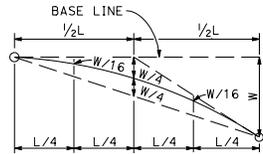
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

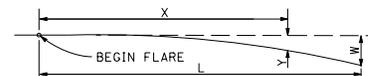
APRIL 17, 2020  
PLANS APPROVAL DATE

NO. C50200  
EXP. 6-30-21  
CIVIL

TO ACCOMPANY PLANS DATED \_\_\_\_\_



TYPICAL PARABOLIC LAYOUT

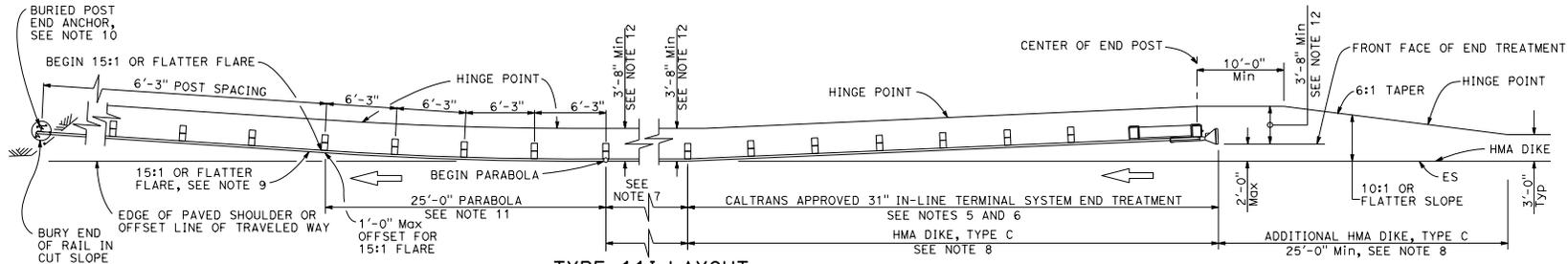


BASE LINE (EDGE OF PAVED SHOULDER OR OFFSET LINE OF EDGE OF TRAVELED WAY)

Y = OFFSET FROM BASE LINE  
W = MAXIMUM OFFSET  
X = DISTANCE ALONG BASE LINE  
L = LENGTH OF FLARE

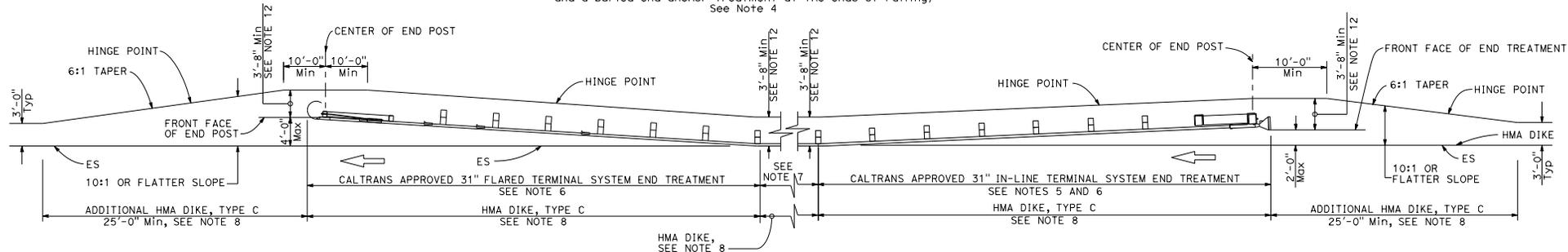
$$Y = \frac{WX^2}{L^2}$$

PARABOLIC FLARE OFFSETS



TYPE 11I LAYOUT

(Embankment MGS installation with 31" in-line end treatment and a buried end anchor treatment at the ends of railing)  
See Note 4



TYPE 11J LAYOUT

(Embankment MGS installation with 31" in-line end treatment and 31" flared end treatment at the ends of railing)  
See Note 4

NOTES:

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks, W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- Layout Types 11D through 11L, shown on the A77P Series of Standard Plans, are typically used where MGS is recommended to shield embankment slopes and a crashworthy 31" end treatment is required for both directions of traffic.
- 31" in-line terminal system end treatments are used where site conditions will not accommodate a 31" flared end treatment.
- The type of 31" terminal system end treatment to be used will be shown on the Project Plans.
- Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
- Where placement of dike is required with MGS installations, see Standard Plan A77N4 for dike positioning details.
- The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of edge of the traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
- For details of the buried post end anchor used with Type 11I Layout, see Standard Plan A77T2.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P1.
- Use this offset for 8-inch block. For 12-inch block, use 4'-0" Min offset.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**

NO SCALE

RSP A77P5 DATED APRIL 17, 2020 SUPERSEDES RSP A77P5 DATED OCTOBER 18, 2019 AND STANDARD PLAN A77P5 DATED MAY 31, 2018 - PAGE 84 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77P5**

2018 REVISED STANDARD PLAN RSP A77P5

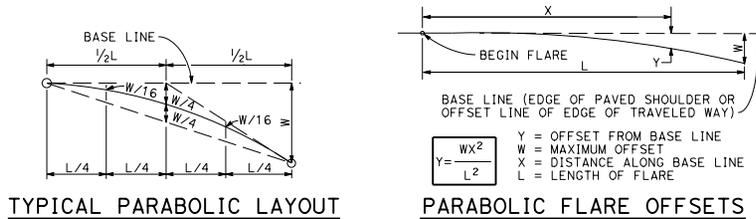
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

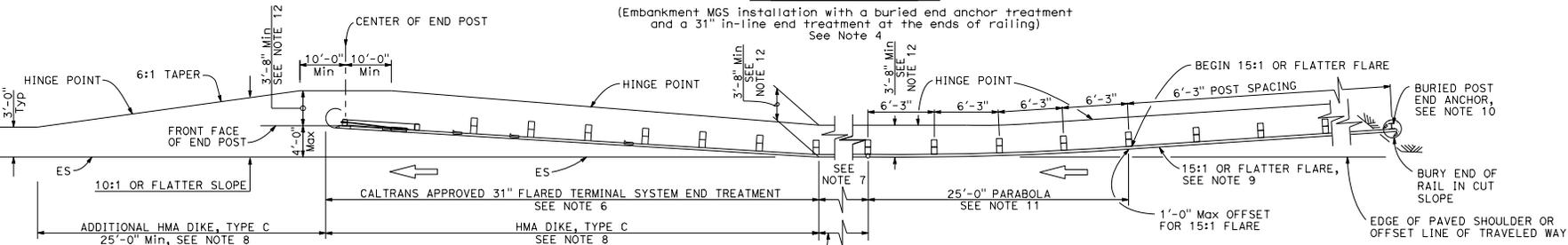
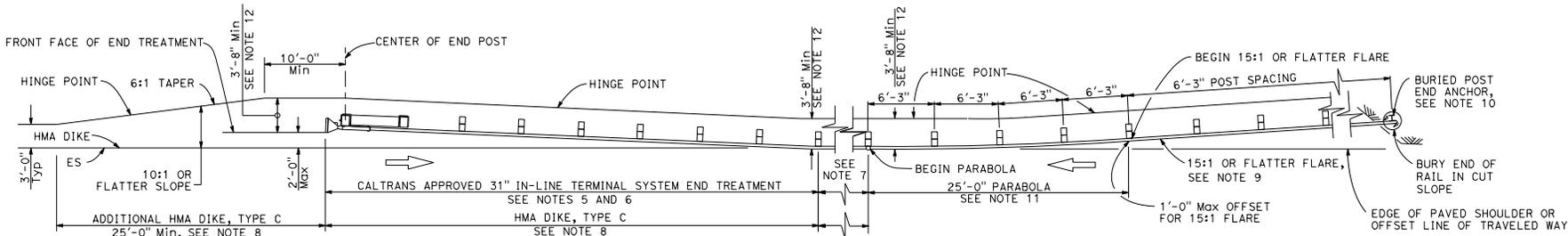
APRIL 17, 2020  
PLANS APPROVAL DATE

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NO. C50200  
EXP. 6-30-21  
CIVIL



TO ACCOMPANY PLANS DATED \_\_\_\_\_



**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks, W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- Layout Types 11D through 11L, shown on the A77P Series of Standard Plans, are typically used where MGS is recommended to shield embankment slopes and a crashworthy 31" end treatment is required for both directions of traffic.
- 31" in-line terminal system end treatments are used where site conditions will not accommodate a 31" flared end treatment.
- The type of 31" terminal system end treatment to be used will be shown on the Project Plans.
- Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
- Where placement of dike is required with MGS installations, see Standard Plan A77N4 for dike positioning details.
- The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of edge of the traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
- For details of the buried post end anchor used with Type 11K and 11L Layouts, see Standard Plan A77T2.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P1.
- Use this offset for 8" block. For 12" block, use 4'-0" Min offset.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**

NO SCALE

RSP A77P6 DATED APRIL 17, 2020 SUPERSEDES RSP A77P6 DATED OCTOBER 18, 2019 AND STANDARD PLAN A77P6 DATED MAY 31, 2018 - PAGE 85 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77P6**

2018 REVISED STANDARD PLAN RSP A77P6

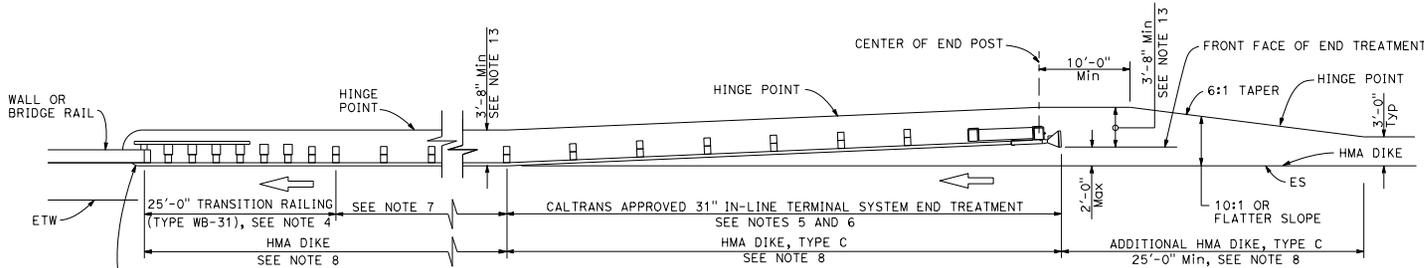
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

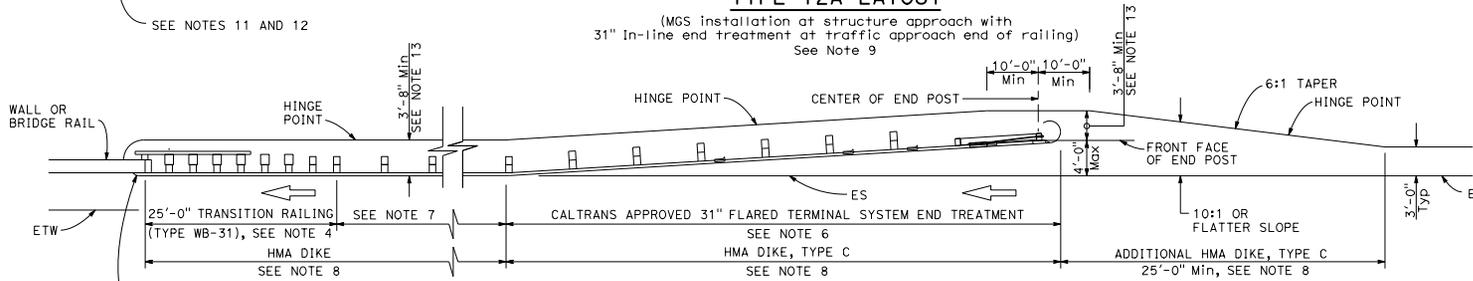
No. C50200  
Exp. 6-30-21  
CIVIL

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**TYPE 12A LAYOUT**

(MGS installation at structure approach with 31" in-line end treatment at traffic approach end of railing)  
See Note 9



**TYPE 12B LAYOUT**

(MGS installation at structure approach with 31" Flared end treatment at traffic approach end of railing)  
See Note 9

**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- For Transition Railing (Type WB-31) details for Types 12A and 12B Layouts, see Standard Plan A77U4.
- 31" in-line terminal system end treatments are used where site conditions will not accommodate a 31" flared end treatment.
- The type of 31" terminal system end treatment to be used will be shown on the Project Plans.
- Dependent on site conditions (embankment height, side slopes, or other fixed objects), it may be advisable to construct additional guard railing (a length equal to multiples of 12'-6" with 6'-3" post spacing) between the transition railing and end treatment. A 12.5 degree angle of departure can be drawn on the Project Plans from the edge of traveled way through the outer most point of the fixed object to determine the additional length of railing needed.
- Where placement of dike is required with guard railing installations, see Standard Plan A77N4 for dike positioning details.
- Type 12A or Type 12B Layouts are typically used:
  - To the right of approaching traffic, at the end of a structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
  - To the left of approaching traffic, at the end of a structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
  - To the right of approaching traffic at the end of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.
  - To the right of approaching traffic at the end of the structure on multilane freeways or expressways with decked median on the bridge.
- See Standard Plan A77Q3 for typical layout used left of approaching traffic at the ends of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.
- For additional details of typical connections to bridge rail, see Connection Detail AA on Standard Plans A77U1 and A77U2 and Connection Detail FF on Standard Plans A77V1 and A77V2.
- For additional details of a typical connection to walls or abutments, see Standard Plan A77U3.
- Use this offset for 8" block. For 12" block, use 4'-0" Min offset.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
STRUCTURE APPROACH**

NO SCALE

RSP A77Q1 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN A77Q1  
DATED MAY 31, 2018 - PAGE 86 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77Q1**

2018 REVISED STANDARD PLAN RSP A77Q1

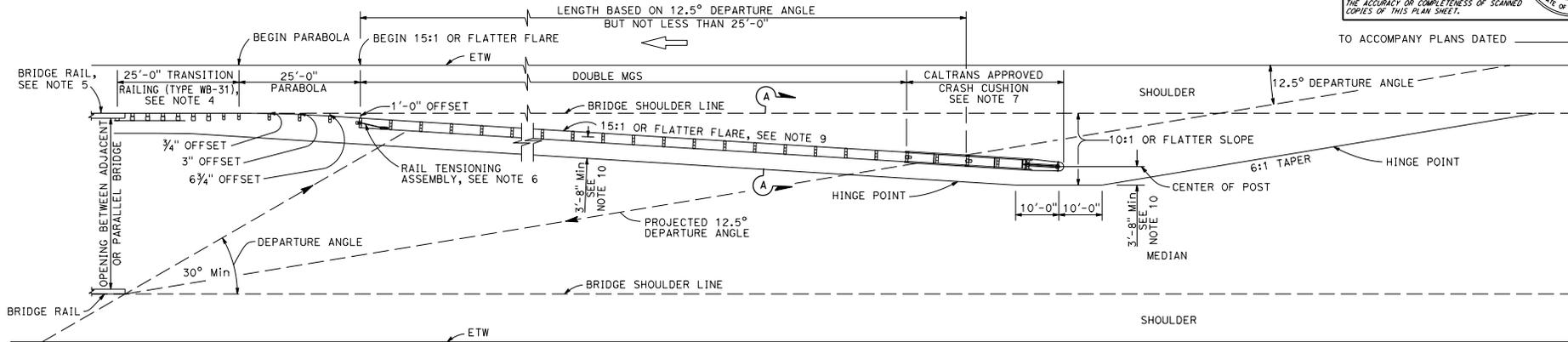
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

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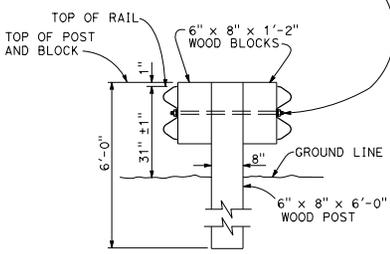
TO ACCOMPANY PLANS DATED \_\_\_\_\_



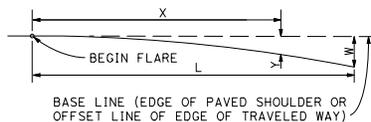
**TYPE 12E LAYOUT**

See Note 9

5/8" Ø BUTTON HEAD BOLT WITH Hex NUT OR  
5/8" Ø ROD, THREADED BOTH ENDS, WITH  
Hex NUTS. 1/2" Max EXPOSED THREADS  
AFTER Hex NUT(S) TIGHTENED. NO WASHER ON  
RAIL FACES FOR BOLTED CONNECTION TO LINE POST



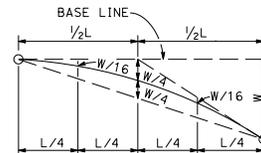
**SECTION A-A**  
**TYPICAL DOUBLE MIDWEST**  
**GUARDRAIL SYSTEM**



Y = OFFSET FROM BASE LINE  
W = MAXIMUM OFFSET  
X = DISTANCE ALONG BASE LINE  
L = LENGTH OF FLARE

$$y = \frac{wx^2}{L^2}$$

**PARABOLIC FLARE OFFSETS**



**TYPICAL PARABOLIC LAYOUT**

**NOTES:**

- Line post, blocks and hardware to be used are shown on Standard Plans A77L1, A77L2, A77N1, A77N2, and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood line posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- For Transition Railing (Type WB-31) details, see Standard Plan A77U4.
- For additional details of a typical connection to bridge rail, see Connection Detail AA on Standard Plan A77U1.
- For Rail Tensioning Assembly details, see Standard Plan A77S2.
- The type of Crash Cushion to be used will be shown on the Project Plans.
- Type 12E Layout is typically used left of approaching traffic at the end of each structure on multilane freeways or expressways where a median type barrier is not constructed between separated roadbeds.
- The 15:1 or flatter flare is measured off of the edge of traveled way.
- Use this offset for 8" block. For 12" block, use 4'-0" Min offset.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM**  
**TYPICAL LAYOUTS FOR**  
**STRUCTURE APPROACH**

NO SCALE

RSP A77Q3 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN A77Q3  
DATED MAY 31, 2018 - PAGE 88 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77Q3**

2018 REVISED STANDARD PLAN RSP A77Q3

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

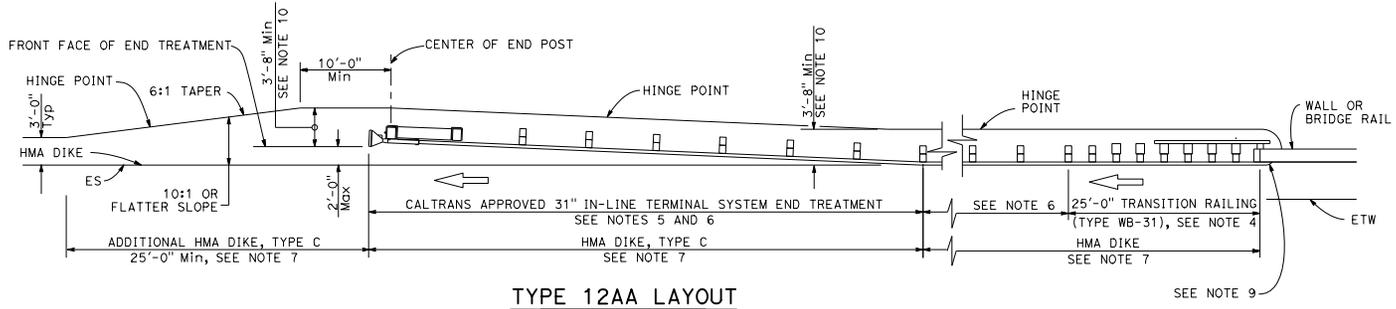
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

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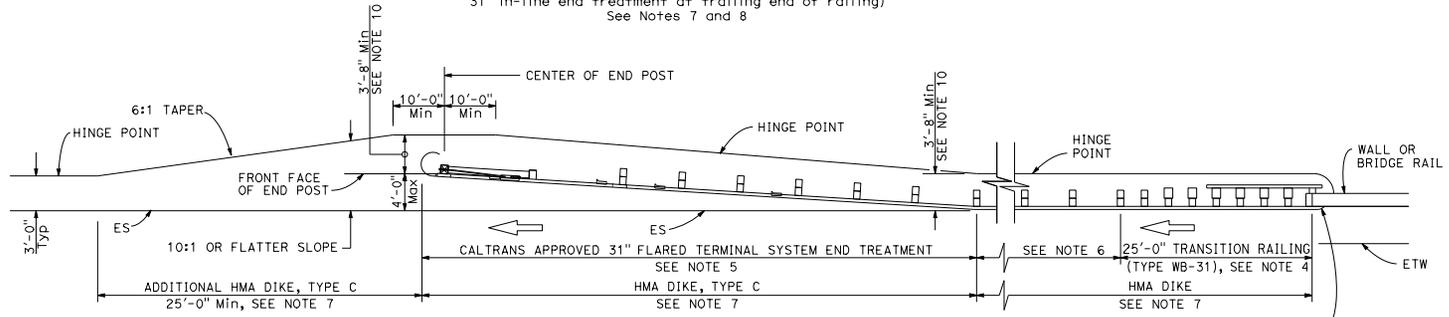
REGISTERED PROFESSIONAL ENGINEER  
Randell D. Hiatt  
No. C50200  
Exp. 6-30-21  
CIVIL  
STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED \_\_\_\_\_



**TYPE 12AA LAYOUT**

(MGS installation at structure departure with 31" in-line end treatment at trailing end of railing)  
See Notes 7 and 8



**TYPE 12BB LAYOUT**

(MGS installation at structure departure with 31" in-line end treatment at trailing end of railing)  
See Notes 7 and 8

**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks, W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- For Transition Railing (Type WB-31) details for Types 12AA and 12BB Layouts, see Revised Standard Plan RSP A77U4.
- The type of 31" terminal system to be used will be shown on the Project Plans.
- Dependent on site conditions (embankment height, side slopes, other fixed objects), it may be advisable to construct additional MGS (a length equal to multiples of 12'-6" with 6'-3" post spacing) between the transition railing and 31" end treatments.
- Where placement of dike is required with MGS installations, see Revised Standard Plan RSP A77N4 for dike positioning details.
- Type 12AA or Type 12BB Layouts are typically used to the right of traffic departing a structure on two-way conventional highways where the roadbed width across the structure is less than 40 feet.
- For additional details of typical connections to bridge rail, see Connection Detail CC on Standard Plan A77U2 and Connection Detail HH on Standard Plan A77V2.
- Use this offset for 8" block. For 12" block, use 4'-0" Min offset.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
STRUCTURE DEPARTURE**

NO SCALE

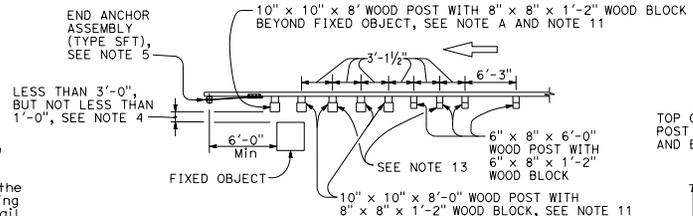
RSP A77Q4 DATED OCTOBER 18, 2019 SUPERSEDES RSP A77Q4 DATED APRIL 19, 2019 AND STANDARD PLAN A77Q4 DATED MAY 31, 2018 - PAGE 89 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77Q4**

2018 REVISED STANDARD PLAN RSP A77Q4

**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks, W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood line posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS sections with post spacing of 6'-3". Construct MGS as shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object" on this plan, where the clearance between the back of post and the face of a fixed object is less than 3'-0", but not less than 1'-0". Where the clearance is less than 1'-0", a concrete wall or barrier should be constructed to shield the fixed object(s).
- For End Anchor Assembly (Type SFT) details, see Standard Plan A77S1.
- For details of Rail Tensioning Assembly, see Standard Plan A77S2.
- The type of crash cushion to be used will be shown on the Project Plans.
- Type 14A layout is typically used on multilane freeways or expressways to shield fixed objects where a median type barrier is not constructed between the separated roadbeds.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Standard Plan A77P1.
- The 15:1 or flatter flare is measured off of the edge of traveled way.
- W6 x 8.5 or W6 x 9 steel post, 8'-0" in length, with 8" x 8" x 1'-2" notched wood block or notched recycled plastic block may be used in place of the 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood block shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object".
- Use this offset for 8" block. For 12" block use minimum 4'-0" offset.
- Do not bolt rail to block. Only bolt block to post.



**NOTE A:** For a series of fixed objects (bridge columns, overhead sign supports, etc.) additional 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood blocks at 3'-1/2" center to center spacing are to be used between fixed objects.

**STRENGTHENED MIDWEST GUARDRAIL SYSTEM  
SECTIONS FOR FIXED OBJECT**

Use strengthened MGS sections with Type 14A layout where minimum clearance between the back of post and the fixed object(s) is less than 3'-0", but not less than 1'-0", see Note 4.

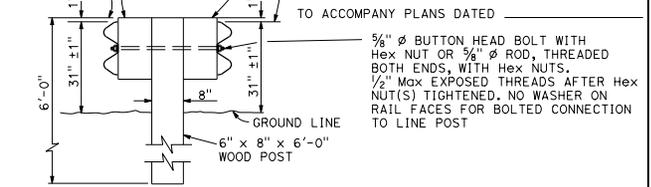
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

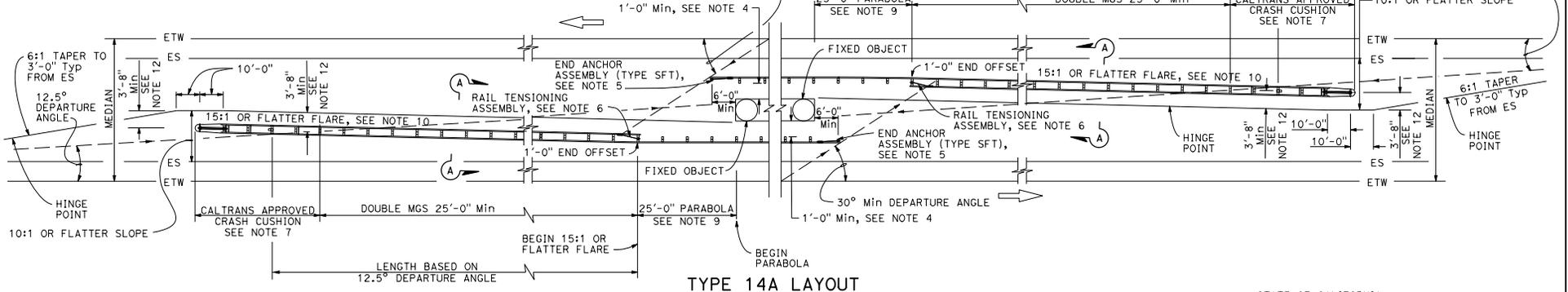
October 18, 2019  
PLANS APPROVAL DATE

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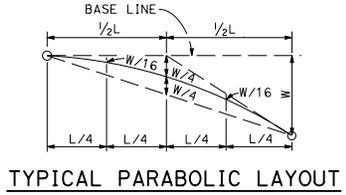
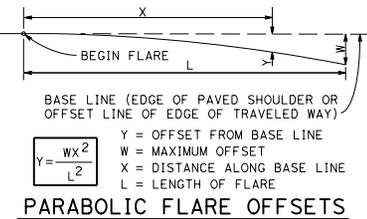
NO. C50200  
EXP. 6-30-21  
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**SECTION A-A  
TYPICAL DOUBLE MIDWEST  
GUARDRAIL SYSTEM**



**TYPE 14A LAYOUT**  
See Note 8



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
FIXED OBJECTS  
BETWEEN SEPARATE ROADBEDS  
(TWO-WAY TRAFFIC)**

NO SCALE

RSP A77R1 DATED OCTOBER 18, 2019 SUPERSEDES RSP A77R1 DATED APRIL 19, 2019 AND STANDARD PLAN A77R1 DATED MAY 31, 2018 - PAGE 91 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77R1**

2018 REVISED STANDARD PLAN RSP A77R1

**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood line posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS section with post spacing of 6'-3". Construct MGS as shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object" on this plan, where the clearance between the back of post and the face of a fixed object is less than 3'-0", but not less than 1'-0". Where the clearance is less than 1'-0", a concrete wall or barrier should be constructed to shield the fixed object(s).

- For End Anchor Assembly (Type SFT) details, see Standard Plan A77S1.
- Type of crash cushion to be used will be shown on the Project Plans.
- Type 15A layout is typically used on multilane freeways or expressways to shield fixed objects in the area between separated one-way roadbeds.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Standard Plan A77P1.
- The 15:1 or flatter flare is measured off of the edge of the traveled way.
- W6 x 8.5 or W6 x 9 steel post, 8'-0" in length, with 8" x 8" x 1'-2" notched wood block or notched recycled plastic block may be used in place of the 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood block shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object".
- Do not bolt rail to block. Only bolt block to post.

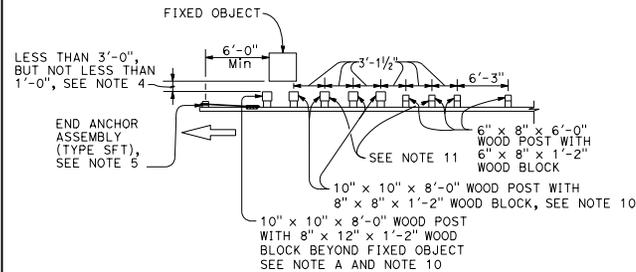
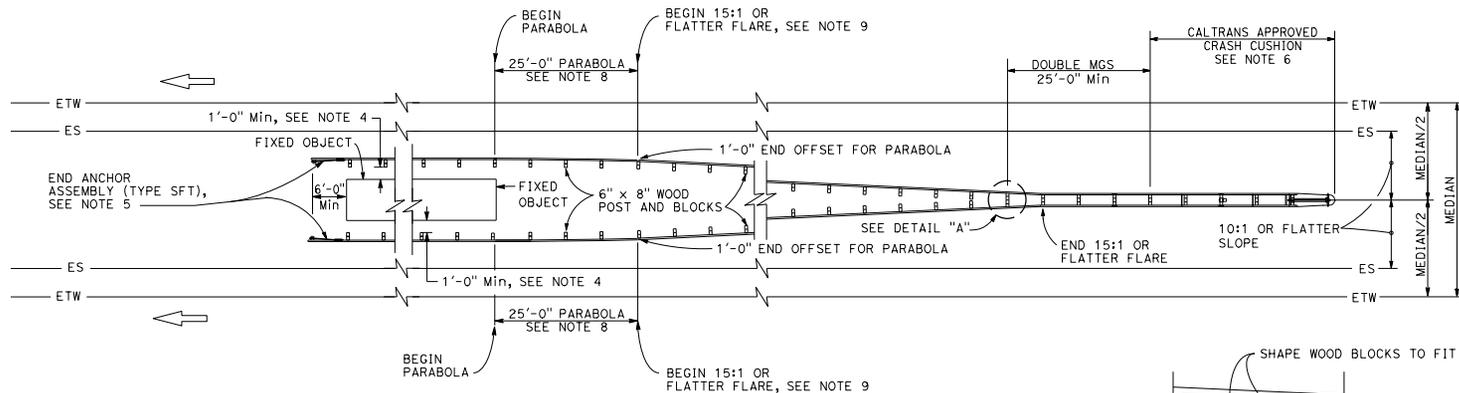
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

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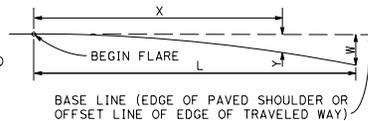
**NOTE A:** For a series of fixed objects (bridge columns, overhead sign supports, etc.) additional 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood blocks at 3'-1/2" center to center spacing are to be used between fixed objects.

**STRENGTHENED MIDWEST GUARDRAIL SYSTEM  
SECTIONS FOR FIXED OBJECT**

Use strengthened MGS sections with Type 15A layout where minimum clearance between the back of post and the fixed object(s) is less than 3'-0", but not less than 1'-0". See Note 4.

**TYPE 15A LAYOUT**

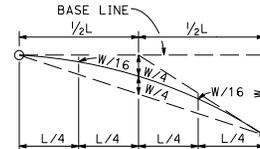
See Note 7



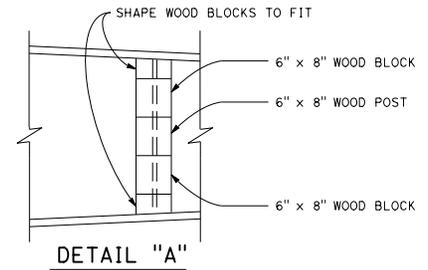
Y = OFFSET FROM BASE LINE  
W = MAXIMUM OFFSET  
X = DISTANCE ALONG BASE LINE  
L = LENGTH OF FLARE

$$Y = \frac{WX^2}{L^2}$$

**PARABOLIC FLARE OFFSETS**



**TYPICAL PARABOLIC LAYOUT**



**DETAIL "A"**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

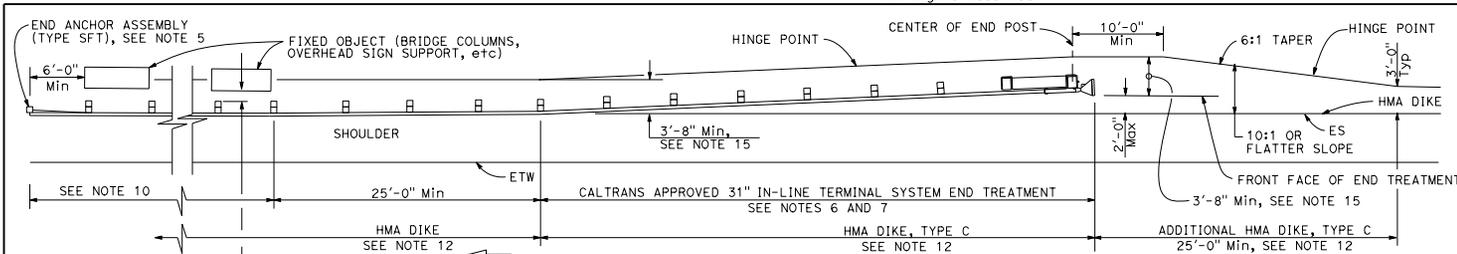
**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
FIXED OBJECTS  
BETWEEN SEPARATE ROADBEDS  
(ONE-WAY TRAFFIC)**

NO SCALE

RSP A77R2 DATED OCTOBER 18, 2019 SUPERSEDES RSP A77R2 DATED APRIL 19, 2019 AND STANDARD PLAN A77R2 DATED MAY 31, 2018 - PAGE 92 OF THE STANDARD PLANS BOOK DATED 2018.

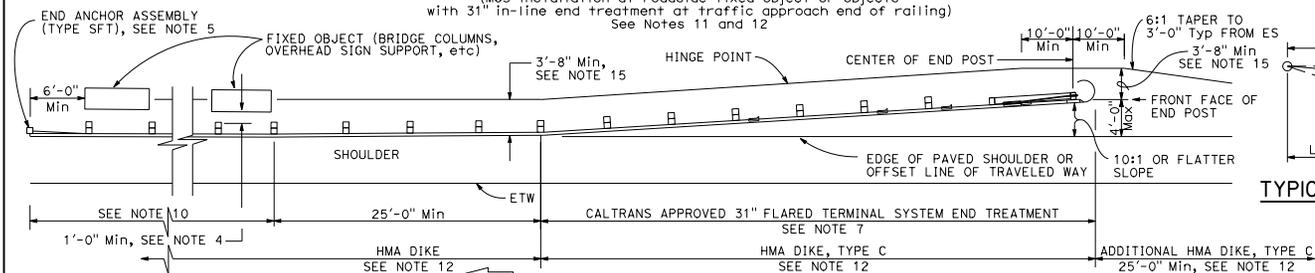
**REVISED STANDARD PLAN RSP A77R2**

2018 REVISED STANDARD PLAN RSP A77R2



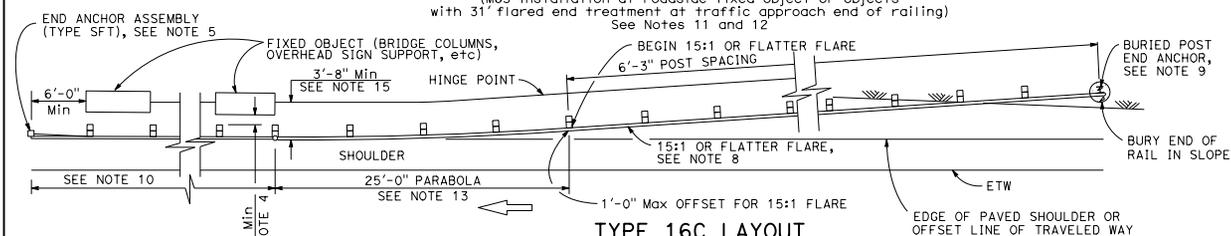
**TYPE 16A LAYOUT**

(MGS installation at roadside fixed object or objects with 31" in-line end treatment at traffic approach end of railing)  
See Notes 11 and 12



**TYPE 16B LAYOUT**

(MGS installation at roadside fixed object or objects with 31" flared end treatment at traffic approach end of railing)  
See Notes 11 and 12



**TYPE 16C LAYOUT**

(MGS installation at roadside fixed object or objects with a buried end anchor treatment at traffic approach end of railing)  
See Notes 11 and 12

**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks, W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood line posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS sections with post spacing of 6'-3". Construct MGS as shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object" on this plan, where the clearance between the back of post and the face of a fixed object is less than 3'-0", but not less than 1'-0". Where the clearance is less than 1'-0", a concrete wall or barrier should be constructed to shield the fixed object(s).
- For End Anchor Assembly (Type SFT) details, see Standard Plan A77S1.
- 31" in-line terminal system end treatments are used where site conditions will not accommodate a 31" flared end treatment.
- The type of 31" terminal system to be used will be shown on the Project Plans.
- The 15:1 or flatter flare used with Type 16C Layout is based on the edge of the paved shoulder or offset line of edge of the traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
- For details of the Buried Post End Anchor used with Type 16C Layout, see Standard Plan A77T2.
- As site conditions dictate, construct additional MGS to shield fixed object(s). Additional MGS length equal to multiples of 12'-6". Post spacing at 6'-3" except as specified in Note 4.
- Layout Types 16A, 16B or 16C are typically used where MGS is recommended to shield roadside fixed object(s) and a crashworthy 31" end treatment is required for only one direction of traffic.
- Where placement of dike is required with MGS, see Standard Plan A77N4 for dike positioning details.
- Offset of 1'-0", see Revised Standard Plan RSP A77P1.
- W6 x 8.5 or W6 x 9 steel post, 8'-0" in length, with 8" x 8" x 1'-2" notched wood block or notched recycled plastic block may be used in place of the 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood block shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object".
- Use this offset for 8" block. For 12" block use minimum 4'-0" offset.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

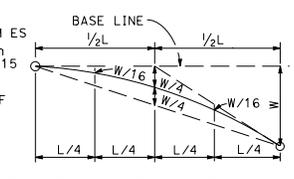
**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

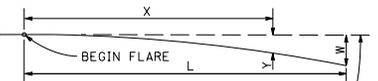
No. C50200  
Exp. 6-30-21  
CIVIL

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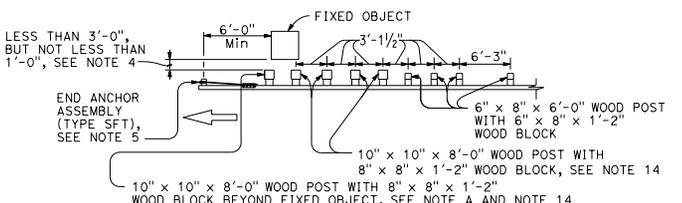


**TYPICAL PARABOLIC LAYOUT**



BASE LINE (EDGE OF PAVED SHOULDER OR OFFSET LINE OF EDGE OF TRAVELED WAY)

Y = OFFSET FROM BASE LINE  
W = MAXIMUM OFFSET  
X = DISTANCE ALONG BASE LINE  
L = LENGTH OF FLARE

$$Y = \frac{WX^2}{L^2}$$


**NOTE A:** For a series of fixed objects (bridge columns, overhead sign supports, etc.) additional 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood blocks at 3'-1/2" center to center spacing are to be used between fixed objects.

**STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS FOR FIXED OBJECT**

Use strengthened MGS sections with Types 16A, 16B or 16C layouts where minimum clearance between the back of post and the fixed object(s) is less than 3'-0", but not less than 1'-0". See Note 4.

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**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
ROADSIDE FIXED OBJECTS**

NO SCALE

RSP A77R3 DATED OCTOBER 18, 2019 SUPERSEDES RSP A77R3 DATED APRIL 19, 2019 AND STANDARD PLAN A77R3 DATED MAY 31, 2018 - PAGE 93 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77R3**

2018 REVISED STANDARD PLAN RSP A77R3

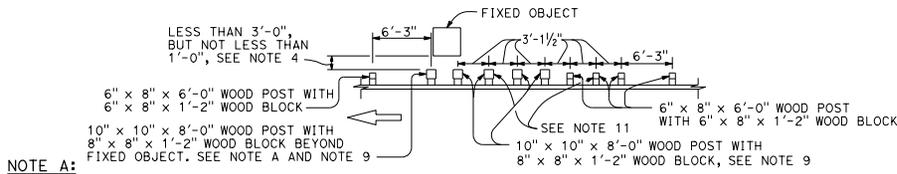
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

No. C50200  
Exp. 6-30-21  
CIVIL

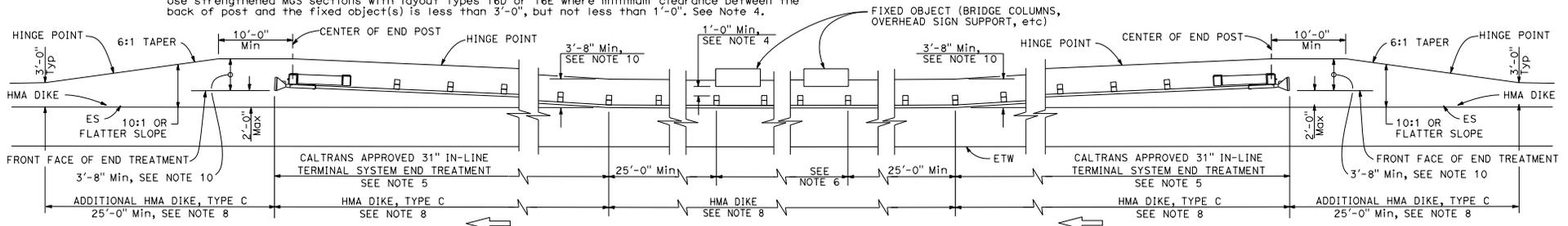
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**NOTE A:**  
For a series of fixed objects (bridge columns, overhead sign supports, etc.) additional 10' x 10' x 8'-0" wood post with 8' x 8' x 1'-2" wood blocks at 3'-1 1/2" center to center spacing are to be used between fixed object(s).

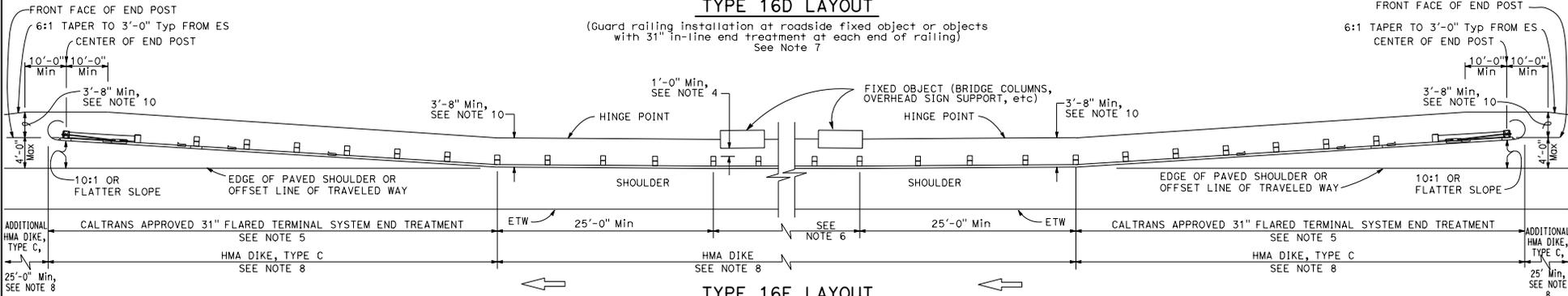
**STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS FOR FIXED OBJECT**

Use strengthened MGS sections with layout Types 16D or 16E where minimum clearance between the back of post and the fixed object(s) is less than 3'-0", but not less than 1'-0". See Note 4.



**TYPE 16D LAYOUT**

(Guard railing installation at roadside fixed object or objects with 31" in-line end treatment at each end of railing) See Note 7.



**TYPE 16E LAYOUT**

(MGS installation at roadside fixed object or objects with 31" in-line end treatment at each end of railing) See Note 7.

**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood line posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS sections with post spacing at 6'-3". Construct MGS as shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object" on this plan, where the clearance between the back of post and the face of a fixed object is less than 3'-0", but not less than 1'-0". Where the clearance is less than 1'-0", a concrete wall or barrier should be constructed to shield the fixed object(s).
- The type of 31" terminal system to be used will be shown on the Project Plans.

- Use this offset for 8" block. For 12" block use minimum 4'-0" offset.
- Do not bolt rail to block. Only bolt block to post.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

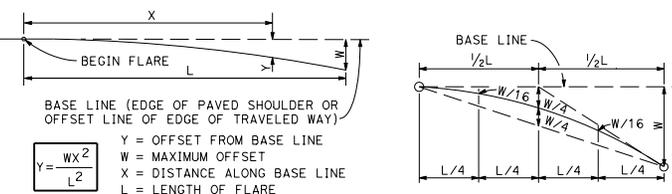
**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
ROADSIDE FIXED OBJECTS**

NO SCALE

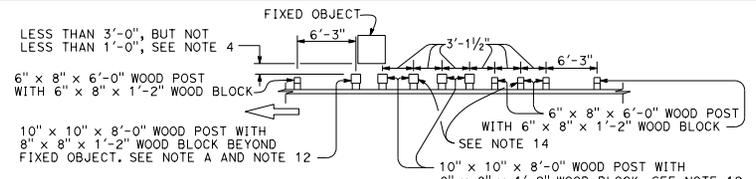
RSP A77R4 DATED OCTOBER 18, 2019 SUPERSEDES RSP A77R4 DATED APRIL 19, 2019 AND STANDARD PLAN A77R4 DATED MAY 31, 2018 - PAGE 94 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77R4**

2018 REVISED STANDARD PLAN RSP A77R4



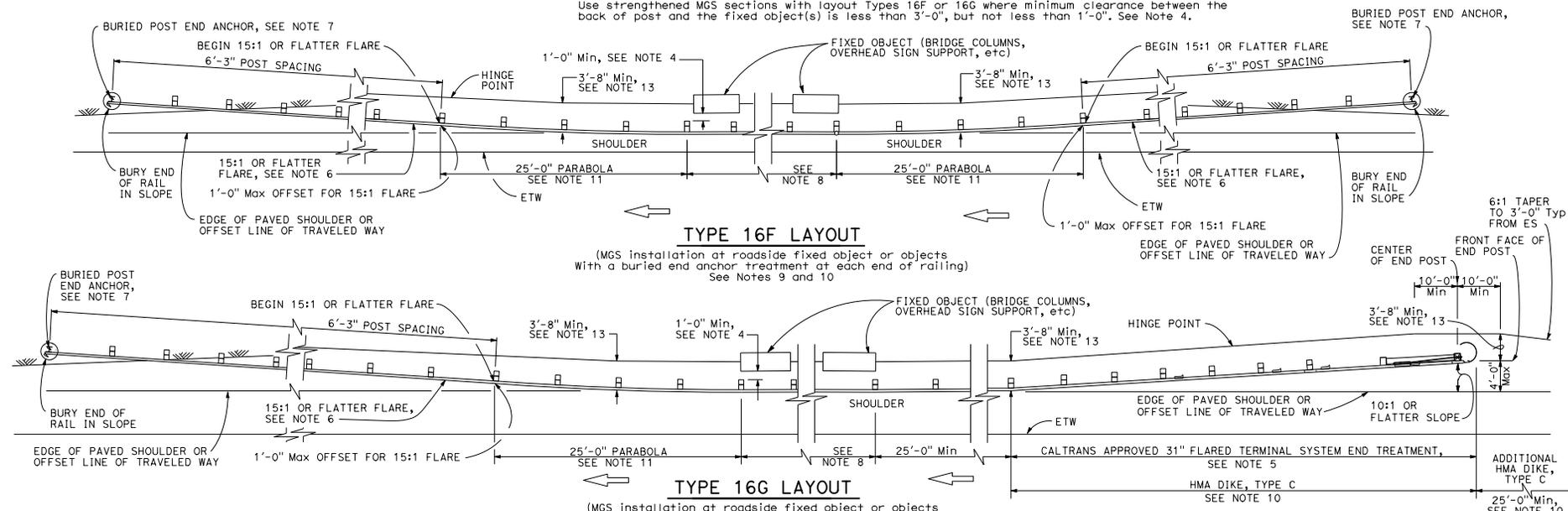
**PARABOLIC FLARE OFFSETS**      **TYPICAL PARABOLIC LAYOUT**



**NOTE A:** For a series of fixed objects (bridge columns, overhead sign supports, etc) additional 10' x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood blocks at 3'-1/2" center to center spacing are to be used between fixed object(s).

**STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS FOR FIXED OBJECT**

Use strengthened MGS sections with layout Types 16F or 16G where minimum clearance between the back of post and the fixed object(s) is less than 3'-0", but not less than 1'-0". See Note 4.



- NOTES:**
- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
  - MGS post spacing to be 6'-3" center to center, except as otherwise noted.
  - Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 8" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
  - A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS sections with post spacing at 6'-3". Construct MGS as shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Objects" on this plan, where the clearance between the back of post and the face of a fixed object is less than 3'-0", but not less than 1'-0". Where the clearance is less than 1'-0", a concrete wall or barrier should be constructed to shield the fixed object(s).
  - The type of 31" terminal system to be used will be shown on the Project Plans.

- The 15:1 or flatter flare for the buried post anchor is based on the edge of the paved shoulder or offset line of edge of the traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
- For details of the Buried Post End Anchor, see Standard Plan A77T2.
- As site conditions dictate, construct additional MGS to shield fixed object(s). Additional MGS length equal to multiples of 12'-6". Post spacing at 6'-3", except as specified in Note 4.
- Layout Types 16D through 16L, shown on the A77R Series of Standard Plans, are typically used on highways where MGS is recommended to shield roadside fixed object(s) and a crashworthy 31" end treatment is required for both directions of traffic.
- Where placement of dike is required with MGS, see Revised Standard Plan RSP A77N4 for dike positioning details.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P1.

- W6 x 8.5 or W6 x 9 steel post, 8'-0" in length, with 8" x 8" x 1'-2" notched wood block or notched recycled plastic block may be used in place of the 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood block shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object".
- Use this offset for 8" block. For 12" block use minimum 4'-0" offset.
- Do not bolt rail to block. Only bolt block to post.

**MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR ROADSIDE FIXED OBJECTS**  
NO SCALE

RSP A77R5 DATED OCTOBER 18, 2019 SUPERSEDES RSP A77R5 DATED APRIL 19, 2019 AND STANDARD PLAN A77R5 DATED MAY 31, 2018 - PAGE 95 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77R5**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

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Randell D. Hiatt  
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2018 REVISED STANDARD PLAN RSP A77R5

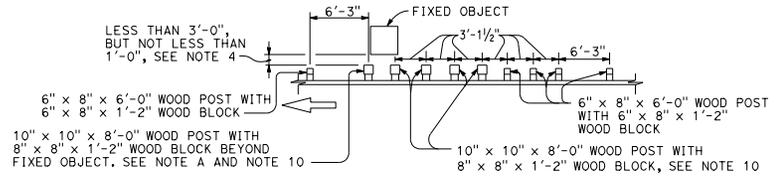
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

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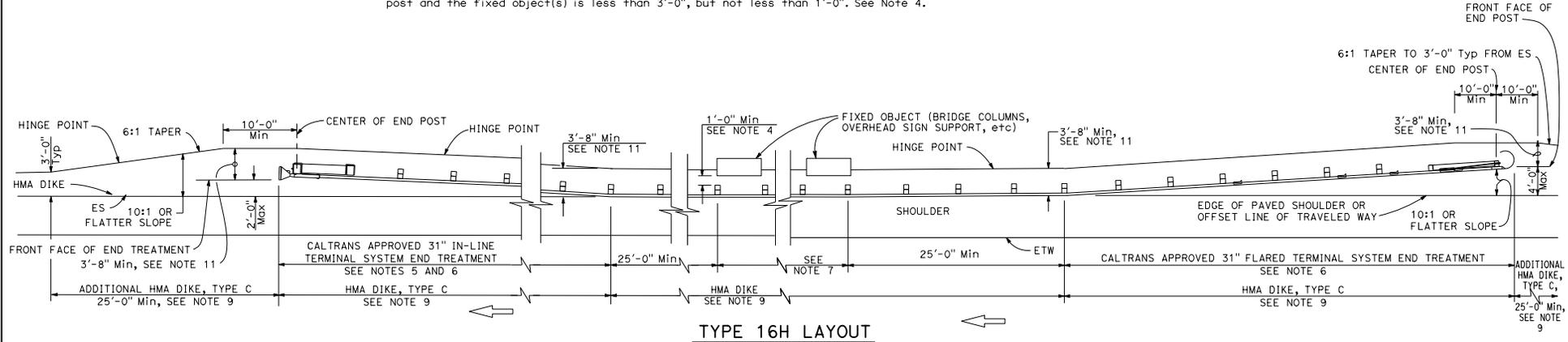
TO ACCOMPANY PLANS DATED \_\_\_\_\_



**NOTE A:** For a series of fixed objects (bridge columns, overhead sign supports, etc.) additional 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood blocks at 3'-1 1/2" center to center spacing are to be used between fixed object(s).

**STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS FOR FIXED OBJECT**

Use strengthened MGS sections with layout Type 16H where minimum clearance between the back of post and the fixed object(s) is less than 3'-0", but not less than 1'-0". See Note 4.



**TYPE 16H LAYOUT**

(MGS installation at roadside fixed object or objects with 31" flared end treatment and 31" in-line end treatment at the ends of railing)  
See Note 8

**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS sections with post spacing at 6'-3". Construct MGS as shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Objects" on this plan, where the clearance between the back of post and the face of a fixed object is less than 3'-0", but not less than 1'-0". Where the clearance is less than 1'-0", a concrete wall or barrier should be constructed to shield the fixed object(s).
- 31" in-line terminal system end treatments are used where site conditions will not accommodate a 31" flared end treatment.
- The type of 31" terminal system to be used will be shown on the Project Plans.
- As site conditions dictate, construct additional MGS to shield fixed object(s). Additional MGS length equal to multiples of 12'-6". Post spacing at 6'-3", except as specified in Note 4.
- Layout Types 16D through 16L, shown on the A77R Series of Standard Plans, typically used where MGS is recommended to shield roadside fixed object(s) and a crashworthy 31" end treatment is required for both directions of traffic.
- Where placement of dike is required with MGS, see Standard Plan A77N4 for dike positioning details.
- W6 x 8.5 or W6 x 9 steel post, 8'-0" in length, with 8" x 8" x 1'-2" notched wood block or notched recycled plastic block may be used in place of the 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood block shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object".
- Use this offset for 8" block. For 12" block use minimum 4'-0" offset.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR ROADSIDE FIXED OBJECTS**

NO SCALE

RSP A77R6 DATED OCTOBER 18, 2019 SUPERSEDES RSP A77R6 DATED APRIL 19, 2019 AND STANDARD PLAN A77R6 DATED MAY 31, 2018 - PAGE 96 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77R6**

2018 REVISED STANDARD PLAN RSP A77R6

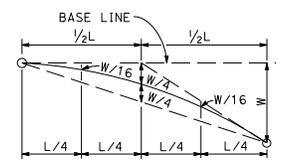
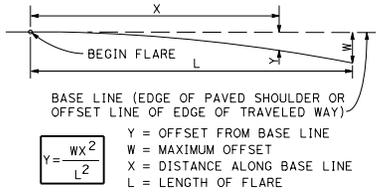
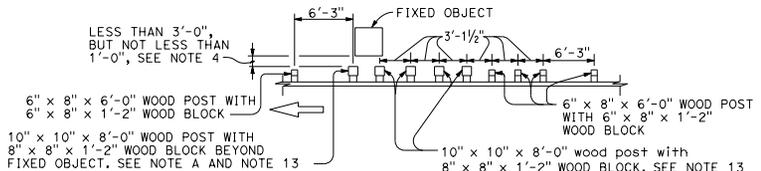
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

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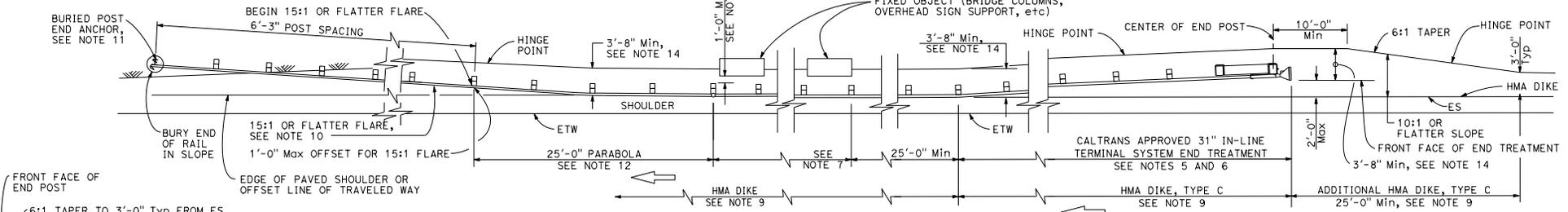


**STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS FOR FIXED OBJECT**

**PARABOLIC FLARE OFFSETS**

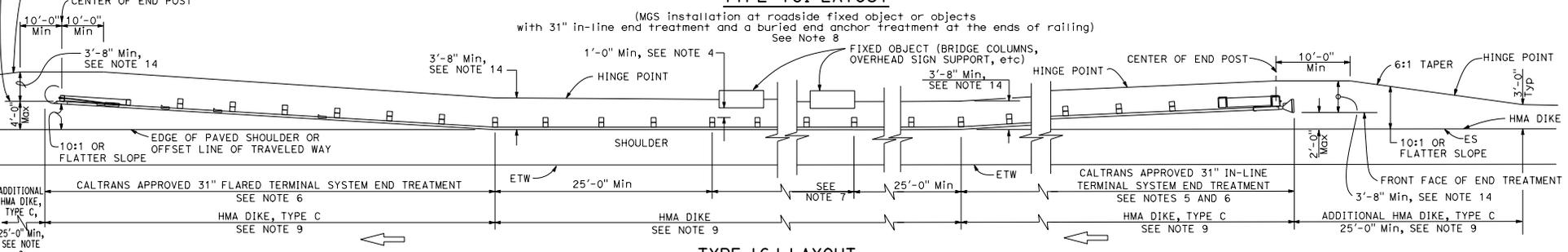
**TYPICAL PARABOLIC LAYOUT**

Use strengthened MGS sections with layout Types 16I or 16J Layouts where minimum clearance between the back of post and the fixed object(s) is less than 3'-0", but not less than 1'-0". See Note 4.



**TYPE 16I LAYOUT**

(MGS installation at roadside fixed object or objects with 31" in-line end treatment and a buried end anchor treatment at the ends of railing) See Note 8



**TYPE 16J LAYOUT**

(MGS installation at roadside fixed object or objects with a 31" in-line end treatment and a 31" flared end treatment at the ends of railing) See Note 8

**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks, W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS sections with post spacing at 6'-3". Construct MGS as shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Objects" on this plan, where the clearance between the back of post and the face of a fixed object is less than 3'-0", but not less than 1'-0". Where the clearance is less than 1'-0", a concrete wall or barrier should be constructed to shield the fixed object(s).
- 31" in-line terminal system end treatments are used where site conditions will not accommodate a 31" flared end treatment.

- The type of 31" terminal system to be used will be shown on the Project Plans.
- As site conditions dictate, construct additional MGS to shield fixed object(s). Additional MGS length equal to multiples of 12'-6". Post spacing at 6'-3", except as specified in Note 4.
- Layout Types 16D through 16L, shown on the A77R Series of Standard Plans, are typically used where MGS is recommended to shield roadside fixed object(s) and a crashworthy 31" end treatment is required for both directions of traffic.
- Where placement of dike is required with guard railing, see Standard Plan A77N4 for dike positioning details.
- The 15:1 or flatter flare for the buried post anchor is based on the edge of the paved shoulder or offset line of the traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
- For details of Buried Post End Anchor, see Standard Plan A77T2.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P1.
- W6 x 8.5 or W6 x 9 steel post, 8'-0" in length, with 8" x 8" x 1'-2" notched wood block or notched recycled plastic block may be used in place of the 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood block shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object".
- Use this offset for 8" block. For 12" block use minimum 4'-0" offset.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
ROADSIDE FIXED OBJECTS**

NO SCALE  
RSP A77R7 DATED OCTOBER 18, 2019 SUPERSEDES RSP A77R7 DATED APRIL 19, 2019 AND STANDARD PLAN A77R7 DATED MAY 31, 2018 - PAGE 97 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP A77R7**

2018 REVISED STANDARD PLAN RSP A77R7

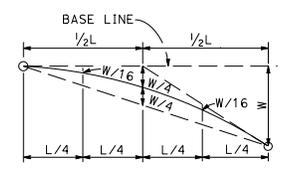
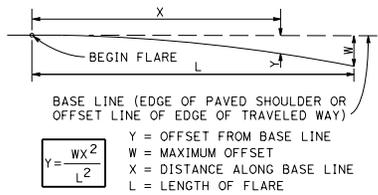
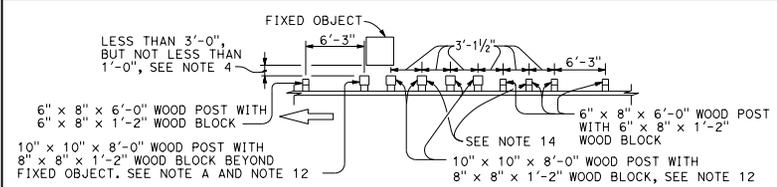
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

October 18, 2019  
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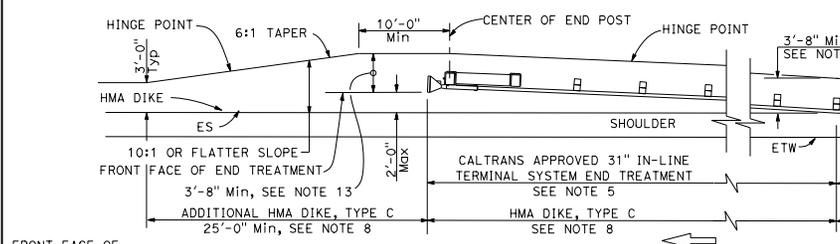


**STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS FOR FIXED OBJECT**

**PARABOLIC FLARE OFFSETS**

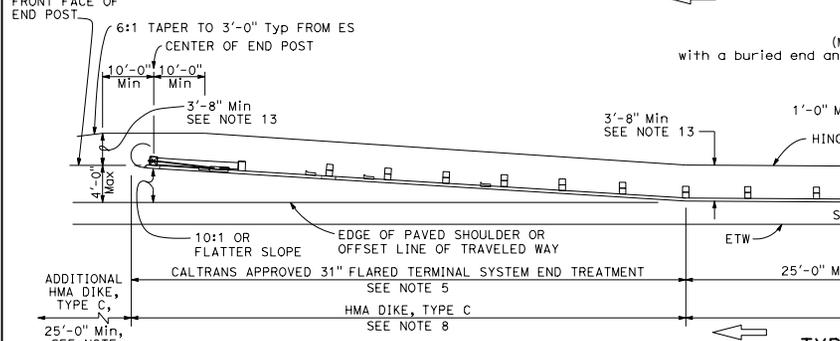
**TYPICAL PARABOLIC LAYOUT**

Use strengthened MGS sections with layout Types 16K or 16L layouts where minimum clearance between the back of post and the fixed object(s) is less than 3'-0", but not less than 1'-0". See Note 4.



**TYPE 16K LAYOUT**

(MGS installation at roadside fixed object or objects with a buried end anchor treatment and a 31" in-line end treatment at the ends of railing) See Note 7



**TYPE 16L LAYOUT**

(MGS installation at roadside fixed object or objects with a buried end anchor treatment and a 31" in-line end treatment at the ends of railing) See Note 7

- NOTES:**
- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
  - MGS post spacing to be 6'-3" center to center, except as otherwise noted.
  - Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 8'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 8" x 8" x 6'-0" wood posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
  - A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS sections with post spacing at 6'-3". Construct MGS as shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Objects" on this plan, where the clearance between the back of post and the face of a fixed object is less than 3'-0", but not less than 1'-0". Where the clearance is less than 1'-0", a concrete wall or barrier should be constructed to shield the fixed object(s).
  - The type of 31" terminal system to be used will be shown on the Project Plans.
  - As site conditions dictate, construct additional MGS to shield fixed object(s). Additional MGS length equal to multiples of 12'-6". Post spacing at 6'-3", except as specified in Note 4.
  - Layout Types 16D through 16L, shown on the A77R Series of Standard Plans are typically used where MGS is recommended to shield roadside fixed object(s) and a crashworthy 31" end treatment is required for both directions of traffic.
  - Where placement of dike is required with MGS, see Revised Standard Plan RSP A77N4 for dike positioning details.
  - The 15:1 or flatter flare for the buried post anchor is based on the edge of the paved shoulder or offset line of edge of the traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
  - For details of Buried Post End Anchor, see Standard Plan A77T2.
  - For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P1.
  - W6 x 8.5 or W6 x 9 steel post, 8'-0" in length, with 8" x 8" x 1'-2" notched wood block or notched recycled plastic block may be used in place of the 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood block shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object".
  - Use this offset for 8" block. For 12" block use minimum 4'-0" offset.
  - Do not bolt rail to block. Only bolt block to post.

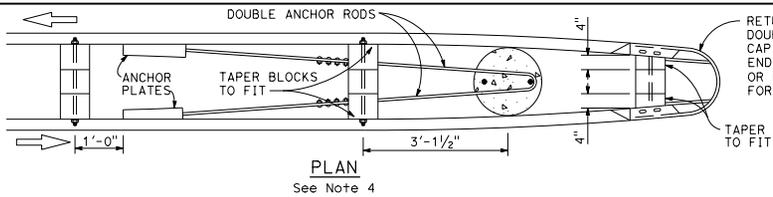
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
ROADSIDE FIXED OBJECTS**

NO SCALE

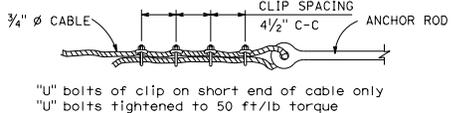
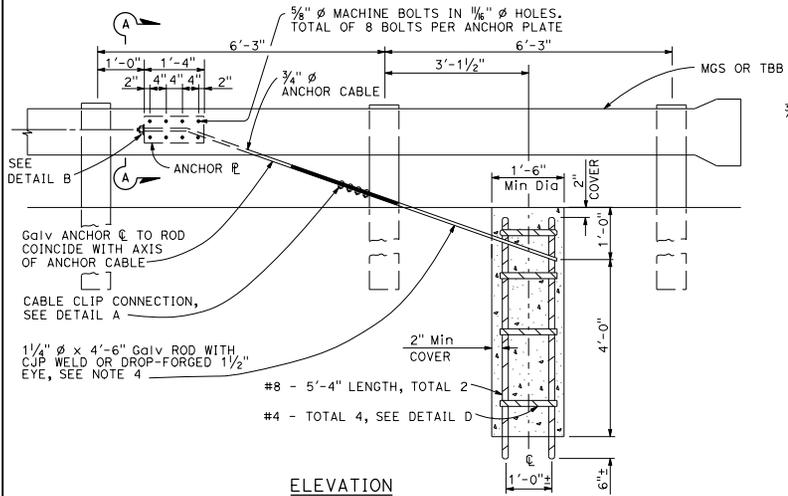
RSP A77R8 DATED OCTOBER 18, 2019 SUPERSEDES RSP A77R8 DATED APRIL 19, 2019 AND STANDARD PLAN A77R8 DATED MAY 31, 2018 - PAGE 98 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A77R8**

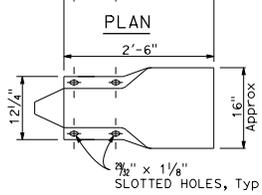
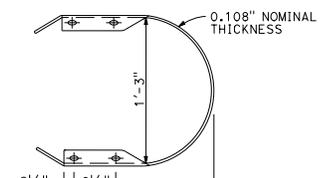
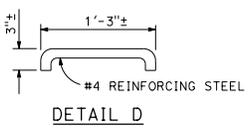
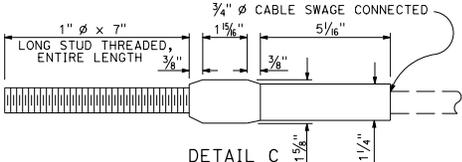
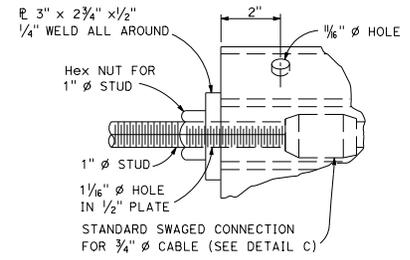
2018 REVISED STANDARD PLAN RSP A77R8



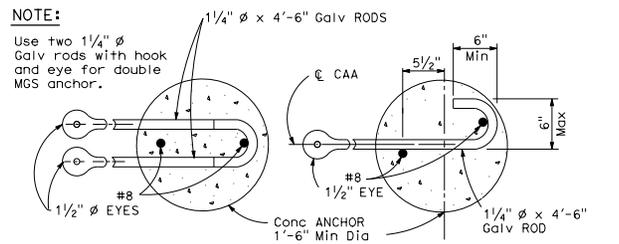
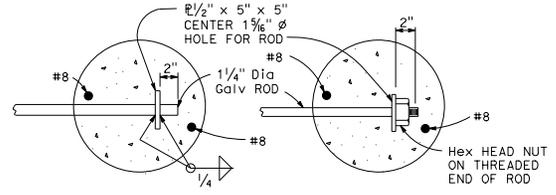
RETURN CAP (TYPE TA) FOR DOUBLE THRIE BEAM OR RETURN CAP (TYPE A) FOR DOUBLE MGS.  
END CAP (TYPE A) FOR SINGLE MGS OR END CAP (TYPE TC) FOR SINGLE THRIE BEAM



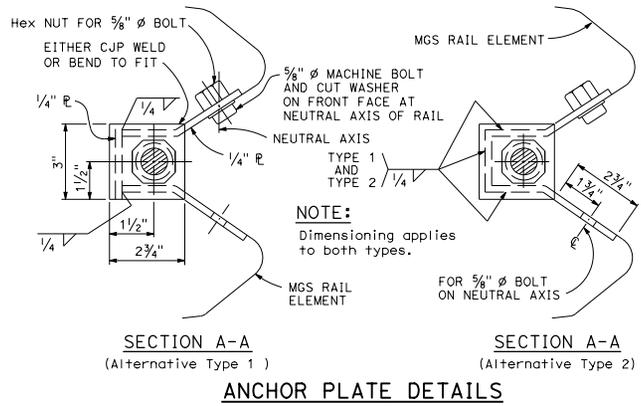
"U" bolts of clip on short end of cable only  
"U" bolts tightened to 50 ft/lb torque



CLIP SPACING 4 1/2" C-C  
ANCHOR ROD  
"U" bolts of clip on short end of cable only  
"U" bolts tightened to 50 ft/lb torque



**NOTE:**  
Use two 1/4"  $\phi$  Galv rods with hook and eye for double MGS anchor.



**NOTE:**  
Dimensioning applies to both types.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**METAL RAILING END ANCHOR ASSEMBLY (TYPE CA)**  
NO SCALE

RSP A77T1 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN A77T1 DATED MAY 31, 2018 - PAGE 102 OF THE STANDARD PLANS BOOK DATED 2018.

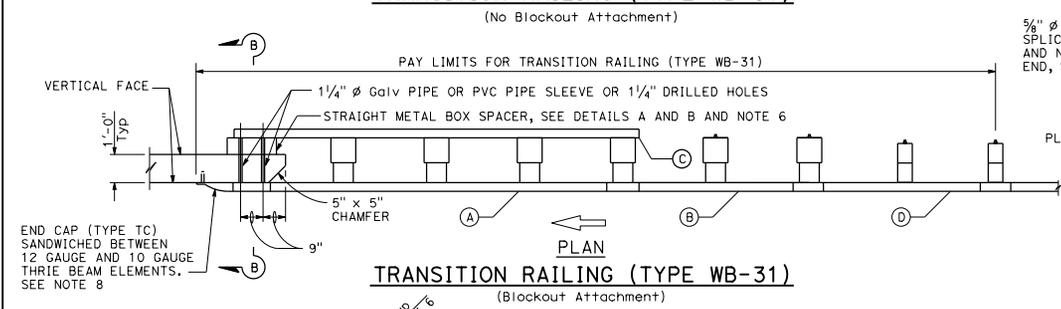
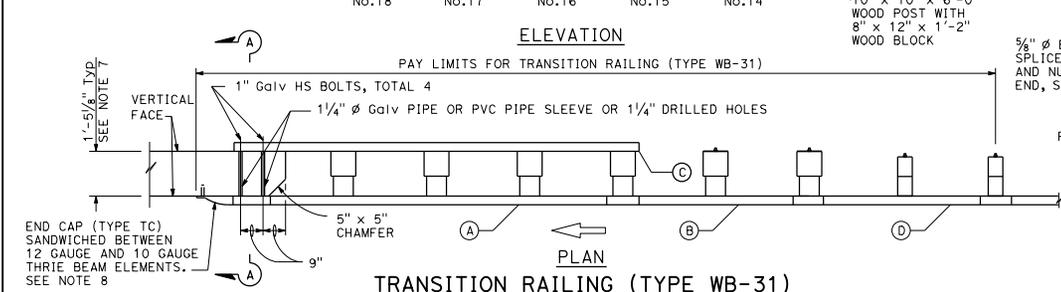
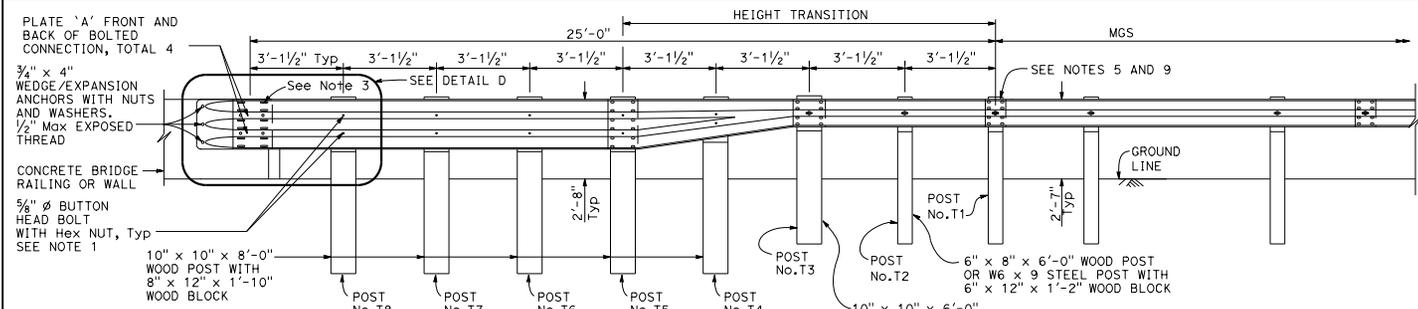
**REVISED STANDARD PLAN RSP A77T1**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

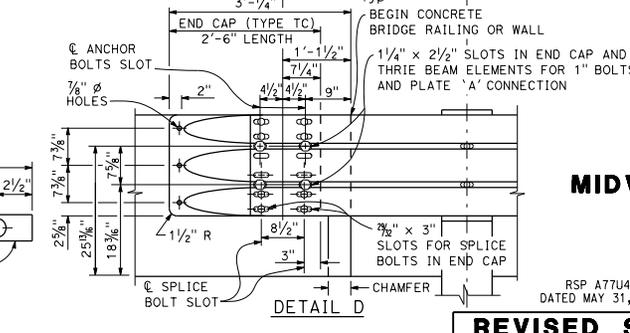
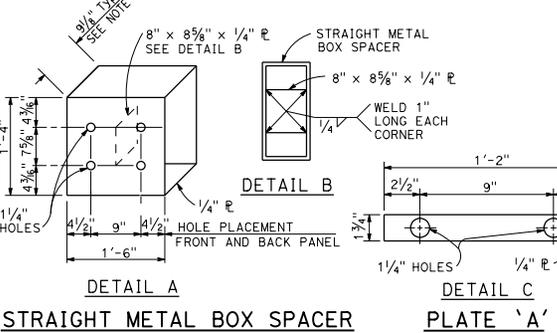
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER  
October 19, 2018  
PLANS APPROVAL DATE  
No. C60200  
Exp. 6-30-19  
CIVIL  
STATE OF CALIFORNIA

- NOTES:**
- For typical use of this type of end anchor, see Standard Plan A78E2.
  - Anchor cable to be parallel to railing for straight runs of rail. Anchor cable may have angle point at anchor plate if railing is curved.
  - Anchor rod hooks to be in contact with anchor reinforcement when concrete is placed. Wire ties may be used to position anchor rods.
  - Single sided railing installations require only one anchor plate, anchor rod and anchor cable. Single sided railing will not have a rail element or blockouts on backside of line posts as shown in the plan view.

2018 REVISED STANDARD PLAN RSP A77T1



- LEGEND:**
- (A) NESTED THRIE BEAM ELEMENTS (ONE 12 GAUGE ELEMENT NESTED OVER ONE 10 GAUGE ELEMENT).
  - (B) ONE ASYMMETRICAL 10 GAUGE "W" BEAM TO THRIE BEAM ELEMENT.
  - (C) ONE 12 GAUGE THRIE BEAM ELEMENT.
  - (D) ONE 10 GAUGE "W" BEAM RAIL ELEMENT (7'-3 1/2" LENGTH)
- 10 GAUGE = 0.138" THICK  
12 GAUGE = 0.108" THICK



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER  
No. C60200  
April 19, 2019  
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

- NOTES:**
- TO ACCOMPANY PLANS DATED \_\_\_\_\_
1. Use 5/8" ø Button head bolts and hex nuts for connections to posts. No washer on rail face for bolted connections to post.
  2. The nested rail elements, end cap, and "W" beam to thrie beam element may be spliced together prior to bolting the elements to the wood post and concrete barrier or railing.
  3. Exterior splice bolt holes for rail element splices at Post No. T5 and the connection to the concrete barrier or railing shall be the standard 3/8" x 1 1/8" slot size. Interior splice bolt holes at these locations may be increased up to 1/4" ø. Only the top 4 and the bottom 4 splice bolts with washers and nuts are required for rail splices at Post No. T5 and the connection to the concrete barrier or railing.
  4. The top elevation of Posts No. T2 through No. T7 shall not project more than 1" above the top elevation of the rail element.
  5. Typically, the railing connected to Transition Railing (Type WB-31) will be either standard railing section of MGS with height transition ratio of 150:1 or a Caltrans approved 31" end treatment attached to Post No. T1.
  6. The depth of the metal box spacer varies from the 9/8" to 1 1/2" and is dependent on the width of the concrete railing or wall. The combined dimension for the depth of the metal box spacer plus the width of railing or wall is typically 21 1/2". Where the space between the backside of the concrete railing or wall and the rear thrie beam element is less than 1 1/2", metal plates similar to Plate 'A' are to be used as spacers.
  7. Where the width of the concrete railing or wall is greater than 1 1/4", wood blocks are to be used to fill the space created between the backside of Posts No. T5 through No. T8 and the rear thrie beam element. These wood blocks shall be 8" in width and 1'-2" in length. The dimension between the front thrie beam element and the rear thrie beam element is to match the width of the concrete railing or wall.
  8. End cap may be installed over 12 gauge and 10 gauge thrie beam elements where transition railing is installed on the departure end of bridge railing.
  9. Conform standard railing section height to 31" at Post No. T1 using height transition ratio of 150:1. MGS tolerance at post No. T1 is ± 1".

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
TRANSITION RAILING  
(TYPE WB-31)**  
NO SCALE

RSP A77U4 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN A77U4  
DATED MAY 31, 2018 - PAGE 107 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP A77U4**

2018 REVISED STANDARD PLAN RSP A77U4



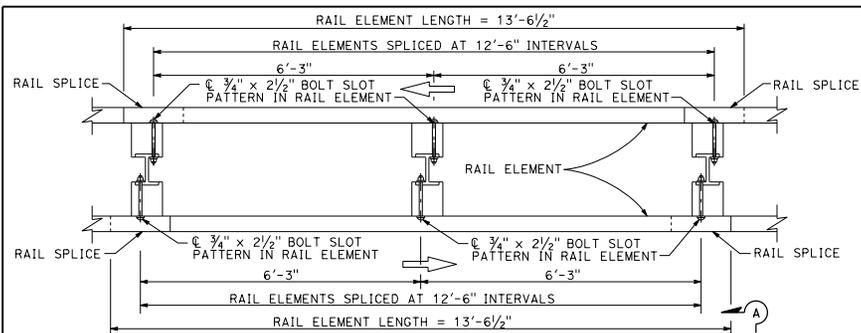
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

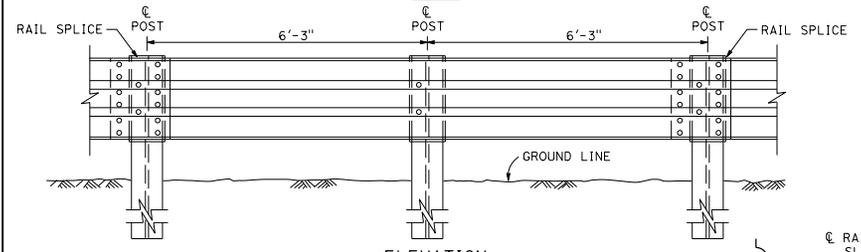
APRIL 19, 2019  
PLANS APPROVAL DATE

NO. C50200  
EXP. 6-30-19  
CIVIL

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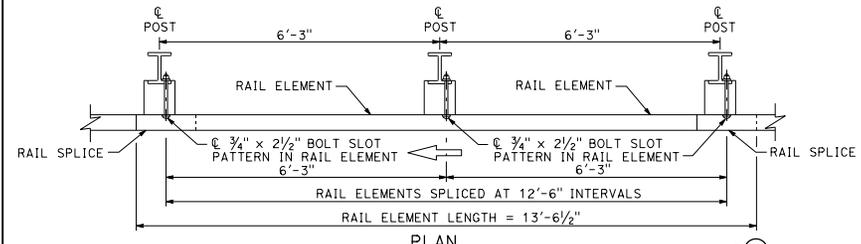
PLAN



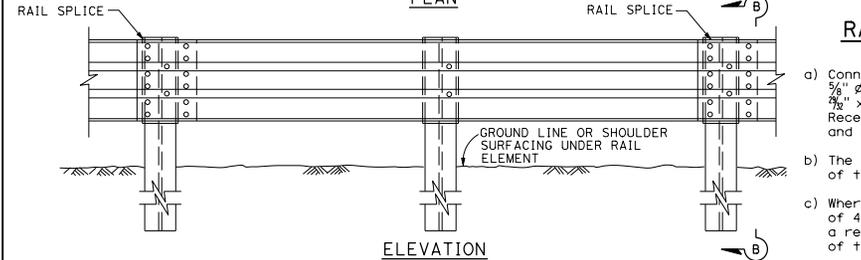
ELEVATION

**DOUBLE THRIE BEAM BARRIER**

(Steel post with notched wood or notched plastic blocks)  
See Note 1



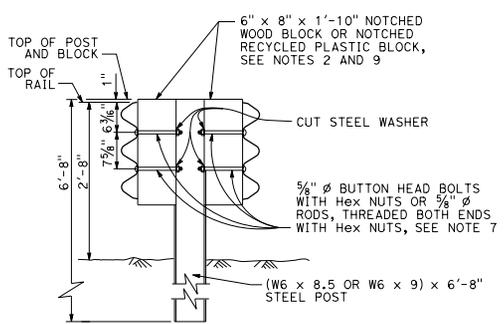
PLAN



ELEVATION

**SINGLE THRIE BEAM BARRIER**

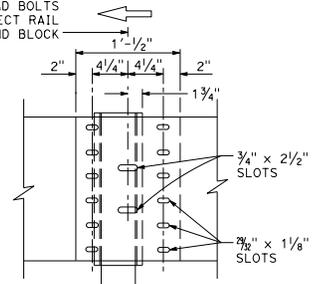
(Steel post with notched wood or notched plastic blocks)  
See Note 1



SECTION A-A

**TYPICAL STEEL LINE POST INSTALLATION**

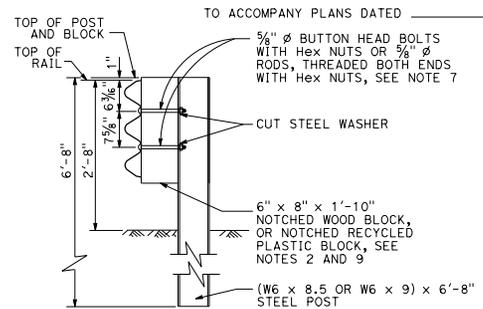
Ø RAIL SPLICE AND SLOTS FOR 5/8" Ø BUTTON HEAD BOLTS TO CONNECT RAIL TO POST AND BLOCK



ELEVATION

**RAIL ELEMENT SPLICE DETAIL**

- Connect the overlapped ends of the thrie beam rail elements with 5/8" x 1 1/4" button head oval shoulder bolts inserted into the 7/8" x 1 1/8" slots and bolted together with 5/8" recessed hex nuts. Recess of hex nut points toward rail element. A total of 12 bolts and nuts are to be used at each rail splice connection.
- The ends of the rail elements are to be overlapped in the direction of traffic (see details).
- Where end cap is to be attached to the end of a rail element, a total of 4 of the above described splice bolts and nuts are to be used. Where a return cap is to be attached to the ends of rail elements, a total of 8 of the above described splice bolts and nuts are to be used.



SECTION B-B

**TYPICAL STEEL LINE POST INSTALLATION**

**NOTES:**

- For details of the cross section of the thrie beam rail element and details for wood post with wood block installations, see Standard Plan A78A.
- For details of standard hardware, posts and blocks used to construct thrie beam barrier, see Standard Plans A78C1 and A78C2.
- Thrie beam barrier post spacing to be 6'-3" center to center, except as otherwise noted.
- Top of barrier rail to be 2'-8" above ground line or shoulder surfacing under the rail element.
- For barrier end treatments and barrier connections, see Standard Plans A78E1, A78E2, A78E3, A78F1, A78F2, A78G and A78H.
- For connection to Concrete Barrier, see Standard Plan A78I.
- Attach rail element to block and steel post with 2 bolts or rods on approaching traffic side of block and post web. No washer on rail face for rod or bolted connections to line post.
- For details of thrie beam barrier on bridges, see Standard Plan A78D2. For details of thrie beam barrier at fixed objects, see Standard Plan A78D1.
- Notched face of block faces steel post.
- Install posts in soil.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**THRIE BEAM BARRIER  
STANDARD BARRIER RAILING  
SECTION (STEEL POST  
WITH NOTCHED WOOD BLOCK  
OR NOTCHED RECYCLED  
PLASTIC BLOCK)**

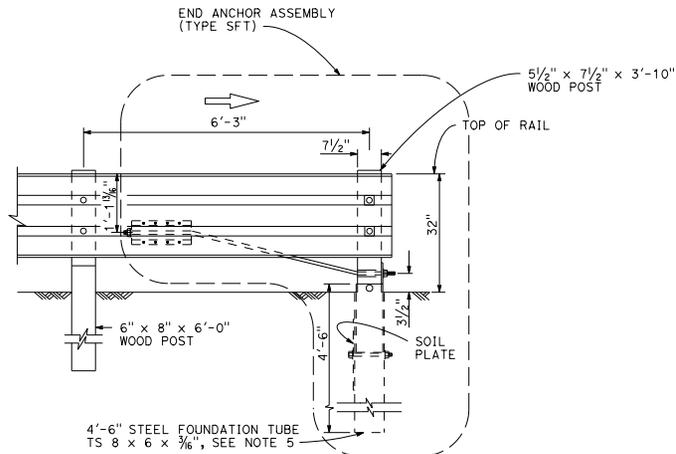
NO SCALE

RSP A78B DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN A78B  
DATED MAY 31, 2018 - PAGE 112 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A78B**

2018 STANDARD PLAN A78B

Dist.	County	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
<i>Randell D. Hiatt</i> REGISTERED CIVIL ENGINEER					
October 19, 2018 PLANS APPROVAL DATE					
No. C50200 Exp. 6-30-19 CIVIL					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					



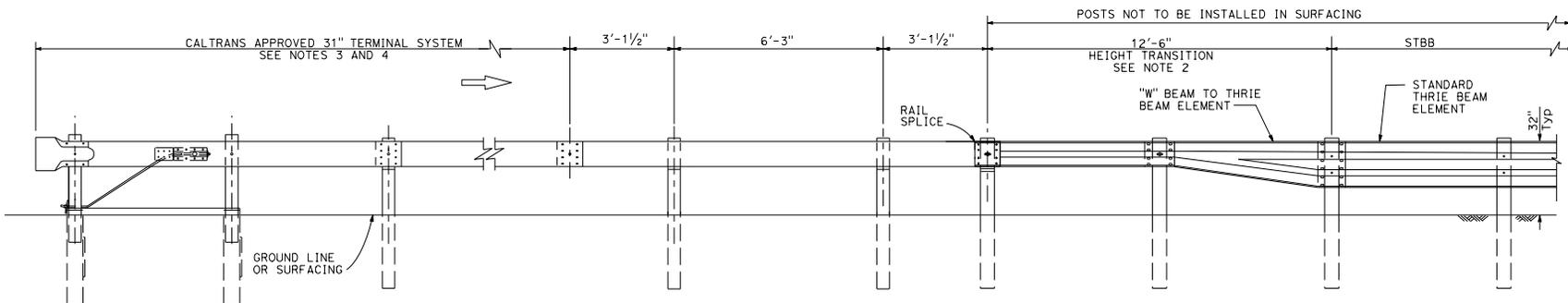
**END ANCHOR FOR TRAFFIC DEPARTURE END  
OF SINGLE THRIE BEAM BARRIER**

(For one-way roadways)  
See Note 1

**NOTES:**

- For additional details of End Anchor Assembly (Type SFT), see Standard Plan A77S1.
- The "W" beam to thrie beam section is only required where the terminal system connection to the thrie beam barrier is a "W" beam rail.
- The type of terminal system to be used will be shown on the Project Plans.
- A Caltrans approved crash cushion should be used in place of a terminal system end treatment where the backside of the railing would be exposed to traffic.
- A 6'-0" length steel foundation tube, TS 8 x 6 x 3/16, without a soil plate, may be furnished and installed in place of the 4'-6" length steel foundation tube and soil plate shown. Minimum embedment of the 6'-0" length tube shall be 5'-9". A 3/8"  $\phi$  hex head bolt and nut shall be installed in the hole in the 6'-0" length tube to keep the wood post from dropping into the tube.

TO ACCOMPANY PLANS DATED \_\_\_\_\_



**ELEVATION  
END TREATMENT FOR TRAFFIC APPROACH END  
OF SINGLE THRIE BEAM BARRIER**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**SINGLE THRIE BEAM BARRIER  
END ANCHOR ASSEMBLY AND  
TERMINAL SYSTEM  
END TREATMENT**

NO SCALE

RSP A78E1 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN A78E1  
DATED MAY 31, 2018 - PAGE 125 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A78E1**

2018 REVISED STANDARD PLAN RSP A78E1

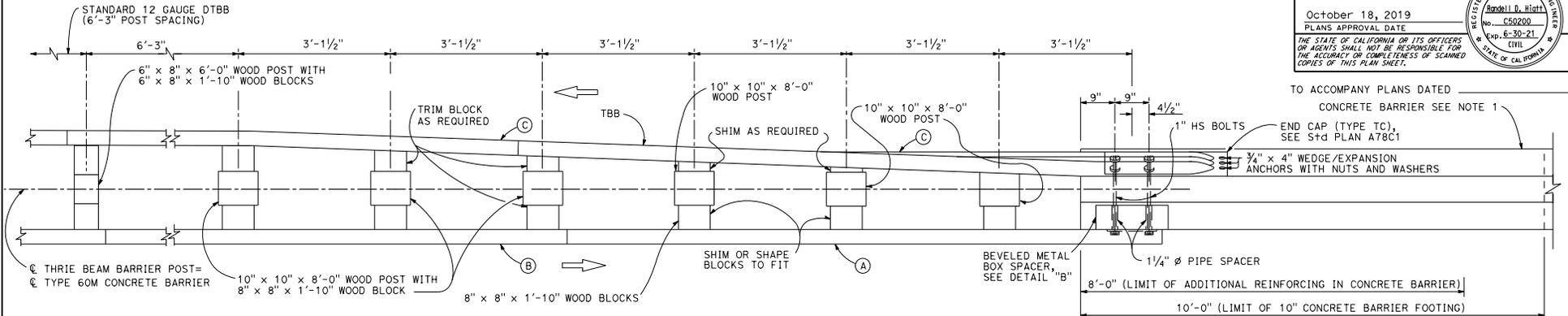
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

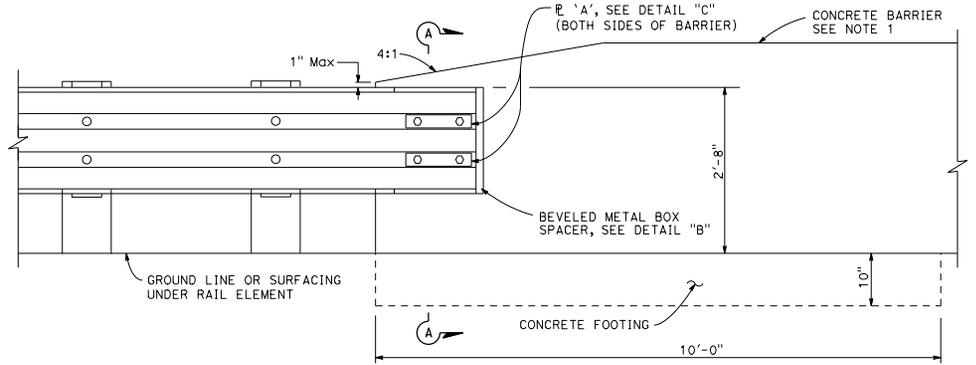
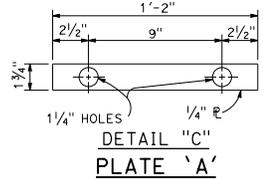
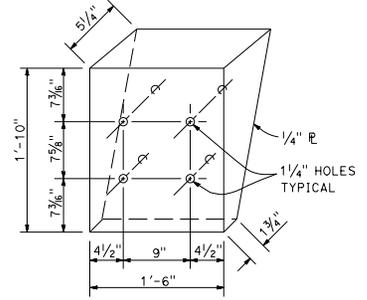
October 18, 2019  
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER  
No. C60200  
Exp. 6-30-21  
CIVIL  
STATE OF CALIFORNIA



PLAN



- NOTES:
- For details of Concrete Barrier Type 60M, see Standard Plan A76A. Thrie beam barrier connections to Concrete Barrier Type 60MS and Type 60MG are similar to details shown on this plan.
  - For additional thrie beam barrier details, see Standard Plans A78A, A78B, A78C1, and A78C2.
  - Where beveled metal box spacer is installed, place 1/4" Ø x 3/4" and 1/4" Ø x 2" pipe spacers on 1" HS bolts passing through interior of box.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

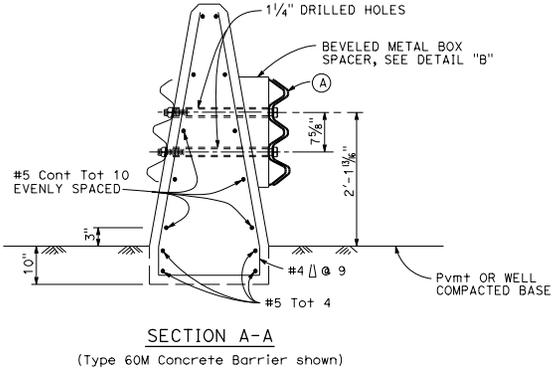
**DOUBLE THRIE BEAM BARRIER  
CONNECTION TO CONCRETE  
BARRIER**

NO SCALE

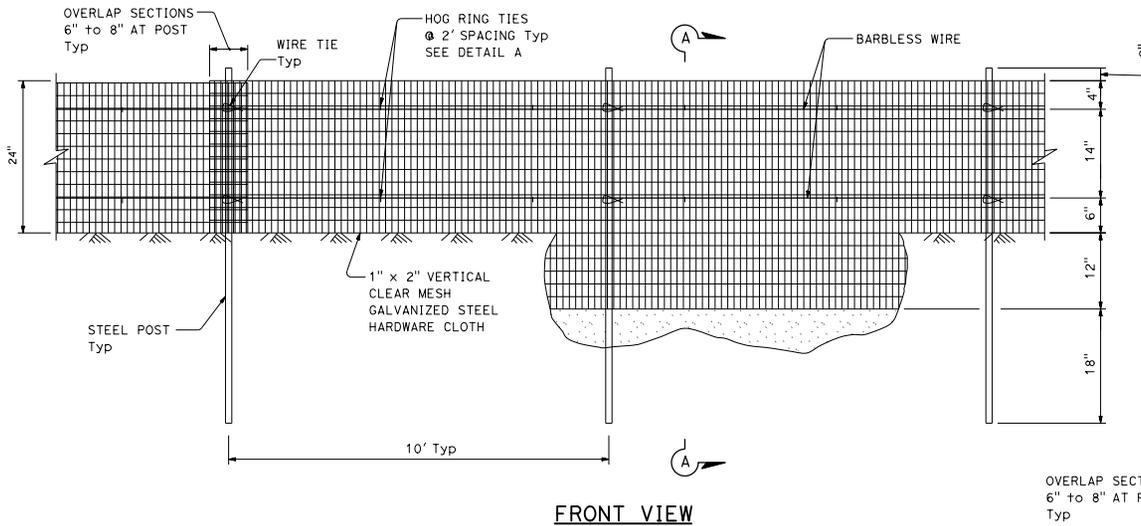
RSP A781 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN A781  
DATED MAY 31, 2018 - PAGE 132 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A781**

- LEGEND
- (A) NESTED THRIE BEAM ELEMENTS (ONE 12 GAUGE ELEMENT NESTED OVER ONE 10 GAUGE ELEMENT).
  - (B) ONE 10 GAUGE THRIE BEAM ELEMENT.
  - (C) ONE 12 GAUGE THRIE BEAM ELEMENT.
- 10 GAUGE = 0.135" THICK  
12 GAUGE = 0.108" THICK



2018 REVISED STANDARD PLAN RSP A781



**FRONT VIEW**

**LEGEND:**

Desert Tortoise Habitat

**NOTE:**

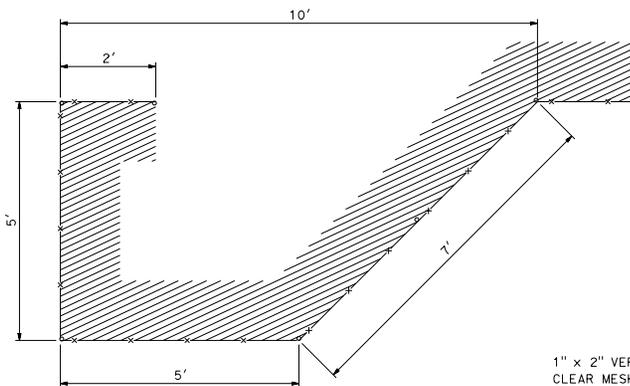
1. Exact locations for desert tortoise fence are shown on the plans.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

*P. Valizadeh*  
REGISTERED CIVIL ENGINEER  
No. C51902  
Exp. 6-30-20  
M. Reza Valizadeh  
REGISTERED PROFESSIONAL ENGINEER  
No. C51902  
Exp. 6-30-20  
CIVIL  
STATE OF CALIFORNIA

October 19, 2018  
PLANS APPROVAL DATE  
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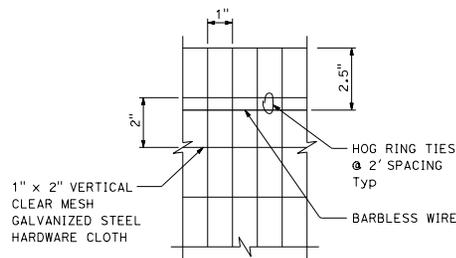
TO ACCOMPANY PLANS DATED \_\_\_\_\_



**REDIRECTIONAL CONFIGURATION PLAN VIEW**

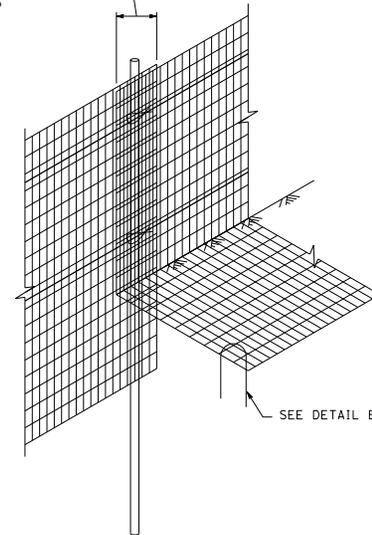
U-SHAPED HOLD DOWN PINS  
6" LONG (24" Max SPACING)

**DETAIL B**

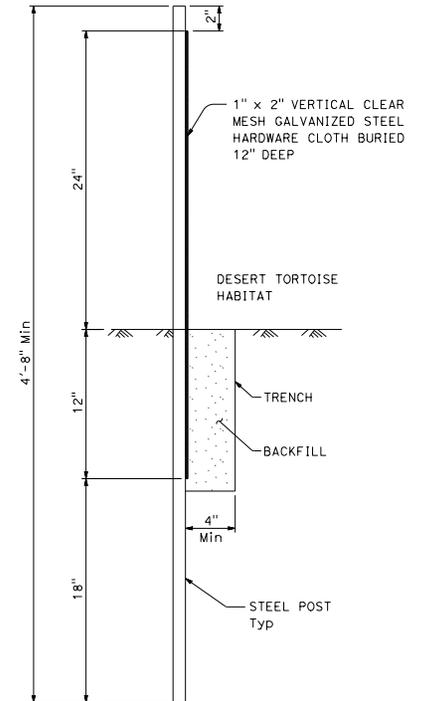


**DETAIL A**

OVERLAP SECTIONS  
6" to 8" AT POST  
Typ



**FENCE TRANSITION FOR  
BEDROCK OR CALICHE SUBSTRATE**



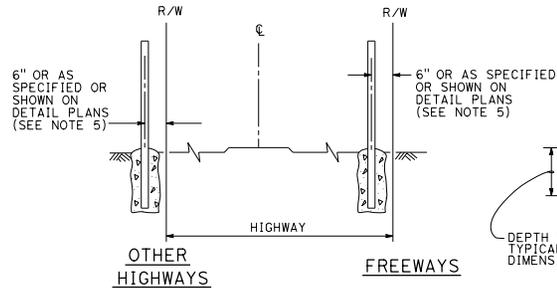
**SECTION A-A**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**DESERT TORTOISE FENCE**  
NO SCALE

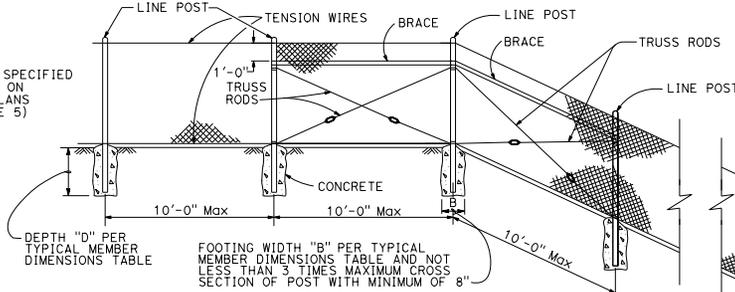
RSP A84B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN A84B  
DATED MAY 31, 2018 - PAGE 139 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP A84B**

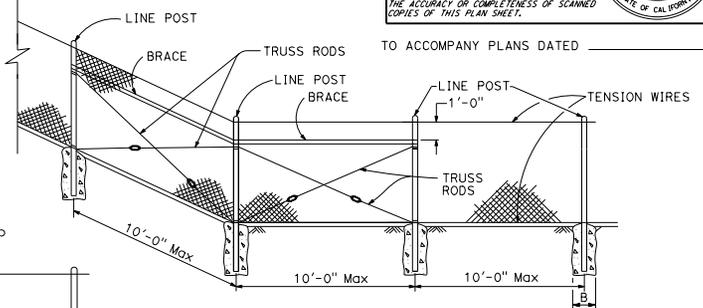
2018 REVISED STANDARD PLAN RSP A84B



**FENCE LOCATION**



**CHAIN LINK FENCE ON SHARP BREAK IN GRADE**



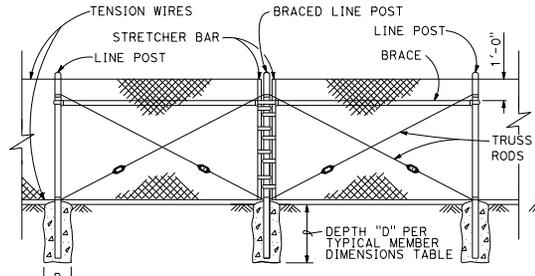
D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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*B. Valizadeh*  
REGISTERED CIVIL ENGINEER

October 19, 2018  
PLANS APPROVAL DATE

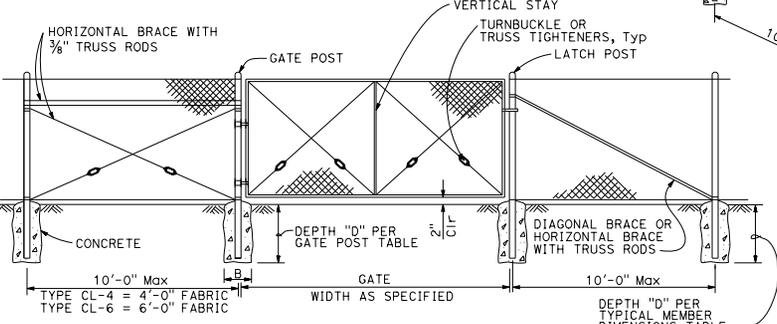
M. Reza Valizadeh  
No. C51902  
Exp. 6-30-20  
CIVIL

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**BRACED LINE POST INSTALLATION**

Braced line post at intervals not exceeding 1000'

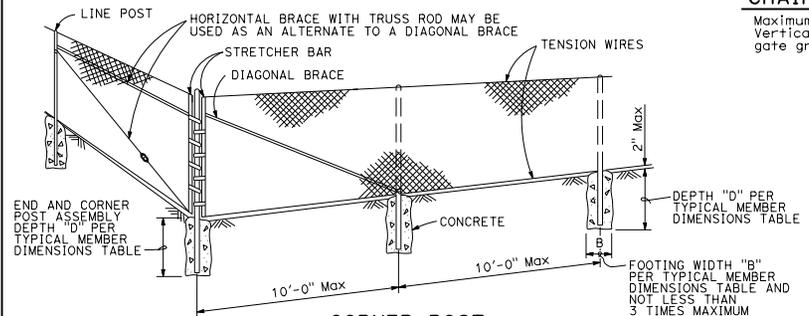


**CHAIN LINK GATE INSTALLATION**

Maximum Gate Width is 12'-0"  
Vertical Stay is required in middle of gate greater than 8'-0" in width.

FENCE HEIGHT (Max)	SLATTED	B (in)	D (ft)	ROUND PIPE		
				ROUND OD PIPE	GROUP 1A WEIGHT (lb/ft)	GROUP 1C WEIGHT (lb/ft)
				5'-0"	NO	12"
6'-0"	NO	12"	2'-6"	3.50"	7.58	5.71
8'-0"	NO	12"	3'-0"	3.50"	7.58	5.71
10'-0"	NO	14"	3'-6"	3.50"	7.58	5.71
5'-0"	YES	12"	3'-0"	4.00"	9.12	6.56
6'-0"	YES	14"	3'-6"	4.50"	10.80	-
8'-0"	YES	18"	3'-6"	5.56"	14.60	-
10'-0"	YES	20"	4'-0"	6.63"	19.00	-

Above post dimensions and weights are minimums. Larger sizes may be used upon approval.



**CORNER POST**

**NOTES:**

- The table to the right shows minimum sized posts and braces complying with the specifications. Larger or heavier post and brace sizes may be used upon approval.
- Sections shown in the tables must also comply with the strength requirements and other provisions of the specifications.
- Other sections which comply with the strength requirements and other provisions of the specifications may be used upon approval.
- Options exercised shall be uniform on any one project.
- Offset to be 2'-0" at monument locations, measured at right angles to R/W lines. Taper to achieve offset to be at least 20'-0" long.
- See Standard Plan A85B for Brace, Stretcher Bar, and Truss Tightener Details.

FENCE HEIGHT (Max)	SLATTED	B (in)	D (ft)	TYPICAL MEMBER DIMENSIONS (See Notes)									
				LINE POSTS						BRACES			
				ROUND PIPE		ROLL FORMED		ROUND PIPE		ROLL FORMED			
				ROUND OD PIPE	GROUP 1A WEIGHT (lb/ft)	GROUP 1C WEIGHT (lb/ft)	SECTION	WEIGHT (lb/ft)	ROUND OD PIPE	GROUP 1A WEIGHT (lb/ft)	GROUP 1C WEIGHT (lb/ft)	SECTION	WEIGHT (lb/ft)
5'-0"	NO	8"	2'-6"	1.90"	2.72	2.28	1.875" x 1.625"	1.85	1.90"	2.72	2.28	1.625" x 1.250"	1.35
6'-0"	NO	10"	2'-6"	2.38"	3.66	3.12	1.875" x 1.625"	2.40	2.38"	3.66	3.12	1.625" x 1.250"	1.35
8'-0"	NO	12"	3'-0"	2.88"	5.80	4.64	3,250" x 2,500"	4.50	2,38"	3.66	3.12	1.625" x 1,250"	1.35
10'-0"	NO	14"	3'-6"	3.50"	7.58	5.71	3,250" x 2,500"	4.50	2,88"	5.80	4.64	1.625" x 1,250"	1.35
5'-0"	YES	12"	3'-0"	4.00"	9.12	6.56	N/A	-	2,38"	3.66	3.12	N/A	-
6'-0"	YES	14"	3'-0"	4.50"	10.80	-	N/A	-	2,38"	3.66	3.12	N/A	-
8'-0"	YES	18"	3'-6"	5.56"	14.60	-	N/A	-	2,38"	3.66	3.12	N/A	-
10'-0"	YES	20"	4'-0"	6.63"	19.00	-	N/A	-	2,88"	5.80	4.64	N/A	-

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CHAIN LINK FENCE**  
NO SCALE

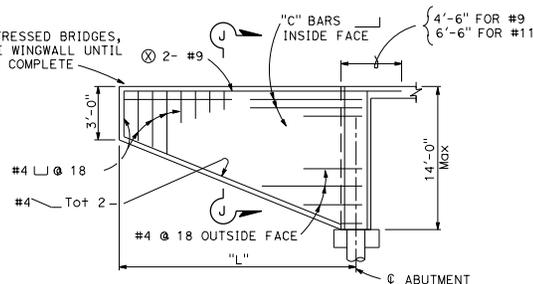
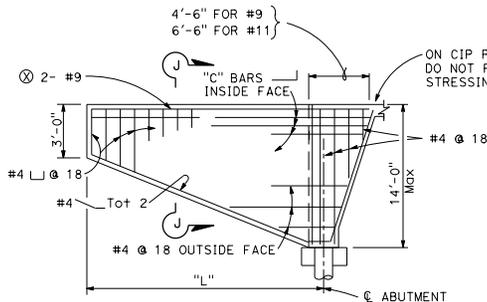
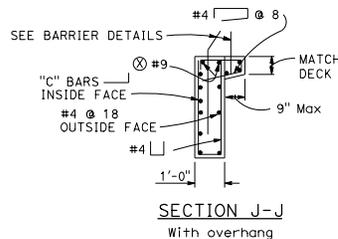
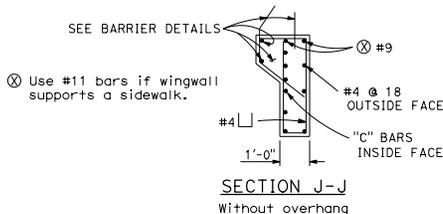
RSP A85 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN A85  
DATED MAY 31, 2018 - PAGE 140 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP A85**

2018 REVISED STANDARD PLAN RSP A85

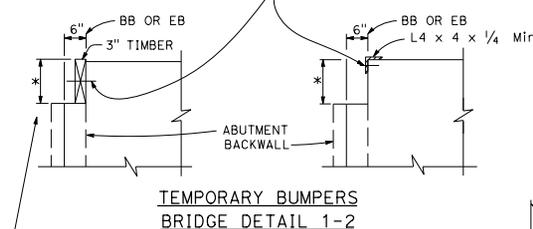
**BRIDGE DESIGNATIONS AND ABBREVIATIONS**

See Standard Plans A3A, A3B, and A3C for additional or standard abbreviations

- J Outer, outer left bridge
- K Outer left bridge
- S Outer right bridge
- T Outer, outer right bridge
- RWLOL Retaining Wall Layout Line
- WWLOL Wingwall Layout Line



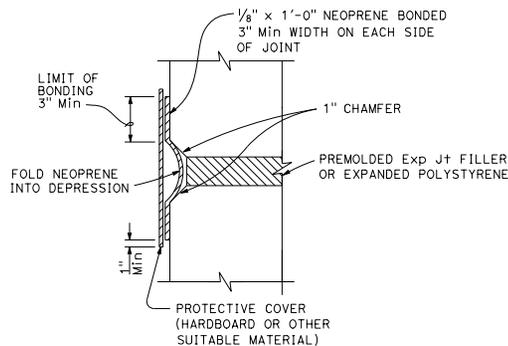
\* Depth of paving notch or dimension to abutment backwall construction joint. Varies, see abutment details.  
1/2" Min Dia BOLT, 3'-0" Max SPACING, 3" Min EMBEDMENT INSERT ASSEMBLY MAY BE USED UPON ENGINEER'S APPROVAL



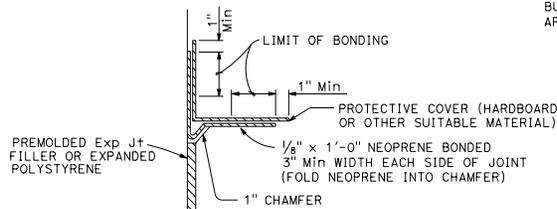
**ALTERNATIVE 1**

**ALTERNATIVE 2**

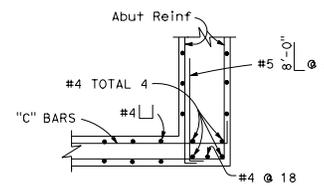
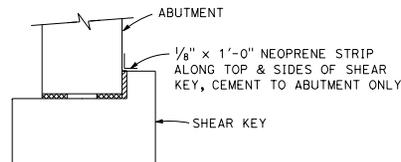
TOP OF BUMPER TO BE AT OR ABOVE THE TOP OF DECK CONCRETE. BUMPERS AND BOLTS TO BE REMOVED IMMEDIATELY PRIOR TO PLACING APPROACH PAVEMENT



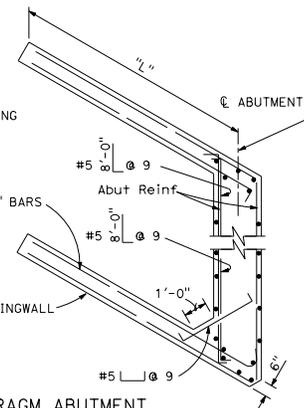
When used on CIP prestressed bridges, do not apply waterstop until stressing is complete.



When used on CIP prestressed bridges, do not apply waterstop until stressing is complete.



**CORNER DETAIL FOR SKEW 20° AND LESS**



"L"	"C" BARS
12'-0"	#5 @ 9"
14'-0"	#6 @ 9"
16'-0"	#7 @ 9"
18'-0"	#8 @ 9"
20'-0"	#9 @ 9"

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**BRIDGE DETAILS**  
NO SCALE

RSP D83B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN D83B  
DATED MAY 31, 2018 - PAGE 318 OF THE STANDARD PLANS BOOK DATED 2018.

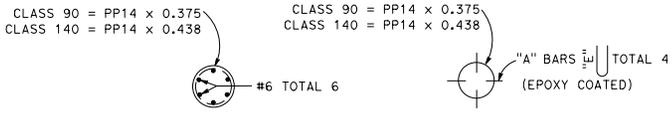
**REVISED STANDARD PLAN RSP B0-1**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

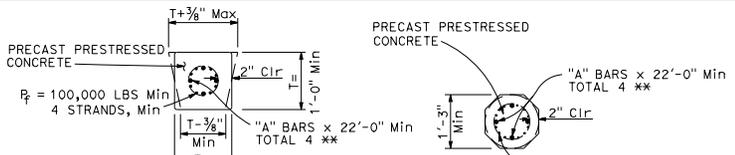
*Peter W. Norbo*  
REGISTERED CIVIL ENGINEER  
No. C57519  
October 19, 2018  
PLANS APPROVAL DATE  
Exp. 12-31-19  
CIVIL  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

2018 REVISED STANDARD PLAN RSP B0-1



SECTION V-V  
SECTION W-W  
PP = Steel pipe pile



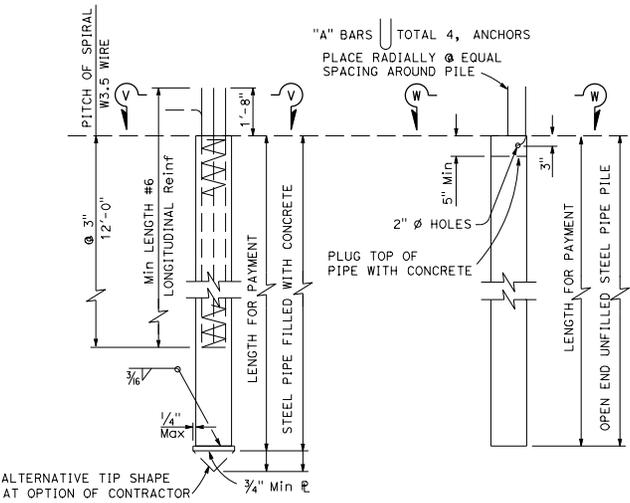
SECTION X-X  
SECTION Y-Y  
\*\* To be in place when pile is cast

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

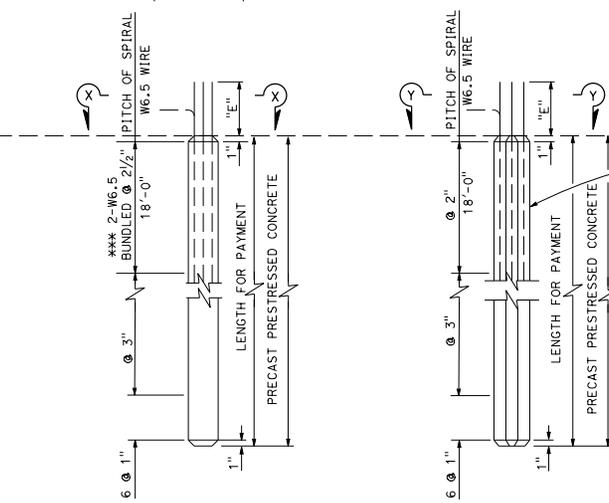
Amir M. Malek  
REGISTERED CIVIL ENGINEER  
No. C62397  
Exp. 9-30-19  
CIVIL

October 19, 2018  
PLANS APPROVAL DATE

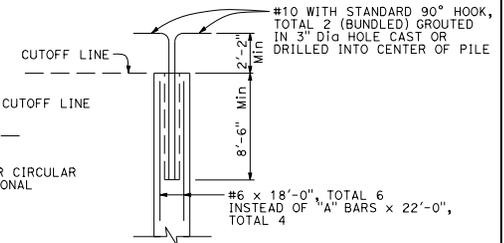
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



ALTERNATIVE "V"  
ALTERNATIVE "W"



ALTERNATIVE "X"  
ALTERNATIVE "Y"  
\*\*\* W11.0 at 2" may be substituted



ALTERNATIVE PILE ANCHOR FOR PRESTRESSED PILES

DESIGN NOTES

- PRECAST PRESTRESSED PILES**
- $P_p$  = Prestressing force (after losses) If section used is larger than the minimum section shown, then " $P_p$ " shall provide 700 psi minimum.
- Concrete Strength:  $f'_c$  @ 28 days = 6,000 psi (Alternative "X")  
5,000 psi (Alternative "Y")  
 $f'_{ci}$  @ transfer = 4,000 psi
- REINFORCED CONCRETE**
- $f'_c$  = 4,000 psi  
 $f_y$  = 60,000 psi
- STEEL PIPE PILE**
- $F_y$  (Minimum yield strength) = 45,000 psi  
 $F_u$  (Minimum tensile strength) = 66,000 psi

DESIGN CAPACITY

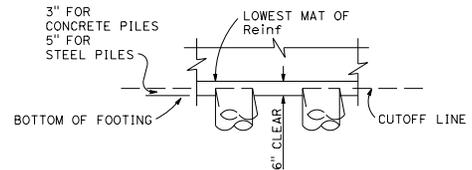
- Class 90**
- Compression = 90 kip (Service state)  
= 180 kip (Nominal axial structural resistance)
- Tension = 36 kip (Service state)  
= 90 kip (Nominal axial structural resistance)
- Class 140**
- Compression = 140 kip (Service state)  
= 280 kip (Nominal axial structural resistance)
- Tension = 56 kip (Service state)  
= 140 kip (Nominal axial structural resistance)

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**PILE DETAILS  
CLASS 90 AND CLASS 140  
NO SCALE**

RSP B2-5 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN B2-5  
DATED MAY 31, 2018 - PAGE 323 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B2-5**

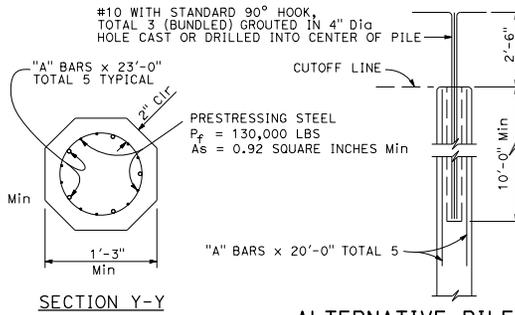
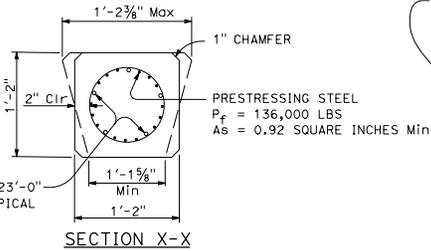
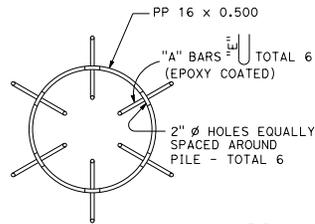


PILE EMBEDMENT

	REQUIRED NOMINAL RESISTANCE (TENSION) *	
	60 kips OR LESS	GREATER THAN 60 kips
"A" BARS	#6	#8
"E" DIMENSION	1'-8"	2'-8"

\* See Pile Data Table on the Project Plans for Nominal Resistance (Tension) Requirements

2018 REVISED STANDARD PLAN RSP B2-5



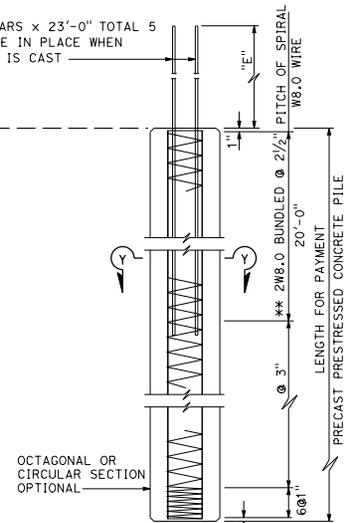
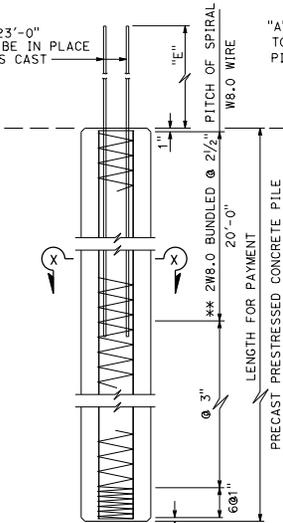
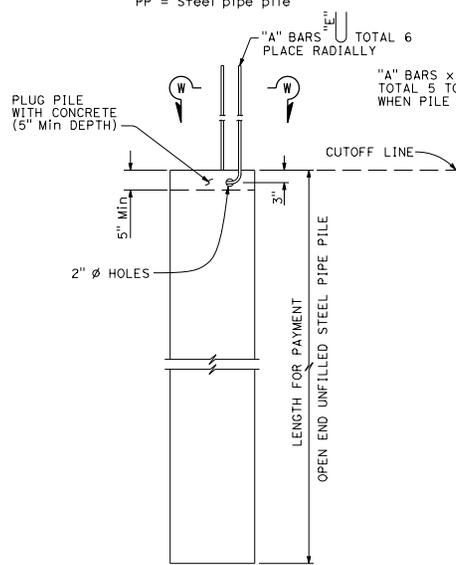
**ALTERNATIVE PILE ANCHOR FOR PRESTRESSED PILE**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER  
Amir M. Malek  
No. C62397  
Exp. 9-30-19  
CIVIL  
STATE OF CALIFORNIA

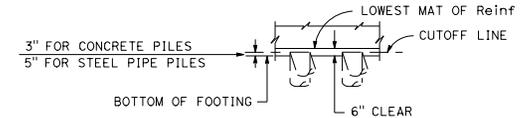
October 19, 2018  
PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_



	REQUIRED NOMINAL RESISTANCE (TENSION) *	
"A" BARS	75 kips OR LESS	GREATER THAN 75 kips
"E" DIMENSION	#6	#8
	1'-8"	2'-8"

\* See Pile Data Table on the Project Plans for Nominal Resistance (Tension) Requirements



**DESIGN NOTES:**

**DESIGN CAPACITY**

- Compression = 200 kip (Service state)
- = 400 kip (Nominal axial structural resistance)
- Tension = 80 kip (Service state)
- = 200 kip (Nominal axial structural resistance)

**REINFORCED CONCRETE**

- $f'_c = 4,000$  psi
- $f_y = 60,000$  psi

**PRECAST PRESTRESSED PILES**

- $P_f$  = Prestress Force (After losses)
- Concrete Strength  $f'_c$  @ 28 days = 7,000 psi
- $f'_c$  @ transfer = 4,000 psi

**STEEL PIPE PILE**

- $F_y$  (minimum yield strength) = 45,000 psi
- $F_u$  (minimum tensile strength) = 66,000 psi

\*\* W11.0 @ 1 1/4" may be substituted

\*\* W11.0 @ 1 1/4" may be substituted

**NOTES:**

- Pile reinforcement extending into footing shall be hooked as required to provide clearance to top of footing. Piles shall be extended only with details shown on the Project Plans.
- At the Contractor's option, alternative steel pipe with at least the diameter and wall thickness shown on these plans may be used. The diameter shall not exceed 1'-6".
- Maximum cut-off length at the top of the Alternative "X" and Alternative "Y" piles is 10'-0".
- 2" clearance to spiral reinforcement shall be maintained if section used is larger than the minimum section shown.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**PILE DETAILS CLASS 200**

NO SCALE

RSP B2-8 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN B2-8  
DATED MAY 31, 2018 - PAGE 324 OF THE STANDARD PLANS BOOK DATED 2018.

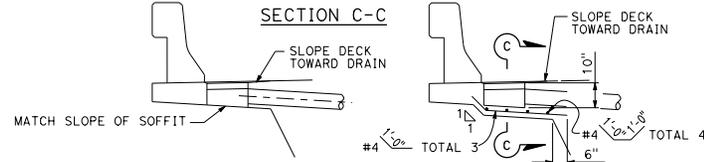
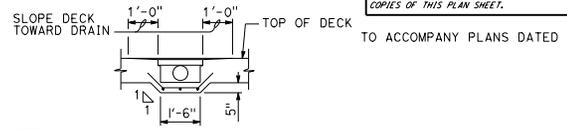
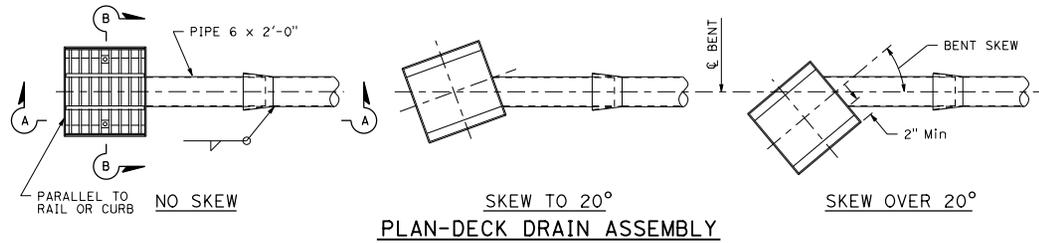
**REVISED STANDARD PLAN RSP B2-8**

2018 REVISED STANDARD PLAN RSP B2-8

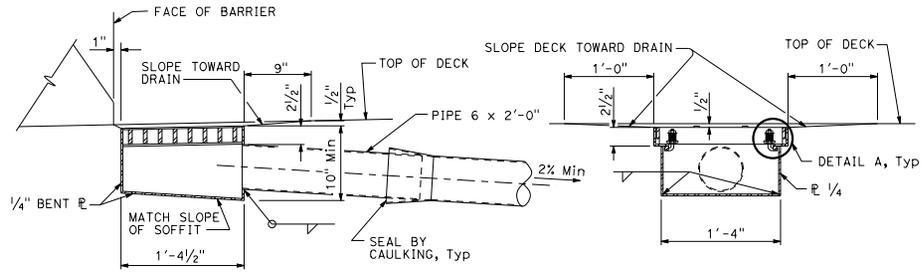
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS


  
 REGISTERED CIVIL ENGINEER  
 C.J. Sims  
 No. C46471  
 Exp. 6-30-21  
 CIVIL  
 STATE OF CALIFORNIA

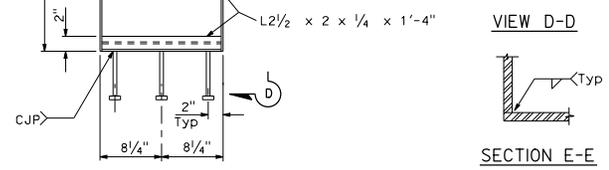
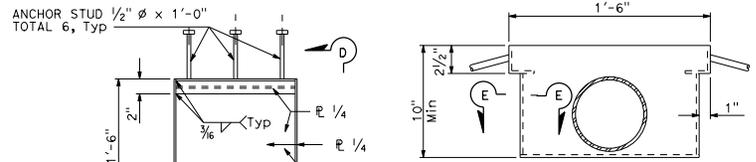
October 18, 2019  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



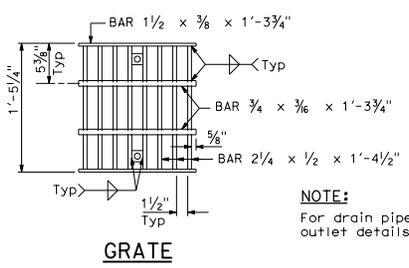
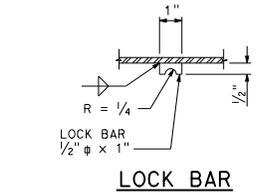
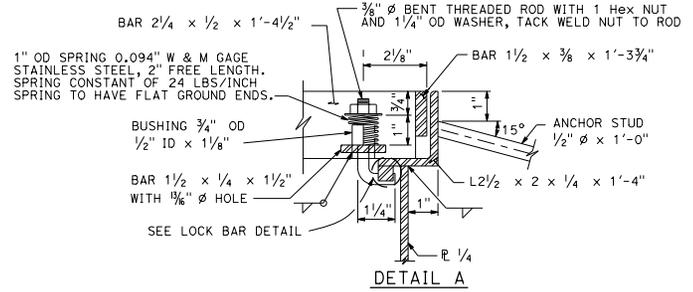
ELEVATION-DECK DRAIN LOCATIONS  
 TO ACCOMPANY PLANS DATED \_\_\_\_\_



SECTION A-A  
 DECK DRAIN ASSEMBLY DETAIL  
 SECTION B-B



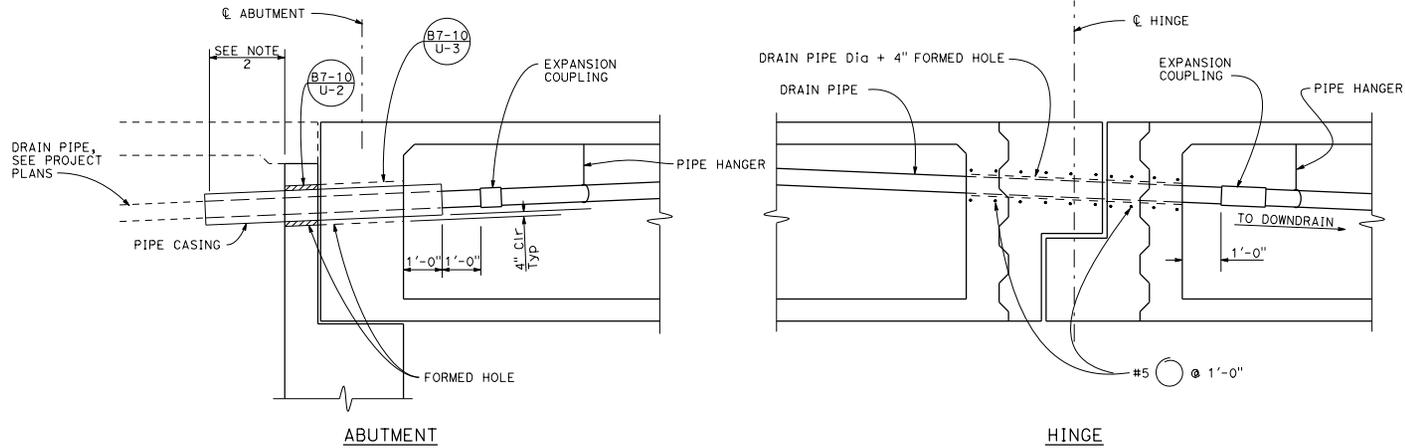
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**DECK DRAIN TYPE D-3**  
 NO SCALE



**NOTE:**  
 For drain pipe alignment, sleeve connection, drain outlet details and notes, see Standard Plan B7-6.

2018 REVISED STANDARD PLAN RSP B7-7

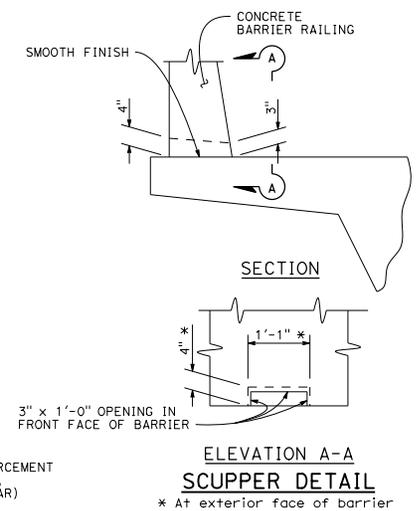
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
REGISTERED CIVIL ENGINEER October 18, 2019 PLANS APPROVAL DATE THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					



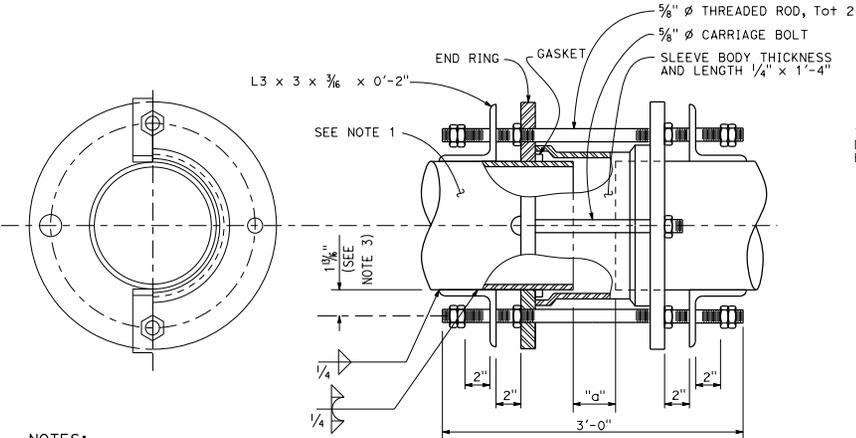
**DECK DRAIN PIPE DETAIL**

**NOTES:**

1. Pipe casing OD = Drain pipe Dia + 4" (1/4" Min wall thickness)
2. Unless otherwise shown on Project Plans, casing shall extend to the greater of 5'-0" beyond the end of approach slab or 20'-0" beyond the back of abutment.



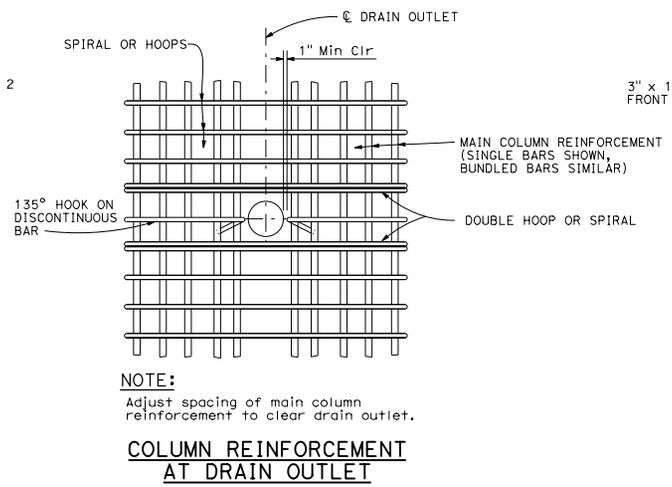
**ELEVATION A-A  
SCUPPER DETAIL**  
\* At exterior face of barrier



**EXPANSION COUPLING**

**NOTES:**

1. For "a" dimension and pipe diameter, see Project Plans.
2. Expansion coupling with 4 bolts shown. Coupling with a greater number of bolts allowed.
3. Adjust dimension to suit coupler end ring bolt circle.



**NOTE:**  
Adjust spacing of main column reinforcement to clear drain outlet.

**COLUMN REINFORCEMENT  
AT DRAIN OUTLET**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**DECK DRAINAGE DETAILS**  
NO SCALE

RSP B7-8 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN B7-8  
DATED MAY 31, 2018 - PAGE 348 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP B7-8**

2018 REVISED STANDARD PLAN RSP B7-8

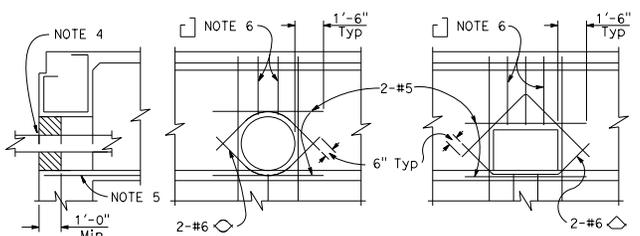
**ABUTMENT DIAPHRAGMS**

**INTERMEDIATE DIAPHRAGMS AND HINGES**

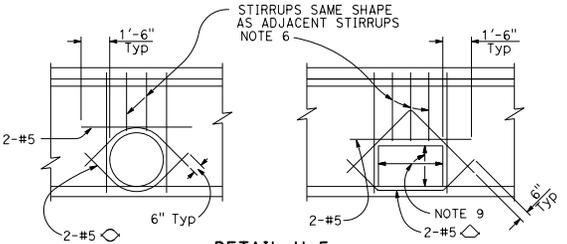
D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

*Peter W. Norbo*  
 REGISTERED CIVIL ENGINEER  
 No. C57519  
 Exp. 12-31-19  
 CIVIL  
 STATE OF CALIFORNIA

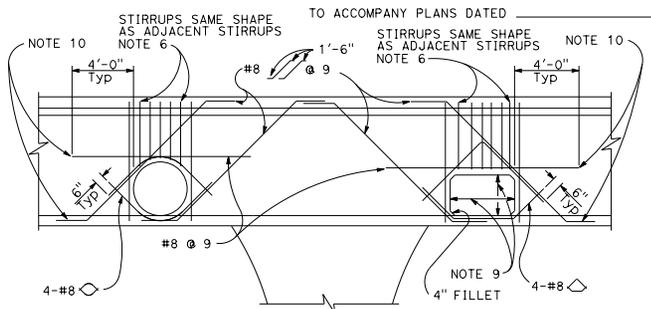
**BENT CAPS**



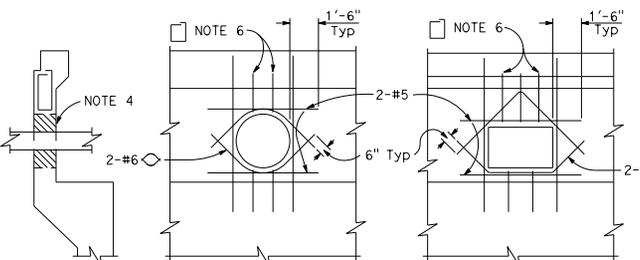
**DETAIL U-1**



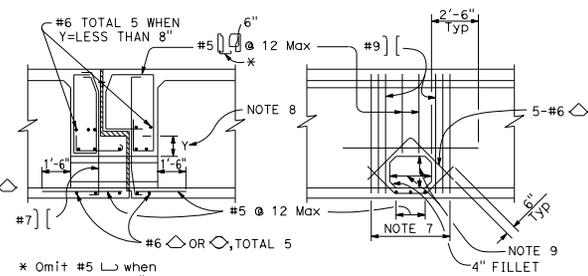
**DETAIL U-5**  
AT INTERMEDIATE DIAPHRAGM



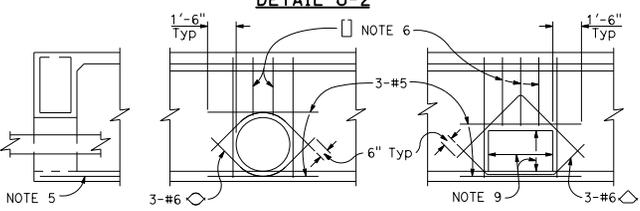
**DETAIL U-7**  
NEAR OR BETWEEN COLUMNS



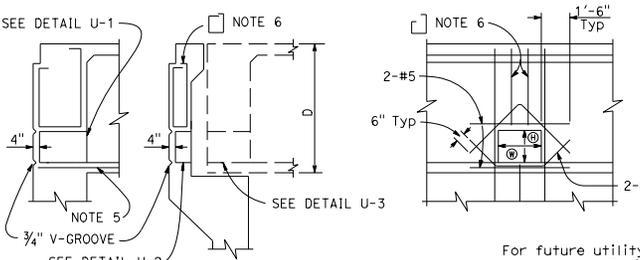
**DETAIL U-2**



**DETAIL U-6**  
AT HINGE



**DETAIL U-3**



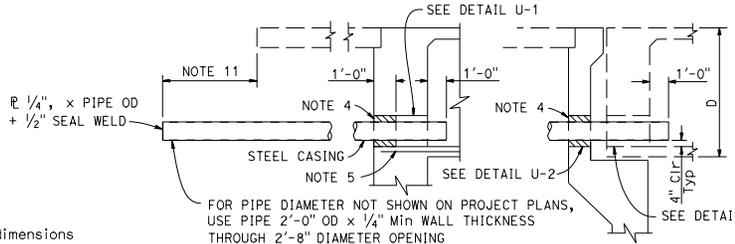
**DETAIL U-4**  
(FOR FUTURE UTILITY OPENING)

For future utility opening dimensions not shown on Project Plans use:

- ⊕ = 1/3 D or 1'-6" minimum, whichever is greater.
- ⊙ = 1/3 D or 2'-0" minimum, whichever is greater.

**NOTES:**

1. The exact location, elevation, size, and direction of openings shall be in accordance with the Project Plans and as directed by the Engineer. Girders not shown. See Project Plans.
2. All reinforcement detailed to be placed in addition to reinforcement shown on Project Plans.
3. Seal utilities at abutments with concrete or mortar, after tightly wrapping utility with 2 layers of 15 LBS building paper. If structure is prestressed, seal to be placed after stressing is completed.
4. Main reinforcement to clear opening.
5. Reinforcement to be same bar size and 2/3 the spacing of adjacent reinforcement shown on Project Plans.
6. Replace each set of 2-#9 bars cut off by opening. Place 1/2 on each side of opening.
7. When "y" is less than 8", extend top of opening to bottom of bearing seat elevation.
8. For future utility opening dimensions, see Project Plans and Detail U-4.
9. When there is insufficient space to place reinforcement as shown, hook reinforcement into exterior girder.
10. Unless otherwise shown on Project Plans, casing shall extend to the greater of 5'-0" beyond the end of the approach slab, 5'-0" beyond the end of the adjacent wingwall, 20'-0" beyond the back of the abutment, or to the State right-of-way limit.



**DETAIL U-8**  
(FOR FUTURE UTILITY PROVISIONS UNDER APPROACH SLAB)

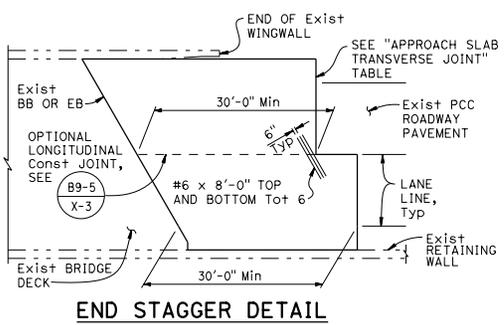
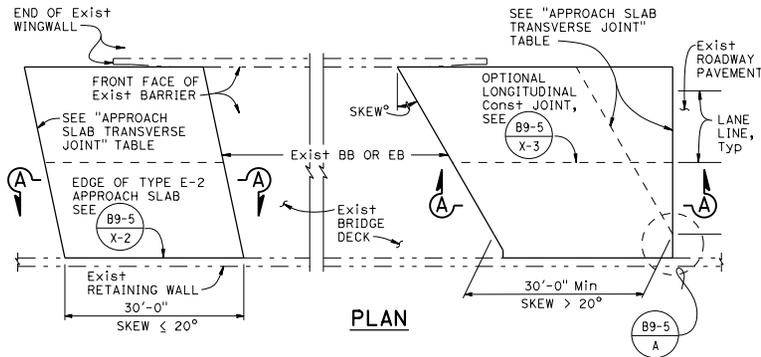
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**UTILITY OPENING  
BOX GIRDER**  
NO SCALE

REVISED STANDARD PLAN RSP B7-10  
RSP B7-10 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN B7-10  
DATED MAY 31, 2018 - PAGE 349 OF THE STANDARD PLANS BOOK DATED 2018.

2018 REVISED STANDARD PLAN RSP B7-10

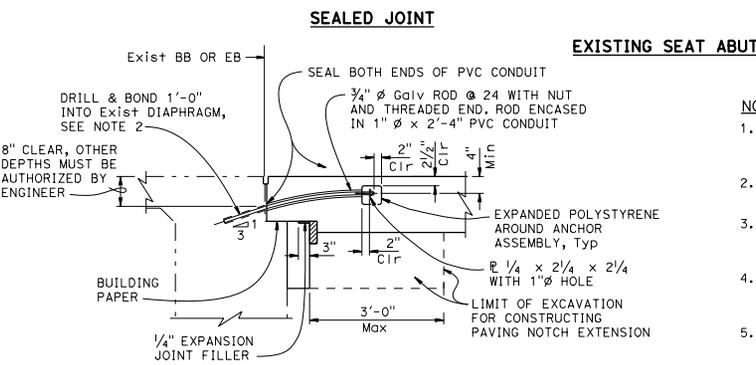
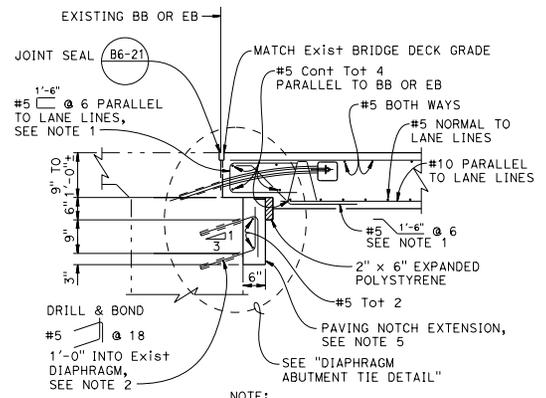
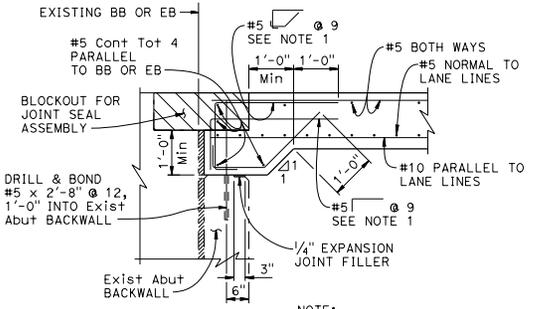
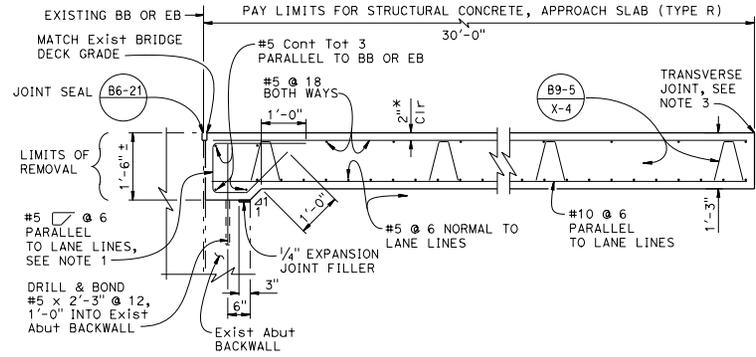
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS


  
 REGISTERED CIVIL ENGINEER  
 April 19, 2019  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS  
 OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
 THE ACCURACY OR COMPLETENESS OF SCANNED  
 COPIES OF THIS PLAN SHEET.



APPROACH SLAB TRANSVERSE JOINT		
APPROACH SKEW, x	WITH HMA ROADWAY PAVEMENT	WITH PCC ROADWAY PAVEMENT
x < 20°	PARALLEL TO BB OR EB	PARALLEL TO BB OR EB
20° < x < 45°	PARALLEL TO BB OR EB	STAGGER AT LANE LINES 24' TO 36' APART, SEE "END STAGGER DETAIL"
x > 45°	PARALLEL TO BB OR EB	STAGGER AT EACH LANE LINE, SEE "END STAGGER DETAIL"

TO ACCOMPANY PLANS DATED \_\_\_\_\_



SECTION A-A

NOTES:

- For MR  $\leq 2'$ , adjust reinforcement to clear sawcut for sealed joint. For MR  $> 2'$ , reinforcement must be normal to BB or EB and spaced to avoid joint seal assembly anchorage.
- Space reinforcement and abutment ties to avoid existing prestressing anchorages and other reinforcement in abutment, as needed.
- Transverse Joint must be a minimum of 5'-0" from an existing or constructed weakened plane joint in approach PCC roadway pavement. Refer to Standard Plans P10 and P14.
- At the Contractor's option, approach slab transverse reinforcement may be placed parallel to BB or EB. Spacing of transverse reinforcement is measured along  $\phi$  roadway.
- Paving notch extension is required if existing diaphragm paving notch is  $< 6"$ .
- For details not shown, refer to Standard Plan B9-5.

LEGEND:

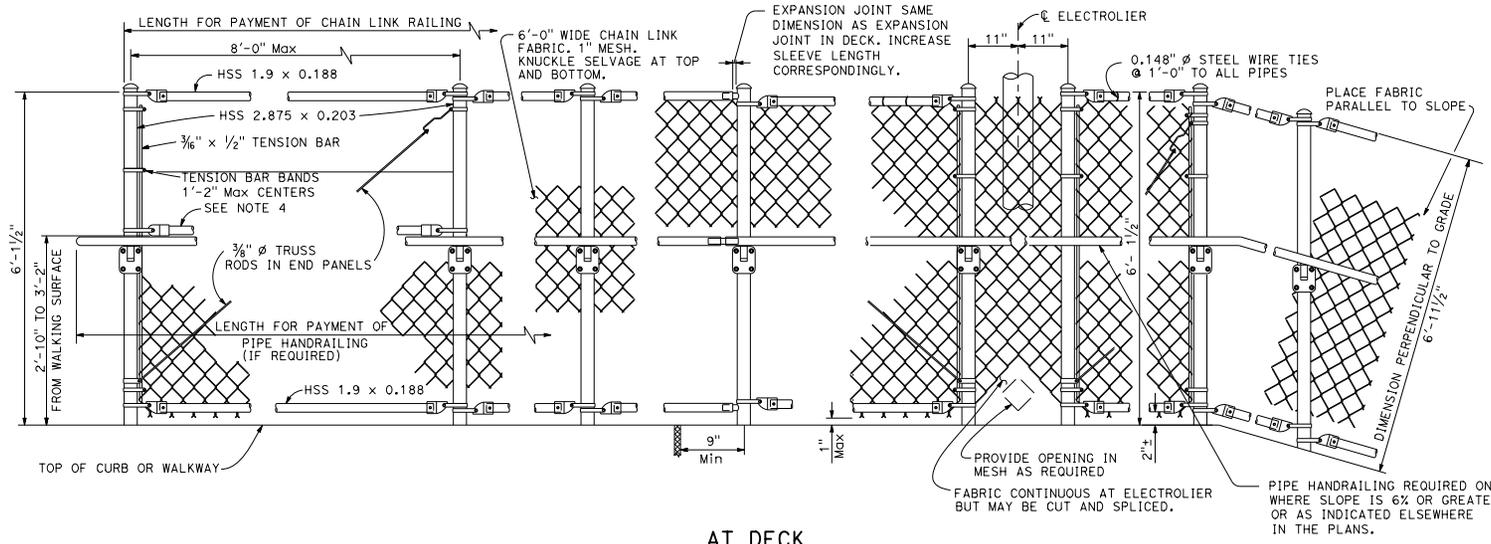
- Indicates Existing Structure
- \* - All approach slab reinforcement shall be epoxy coated and top mat cover  $2\frac{1}{2}"$  clear in Freeze-Thaw Area.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**STRUCTURE APPROACH  
TYPE R (30)**  
NO SCALE

RSP B9-2 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN B9-2  
DATED MAY 31, 2018 - PAGE 353 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B9-2**

2018 REVISED STANDARD PLAN RSP B9-2



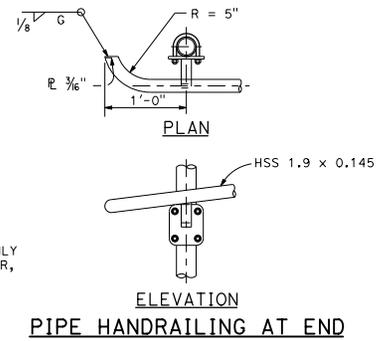
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

REGISTERED CIVIL ENGINEER

October 16, 2020  
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_



END POST

INTERMEDIATE POSTS

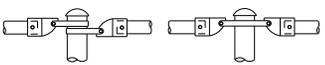
AT DECK

EXPANSION JOINTS

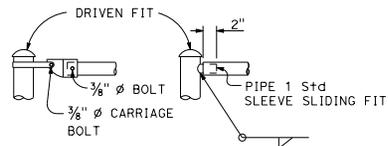
AT ELECTROLIER

ON SLOPES

PIPE HANDRAILING AT END



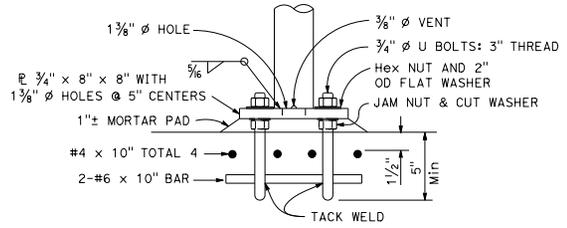
ALTERNATIVE DETAILS



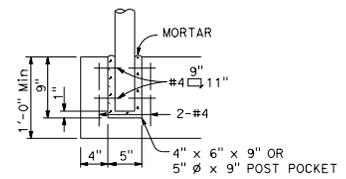
TYPICAL CONNECTION DETAILS

NOTES:

1. Peen all bolt threads.
2. Railing shall conform to horizontal and vertical alignment. Posts shall be vertical. Top and bottom pipes shall be bent if radius is 148'-0" or less; may be on 8'-0" chords if radius is over 148'-0".
3. When railing is on slope, 6'-0" chain link fabric shall be placed parallel to slope.
4. Additional HSS 1.9 x 0.188 required when radius is less than 150'-0".



ANCHORAGE DETAIL

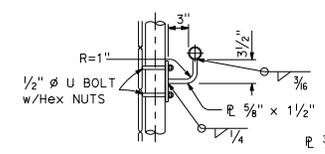
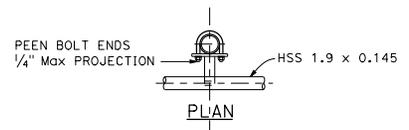


ALTERNATIVE ANCHORAGE DETAIL

May be used when thickness of concrete is 1'-0" or more.

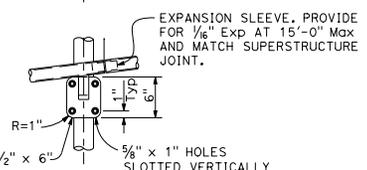
DESIGN NOTES

- DESIGN:  
AASHTO LRFD Bridge Design Specifications 8th Edition 2017 with California Amendments April 2019
- CONCRETE:  
 $f_y = 60$  ksi  
 $f'_c = 3.6$  ksi
- STRUCTURAL STEEL  
HSS:  $f_y = 50$  ksi



SIDE VIEW

PIPE HANDRAILING BRACKET



ELEVATION

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CHAIN LINK RAILING**  
NO SCALE

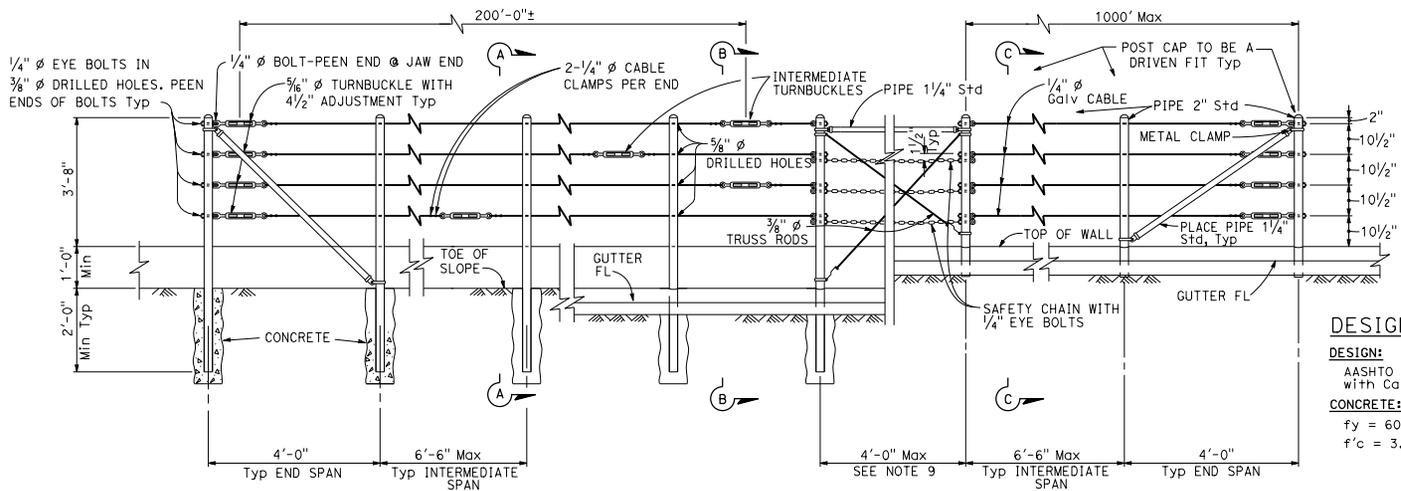
RSP B11-7 DATED OCTOBER 16, 2020 SUPERSEDES STANDARD PLAN B11-7 DATED MAY 31, 2018 - PAGE 358 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP B11-7**

2018 REVISED STANDARD PLAN RSP B11-7

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER  
 Tiliot Satter  
 No. C42892  
 Exp. 3-31-22  
 CIVIL  
 STATE OF CALIFORNIA

October 16, 2020  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



EXISTING WALL (WITHOUT GUTTER) Existing  
 RETAINING WALL (WITH GUTTER) Existing  
 RETAINING WALL (WITH GUTTER) New construction

**ELEVATION**

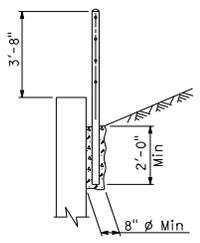
**DESIGN NOTES**

**DESIGN:**  
 AASHTO LRFD Bridge Design Specifications 8th Edition 2017 with California Amendments April 2019

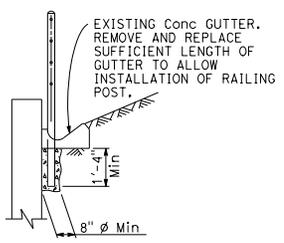
**CONCRETE:**  
 fy = 60 ksi  
 f'c = 3.6 ksi

**NOTES:**

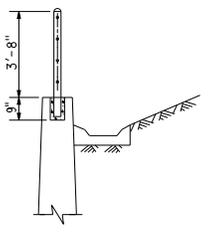
- Maximum distance between turnbuckles shall be 200'-0"±.
- Intermediate turnbuckles to be placed in adjacent spans.
- Cable shall not be spliced between intermediate turnbuckles and end posts.
- Posts to be vertical.
- Alignment of holes in posts may vary to conform to slope of top of retaining wall.
- The Contractor shall verify all dependent dimensions in the field before ordering or fabricating any material.
- Line posts shall be braced horizontally and trussed diagonally in both directions at intervals not to exceed 1000'.
- Post pockets to be centered in top of wall.
- Typical end spans, braced in both directions, shall be constructed at changes in line where the angle of deflection is 15° or more.
- Shall not be used for pedestrian walkways.



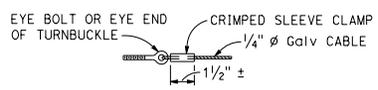
SECTION A-A Existing



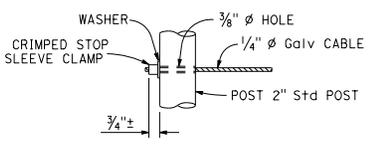
SECTION B-B Existing



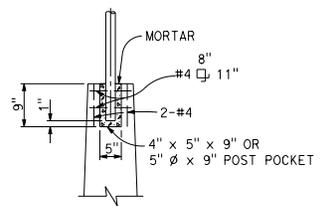
SECTION C-C New construction



ALTERNATIVE CABLE CONNECTION



ALTERNATIVE DEAD END ANCHORAGE



POST POCKET

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**CABLE RAILING**  
 NO SCALE

RSP B11-47 DATED OCTOBER 16, 2020 SUPERSEDES STANDARD PLAN B11-47  
 DATED MAY 31, 2018 - PAGE 359 OF THE STANDARD PLANS BOOK DATED 2018.

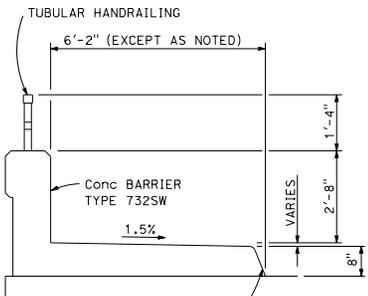
**REVISED STANDARD PLAN RSP B11-47**

2018 REVISED STANDARD PLAN RSP B11-47

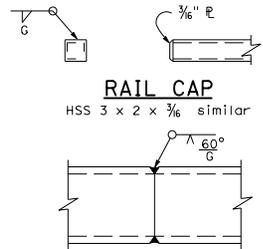
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER  
 Tiliot Satter  
 No. C42892  
 Exp. 3-31-22  
 CIVIL  
 STATE OF CALIFORNIA

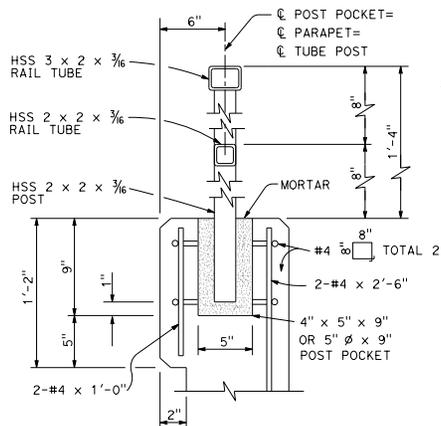
October 16, 2020  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



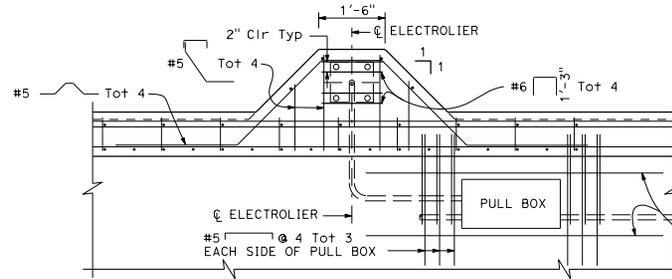
TYPICAL SECTION



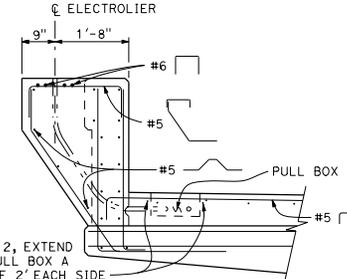
TUBE-WELDED SPLICE



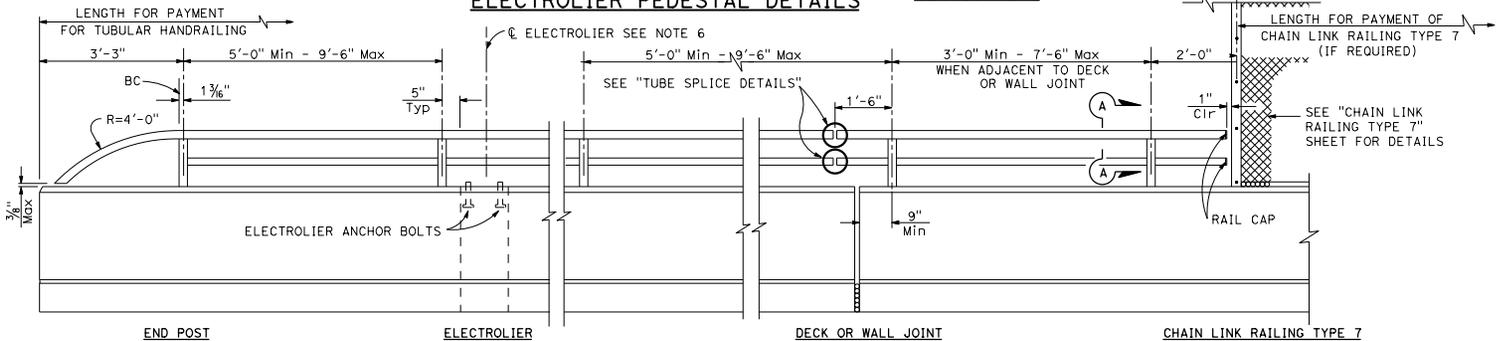
POST ANCHORAGE DETAILS



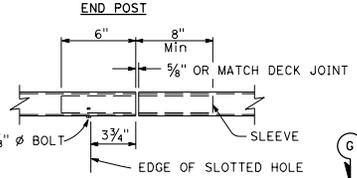
PLAN



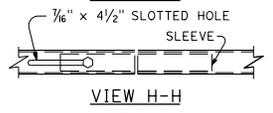
SECTION B-B



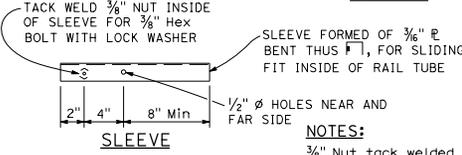
ELEVATION



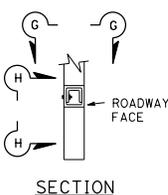
VIEW G-G



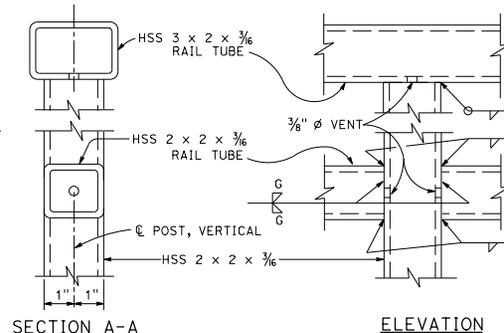
VIEW H-H



TUBE SPLICE DETAILS



SECTION



SECTION A-A

RAIL CONNECTION DETAILS

DESIGN NOTE:  
 AASHTO LRFD Bridge Design Specifications 8th Edition 2017 with California Amendments April 2019

- NOTES:
1. Post shall be normal to railing.
  2. Rail tubes shall be shop bent or fabricated to fit horizontal curve when radius is less than 950'.
  3. Tube splices shall be located in the tubes spanning deck or wall joints. Increase joint width in tubes to match expansion joint width and increase sleeve length correspondingly.
  4. Top rail tube shall be continuous over not less than two posts except a short post spacing is permitted near deck or wall joints, electroliers, or other rail discontinuities as noted.
  5. For details and reinforcement not shown see Standard Plan B11-58.
  6. For electrolier mounting details, see Revised Standard Plan RSP ES-6A and Standard Plan ES-6B.

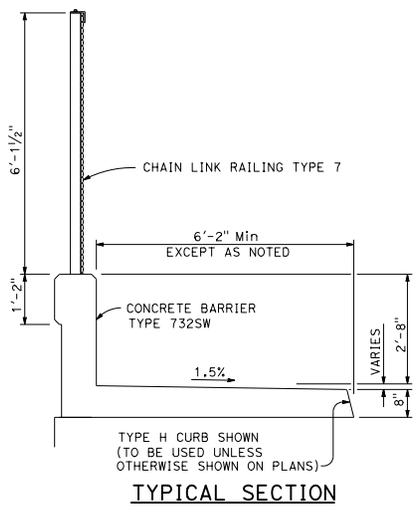
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TUBULAR HANDRAILING**

NO SCALE

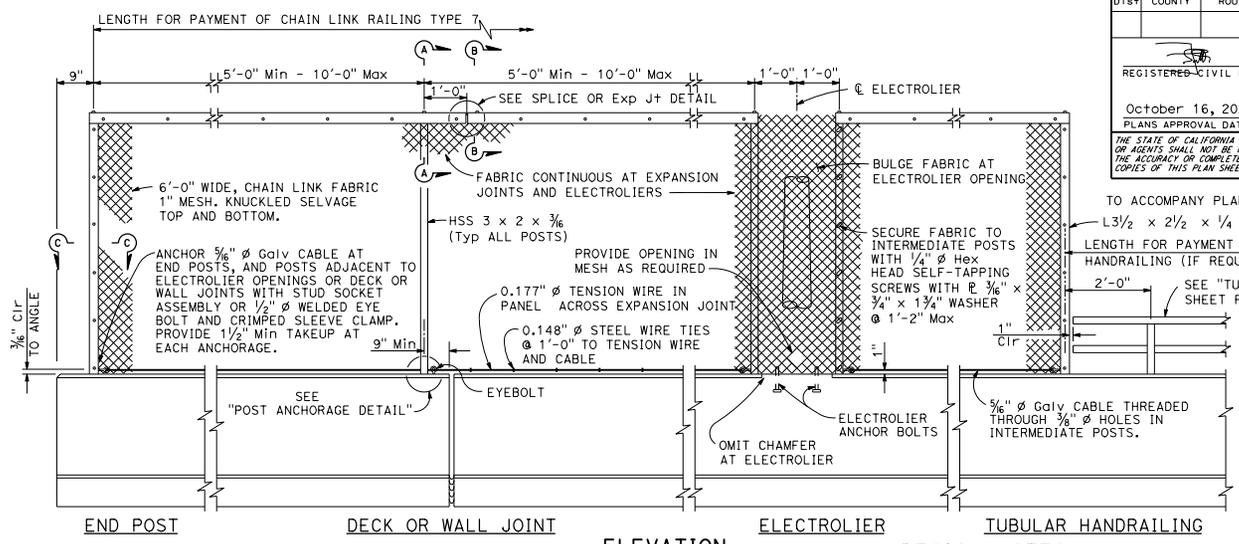
RSP B11-51 DATED OCTOBER 16, 2020 SUPERSEDES RSP B11-51 DATED OCTOBER 18, 2019 AND STANDARD PLAN B11-51 DATED MAY 31, 2018 - PAGE 360 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B11-51**

2018 REVISED STANDARD PLAN RSP B11-51



**TYPICAL SECTION**



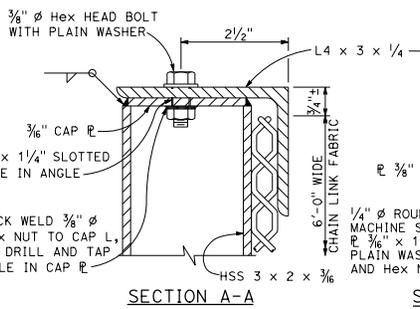
**ELEVATION**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

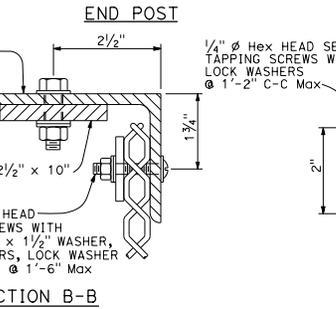
REGISTERED CIVIL ENGINEER  
 Tiliot Satter  
 No. C42892  
 Exp. 3-31-22  
 CIVIL  
 STATE OF CALIFORNIA

October 16, 2020  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

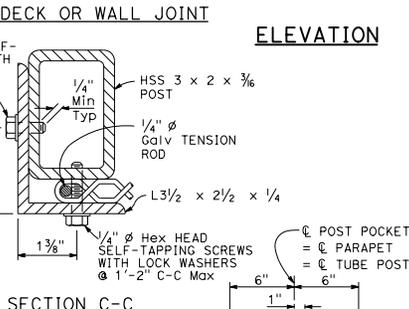
TO ACCOMPANY PLANS DATED \_\_\_\_\_  
 LENGTH FOR PAYMENT OF TUBULAR HANDRAILING (IF REQUIRED)  
 SEE "TUBULAR HANDRAILING" SHEET FOR DETAILS.



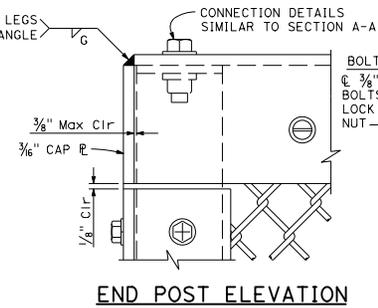
**SECTION A-A**



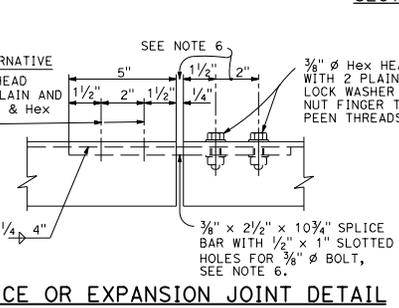
**SECTION B-B**



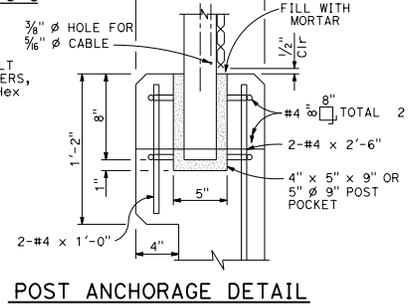
**SECTION C-C**



**END POST ELEVATION**



**SPLICE OR EXPANSION JOINT DETAIL**



**POST ANCHORAGE DETAIL**

**DESIGN NOTES**

**DESIGN:**  
 AASHTO LRFD Bridge Design Specifications 8th Edition 2017 with California Amendments April 2019

**CONCRETE:**  
 fy = 60 ksi  
 f'c = 3.6 ksi

**NOTES:**

1. Posts shall be vertical.
2. Railing shall conform to horizontal and vertical alignment. When railing is placed on a curved horizontal alignment with radius of 148'-0" or less, thread the 3/8" diameter cable through 3/8" diameter welded eye rods embedded 4" into the top of the concrete parapet and equally spaced to limit the midordinate distance between the 3/8" diameter cable and the curve to 1" maximum. Horizontal angle shall be bent to conform to horizontal alignment if radius is 148'-0" or less and may be on 10'-0" chords if radius is over 148'-0".
3. Horizontal angle shall be continuous over not less than two intermediate posts, except that a shorter length is permitted at expansion joints, electroliers and other rail discontinuities.
4. When rail is on slope, place fabric parallel to slope.
5. For details and reinforcement not shown see Standard Plan B11-58.
6. Expansion joint same dimension as expansion joint in deck or wall. Increase slotted hole length and splice bar length correspondingly.
7. Design valid for bridges with the top of Chain Link Railing Type 7 equal to or less than 150' height above surrounding ground surfaces.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

**CHAIN LINK RAILING  
 TYPE 7**

NO SCALE

RSP B11-52 DATED OCTOBER 16, 2020 SUPERSEDES STANDARD PLAN B11-52 DATED MAY 31, 2018 - PAGE 361 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B11-52**

2018 REVISED STANDARD PLAN RSP B11-52

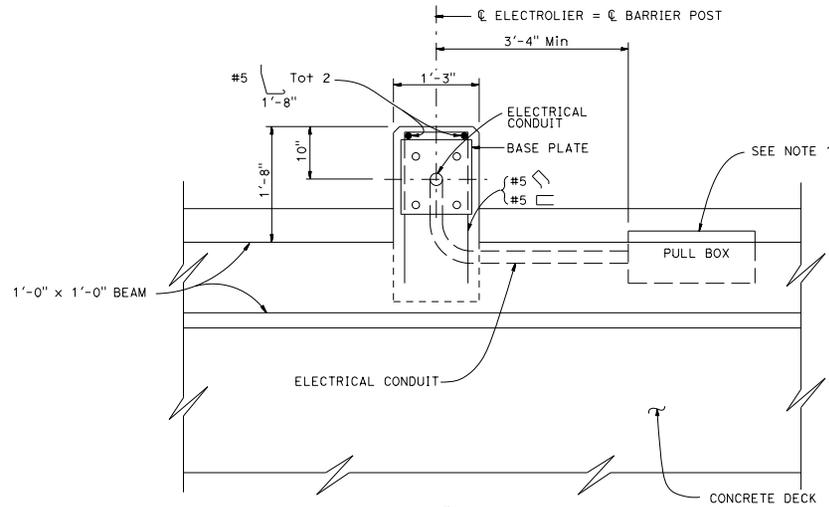
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

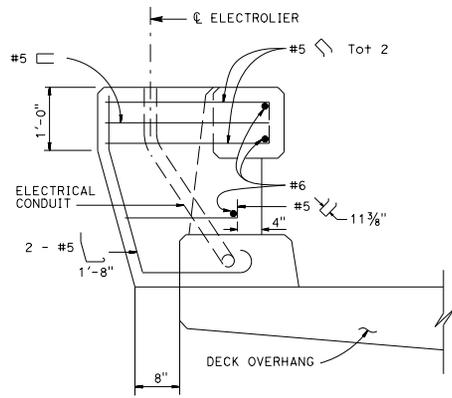
Tillot Satter  
No. C42892  
Exp. 3-31-22  
CIVIL  
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS  
OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
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**PLAN**

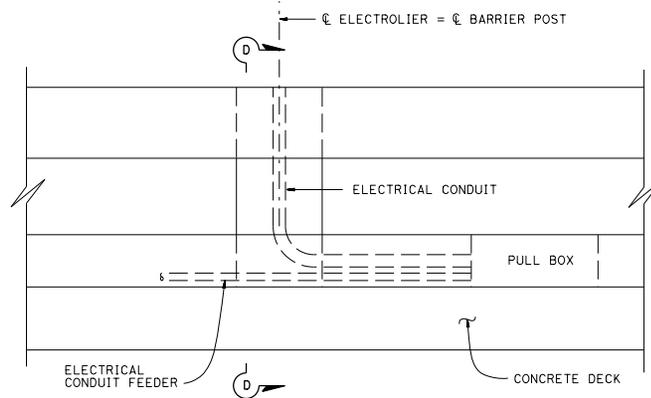
Bend #5 and #8 Reinf in curb as required to clear pull box.



**SECTION D-D**

**BARRIER MODIFICATION FOR ELECTROLIER**

See Note 4



**ELEVATION**

**ELECTROLIER NOTES:**

1. See Project Plans for electrolier and pull box locations.
2. For electrical details, see Standard Plans ES-9A and ES-9B, and Revised Standard Plans RSP ES-9C, RSP ES-9D, and RSP ES-9E.
3. This barrier is designed to accommodate only two 1/2" electrical conduit for electroliers on the structure. Any transporting of larger conduit is restricted to within the structure.
4. Only the additional reinforcing for the electrolier pedestal is shown. For other typical reinforcing for Type 80 Barrier, see Standard Plan B11-60.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CONCRETE BARRIER  
TYPE 80  
(SHEET 2 of 2)**

NO SCALE

RSP B11-61 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B11-61  
DATED MAY 31, 2018 - PAGE 368 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B11-61**

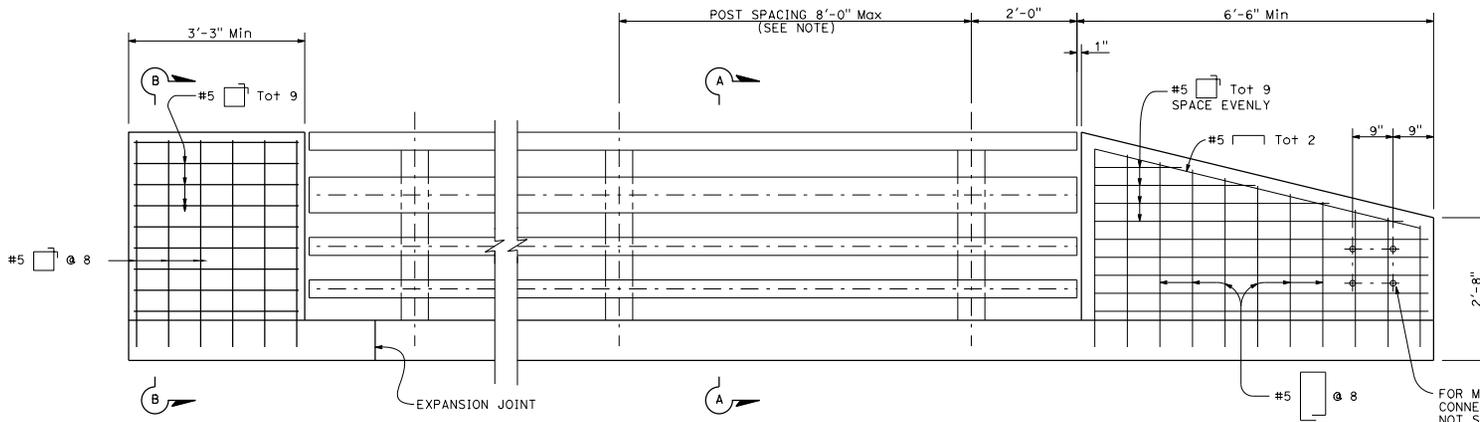
2018 REVISED STANDARD PLAN RSP B11-61

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

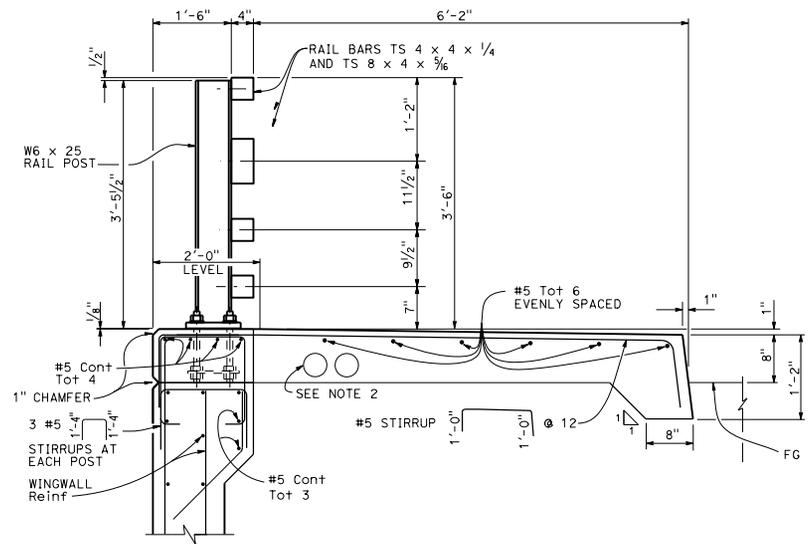
REGISTERED CIVIL ENGINEER 	
October 18, 2019 PLANS APPROVAL DATE	
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TO ACCOMPANY PLANS DATED \_\_\_\_\_



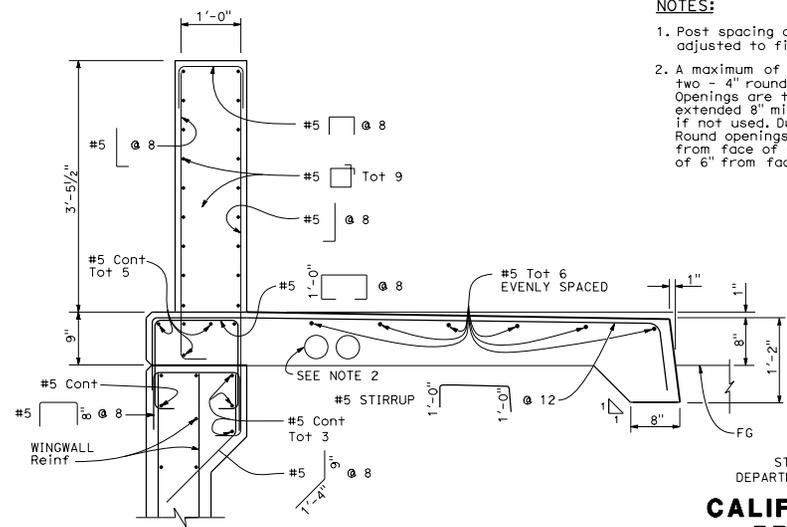
**END OF RAILING ELEVATION**

FOR METAL RAILING CONNECTION DETAILS NOT SHOWN, SEE STANDARD PLANS A77V1 AND A77V2.



**SECTION A-A**

For details not shown, see Typical Section



**SECTION B-B**

For details not shown, see Typical Section

**NOTES:**

1. Post spacing and/or end block length to be adjusted to fit bridge length or wingwall length.
2. A maximum of six - 4" and a minimum of two - 4" round openings for future utilities. Openings are to be sealed at ends and extended 8" minimum past end of sidewalk. If not used, Duct Forms are to be tied down. Round openings are to be a minimum of 1'-6" from face of sidewalk curb and a minimum of 6" from face of rail.

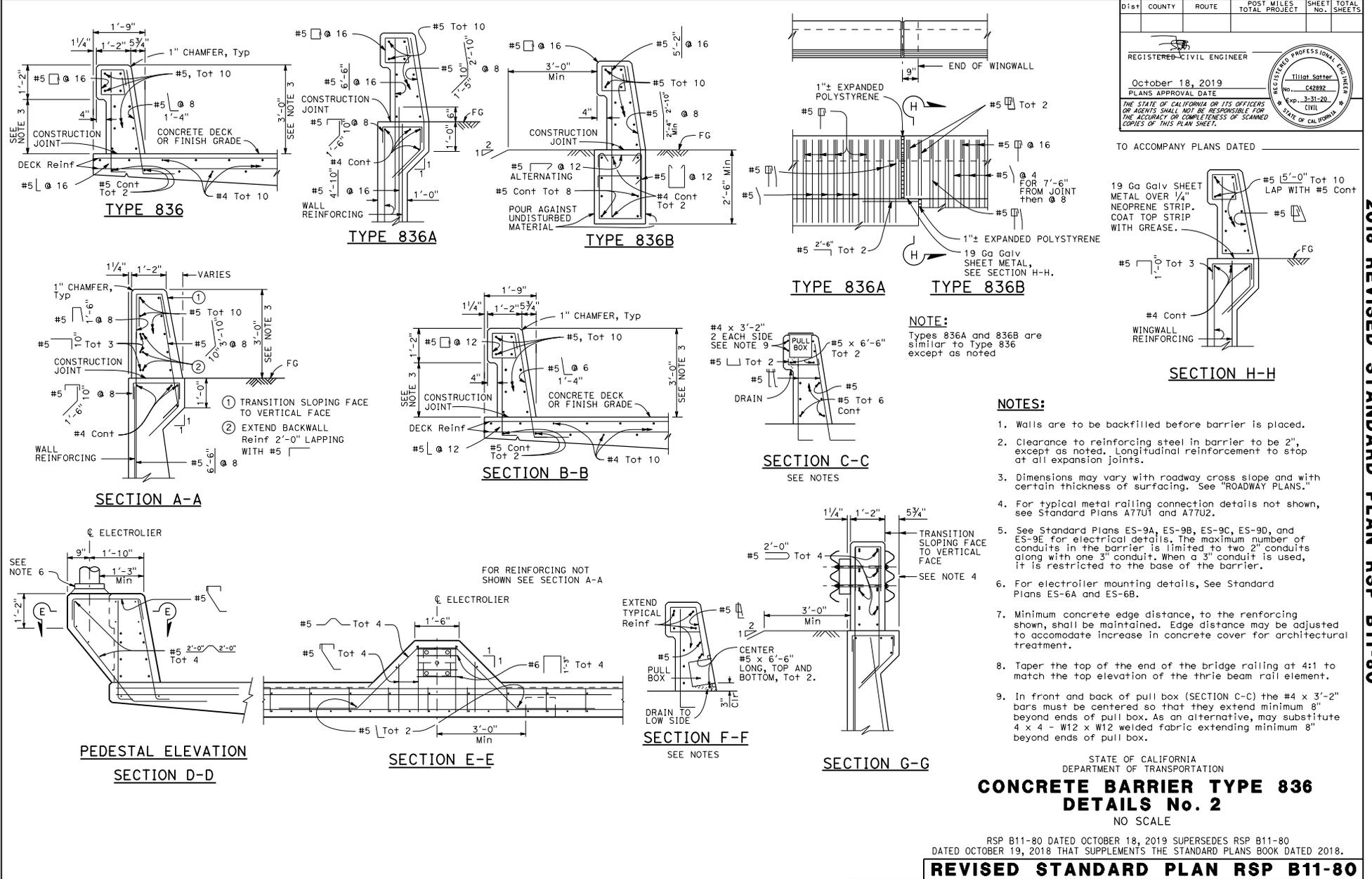
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CALIFORNIA ST-40  
BRIDGE RAIL  
(SHEET 2 OF 2)**  
NO SCALE

RSP B11-67 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN B11-67 DATED MAY 31, 2018 - PAGE 374 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B11-67**

2018 REVISED STANDARD PLAN RSP B11-67





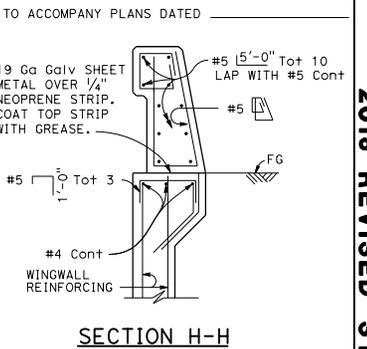
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER  
Tillot Satter  
No. C42892  
Exp. 3-31-20  
CIVIL  
STATE OF CALIFORNIA



2018 REVISED STANDARD PLAN RSP B11-80

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CONCRETE BARRIER TYPE 836**  
**DETAILS No. 2**  
NO SCALE

RSP B11-80 DATED OCTOBER 18, 2019 SUPERSEDES RSP B11-80  
DATED OCTOBER 19, 2018 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B11-80**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

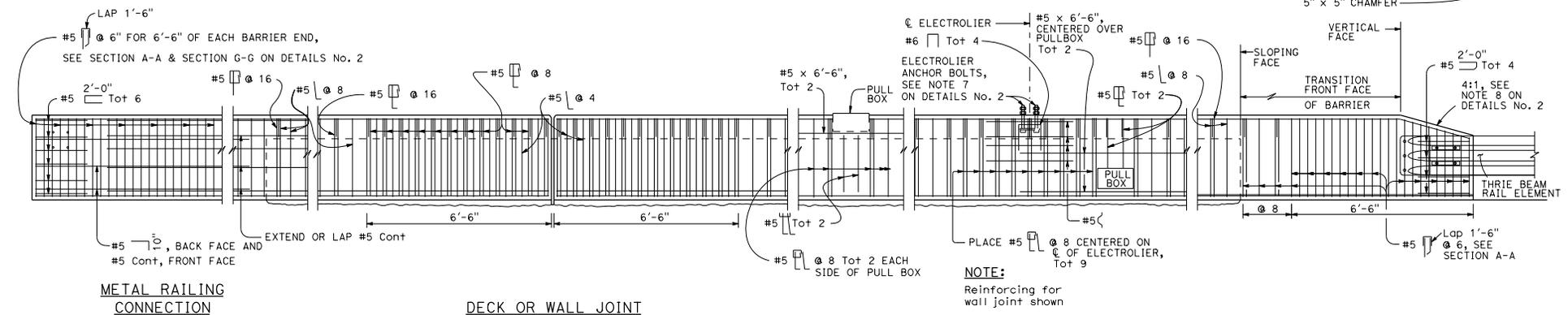
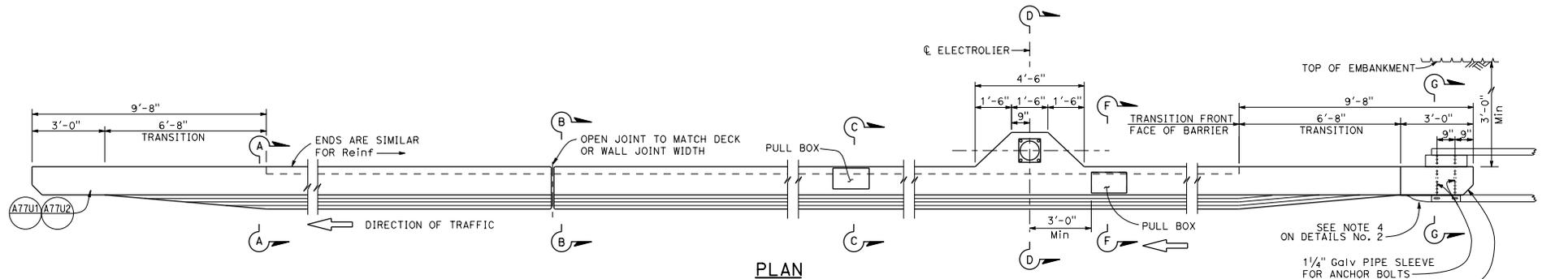
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

Tillot Satter  
No. C42892  
Exp. 3-31-20  
CIVIL  
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_



**ELEVATION**

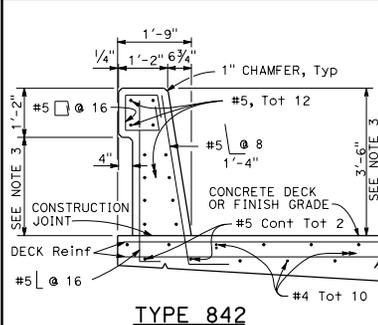
**ELECTROLIER**  
(SEE NOTE 5 ON DETAILS No. 2)

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CONCRETE BARRIER TYPE 842  
DETAILS No. 1**  
NO SCALE

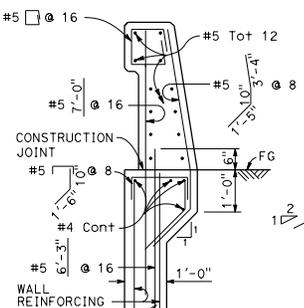
RSP B11-81 DATED OCTOBER 18, 2019 SUPERSEDES RSP B11-81  
DATED OCTOBER 19, 2018 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B11-81**

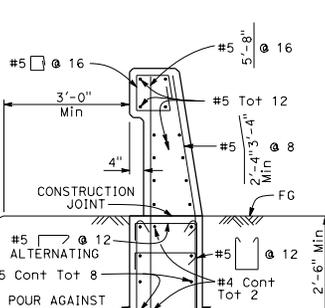
2018 REVISED STANDARD PLAN RSP B11-81



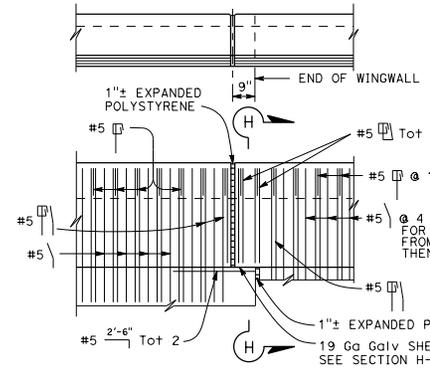
TYPE 842



TYPE 842A

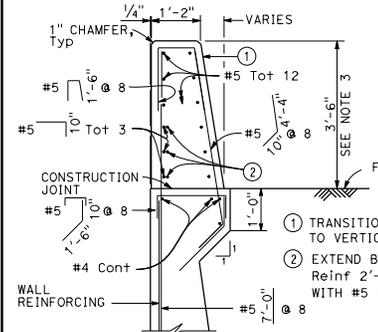


TYPE 842B

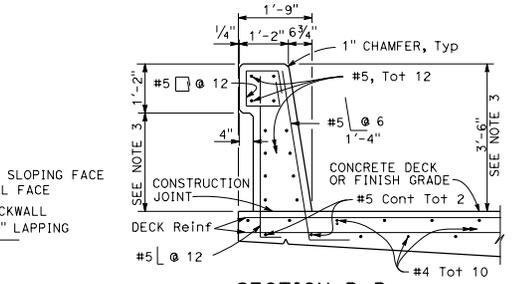


TYPE 842A

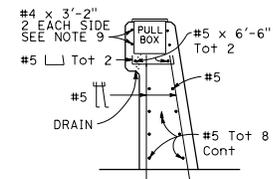
TYPE 842B



SECTION A-A

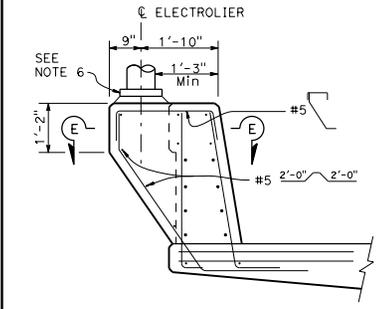


SECTION B-B

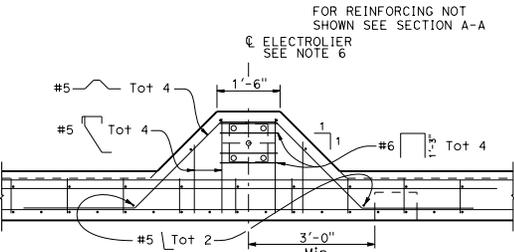


SECTION C-C

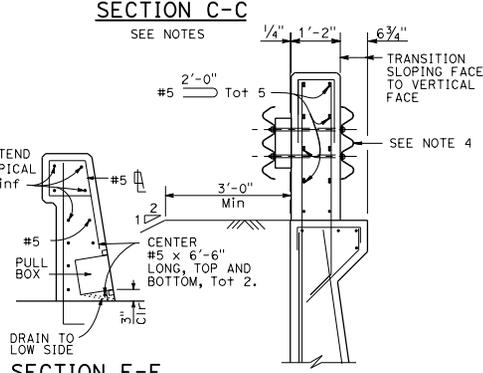
NOTE:  
Types 842A & 842B are similar to Type 842 except as noted



PEDESTAL ELEVATION



SECTION E-E

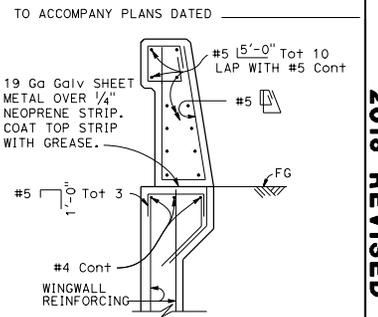


SECTION F-F

SECTION G-G

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

REGISTERED CIVIL ENGINEER  
October 18, 2019  
PLANS APPROVAL DATE  
No. C42892  
Exp. 3-31-20  
Tillett Satter  
PROFESSIONAL ENGINEER  
CIVIL  
STATE OF CALIFORNIA



SECTION H-H

NOTES:

1. Walls are to be backfilled before barrier is placed.
2. Clearance to reinforcing steel in barrier to be 2", except as noted. Longitudinal reinforcement to stop at all expansion joints.
3. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See "ROADWAY PLANS."
4. For typical metal railing connection details not shown, see Standard Plans A77U1 and A77U2.
5. See Standard Plans ES-9A, ES-9B, ES-9C, ES-9D, and ES-9E for electrical details. The maximum number of conduits in the barrier is limited to two 2" conduits along with one 3" conduit. When a 3" conduit is used, it is restricted to the base of the barrier.
6. For electrolier mounting details, See Standard Plans ES-6A and ES-6B.
7. Minimum concrete edge distance, to the reinforcing shown, shall be maintained. Edge distance may be adjusted to accommodate increase in concrete cover for architectural treatment.
8. Taper the top of the end of the bridge railing at 4:1 to match the top elevation of the thrie beam rail element.
9. In front and back of pull box (SECTION C-C) the #4 x 3'-2" bars must be centered so that they extend minimum 8" beyond ends of pull box. As an alternative, may substitute 4 x 4 - W12 x W12 welded fabric extending minimum 8" beyond ends of pull box.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CONCRETE BARRIER TYPE 842  
DETAILS No. 2**

NO SCALE  
RSP B11-82 DATED OCTOBER 18, 2019 SUPERSEDES RSP B11-82  
DATED OCTOBER 19, 2018 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B11-82**

2018 REVISED STANDARD PLAN RSP B11-82

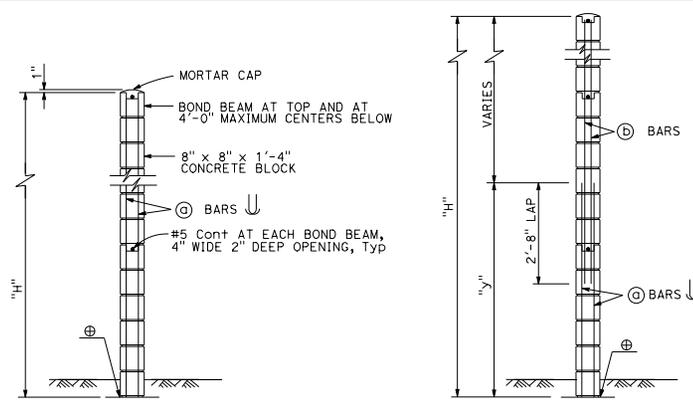
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
Tillot Satter  
No. C42892  
Exp. 3-31-22  
CIVIL  
STATE OF CALIFORNIA

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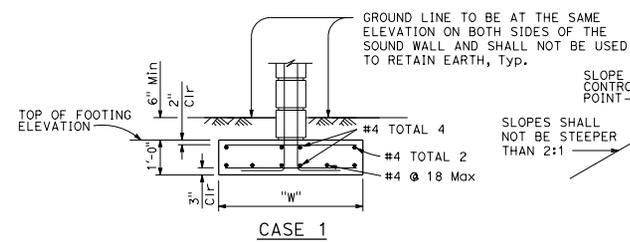


H=6'-0" THRU H=10'-0"

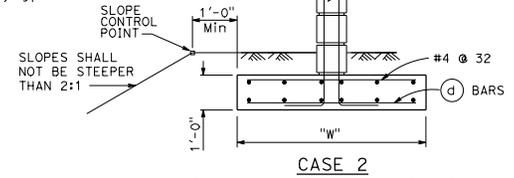
H=12'-0" THRU H=16'-0"  
For details not shown, see H=6'-0" thru H=10'-0".

**TYPICAL SECTION**

⊕ Full mortar bed at bottom of wall



For details not shown, see Case 2.  
Level ground (±10%) on both sides of the sound wall.



For details not shown, see Case 1.  
Level ground (±10%) on the traffic side of the sound wall and sloping ground on the opposite side.

**SPREAD FOOTING SECTION**

**SOUND WALL REINFORCEMENT TABLE**

MAXIMUM H	⊕ BARS @ 1'-4" Max	Ⓧ BARS @ 1'-4" Max	"y"
6'-0"	#4		
8'-0"	#4		
10'-0"	#4		
12'-0"	#5	#4	6'-0"
14'-0"	#6	#4	8'-0"
16'-0"	#6	#4	10'-0"

**TRENCH FOOTING**

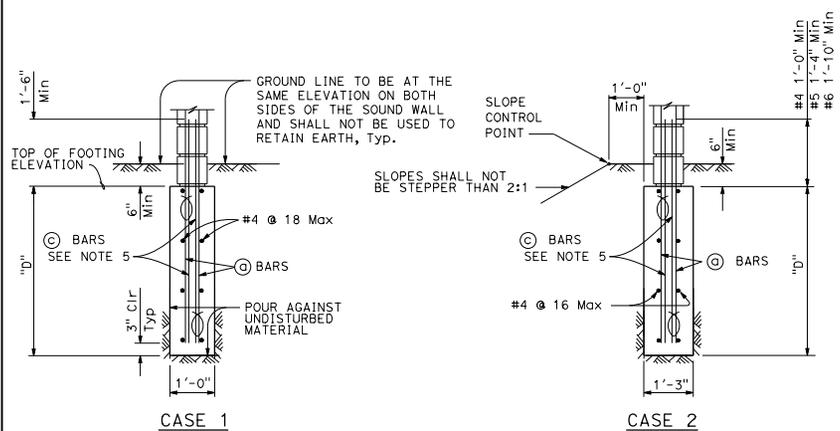
MAXIMUM H	CASE 1			CASE 2		Ⓧ BARS @ 1'-4" Max
	⌀ = 25 Min D	⌀ = 30 Min D	⌀ = 35 Min D	⌀ = 30 Min D	⌀ = 35 Min D	
6'-0"	5'-3"	4'-3"	3'-9"	7'-9"	5'-0"	
8'-0"	6'-0"	5'-0"	4'-6"	8'-9"	6'-0"	#4
10'-0"	6'-9"	5'-9"	5'-0"	10'-0"	6'-9"	#4
12'-0"	7'-9"	6'-6"	5'-6"	11'-0"	7'-9"	#5
14'-0"	8'-6"	7'-3"	6'-0"	11'-9"	8'-6"	#5
16'-0"	9'-3"	7'-9"	6'-6"	12'-9"	9'-3"	#6

Case 1 - Level ground (±10%) on both sides of the sound wall.  
Case 2 - Level ground (±10%) on both sides of the sound wall and sloping ground on opposite side.

**SPREAD FOOTING**

MAXIMUM H	W	Ⓧ BARS
6'-0"	3'-3"	#5 @ 16
8'-0"	4'-0"	#5 @ 16
10'-0"	5'-0"	#5 @ 16
12'-0"	5'-9"	#5 @ 16
14'-0"	6'-6"	#4 @ 8
16'-0"	7'-6"	#4 @ 8

LEGEND:  
Ⓧ Bundled reinforcement



For details not shown, see Case 2.  
Level ground (±10%) on both sides of the sound wall.

For details not shown, see Case 1.  
Level ground (±10%) on one side of the sound wall and sloping ground on the opposite side.

**TRENCH FOOTING SECTION**

**NOTES:**

- For type of block and joint finish, see other sheets.
- When blocks are laid in stacked bond, ladder type, galvanized joint reinforcement shall be provided. A minimum of 2-9 gauge wires continuous at 4'-0" maximum to be used. Locate reinforcement in joints that are at the approximate midpoint between bond beams.
- Horizontal joints shall be tooled concave or may be weathered. Vertical joints shall be tooled concave or may be raked.
- For intermediate wall heights that are between the "H"s given, use the tabular information for the next higher "H".
- Bundle additional ⊕ bars with typical ⊕ bars.
- If wall is placed behind traffic barriers, clear distance from face of barrier to face of wall must exceed 4'-0". Wall is not designed for impact loading.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**SOUND WALL MASONRY BLOCK ON FOOTING DETAILS (1)**

NO SCALE

RSP B15-1 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-1 DATED MAY 31, 2018 - PAGE 390 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP B15-1**

2018 REVISED STANDARD PLAN RSP B15-1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

Tillot Satter  
No. C42892  
Exp. 3-31-22  
CIVIL

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

### DESIGN NOTES

DESIGN:  
AASHTO LRFD Bridge Design Specifications,  
8th Edition, TMS 402-13  
2016 California Building Code

DESIGN WIND LOAD:  
36.5 psf

DESIGN SEISMIC LOAD:  
0.57 Dead Load

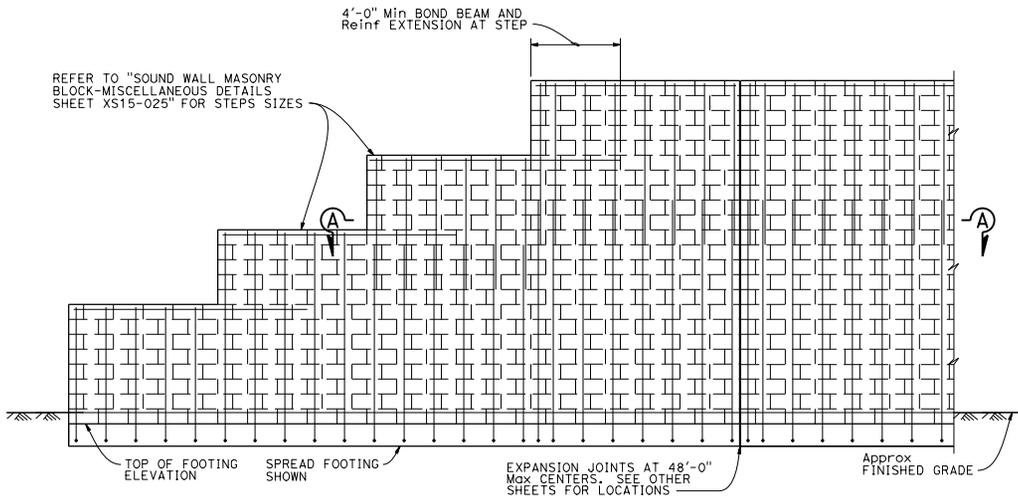
REINFORCED CONCRETE &  
CONCRETE MASONRY:  
 $f_y = 60$  ksi  
 $f'_c = 3.6$  ksi  
 $f'_m = 2000$  psi \*

\* Provide materials to achieve  
the net compressive strength  
of concrete masonry unit equal  
or greater than the specified  $f'_m$ .

TO ACCOMPANY PLANS DATED \_\_\_\_\_

#### NOTE:

- For details not shown, see "SOUND WALL MASONRY BLOCK ON FOOTING-DETAILS No. 1" SHEET



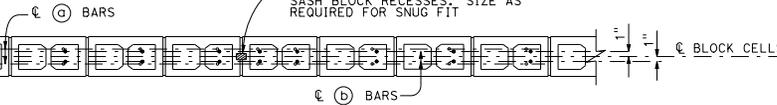
### ELEVATION

CELLS WITH VERTICAL Reinf AND BOND BEAMS TO BE FILLED WITH GROUT

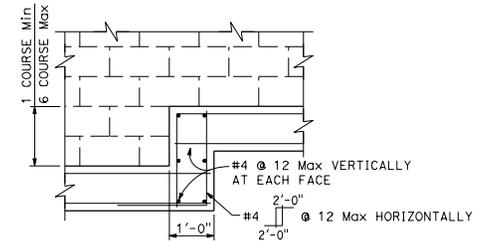


SEE NOTE 3 ON "SOUND WALL MASONRY BLOCK ON FOOTING-DETAILS No. 1" SHEET

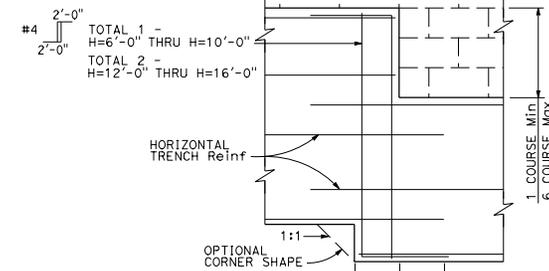
AT EXPANSION JOINTS: CONTINUOUS EXPANSION JOINT FILLER PLACED IN SASH BLOCK RECESSES. SIZE AS REQUIRED FOR SNUG FIT



### SECTION A-A



### SPREAD FOOTING



### TRENCH FOOTING

### FOOTING STEP DETAILS

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

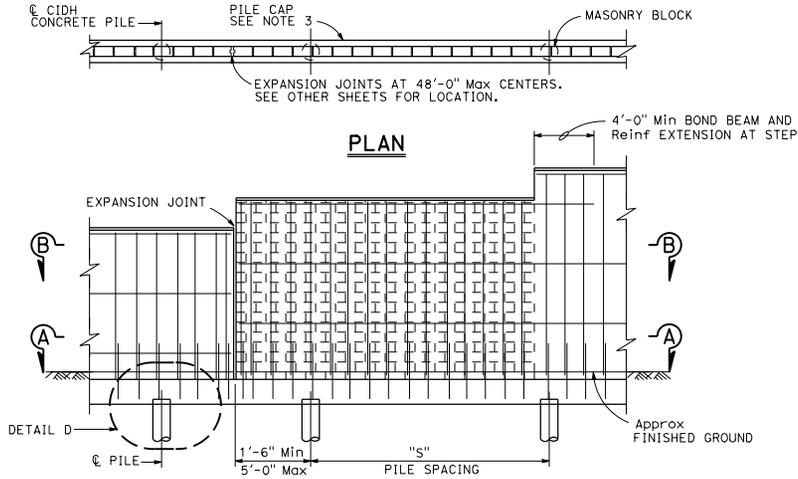
## SOUND WALL MASONRY BLOCK ON FOOTING DETAILS (2)

NO SCALE

RSP B15-2 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-2  
DATED MAY 31, 2018 - PAGE 391 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B15-2**

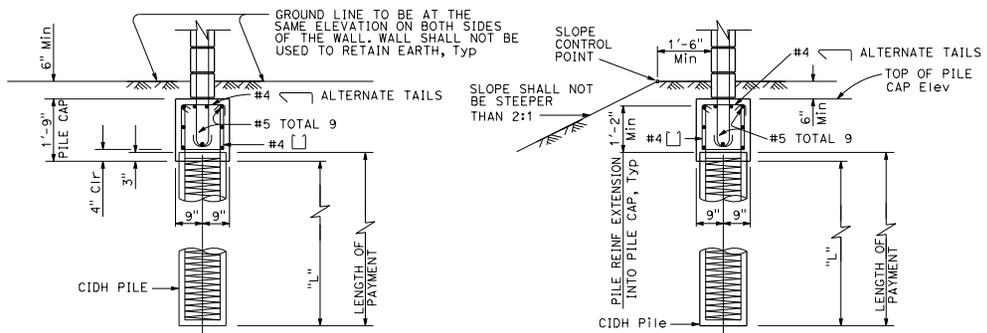
2018 REVISED STANDARD PLAN RSP B15-2



**ELEVATION C-C**

**Note:**  
For "DETAIL D", See "SOUND WALL MASONRY BLOCK ON PILE CAP-DETAILS No. 3" sheet.

**Note I:** For sections and details not shown, see "SOUND WALL MASONRY BLOCK ON PILE CAP - DETAILS No. 2" and "MASONRY BLOCK SOUND WALL ON PILE CAP - DETAILS No. 3" sheets.  
**Note II:** See "SOUND WALL MASONRY BLOCK MISCELLANEOUS DETAILS" sheet for other details.



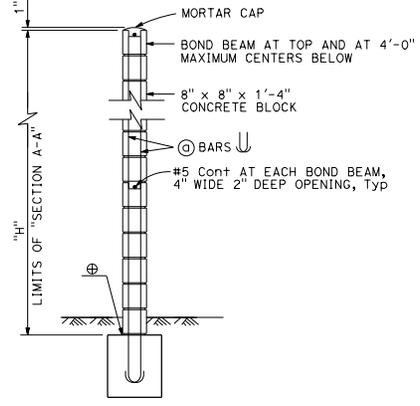
**PILE CAP SECTION**

For details not shown, see Case 2.  
Level ground (±10%) on one side of the sound wall.

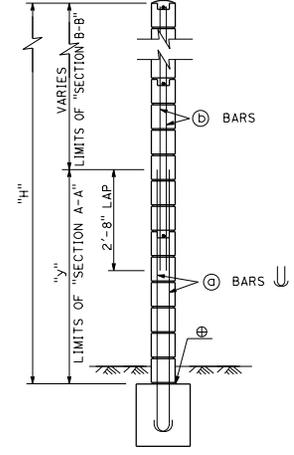
For details not shown, see Case 1.  
Level ground (±10%) on one side of the sound wall and sloping ground on the opposite side.

**SOUND WALL REINFORCEMENT TABLE**

MAXIMUM H	(a) BARS @ 1'-4" Max	(b) BARS @ 1'-4" Max	"y"
6'-0"	#4		
8'-0"	#4		
10'-0"	#4		
12'-0"	#5	#4	6'-0"
14'-0"	#6	#4	8'-0"
16'-0"	#6	#4	10'-0"



**H=6'-0" THRU H=10'-0"**



**H=12'-0" THRU H=16'-0"**

For details not shown, see H=6'-0" thru H=10'-0".

**TYPICAL SECTION**

⊕ Full mortar bed at bottom of wall.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**SOUND WALL  
MASONRY BLOCK ON PILE CAP  
DETAILS (1)**

NO SCALE

RSP B15-3 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-3  
DATED MAY 31, 2018 - PAGE 392 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B15-3**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

REGISTERED CIVIL ENGINEER  
Tillot Satter  
No. C42892  
Exp. 3-31-22  
CIVIL  
STATE OF CALIFORNIA

April 17, 2020  
PLANS APPROVAL DATE

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

2018 REVISED STANDARD PLAN RSP B15-3

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
Tillot Satter  
No. C42892  
Exp. 3-31-22  
CIVIL  
STATE OF CALIFORNIA

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**GENERAL NOTES:**

1. For type of block and joint finish, see other sheets.
2. When blocks are laid in stacked bond, ladder type, galvanized joint reinforcement shall be provided. A minimum of 2-9 gauge wires continuous at 4'-0" maximum to be used. Locate reinforcement in joints that are at the approximate midpoint between bond beams.
3. Horizontal joints shall be tooled concave or may be weathered. Vertical joints shall be tooled concave or may be raked.
4. For intermediate wall heights that are between the "H's" given, use the tabular information for the next higher "H".
5. If wall is placed behind traffic barriers, clear distance from face of barrier to face of wall must exceed 4'-0". Wall is not designed for impact loading.

**DESIGN NOTES**

DESIGN:  
AASHTO LRFD Bridge Design Specifications,  
8th Edition, TMS 402-13  
2016 California Building Code

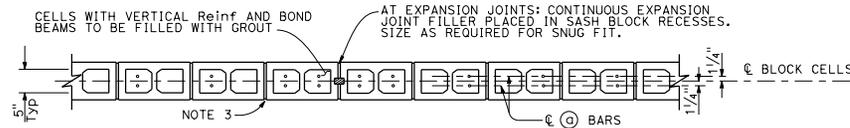
DESIGN WIND LOAD:  
36.5 psf

DESIGN SEISMIC LOAD:  
0.57 Dead Load

REINFORCED CONCRETE &  
CONCRETE MASONRY:  
f<sub>y</sub> = 60 ksi  
f'<sub>c</sub> = 3.6 ksi  
f'm = 2000 psi \*

\* Provide materials to achieve the net compressive strength of concrete masonry unit equal or greater than the specified f'm.

TO ACCOMPANY PLANS DATED \_\_\_\_\_



**SECTION A-A**

For details not shown, see other sections.

**H=6'-0" THRU H=10'-0"**



**SECTION A-A**

For details not shown, see other sections.

**H=12'-0" THRU H=16'-0"**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**SOUND WALL  
MASONRY BLOCK ON PILE CAP  
DETAILS (2)**  
NO SCALE

RSP B15-4 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-4  
DATED MAY 31, 2018 - PAGE 393 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B15-4**

2018 REVISED STANDARD PLAN RSP B15-4

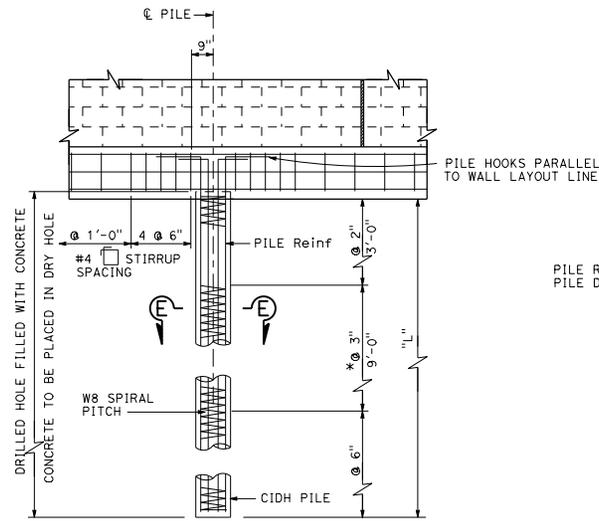
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

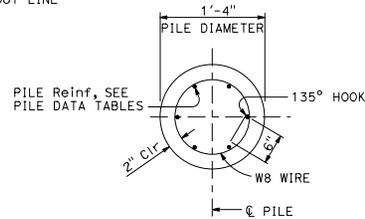
Tillot Satter  
No. C42892  
Exp. 3-31-22  
CIVIL  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF CALIFORNIA

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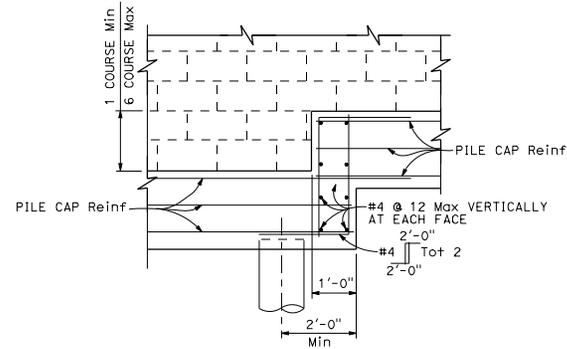


**DETAIL D**

\* @ 2" at option of Contractor



**SECTION E-E**



**PILE CAP STEP DETAIL**

**NOTE:**

- For details not shown, see "SOUND WALL MASONRY BLOCK ON PILE CAP - DETAILS No. 1" and "SOUND WALL MASONRY BLOCK ON PILE CAP - DETAILS No. 2" sheets.

MAXIMUM H	Ø = 25 Min			Ø = 30 Min			Ø = 35 Min			MAXIMUM H
	S	L	PILE Reinf	S	L	PILE Reinf	S	L	PILE Reinf	
6'-0"	16'-0"	9'-6"	#6 Tot 6	16'-0"	7'-6"	#6 Tot 6	16'-0"	6'-0"	#6 Tot 6	6'-0"
8'-0"	16'-0"	10'-6"	#6 Tot 7	16'-0"	8'-6"	#6 Tot 7	16'-0"	7'-0"	#6 Tot 7	8'-0"
10'-0"	16'-0"	11'-6"	#7 Tot 6	16'-0"	9'-6"	#7 Tot 6	16'-0"	8'-0"	#7 Tot 6	10'-0"
12'-0"	15'-0"	12'-6"	#8 Tot 7	16'-0"	10'-6"	#8 Tot 7	16'-0"	8'-6"	#8 Tot 7	12'-0"
14'-0"	13'-0"	13'-0"	#8 Tot 7	14'-0"	11'-0"	#8 Tot 7	14'-0"	9'-0"	#8 Tot 7	14'-0"
16'-0"	12'-0"	13'-6"	#8 Tot 7	13'-0"	11'-6"	#8 Tot 7	13'-0"	9'-6"	#8 Tot 7	16'-0"

Case 1 - Level ground (±10%) on both sides of the sound wall.

MAXIMUM H	Ø = 30 Min			Ø = 35 Min			MAXIMUM H
	S	L	PILE Reinf	S	L	PILE Reinf	
6'-0"	16'-0"	13'-0"	#8 Tot 7	16'-0"	9'-6"	#6 Tot 7	6'-0"
8'-0"	16'-0"	15'-0"	#8 Tot 7	16'-0"	10'-6"	#7 Tot 6	8'-0"
10'-0"	15'-0"	16'-0"	#8 Tot 7	16'-0"	12'-0"	#7 Tot 7	10'-0"
12'-0"	12'-0"	16'-0"	#8 Tot 7	15'-0"	13'-6"	#8 Tot 7	12'-0"
14'-0"	10'-0"	16'-0"	#8 Tot 7	12'-0"	13'-6"	#8 Tot 7	14'-0"
16'-0"	8'-0"	16'-0"	#8 Tot 7	11'-0"	14'-0"	#8 Tot 7	16'-0"

Case 2 - Level ground (±10%) on traffic side of the sound wall and sloping ground on opposite side.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

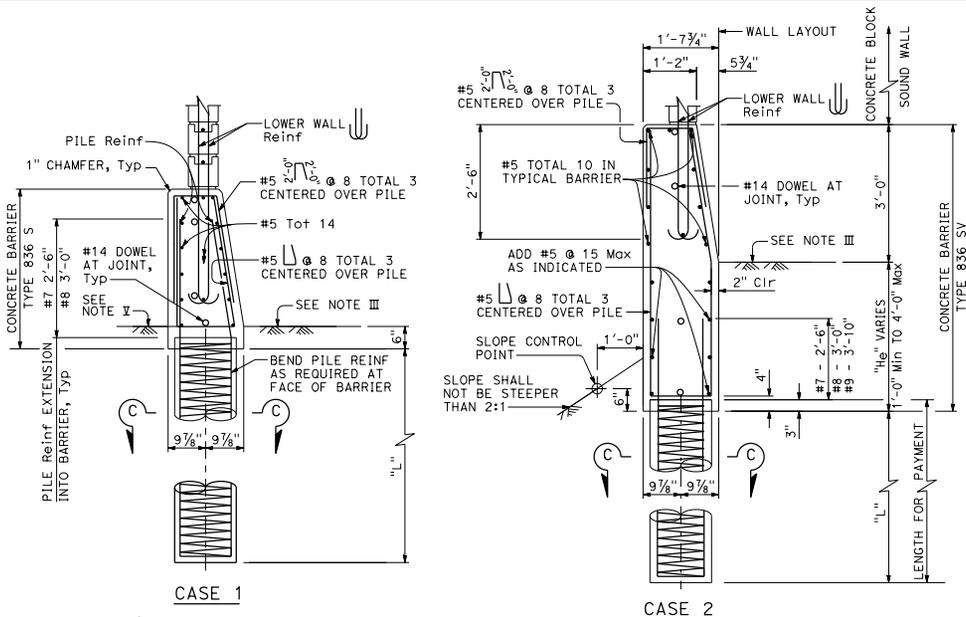
**SOUND WALL  
MASONRY BLOCK ON PILE CAP  
DETAILS (3)**

NO SCALE

RSP B15-5 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-5  
DATED MAY 31, 2018 - PAGE 394 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B15-5**

2018 REVISED STANDARD PLAN RSP B15-5

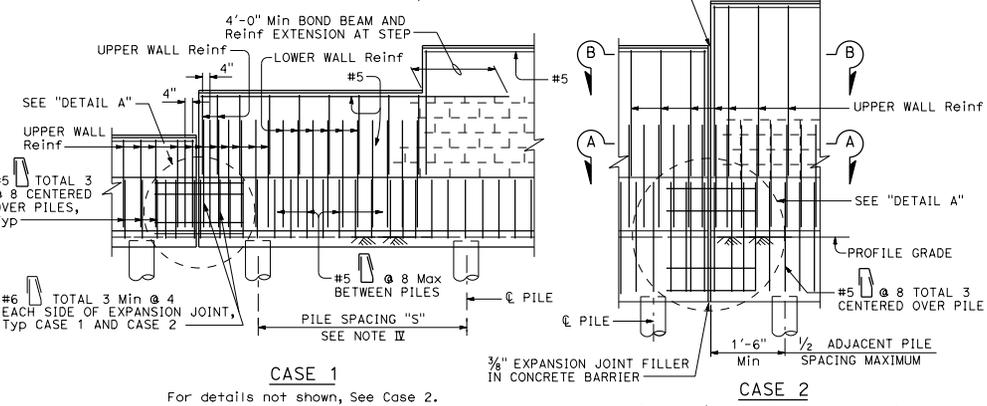


For details not shown, See Case 2.  
Level ground ±10% on both sides of barrier.

For details not shown, See Case 1.  
Level ground ±10% at the traffic side of barrier and sloping ground on the opposite side.

**BARRIER SECTIONS**

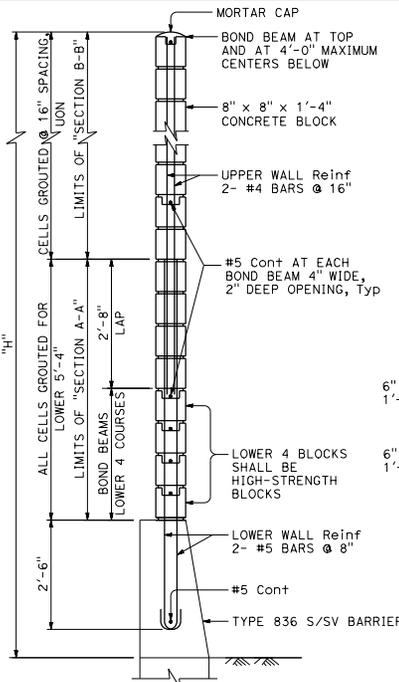
EXPANSION JOINTS AT 96'-0" Max & 24'-0" Min CENTERS IN CONCRETE BARRIER. EXPANSION JOINTS AT 48'-0" Max & 24'-0" Min CENTERS IN MASONRY BLOCK WALL, SEE OTHER SHEETS FOR LOCATIONS



For details not shown, See Case 2.

For details not shown, See Case 1.

**PARTIAL ELEVATIONS**



**TYPICAL SECTION**

See "SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER-DETAILS No. 3" sheet for pile details.

**NOTES I THROUGH VI:**

- I. Details shown are primarily to conform design of sound walls to Type 836S and Type 836 SV Concrete Barriers.
- II. For details and sections not shown, see "SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER-DETAILS No. 2" and "SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER-DETAILS No. 3"
- III. Slope ground at traffic side of barrier to drain. Maximum slope ±10%. See Revised Standard Plan B11-80, Note 3.
- IV. Pile spacing may be varied, but shall not exceed the tabular values. See "SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER-DETAILS No. 3" sheet.
- V. For Case 1 - ground line to be at the same elevation on both sides of the barrier. Barrier shall not be used to retain earth.
- VI. See "SOUND WALL MASONRY BLOCK MISCELLANEOUS DETAILS" sheet for other details.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

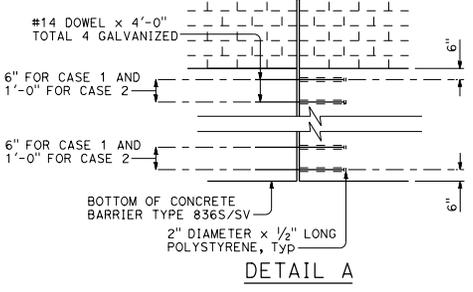
REGISTERED CIVIL ENGINEER  
Tillot Satter  
No. C42892  
Exp. 3-31-22  
CIVIL  
STATE OF CALIFORNIA

April 17, 2020  
PLANS APPROVAL DATE

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

ENCLOSE PORTION OF #14 BAR AND WRAP AROUND #14 BAR WITH 2 LAYERS OF BUILDING PAPER



**NOTES A THROUGH G:**

- A. For type of block, type of block bond, and joint finish, see other sheets.
- B. When blocks are laid in stacked bond, ladder type, galvanized joint reinforcement shall be provided. A minimum of 2-9 gauge wires continuous at 4'-0" maximum to be used. Locate reinforcement in joints that are at the approximate midpoint between bond beams.
- C. Horizontal joints shall be tooled concave or may be weathered. Vertical joints shall be tooled concave or may be raked.
- D. For intermediate wall heights (H), or barrier depths (He), that are between the values given, use the tabular information for the next higher (H) or (He).
- E. Refer to "SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER-DETAILS No. 2" sheet, for masonry strength.
- F. For wall heights = 7'-8", the upper wall reinforcement may be omitted.
- G. Minimum wall height shall be 7'-8". Maximum wall height shall be 16'-4".

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER DETAILS (1)**  
NO SCALE

RSP B15-6 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-6 DATED MAY 31, 2018 - PAGE 395 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B15-6**

2018 REVISED STANDARD PLAN RSP B15-6

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER	
	
April 17, 2020	
PLANS APPROVAL DATE	
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>	

### DESIGN NOTES

DESIGN:  
AASHTO LRFD Bridge Design Specifications,  
8th Edition, TMS 402-13  
2016 California Building Code

DESIGN WIND LOAD:  
36,5 psf

DESIGN SEISMIC LOAD:  
0.57 Dead Load

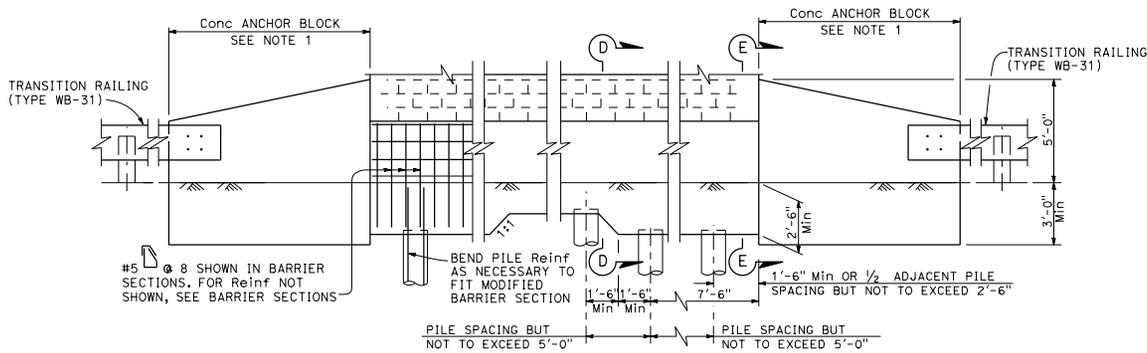
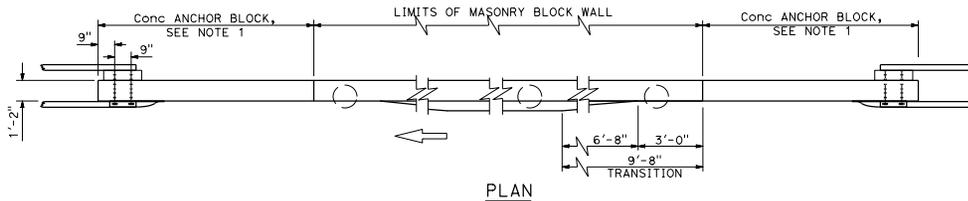
DESIGN IMPACT LOAD:  
TL-3

DESIGN LIVE LOAD SURCHARGE:  
240 psf surcharge on level ground surface

REINFORCED CONCRETE AND CONCRETE MASONRY:  
f<sub>y</sub> = 60 ksi  
f'<sub>c</sub> = 3.6 ksi  
f'<sub>m</sub> = 2000 psi \*  
f'<sub>m</sub> = 2500 psi for high-strength blocks only \*

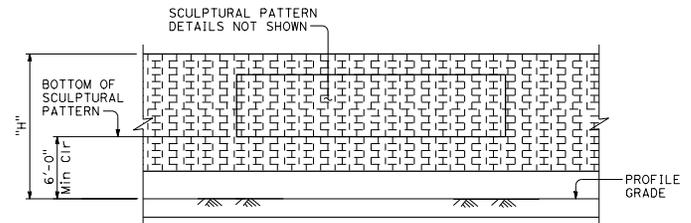
\* Provide materials to achieve the net compressive strength of concrete masonry unit equal or greater than the specified f'<sub>m</sub>.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

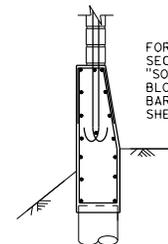


### ELEVATION MIDWEST GUARDRAIL SYSTEM ANCHORAGE

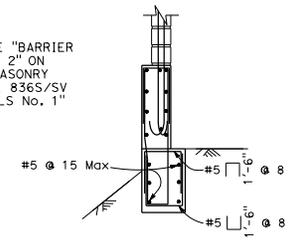
For details not shown, see Revised Standard Plans RSP B11-79 and RSP B11-80.



### CLEARANCE DETAIL

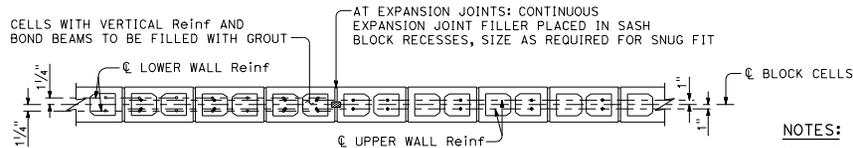


SECTION D-D



SECTION E-E

FOR Reinf, SEE "BARRIER SECTIONS CASE 2" ON "SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER-DETAILS No. 1" SHEET.



SECTION A-A

SECTION B-B

For details not shown, see other details.

### NOTES:

1. For Concrete Anchor Block and connection details, see "Connection Detail DD" on Standard Plan A77U3.
2. At this location, Pile Reinforcement shall be taken from "SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER DETAILS No. 3" sheet.

## STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER DETAILS (2)

NO SCALE

RSP B15-7 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-7  
DATED MAY 31, 2018 - PAGE 396 OF THE STANDARD PLANS BOOK DATED 2018.

## REVISED STANDARD PLAN RSP B15-7

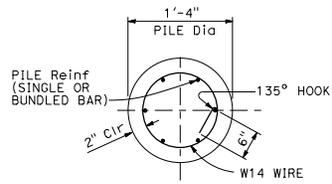
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

Tillot Satter  
No. C42892  
Exp. 3-31-22  
CIVIL  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF CALIFORNIA

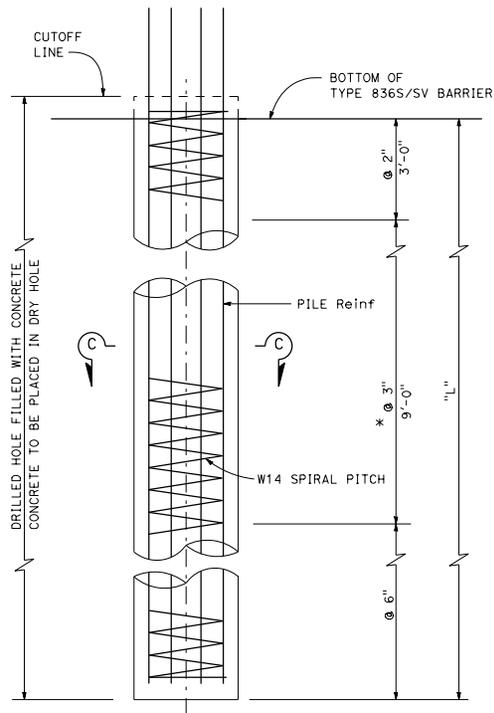
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SECTION C-C

**CASE 1: PILE DATA TABLE**

MAXIMUM H	Ø = 25 Min			Ø = 30 Min			Ø = 35 Min		
	S	L	PILE Reinf	S	L	PILE Reinf	S	L	PILE Reinf
8'-4"	10'-0"	16'-0"	#7 Tot 7	10'-0"	10'-0"	#7 Tot 7	10'-0"	8'-0"	#8 Tot 6
10'-4"	10'-0"	16'-0"	#7 Tot 7	10'-0"	10'-0"	#7 Tot 7	10'-0"	8'-0"	#8 Tot 6
12'-4"	10'-0"	16'-0"	#7 Tot 7	10'-0"	10'-0"	#7 Tot 7	10'-0"	8'-6"	#8 Tot 6
14'-4"	10'-0"	16'-0"	#7 Tot 7	10'-0"	10'-6"	#7 Tot 7	10'-0"	9'-0"	#8 Tot 6
16'-4"	10'-0"	16'-0"	#8 Tot 7	10'-0"	11'-6"	#8 Tot 7	10'-0"	9'-6"	#8 Tot 6



ELEVATION

\* @ 2" at option of Contractor

**CASE 2: PILE DATA TABLE**

H <sub>e</sub>	MAXIMUM H	Ø = 30 Min			Ø = 35 Min		
		S	L	PILE Reinf	S	L	PILE Reinf
1'-0"	8'-4"	10'-0"	16'-0"	#7 Tot 7	10'-0"	11'-6"	#7 Tot 7
	10'-4"	9'-7"	16'-0"	#7 Tot 7	10'-0"	12'-6"	#7 Tot 7
	12'-4"	8'-4"	16'-0"	#7 Tot 7	10'-0"	13'-0"	#8 Tot 7
	14'-4"	7'-1"	16'-0"	#7 Tot 7	10'-0"	14'-0"	#8 Tot 7
	16'-4"	6'-3"	16'-0"	#7 Tot 7	10'-0"	14'-6"	#8 Tot 7
2'-0"	8'-4"	8'-4"	16'-0"	#7 Tot 7	10'-0"	13'-0"	#7 Tot 7
	10'-4"	7'-6"	16'-0"	#7 Tot 7	10'-0"	13'-6"	#8 Tot 7
	12'-4"	6'-3"	16'-0"	#7 Tot 7	10'-0"	14'-6"	#8 Tot 7
	14'-4"	5'-10"	16'-0"	#7 Tot 7	10'-0"	15'-0"	**#8 Tot 10
	16'-4"	5'-0"	16'-0"	#7 Tot 7	9'-7"	15'-6"	**#8 Tot 10
3'-0"	8'-4"	6'-3"	16'-0"	#7 Tot 7	10'-0"	14'-6"	#8 Tot 7
	10'-4"	5'-5"	16'-0"	#7 Tot 7	10'-0"	15'-0"	**#8 Tot 10
	12'-4"	5'-0"	16'-0"	#7 Tot 7	10'-0"	15'-6"	**#8 Tot 10
	14'-4"	4'-7"	16'-0"	#7 Tot 7	9'-7"	16'-0"	**#8 Tot 10
	16'-4"	4'-2"	16'-0"	#7 Tot 7	8'-4"	16'-0"	**#8 Tot 10
4'-0"	8'-4"	4'-7"	16'-0"	#7 Tot 7	10'-0"	16'-0"	#9 Tot 6
	10'-4"	4'-2"	16'-0"	#7 Tot 7	9'-2"	16'-0"	**#8 Tot 10
	12'-4"	3'-9"	16'-0"	#7 Tot 7	8'-4"	16'-0"	**#8 Tot 10
	14'-4"	3'-4"	16'-3"	#7 Tot 7	7'-11"	16'-0"	**#8 Tot 10
	16'-4"	3'-4"	16'-6"	#7 Tot 7	7'-1"	16'-0"	**#8 Tot 10

\*\* Indicates bundled bars (bundle of two bars)

**NOTE:**

- For details not shown, see "SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER-DETAILS No. 1" and "SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER DETAILS No. 2".

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

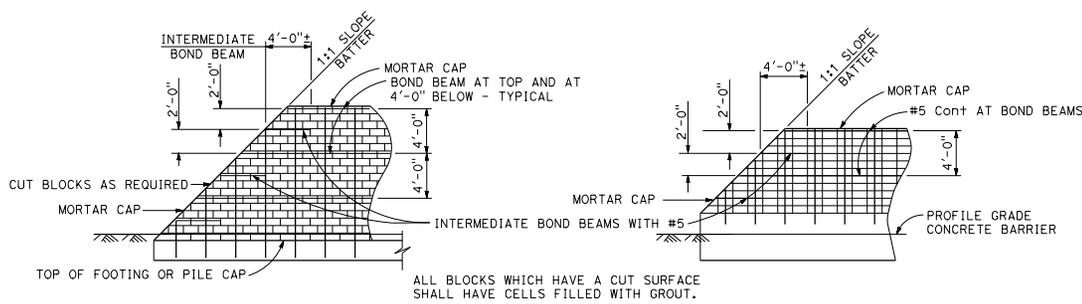
**SOUND WALL MASONRY BLOCK  
ON TYPE 836S/SV BARRIER  
DETAILS (3)**

NO SCALE

RSP B15-8 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-8  
DATED MAY 31, 2018 - PAGE 397 OF THE STANDARD PLANS BOOK DATED 2018.

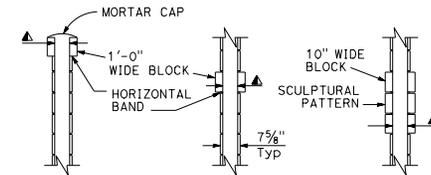
**REVISED STANDARD PLAN RSP B15-8**

2018 REVISED STANDARD PLAN RSP B15-8



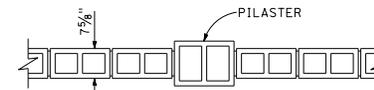
**TYPE I**

Slope batter shall not be flatter than 1:1.

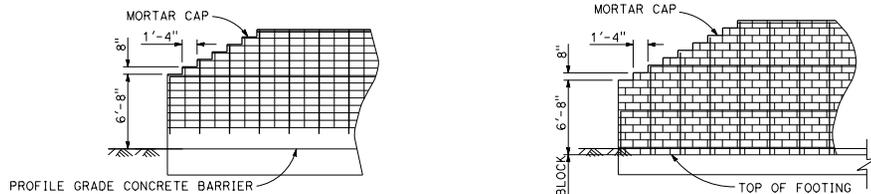


**ARCHITECTURAL ALTERNATIVES**

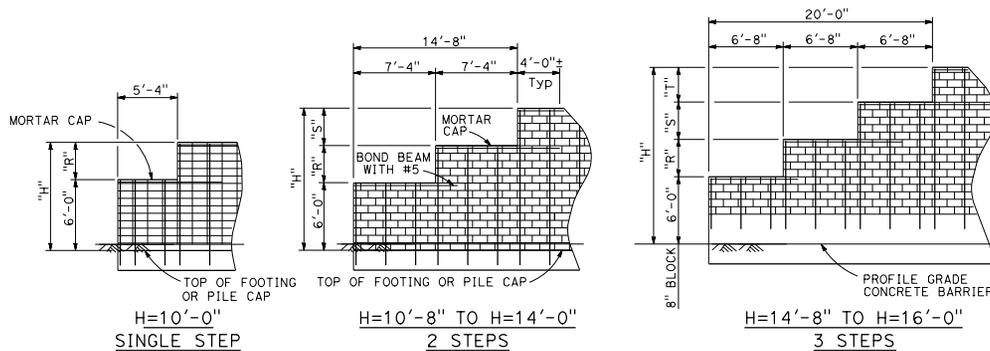
▲ Cell width to match 8" block.



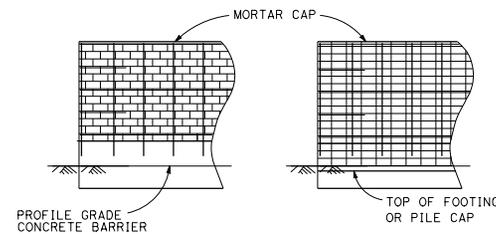
**1'-0" WIDE PROJECTING BLOCK**



**TYPE II**



**TYPE III**



**END OF WALL DETAILS**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

Tillot Satter  
No. C42892  
Exp. 3-31-22  
CIVIL  
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

- 1'-0" wide block not allowed within 6'-0" of profile grade.
- For structural details, see other sheets.
- Type III not permitted for sound walls with "H" less than 10'-0".
- The end of the wall details may be used with any of the standard supporting foundations for masonry block. The foundations shown for the different types are for the purpose of illustration only.

**8" x 8" x 16" BLOCK**

H	R	S	T
10'-0"	4'-0"	—	—
10'-8"	2'-8"	2'-0"	—
11'-4"	2'-8"	2'-8"	—
12'-0"	3'-4"	2'-8"	—
12'-8"	3'-4"	3'-4"	—
13'-4"	4'-0"	3'-4"	—
14'-0"	4'-0"	4'-0"	—
14'-8"	3'-4"	2'-8"	2'-8"
15'-4"	3'-4"	3'-4"	2'-8"
16'-0"	3'-4"	3'-4"	3'-4"

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**SOUND WALL  
MASONRY BLOCK  
MISCELLANEOUS DETAILS**

NO SCALE

RSP B15-9 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-9  
DATED MAY 31, 2018 - PAGE 398 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B15-9**



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

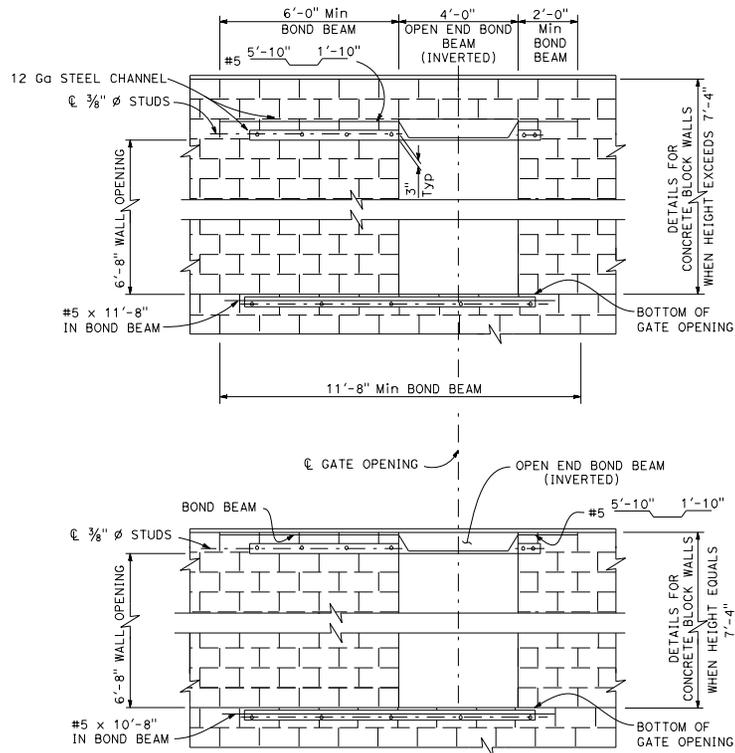
REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

Tillot Satter  
No. C42892  
Exp. 3-31-22  
CIVIL  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF CALIFORNIA

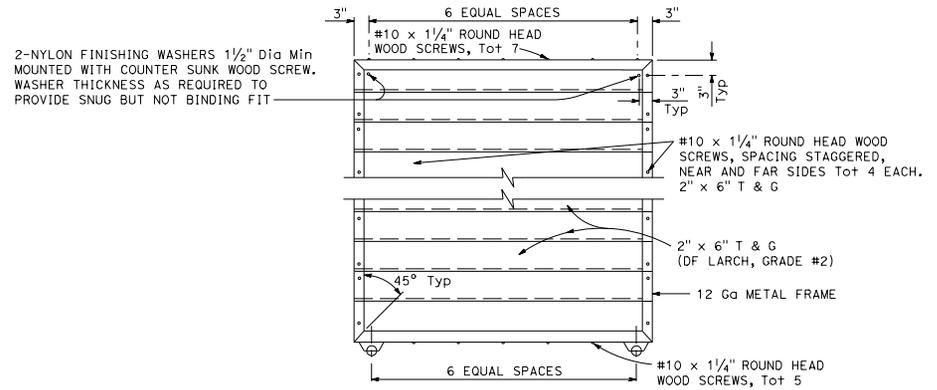
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TO ACCOMPANY PLANS DATED \_\_\_\_\_



**PARTIAL ELEVATION (BACK)**

For details not shown, see above.



**ELEVATION - METAL FRAME**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**SOUND WALL MASONRY BLOCK  
ON FOOTING OR PILE CAP  
5'-0" ACCESS GATE  
DETAILS (2)**

NO SCALE

RSP B15-11 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-11  
DATED MAY 31, 2018 - PAGE 400 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B15-11**

2018 REVISED STANDARD PLAN RSP B15-11

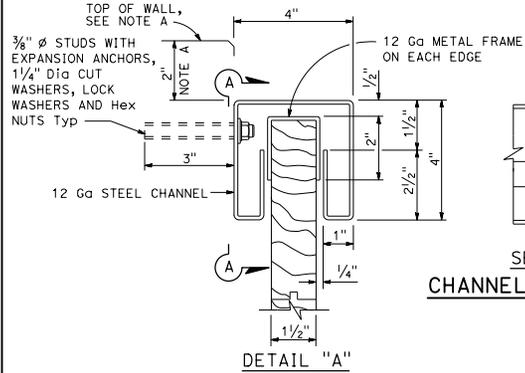
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

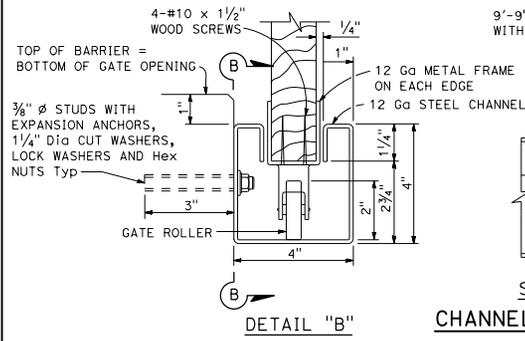
April 17, 2020  
PLANS APPROVAL DATE

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SECTION A-A  
CHANNEL MOUNTING HOLE

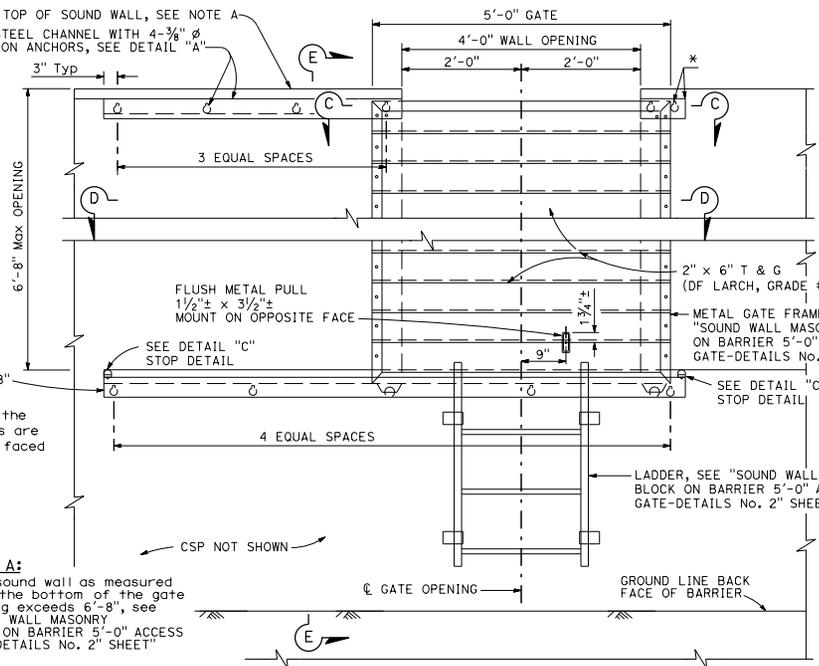


SECTION B-B  
CHANNEL MOUNTING HOLE

9'-9" LONG CHANNEL ATTACHED WITH 5-3/8" Ø STUDS, SEE DETAIL "B"

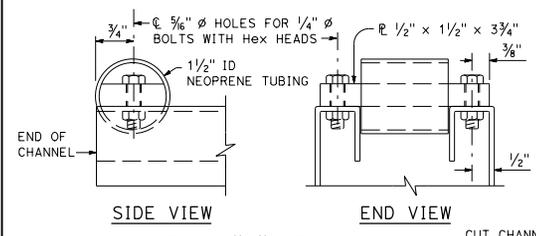
NOTE:  
Those blocks upon which the supporting steel channels are mounted shall be smooth faced on the mounted side.

NOTE A:  
When sound wall as measured from the bottom of the gate opening exceeds 6'-8", see "SOUND WALL MASONRY BLOCK ON BARRIER 5'-0" ACCESS GATE-DETAILS No. 2" SHEET"



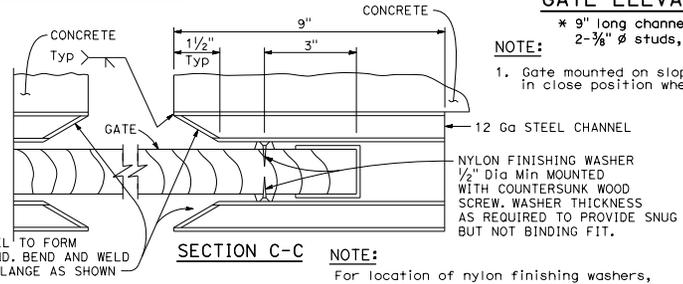
GATE ELEVATION - BACK

NOTE:  
1. Gate mounted on sloping grade shall be oriented to be in close position when at lower grade point.

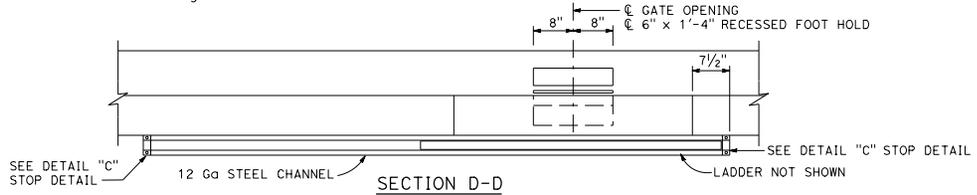


DETAIL "C" STOP DETAIL

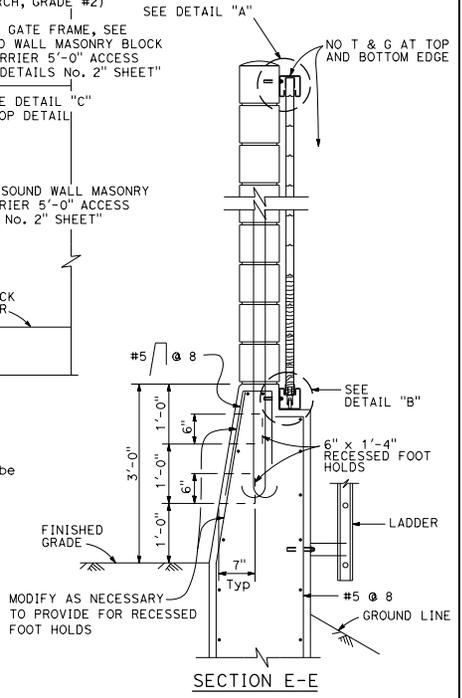
NOTE: Two masonry cells adjacent to each side of the gate to be reinforced and grouted.



NOTE:  
For location of nylon finishing washers, see "5'-0" GATE-DETAILS No. 2" sheet.



SECTION D-D



SECTION E-E

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**SOUND WALL MASONRY BLOCK  
ON BARRIER  
5'-0" ACCESS GATE  
DETAILS (1)**  
NO SCALE

RSP B15-12 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-12  
DATED MAY 31, 2018 - PAGE 401 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP B15-12**

2018 REVISED STANDARD PLAN RSP B15-12

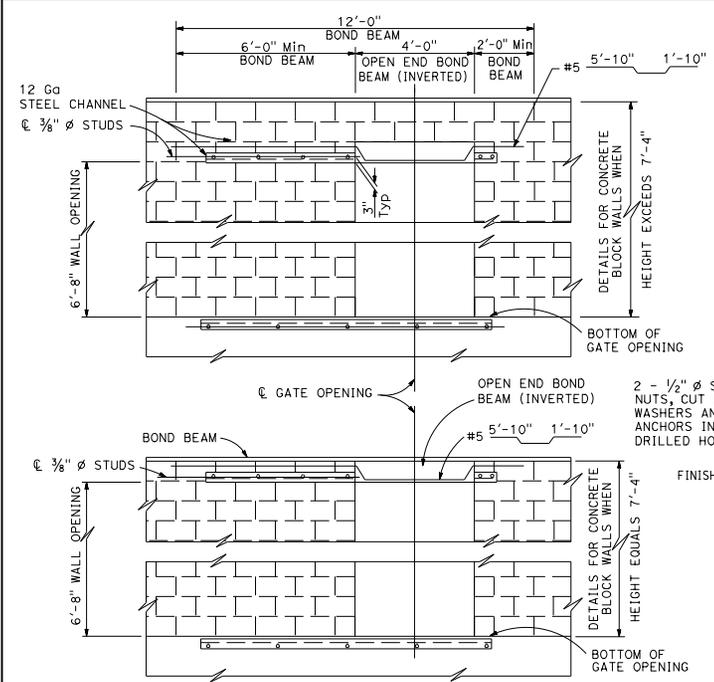
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

Tillot Satter  
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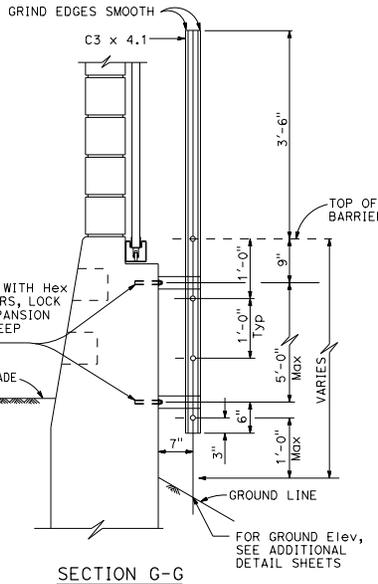


**PART ELEVATION (BACK)**

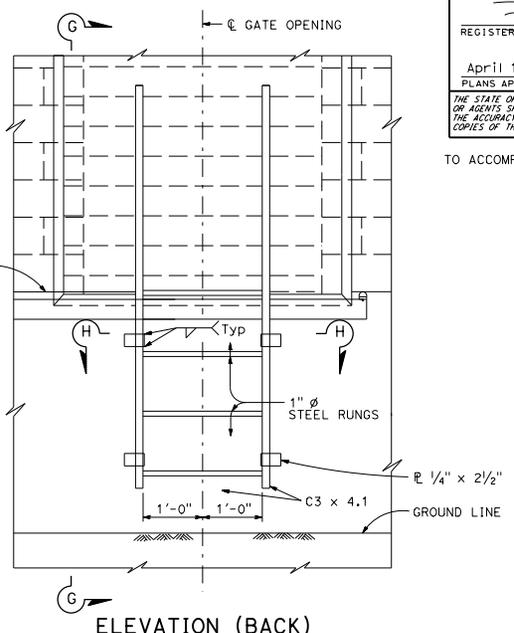
For details not shown, see above.

**NOTE:**

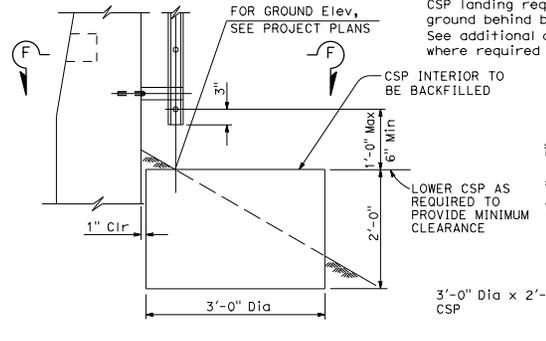
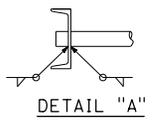
CSP landing required when slope of ground behind barrier is steeper than 8:1. See additional detail sheets for location where required



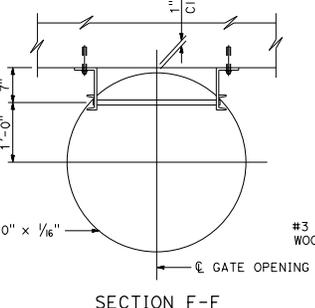
**SECTION G-G**



**ELEVATION (BACK)**

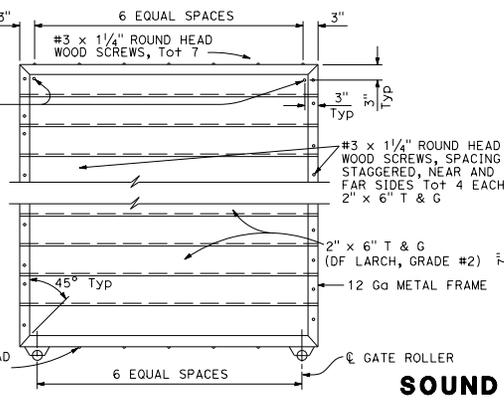


**CORRUGATED STEEL PIPE LANDING DETAILS**

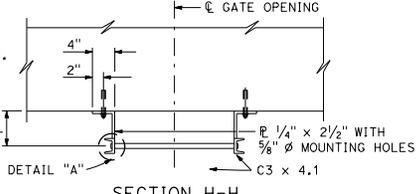


**SECTION F-F**

2-NYLON FINISHING WASHERS 1/2" Dia Min MOUNTED WITH COUNTERSUNK WOOD SCREW. WASHER THICKNESS AS REQUIRED TO PROVIDE SNUG BUT NOT BINDING FIT



**ELEVATION - METAL FRAME**



**SECTION H-H**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**SOUND WALL MASONRY BLOCK ON BARRIER 5'-0" ACCESS GATE DETAILS (2)**

NO SCALE

RSP B15-13 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-13 DATED MAY 31, 2018 - PAGE 402 OF THE STANDARD PLANS BOOK DATED 2018.

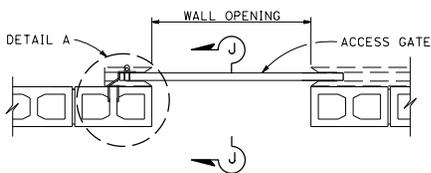
**REVISED STANDARD PLAN RSP B15-13**

2018 REVISED STANDARD PLAN RSP B15-13

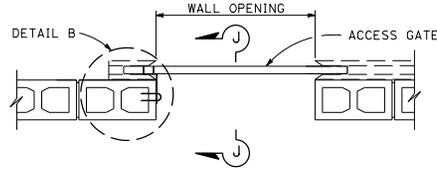
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

REGISTERED CIVIL ENGINEER  
Tillot Satter  
No. C42892  
PLANS APPROVAL DATE  
April 17, 2020  
EXP. 3-31-22  
CIVIL  
STATE OF CALIFORNIA

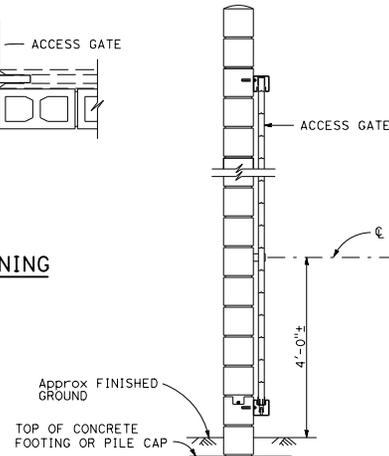
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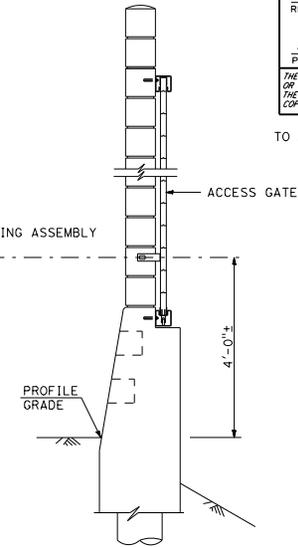
PLAN  
LOCK ON  
GATE SIDE OF WALL



PLAN  
LOCK ON  
INSIDE OF WALL OPENING

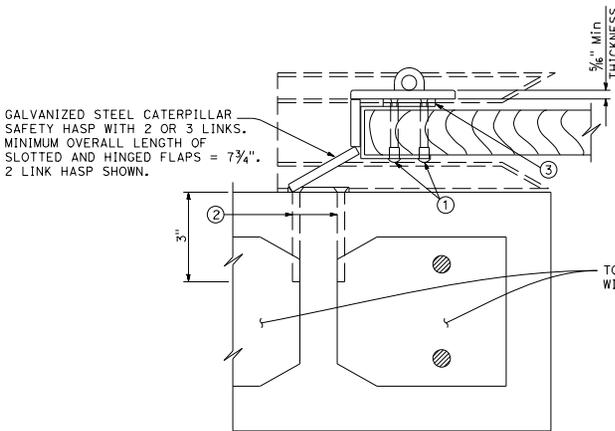


MASONRY ON FOOTING  
OR PILE CAP

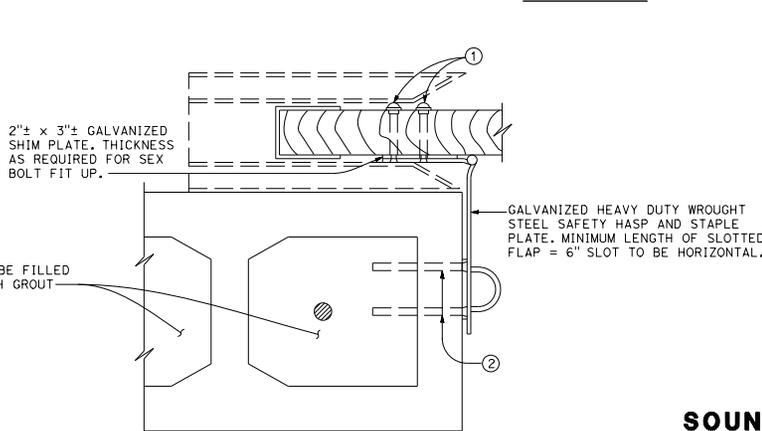


MASONRY ON BARRIER

SECTION J-J



DETAIL A



DETAIL B

NOTES:

1. Masonry anchors to be installed after the grout in the block cells has attained specified strength.
2. The Contractor may submit alternative gate locking assemblies for approval by the Engineer.
3. See other sheets for gate details.

- ① 4 - SEX BOLTS WITH 1/4" - 20 FLAT HEAD CORROSION RESISTANT MACHINE SCREWS.
- ② 4 - 1/4" Ø x 3" LONG FLAT HEAD SLEEVE TYPE CORROSION RESISTANT MASONRY ANCHORS.
- ③ GALVANIZED SHIM PLATE. SIZE AS REQUIRED TO MATCH HASP STAPLE PLATE. THICKNESS AS REQUIRED FOR SEX BOLT FIT UP.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**SOUND WALL MASONRY BLOCK  
ACCESS GATE LOCKING DETAILS**  
NO SCALE

RSP B15-14 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-14  
DATED MAY 31, 2018 - PAGE 403 OF THE STANDARD PLANS BOOK DATED 2018.

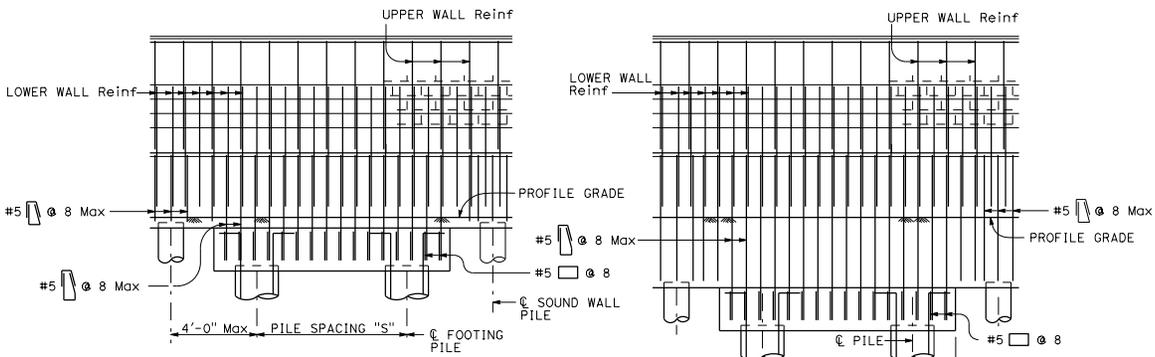
**REVISED STANDARD PLAN RSP B15-14**

2018 REVISED STANDARD PLAN RSP B15-14

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

REGISTERED CIVIL ENGINEER  
Tililat Satter  
No. C42892  
Exp. 3-31-22  
CIVIL  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

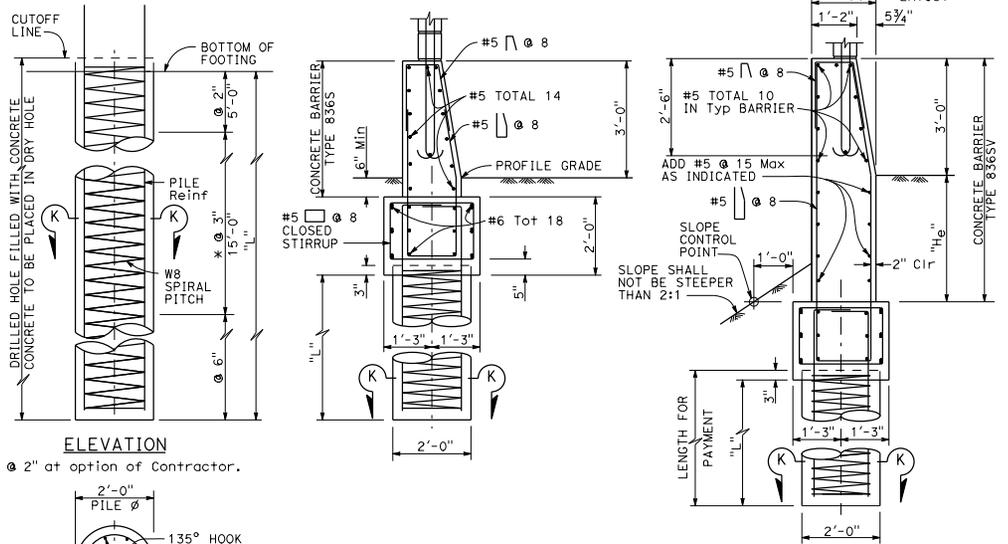
TO ACCOMPANY PLANS DATED \_\_\_\_\_



**CASE 1**  
For details not shown, see Case 2.  
See Note 1

**CASE 2**  
For details not shown, see Case 1.  
See Note 1

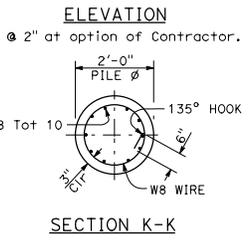
**PART ELEVATIONS**



**CASE 1**  
Level ground  $\pm 10\%$  at both sides of barrier.  
For details not shown, see Case 2.

**CASE 2**  
Level ground  $\pm 10\%$  at the traffic side of barrier and sloping ground on the opposite side.  
For details not shown, see Case 1.

**BARRIER SECTIONS**



**DESIGN NOTES:**

**DESIGN**  
AASHTO LRFD Bridge Design Specs, 8th Edition  
TMS 402-13  
2016 California Building Code

**DESIGN WIND LOAD**      **DESIGN SEISMIC LOAD**      **DESIGN IMPACT LOAD**  
36.5 psf                      0.57 Dead load                      TL-3

**DESIGN LIVE LOAD SURCHARGE**  
240 psf surcharge on level ground surface

**REINFORCED CONCRETE & CONCRETE MASONRY**  
f'c = 3.6 ksi  
fy = 60 ksi  
f'm = 2000 psi \*  
f'm = 2500 psi for high-strength blocks only \*

\* Provide materials to achieve the net compressive strength of concrete masonry unit equal or greater than the specified f'm.

**CASE 1 : PILE DATA TABLE**

MAXIMUM H	Ø = 25		Ø = 30		Ø = 35		MAXIMUM H
	S	L	S	L	S	L	
8'-4"	16'-0"	13'-6"	16'-0"	10'-0"	16'-0"	8'-0"	8'-4"
10'-4"	16'-0"	14'-0"	16'-0"	10'-6"	16'-0"	8'-6"	10'-4"
12'-4"	16'-0"	14'-6"	16'-0"	11'-0"	16'-0"	8'-6"	12'-4"
14'-4"	16'-0"	15'-0"	16'-0"	11'-6"	16'-0"	9'-0"	14'-4"
16'-4"	16'-0"	15'-6"	16'-0"	12'-0"	16'-0"	9'-6"	16'-4"

**CASE 2 : PILE DATA TABLE**

H <sub>e</sub>	H	Ø = 30		Ø = 35		H
		Min		Min		
		S	L	S	L	
1'-0"	8'-4"	16'-0"	18'-0"	16'-0"	13'-6"	8'-4"
	10'-4"	16'-0"	19'-0"	16'-0"	14'-6"	10'-4"
	12'-4"	16'-0"	19'-6"	16'-0"	15'-6"	12'-4"
	14'-4"	16'-0"	20'-6"	16'-0"	16'-6"	14'-4"
	16'-4"	16'-0"	21'-6"	16'-0"	17'-6"	16'-4"
2'-0"	8'-4"	16'-0"	20'-0"	16'-0"	15'-0"	8'-4"
	10'-4"	16'-0"	20'-6"	16'-0"	16'-0"	10'-4"
	12'-4"	16'-0"	21'-6"	16'-0"	17'-0"	12'-4"
	14'-4"	16'-0"	22'-6"	16'-0"	18'-0"	14'-4"
	16'-4"	16'-0"	22'-6"	16'-0"	18'-6"	16'-4"
3'-0"	8'-4"	16'-0"	22'-0"	16'-0"	16'-6"	8'-4"
	10'-4"	15'-6"	22'-6"	16'-0"	17'-6"	10'-4"
	12'-4"	14'-0"	22'-6"	16'-0"	18'-6"	12'-4"
	14'-4"	13'-0"	22'-6"	15'-6"	19'-0"	14'-4"
	16'-4"	12'-0"	22'-6"	14'-0"	19'-0"	16'-4"
4'-0"	8'-4"	12'-3"	22'-6"	15'-3"	18'-0"	8'-4"
	10'-4"	11'-6"	22'-6"	14'-3"	18'-6"	10'-4"
	12'-4"	10'-9"	22'-6"	13'-3"	18'-6"	12'-4"
	14'-4"	10'-0"	22'-6"	12'-3"	18'-6"	14'-4"
	16'-4"	9'-6"	22'-6"	11'-3"	19'-0"	16'-4"

**NOTE:**  
1. Refer to "SOUND WALL MASONRY BLOCK ON TYPE 836S/SV BARRIER DETAILS No. 1" for wall reinforcement details.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**SOUND WALL MASONRY BLOCK  
ON TYPE 836S/SV BARRIER ON PILE FOOTING  
FOR SPANNING UTILITIES**

NO SCALE

RSP B15-15 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-15  
DATED MAY 31, 2018 - PAGE 404 OF THE STANDARD PLANS BOOK DATED 2018.

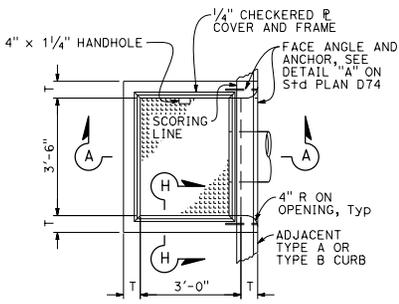
**REVISED STANDARD PLAN RSP B15-15**

2018 REVISED STANDARD PLAN RSP B15-15

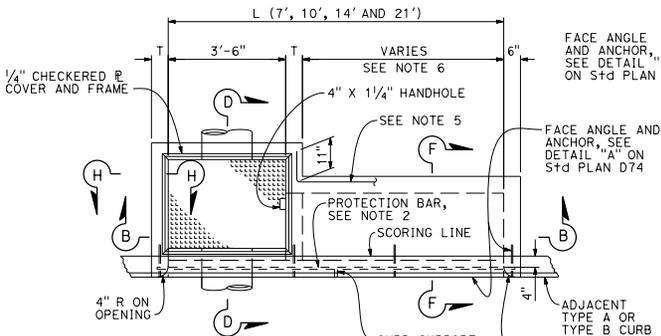
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS


  
 REGISTERED CIVIL ENGINEER  
 Carl M. Dunn  
 No. C59976  
 Exp. 6-30-20  
 CIVIL  
 STATE OF CALIFORNIA

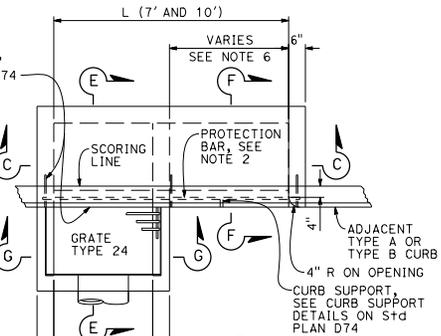
April 19, 2019  
 PLANS APPROVAL DATE  
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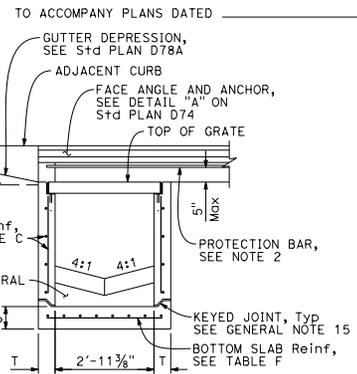
PLAN  
TYPE OS



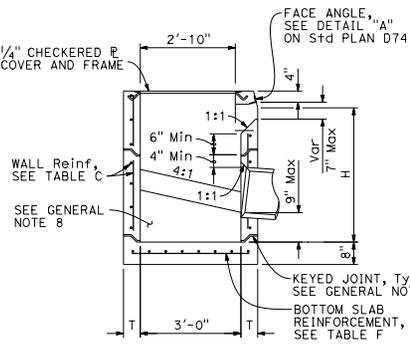
PLAN  
TYPE OL



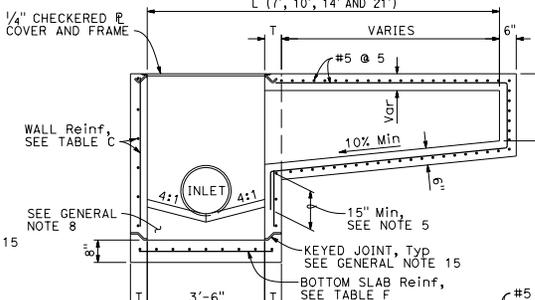
PLAN  
TYPE GOL



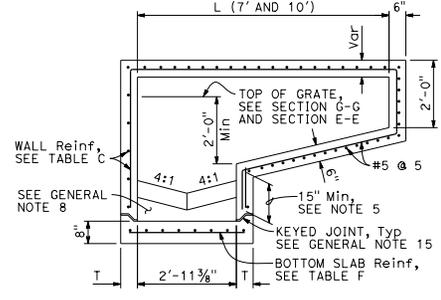
SECTION G-G



SECTION A-A



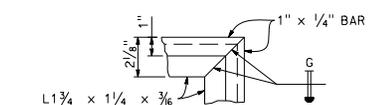
SECTION B-B



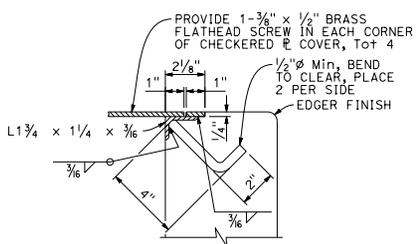
SECTION C-C

NOTES:

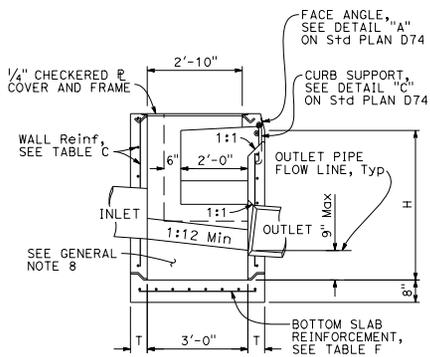
1. See Standard Plan D73F for General Notes and additional details. See Standard Plan D73G for tables, wall thickness "T" and quantities.
2. When shown on the project plans, place a 3/4" plain round protection bar horizontally across the length of the opening and bend back 4" into the inlet wall on each side.
3. Complete joint penetration butt welds may be substituted for the fillet welds on all anchors.
4. Standard square, hexagon, round or equivalent headed anchors may be substituted for the right angle hooks on the anchors shown on this plan.
5. Extend all horizontal bars from inlet extensions into adjacent concrete elements of main inlet box a minimum of 15". Where shown, bend horizontal bars into box. If necessary rotate bars to maintain 2" clear coverage.
6. Height of curb opening will vary with the type of curb and the depth of the local depression.



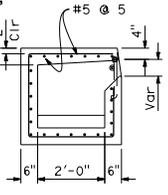
COVER FRAME  
TYPICAL EACH CORNER  
(CHECKERED COVER NOT SHOWN)



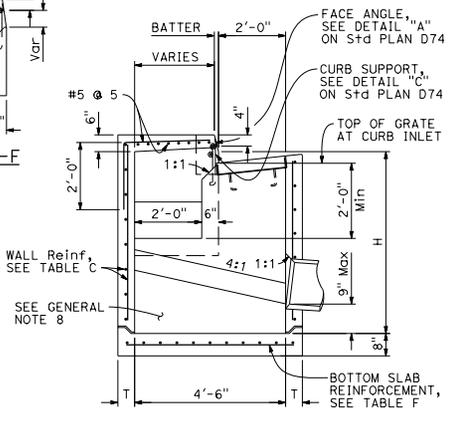
SECTION H-H



SECTION D-D



SECTION F-F  
SEE NOTE 5



SECTION E-E

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**PRECAST  
 DRAINAGE INLETS  
 TYPES OS, OL AND GOL**  
 NO SCALE

RSP D73A DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN D73A  
DATED MAY 31, 2018 - PAGE 202 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP D73A**

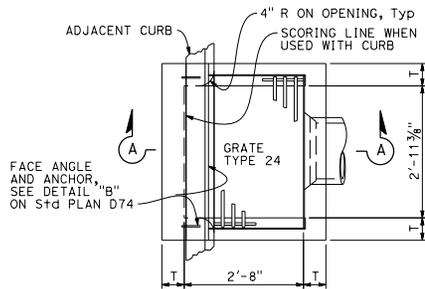
2018 REVISED STANDARD PLAN RSP D73A

Dist#	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

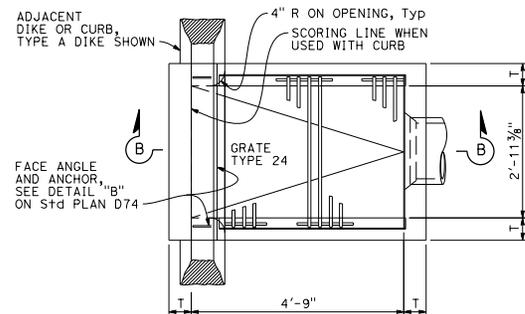

  
 REGISTERED CIVIL ENGINEER  
 Carl M. Dunn  
 No. C59976  
 Exp. 6-30-20  
 CIVIL  
 STATE OF CALIFORNIA

April 19, 2019  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS  
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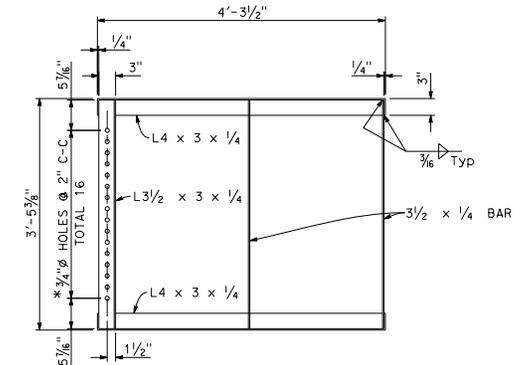
TO ACCOMPANY PLANS DATED \_\_\_\_\_



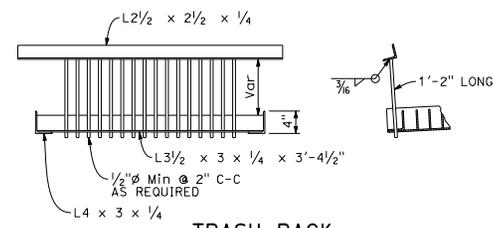
PLAN  
TYPE GO



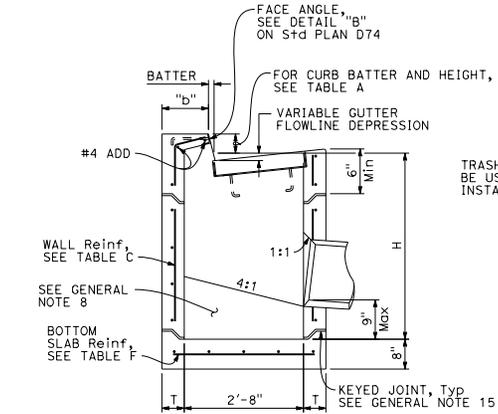
PLAN  
TYPE GDO



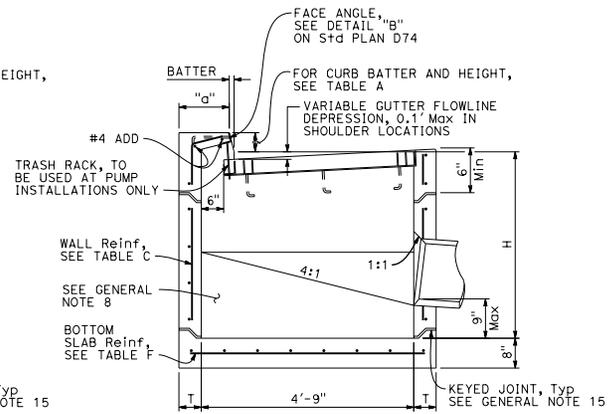
GRATE FRAME FOR TYPE GDO INLET  
\* HOLES REQUIRED ONLY WITH TRASH RACK



TRASH RACK  
FOR USE WITH PUMP INSTALLATION



SECTION A-A



SECTION B-B

NOTES:

1. See Standard Plan D73F for General Notes and additional details. See Standard Plan D73G for tables, wall thickness "T" and quantities.
2. Where shown on the project plans, place a 3/4" plain round protection bar horizontally across the length of the opening and bend back 4" into the inlet wall on each side.
3. Complete joint penetration butt welds may be substituted for the fillet welds on all anchors.
4. Standard square, hexagon, round or equivalent headed anchors may be substituted for the right angle hooks on the anchors shown on this plan.

CURB TYPE	NORMAL CURB HEIGHT	CURB BATTER	"a" DIMENSION	"b" DIMENSION
A1-6	6"	1 1/2"	T+7 1/2"	T+6 1/2"
A1-8	8"	2"	T+7"	T+6"
B1-6	6"	4"	T+5"	T+4"
TYPE A DIKE	6"	3"	T+6"	T+5"

Height of curb opening will vary with the type of curb and the depth of the local depression.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**PRECAST  
 DRAINAGE INLETS  
 TYPES GO AND GDO**  
 NO SCALE

RSP D73E DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN D73E  
 DATED MAY 31, 2018 - PAGE 206 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP D73E**

2018 REVISED STANDARD PLAN RSP D73E

**DESIGN NOTES:**

**Design Specifications:**  
AASHTO LRFD Bridge Design Specifications, 6th Edition with California Amendments.

**Loading:**  
Live load: (AASHTO LRFD 3.6.1.2)  
HL-93 consists of design truck or design tandem and design lane load.

**Impact Factor:** (Apply to roof slab only)  
 $IM = 33(1.0 - 0.125D_c) \geq 0\%$  (AASHTO LRFD 3.6.2.2)  
 $D_c$  = minimum depth of earth cover

**Earth load:**  
Earth pressure for two conditions:  
140 pcf vertical, 36 pcf horizontal  
140 pcf vertical, 120 pcf horizontal

**Load Factors:**  
AASHTO LRFD Table 3.4.1.1 & Table 3.4.1.2

**Unit stresses:**  
 $f'_c$  = 3600 psi  
 $f_y$  = 60,000 psi

**Distribution "d" bars:**  
Up to and including 10'-0" cover  
Express as a percentage of main positive reinforcement required: 100%, Max 50%,  
Over 10'-0" cover,  $\sqrt{5}$   
# 4 @ 12 maximum

**Shear:**  
 $V_c = \{2.14\sqrt{f'_c} + 4600 \frac{A_s V_u d_e}{b_w d_u}\} b_w d_e \leq 4.0\sqrt{f'_c} b_w d_e$  (Pounds)  
 $V_c$  shall not be less than  $3.00\sqrt{f'_c} b_w d_e$  for frame members and  $2.5\sqrt{f'_c} b_w d_e$  for simply supported members.

**Exclusion:**  
Compressive reinforcement and negative moment reduction (for continuity) do not apply.  
Axial loading on members has not been considered.

**CONSTRUCTION NOTES:**

**Construction loads:**  
Strutting required as shown on Standard Plan D88. Strutting may be required on culvert extensions when existing parapet is removed.

**Expansion joints:**  
Invert:  
No expansion joints shall be permitted.

**Roof and Walls:**  
When cover is less than span length-  
Place 1/2" preformed expansion joint filler at 30'-0" ± centers outside the paved roadway lanes and place Bridge Detail 3-2, Standard Plan B0-3, at 30'-0" centers under paved roadway lanes.  
When cover is more than span length-  
Place 1/2" preformed expansion joint filler at 30'-0" ± centers and additional 1/2" preformed expansion joints at locations of change in foundation character, as directed by the Engineer.

**Construction joints:**  
Temporary joints may be permitted if normal (or radial) to  $\phi$  of RCB. Otherwise, the contractor is to submit a proposal for consideration.

**Cutoff walls:**  
4'-0" cutoff walls are to be provided at inlet and/or outlet unless adjacent channel is lined and unless otherwise shown. These walls are to be extended if scour conditions warrant.

**Earthwork:**  
See Standard Plan A62E.

**Backfill:**  
See Standard Specifications, except that the difference in level of backfill (against outside walls) shall not exceed 2'-0".

**GENERAL NOTES:**

**Designation:**  
Standard single or multiple box culverts are shown on plans as span times height with maximum cover over roof thus: 8' x 5' RCB with 10' or double 10' x 5' RCB with 20', followed by alternatives.

**Alternatives:**  
Single cell: Invert will be sloped unless "trapezoidal invert", "flat invert" or "V invert" is included in designation.  
Multiple cell: Invert will be vee unless "flat invert" is specified. Ends of culvert will be rounded unless "square ends" are designated. Parapets will be as shown unless designated in plans. Such designations may be different for inlet and outlet ends.

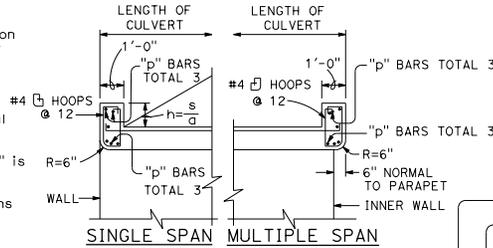
**Quantities:**  
Quantities do not include the following:  
• Concrete for parapet, paving notches and cut-off wall.  
• Reinforcement for 2% splices, parapets, paving notches, cut-off wall and additional required bars for exposed top slab (D-80, Note 9).

**Reinforcement placement:**  
Main reinforcement is to be placed transversely or, for curved culverts, radially. When radial, reinforcing spacing of the "a", "f" and "g" bars is measured along the centerline. Stagger splices not shown. Hooks may be rotated or fillet, as necessary, for clearance.

**Special reinforcement coverage:**  
Box standard plans are not to be used for culverts in a corrosive environment or where there is a severe abrasive flow condition or in freeze-thaw locations.

**Special design:**  
Required for culverts with conditions, loads, design bearing pressures or sizes greater than those given on this plan or Standard Plans D80 & D81. Also required for multiple cell culverts with unequal spans. For culverts with railroad loading, see the current AREMA design specification.

**3 or more cells:**  
For culverts with more than two cells, use dimensions and reinforcement for the standard "double box culvert" and adjust quantities accordingly.

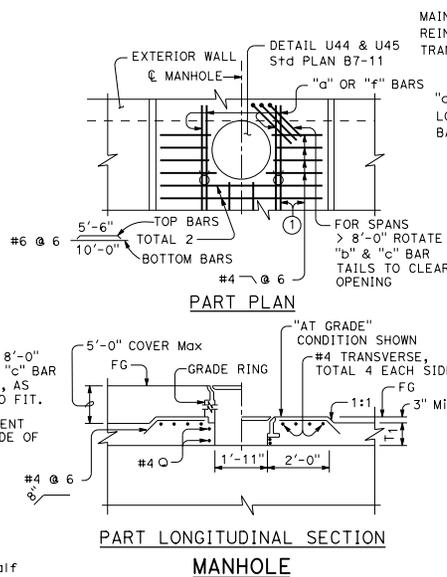


**PARAPET DETAIL**

s = Clear span (ft)  
a = 12 cosine skew angle  
h = Height, 1'-0" Min

SPAN	PARAPET "p" BARS		
	SKW ANGLE TO 0°	16° TO 30°	31° TO 45°
4'	#4	#4	#4
6'	#4	#4	#5
8'	#4	#5	#6
10'	#4	#6	#7
12'	#6	#7	#8
14'	#7	#8	#9

**PARAPET REINFORCEMENT**

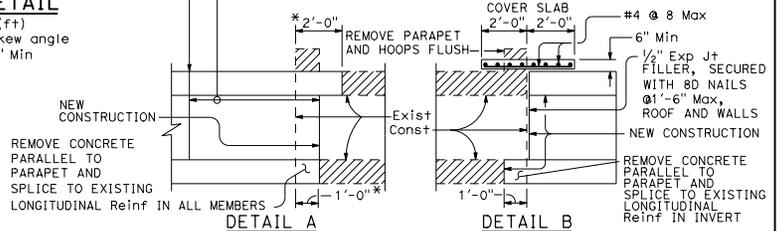


DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

REGISTERED CIVIL ENGINEER  
October 19, 2018  
PLANS APPROVAL DATE  
No. C59376  
Exp. 6-30-20  
CIVIL  
STATE OF CALIFORNIA

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LOCATE Exp Jt WITHIN A Max OF 2 TIMES SPAN OR 2 TIMES HEIGHT FROM THIS CONSTRUCTION JOINT

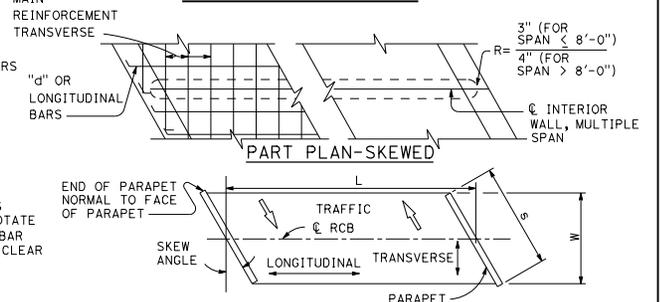


20° maximum skew as shown. If existing longitudinal and transverse reinforcing bars in top slab are lap spliced with new longitudinal and transverse reinforcing bars, the 20° skew may be exceeded. Lap splicing may require removal of top slab in excess of 2'-0" shown.

Single cell only, no skew allowed, 1'-0" minimum cover.

\* Measured perpendicular to parapet

**CULVERT EXTENSION**



**RCB TERMINOLOGY**

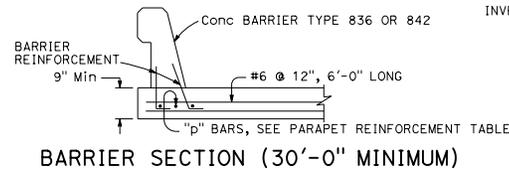
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT MISCELLANEOUS DETAILS**

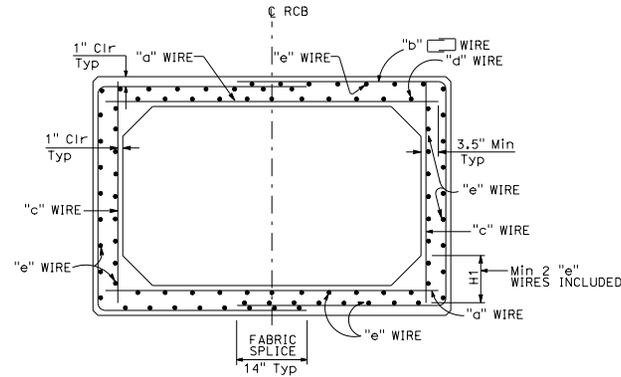
NO SCALE

RSP D82 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN D82 DATED MAY 31, 2018 - PAGE 223 OF THE STANDARD PLANS BOOK DATED 2018.

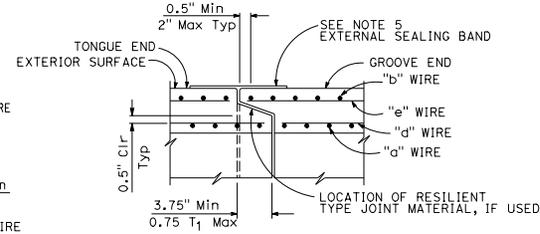
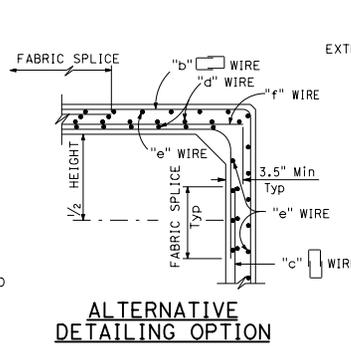
**REVISED STANDARD PLAN RSP D82**



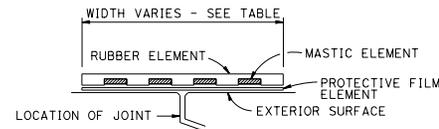
2018 REVISED STANDARD PLAN RSP D82



TYPICAL SECTION - SPANS 4'-0" THRU 12'-0"



END JOINT DETAIL

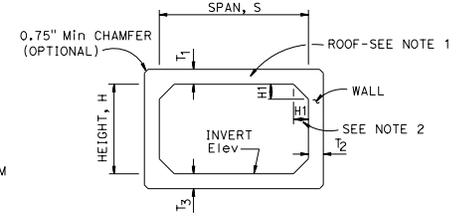


EXTERNAL SEALING BAND SCHEMATIC

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
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TO ACCOMPANY PLANS DATED \_\_\_\_\_



SCHEMATIC

TABLE	
SPAN	EXTERNAL SEALING BAND WIDTH, Min
4'-6'	9"
7'-8'	11"
10'-12'	13"

SPAN, S	4'				5'				6'				7'				
	2'	3'	4'	2'	3'	4'	5'	3'	4'	5'	6'	3'	4'	5'	6'		
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	
CONCRETE (INCH)	ROOF	T1	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	
	SIDE WALL	T2	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	
	INVERT	T3	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	
MINIMUM WELDED WIRE FABRIC (Inch <sup>2</sup> /ft <sup>2</sup> )	"a"	.33	.47	.34	.49	.34	.50	.40	.62	.41	.62	.42	.64	.43	.64	.44	
	"b"	.23	.28	.23	.25	.21	.23	.26	.36	.24	.36	.24	.33	.24	.30	.28	
	"c"	.11	.11	.11	.12	.18	.24	.11	.11	.11	.13	.23	.24	.34	.11	.11	
	"d"	.16	.11	.16	.11	.16	.11	.17	.11	.18	.11	.18	.11	.18	.11	.18	.11
	"e"	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11
* QUANTITY	Conc	.31	.34	.38	.37	.41	.44	.48	.51	.56	.60	.64	.63	.68	.73	.78	
	Reinf	35	41	39	45	45	51	49	58	49	62	54	69	62	78	60	
** SOIL PRESSURE (ksf)		2.3	4.4	2.4	4.5	2.4	4.5	3.1	4.4	3.1	4.5	3.1	4.5	2.7	4.5	2.8	

NOTES:

- The inside and outside surfaces of the RCB roof shall be marked "TOP".
- H1 minimum shall equal the wall thickness. H1 maximum shall be 8" for spans through 8' and 14" for spans over 8'.
- Quantities are approximate and for design purposes only.
- For design and details not shown see Revised Standard Plan RSP D83B.
- For external sealing band applications see Revised Standard Plan RSP A62C.
- Soil pressures shown are factored per AASHTO LRFD and include soil weight of fill over box, self weight of box and live load where applicable.
- If earth cover is less than 2', the concrete cover for the reinforcement at the top of top slab shall be 2" T1 in the Table shall have an additional 1" and quantities shall be revised accordingly in this case.

SPAN, S	4'				5'				6'				7'				8'				9'				10'				11'				12'			
	2'	3'	4'	2'	3'	4'	5'	3'	4'	5'	6'	3'	4'	5'	6'	3'	4'	5'	6'	3'	4'	5'	6'	3'	4'	5'	6'	3'	4'	5'	6'					
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'						
CONCRETE (INCH)	ROOF	T1	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"						
	SIDE WALL	T2	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"						
	INVERT	T3	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"					
MINIMUM WELDED WIRE FABRIC (Inch <sup>2</sup> /ft <sup>2</sup> )	"a"	.55	.87	.56	.90	.57	.92	.58	.93	.58	.94	.66	1.07	.67	1.10	.69	1.13	.70	1.14	.70	1.16	.71	1.16	.73	1.21	.74	1.24	.77	1.27	.81						
	"b"	.37	.59	.35	.55	.33	.52	.33	.52	.36	.57	.45	.74	.43	.70	.41	.67	.40	.64	.43	.67	.48	.67	.51	.85	.85	.81	.49	.77	.81						
	"c"	.11	.11	.11	.11	.20	.31	.31	.42	.38	.62	.11	.11	.11	.22	.31	.36	.42	.40	.62	.54	.86	.11	.11	.11	.23	.30	.37	.42	.42	.60					
	"d"	.19	.11	.19	.11	.20	.11	.20	.11	.20	.11	.20	.11	.20	.11	.21	.11	.21	.11	.21	.11	.21	.11	.20	.11	.20	.11	.21	.11	.22	.11					
	"e"	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11				
* QUANTITY	Conc	.78	.83	.88	.94	.99	1.10	1.17	1.23	1.29	1.35	1.41	1.56	1.63	1.70	1.78	1.85	1.93	2.00																	
	Reinf	93	129	97	133	105	148	117	161	131	189	133	191	138	196	148	212	191	225	176	253	201	282	174	255	179	261	191	279	207						
** SOIL PRESSURE (ksf)		2.5	4.6	2.5	4.6	2.5	4.6	2.5	4.6	3.8	4.6	3.8	4.7	3.8	4.7	4.6	4.7	3.9	4.7	3.9	4.8	3.6	4.7	3.7	4.7	3.7	4.8	3.7	4.8	3.7						

\* See Note 3      \*\* See Note 6

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**PRECAST REINFORCED CONCRETE BOX CULVERT**  
NO SCALE

RSP D83A DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN D83A  
DATED MAY 31, 2018 - PAGE 224 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP D83A**

2018 REVISED STANDARD PLAN RSP D83A

**DESIGN NOTES:**

Specifications:  
AASHTO LRFD Bridge Design Specifications,  
6th Edition with California Amendments.

Earth load:  
Earth pressures for two conditions:  
140 pcf Vert, 36 pcf Horiz  
140 pcf Vert, 120 pcf Horiz

Unit stresses:  
 $f'c = 5.0$  ksi  
 $f_y = 65.0$  ksi for weld wire fabric  
 $n = 7$

Shear:  
Based on  
 $V_c = (2.14\sqrt{f'c} + 4600 \frac{A_s V_u d_e}{D d_o M_u}) b_w d_e \leq 4.0\sqrt{f'c} b_w d_e$  (Pounds)  
 $V_c$  shall not be less than  $3.00\sqrt{f'c} b_w d_e$   
for frame members and  $2.5\sqrt{f'c} b_w d_e$   
for simply supported members.

Exclusion:  
Axial loading on the members has  
not been considered.

**GENERAL NOTES:**

Designation:  
Standard single or multiple precast box culverts are shown on the plans  
as span times height with maximum cover over roof thus: 8' x 5' RCB  
with 10'-0" or double 10' x 5' RCB with 20'-0", followed by alternatives.

Alternatives:  
Single cell:  
Standard dimensions of AASHTO Material Specification 'M259' or 'M273'.  
Multiple cell:  
Constructed by placing single cells adjacent to each other. Inlet  
and outlet ends of culvert will be rounded unless square ends are  
designated. Parapet will be shown unless designated in plans. Such  
designation may be different for inlet and outlet ends.

Limitations:  
Where the overfill is less than 12", Precast RCB culverts are  
not to be used. Precast RCB culverts are not to be used in siphon  
or pressurized installations unless appropriate "watertight"  
jointing is provided.

Special reinforcement coverage:  
Precast RCB culvert standard plans are not to be used in a  
corrosive environment or where there is a severe abrasive flow  
condition or freeze-thaw locations.

Special design:  
Required for culvert with different conditions, loads or design bearing  
pressures greater than those given on these plans. Required  
for culverts where end details need higher skew angles,  
higher parapets or barrier sections.

**CONSTRUCTION NOTES:**

Cutoff walls:  
4'-0" Cutoff walls are to be provided at inlet and/or  
outlet unless channel is lined and unless otherwise  
shown. These walls are to be extended if scour  
conditions warrant. See Standard Plans D84,  
D85 and D86A.

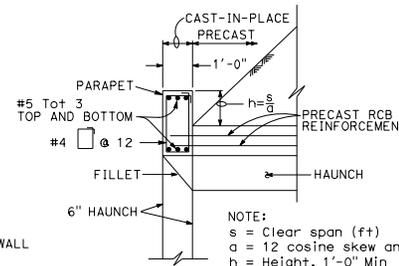
Wingwalls:  
Wingwalls shall be cast-in-place and shall conform to  
standard plan details for box culvert wingwalls. See  
Standard Plans D84, D85 and D86A.

Earthwork:  
See Revised Standard Plan RSP A62G.

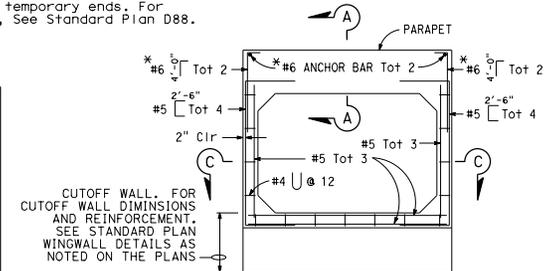
Construction loads:  
Strutting may be required near temporary ends. For  
construction loads on culverts, See Standard Plan D88.

SPAN	PARAPET "P" BARS		
	0° TO 15°	16° TO 30°	31° TO 45°
4'-0"	#5	#5	#5
5'-0"	#5	#5	#6
6'-0"	#6	#6	#6
7'-0"	#7	#7	#7
8'-0"	#7	#7	#8
10'-0"	#8	#8	#9
12'-0"	#9	#9	#10

**BARRIER PARAPET  
REINFORCEMENT**

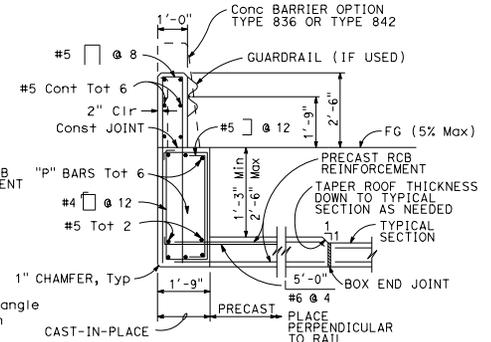


**SECTION A-A**  
(Standard Height Parapet)



**CAST-IN-PLACE  
END ELEVATION**

\* Reinforcing required for barrier  
parapet application only.



**SECTION A-A**  
(Barrier Parapet)

**TYPICAL CULVERT END DETAILS**  
For wall and invert reinforcement not shown, See "End Elevation" detail.

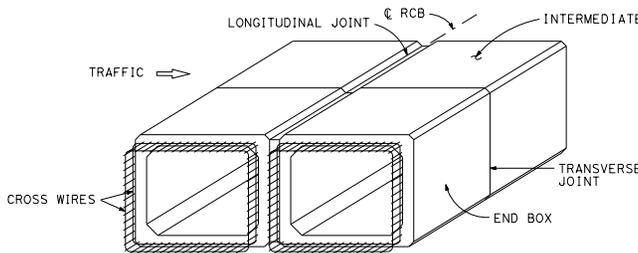
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**PRECAST REINFORCED  
CONCRETE BOX CULVERT  
MISCELLANEOUS DETAILS**

RSP D83B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN D83B  
DATED MAY 31, 2018 - PAGE 225 OF THE STANDARD PLANS BOOK DATED 2018.

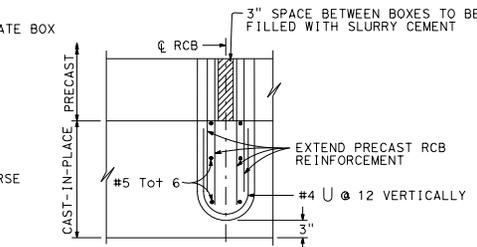
NO SCALE

**REVISED STANDARD PLAN RSP D83B**

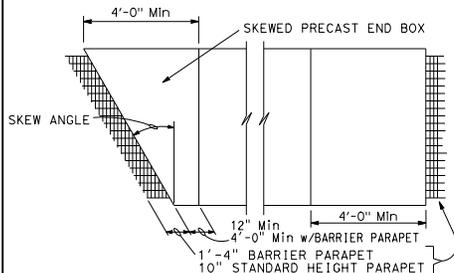


**PRECAST RCB TERMINOLOGY**

NOTE: Inner and outer reinforcement to be exposed as required to  
tie to cast-in-place construction. A minimum of two cross  
wires shall be exposed on all sides.

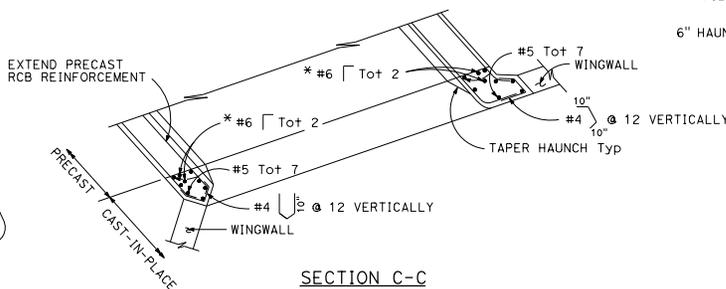


**PARTIAL PLAN INTERIOR WALL  
MULTICELL CULVERT**



**PARTIAL PLAN VIEW**

For illustrative purposes only.  
For correct skew direction see plans.



**SECTION C-C**

\* Reinforcing required for barrier  
parapet application only.

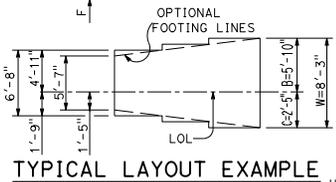
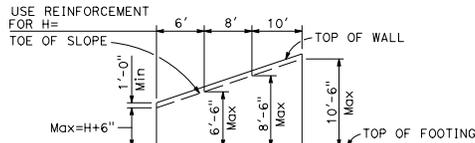
2018 REVISED STANDARD PLAN RSP D83B

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

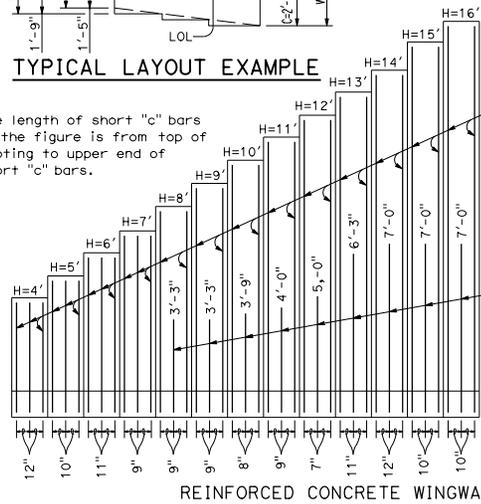
**REGISTERED CIVIL ENGINEER**  
October 19, 2018  
PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

Carl M. Dunn  
No. C59976  
Exp. 6-30-20  
CIVIL ENGINEER  
STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED \_\_\_\_\_



The length of short "c" bars in the figure is from top of footing to upper end of short "c" bars.

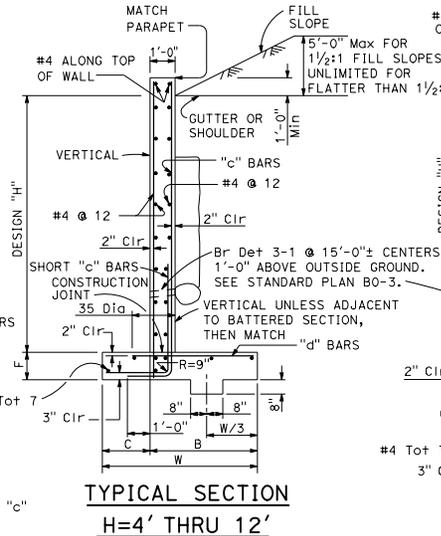


"H"	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'
W	5'-7"	6'-2"	6'-8"	7'-1"	7'-6"	7'-10"	8'-3"	8'-8"	9'-2"	9'-7"	10'-2"	10'-6"	11'-1"
C	1'-5"	1'-7"	1'-9"	1'-11"	2'-1"	2'-3"	2'-5"	2'-8"	2'-10"	3'-1"	3'-4"	3'-6"	3'-8"
B	4'-2"	4'-7"	4'-11"	5'-2"	5'-5"	5'-7"	5'-10"	6'-0"	6'-4"	6'-6"	6'-10"	7'-0"	7'-5"
F	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-3"	1'-3"	1'-5"	1'-6"	1'-6"	1'-8"
BATTER	None						1/2:12						
S	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-6 1/2"	1'-7"	1'-7 1/2"	1'-8"	
"c" BARS	#4@12	#4@10	#5@11	#5@9	#6@9	#7@9	#7@8	#8@9	#7@7	#8@11	#9@12	#10@10	#10@10
"d" BARS	#5@12	#5@10	#6@11	#6@9	#6@9	#6@9	#6@8	#7@9	#6@7	#7@11	#8@12	#8@10	#9@10
* Conc CY/LF	0.46	0.52	0.58	0.64	0.69	0.74	0.80	0.88	1.00	1.25	1.37	1.45	1.61
* Reinf LB/LF	26	32	41	50	59	70	81	95	102	112	120	156	171
** CASE I qu (ksf), B' (ft)	3.75,2.24	3.66,2.69	3.59,3.11	3.56,3.49	3.52,3.89	3.52,4.21	3.69,4.46	3.77,4.77	3.89,5.17	3.92,5.61	3.92,6.18	4.04,6.40	4.13,6.95
** CASE II qu (ksf), B' (ft)	1.16,5.58	1.33,6.13	1.51,6.55	1.69,6.86	1.88,7.16	2.08,7.33	2.29,7.60	2.50,7.86	2.77,8.14	2.97,8.47	3.18,8.93	3.41,9.05	3.70,9.43
** CASE III qu (ksf), B' (ft)	1.26,5.46	1.36,5.97	1.49,6.37	1.64,6.66	1.79,6.93	1.95,7.08	2.11,7.33	2.28,7.55	2.50,7.84	2.66,8.12	2.81,8.59	3.00,8.69	3.22,9.10

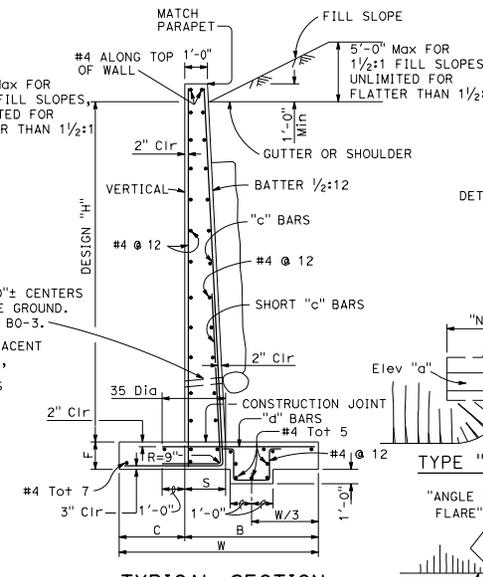
B' = B - (2) eccentricity, B' is the effective footing width.  
 \* Quantities include 1'-0" extension above the design "H" limit.  
 \*\* Soil bearing pressure shown in the table is the equivalent uniform pressure per AASHTO LRFD - 11.6.3.2

**NOTES:**

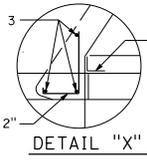
- Unit Stresses: f'c=3,600 psi, fy=60,000 psi
- Earth density: 120 pcf
- Equivalent fluid pressure: 36 pcf
- Elevations, length and angle of flare of wings may be varied by the Engineer to suit conditions encountered in the field.
- Dimensions "H", "L", "M", "N", "Elevation "a" and "Angle of flare" (as applicable) are shown on the plans.
- Wall height may be exceeded by 6" before going to next greater "H".
- Eliminate cutoff wall if adjacent channel is paved and skew is 20° maximum.
- For wall offset values, see Standard Plan B3-5.



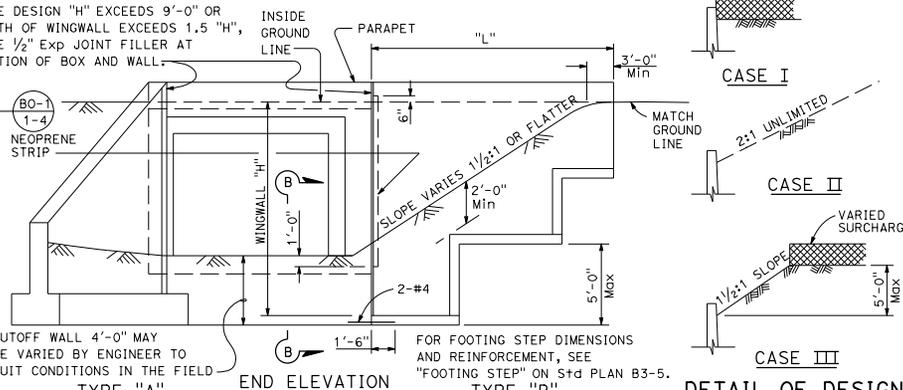
**TYPICAL SECTION  
H=4' THRU 12'**



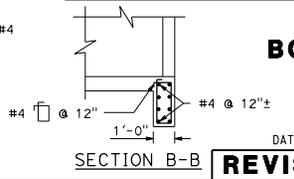
**TYPICAL SECTION  
H=13' THRU 16'**



WHERE DESIGN "H" EXCEEDS 9'-0" OR LENGTH OF WINGWALL EXCEEDS 1.5 "H", PLACE 1/2" Exp JOINT FILLER AT JUNCTION OF BOX AND WALL.



**STRAIGHT WINGWALLS**



**SECTION B-B**

**BOX CULVERT WINGWALLS  
TYPES A, B AND C**

NO SCALE

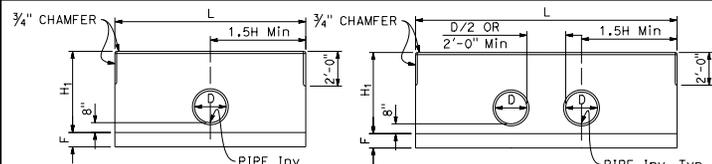
RSP D84 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN D84 DATED MAY 31, 2018 - PAGE 226 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP D84**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

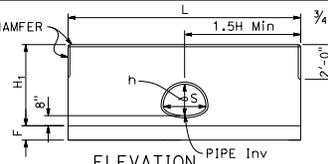
REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

2018 REVISED STANDARD PLAN RSP D84

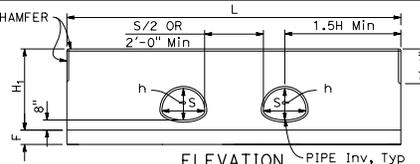


ELEVATION  
STRAIGHT HEADWALL  
SINGLE CIRCULAR PIPE

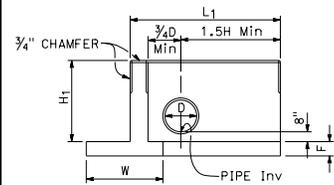
ELEVATION  
STRAIGHT HEADWALL  
DOUBLE CIRCULAR PIPE



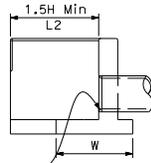
ELEVATION  
STRAIGHT HEADWALL  
SINGLE CMP



ELEVATION  
STRAIGHT HEADWALL  
DOUBLE CMP

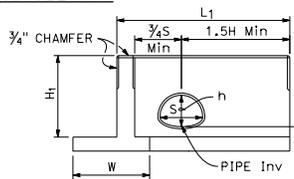


ELEVATION  
"L" HEADWALL

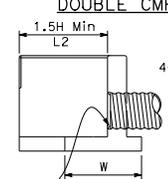


SECTION  
"L" HEADWALL

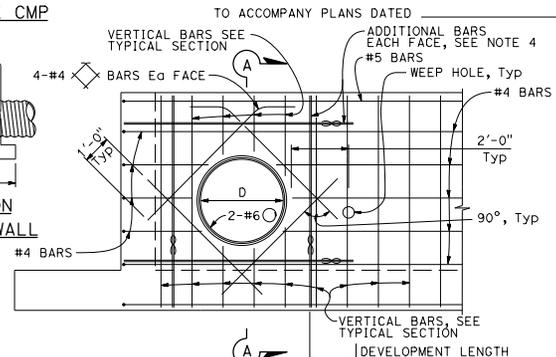
H (Min)	CIRCULAR PIPE SIZE D	CMP ARCH SIZE S x h
3'-11"	12"	-
4'-2"	15"	21" x 15"
4'-5"	18"	24" x 18"
4'-8"	21"	28" x 20"
4'-11"	24"	35" x 24"
5'-2"	27"	-
5'-5"	30"	42" x 29"
5'-8"	33"	49" x 33"
5'-11"	36"	-
6'-2"	39"	57" x 38"
6'-5"	42"	64" x 43"
6'-8"	45"	-
6'-11"	48"	71" x 47"



ELEVATION  
"L" HEADWALL  
CMP ARCH CULVERT HEADWALLS

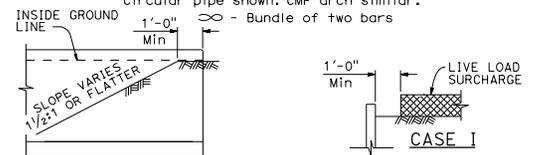


SECTION  
"L" HEADWALL



**REINFORCEMENT MODIFICATION**

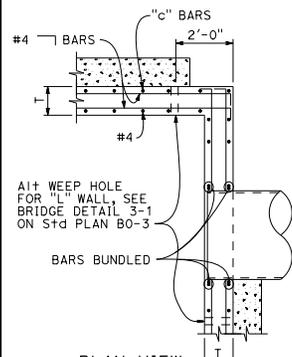
"L" headwall shown. Straight headwall similar. Circular pipe shown. CMP arch similar.



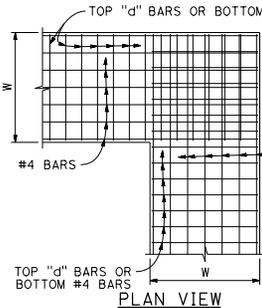
**DETAIL OF DESIGN LOADING CASES**

**NOTES:**

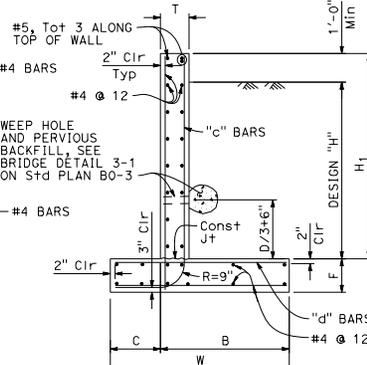
- Length of wall from center of pipe to end of wall is 1.5H Min. The ends of headwall need to be embedded into the slope by one foot.
- Single circular pipe or single CMP shown for "L" headwall. For double pipe in "L" headwall, see "ELEVATION STRAIGHT HEADWALL DOUBLE CIRCULAR PIPE" or "ELEVATION STRAIGHT HEADWALL DOUBLE CMP" detail for additional information.
- Cable railing to be installed on top of headwall when shown on Project Plans. See Standard Plan B11-47 for cable railing details.
- Adjacent to each side of the opening, place additional reinforcement equivalent to half the interrupted main reinforcement.
- Quantities are approximate and for design purposes only. No deduction is made for pipe or arch occupancy.
- Provide necessary erosion protection in front of wall.
- If precast construction is used, the design standard shall be equal to or exceed that shown here, and the bottom of footing must be roughened.
- Minimum earth cover of two feet at ETW of the roadway without cap protection to pipe.



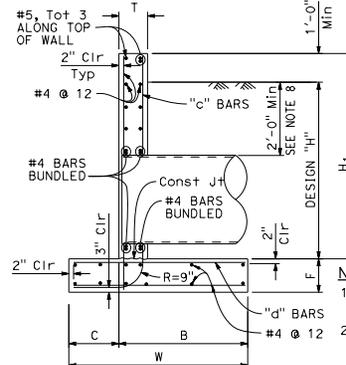
PLAN VIEW  
STEM WALL



PLAN VIEW  
FOOTING



TYPICAL SECTION



SECTION A-A

H	3'-11"	4'-2"	4'-5"	4'-8"	4'-11"	5'-2"	5'-5"	5'-8"	5'-11"	6'-2"	6'-5"	6'-8"	6'-11"
T	10"	10"	10"	10"	10"	10"	10"	10"	10"	1'-0"	1'-0"	1'-0"	1'-0"
W	4'-10"	4'-10"	5'-0"	5'-4"	5'-4"	5'-4"	5'-4"	5'-4"	5'-4"	5'-4"	5'-6"	5'-9"	6'-0"
C	1'-0"	1'-0"	1'-0"	1'-4"	1'-4"	1'-4"	1'-4"	1'-4"	1'-4"	1'-4"	1'-6"	1'-6"	1'-6"
B	3'-10"	3'-10"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-3"	4'-6"
F	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-2"	1'-2"	1'-2"	1'-2"
"c" BARS	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 9	#5 @ 9
"d" BARS	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 8	#5 @ 8	#5 @ 8	#5 @ 8	#6 @ 8	#6 @ 8	#6 @ 8	#6 @ 6	#6 @ 6	#6 @ 6
* Conc CY/LF	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.40	0.41	0.50	0.51	0.53	0.55
* Reinf LB/LF	32	32	33	37	38	39	39	43	47	48	53	58	60
**CASE 1 Ser (a'o, B)	0.87, 4.68	0.88, 4.69	0.88, 4.75	0.89, 4.80	0.90, 4.95	0.92, 5.09	0.95, 5.00	0.96, 4.90	1.05, 4.80	1.10, 4.67	1.12, 4.70	1.14, 5.05	1.15, 5.32
Str (q'o, B)	1.45, 4.60	1.49, 4.65	1.50, 4.71	1.52, 4.78	1.53, 4.81	1.55, 4.99	1.62, 4.50	2.10, 3.15	2.20, 2.50	2.38, 1.63	2.15, 1.65	2.10, 2.20	2.04, 2.41

**REINFORCED CONCRETE HEADWALL**

Quantities do not include added diagonals and do not consider pipe occupancy.

NOTE: Reinforced Concrete:  $f_y = 60,000$  psi  
 $f'_c = 3,600$  psi  
Earth Density: 120 pcf  
Equivalent Fluid Pressure: 36 pcf

\* Quantities include 1'-0" extension above the design "H" limit.  
\*\* q'o = net bearing stress (ksf), B' = effective footing width (ft)  
Ser = service limit  
Str = strength limit

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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REGISTERED CIVIL ENGINEER  
October 18, 2019  
PLANS APPROVAL DATE

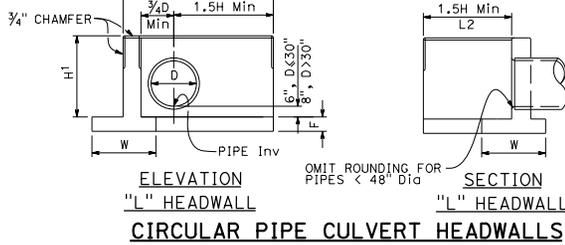
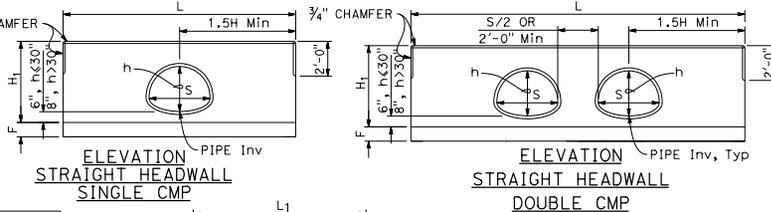
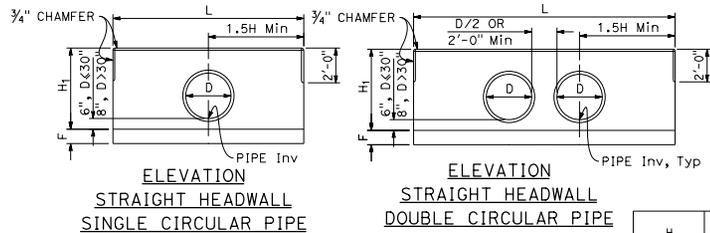
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2018 REVISED STANDARD PLAN RSP D89A

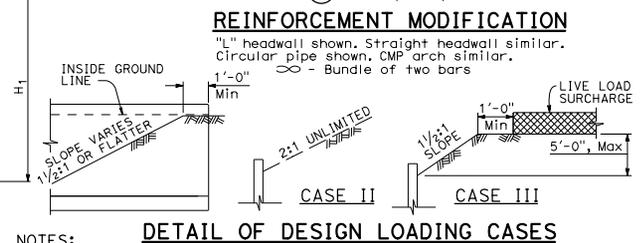
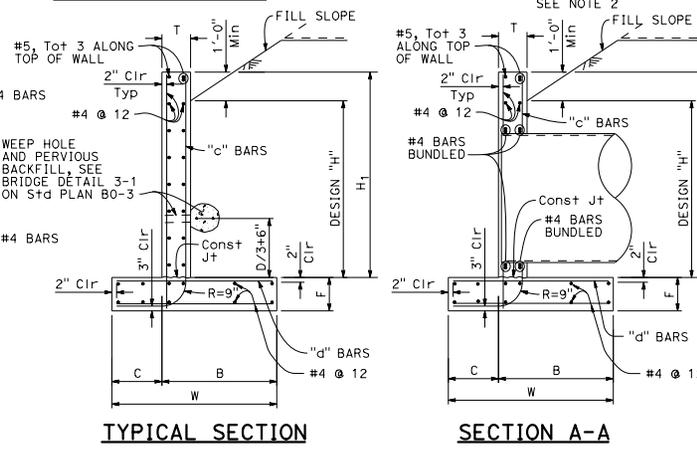
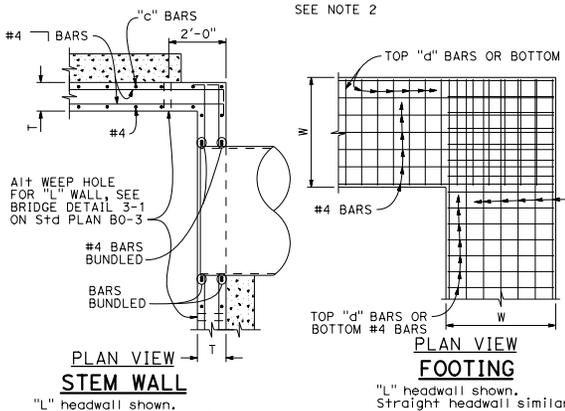
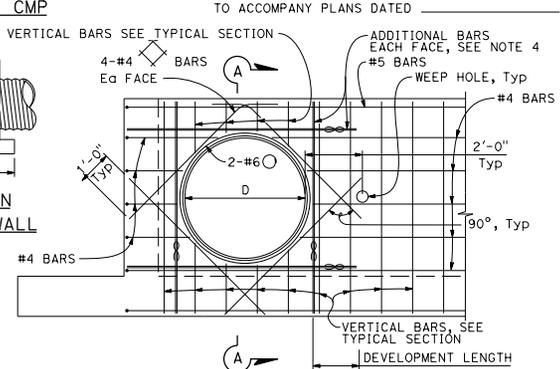
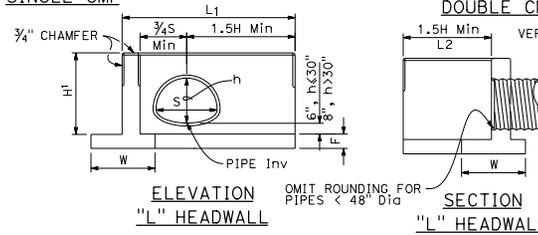
**PIPE CULVERT HEADWALLS  
STRAIGHT AND "L"**

NO SCALE  
RSP D89A DATED OCTOBER 18, 2019 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP D89A**



H	CIRCULAR PIPE SIZE D	CMP ARCH SIZE S x h
2'-8"	12"	-
2'-11"	15"	21" x 15"
3'-2"	18"	24" x 18"
3'-5"	21"	28" x 20"
3'-8"	24"	35" x 24"
3'-11"	27"	-
4'-2"	30"	42" x 29"
4'-8"	33"	49" x 33"
4'-11"	36"	-
5'-2"	39"	57" x 38"
5'-5"	42"	64" x 43"
5'-8"	45"	-
5'-11"	48"	71" x 47"
6'-2"	51"	-
6'-5"	54"	-



- NOTES:**
- Length of wall from C of pipe to end of wall is 1.5H Min. The ends of headwall need to be embedded into the slope by one foot.
  - Single circular pipe or single CMP shown for "L" headwall. For double pipe in "L" headwall, see "ELEVATION STRAIGHT HEADWALL DOUBLE CIRCULAR PIPE" or "ELEVATION STRAIGHT HEADWALL DOUBLE CMP" detail for additional information.
  - Cable railing to be installed on top of headwall when shown on Project Plans. See Standard Plan B11-47 for cable railing details.
  - Adjacent to each side of the opening, place additional reinforcement equivalent to half the interrupted main reinforcement.
  - Quantities are approximate and for design purposes only. No deduction is made for pipe or arch occupancy.
  - Provide necessary erosion protection in front of wall.
  - If precast construction is used, the design standard shall be equal to or exceed that shown here, and the bottom of footing must be roughened.

	H	2'-8"	2'-11"	3'-2"	3'-5"	3'-8"	3'-11"	4'-2"	4'-8"	4'-11"	5'-2"	5'-5"	5'-8"	5'-11"	6'-2"	6'-5"
T	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"
W	2'-3"	2'-3"	2'-3"	2'-6"	2'-6"	2'-6"	3'-0"	3'-0"	3'-3"	3'-9"	4'-0"	4'-0"	4'-2"	4'-6"	4'-6"	4'-9"
C	6"	6"	6"	6"	6"	6"	6"	9"	9"	9"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-3"
B	1'-9"	1'-9"	1'-9"	2'-0"	2'-0"	2'-0"	2'-3"	2'-3"	2'-3"	2'-9"	3'-0"	3'-0"	3'-2"	3'-6"	3'-6"	3'-6"
F	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"
"c" BARS	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 9	#5 @ 9	#5 @ 9
"d" BARS	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 9	#5 @ 9	#5 @ 9	#5 @ 9	#5 @ 9	#6 @ 12	#6 @ 9	#6 @ 9	#6 @ 9
* Conc. CY/LF	0.20	0.20	0.21	0.23	0.24	0.26	0.29	0.30	0.32	0.35	0.37	0.39	0.44	0.46	0.48	0.48
* Reinf LB/LF	19	20	21	22	24	24	27	32	33	36	38	39	43	47	47	49
**CASE II Ser (q <sub>o</sub> , B')	0.41, 1.85	0.48, 1.89	0.55, 1.91	0.60, 1.95	0.62, 2.08	0.62, 2.20	0.63, 2.44	0.67, 2.61	0.71, 2.72	0.75, 2.87	0.80, 2.93	0.84, 3.10	0.88, 3.20	0.91, 3.44	0.95, 3.78	1.07, 1.80
Str (q <sub>o</sub> , B')	1.07, 1.80	1.12, 1.83	1.20, 1.85	1.32, 1.89	1.34, 2.05	1.36, 2.19	1.39, 2.36	1.45, 2.48	1.50, 2.64	1.55, 2.77	1.62, 2.91	1.69, 3.16	1.72, 3.23	1.79, 3.33	1.82, 3.67	0.56, 2.05
**CASE III Ser (q <sub>o</sub> , B')	0.56, 2.05	0.62, 2.08	0.70, 2.10	0.75, 2.12	0.81, 2.20	0.83, 2.38	0.85, 2.49	0.91, 2.60	0.94, 2.75	0.97, 2.81	1.02, 2.91	1.09, 3.05	1.12, 3.12	1.18, 3.23	1.22, 3.50	0.91, 2.01
Str (q <sub>o</sub> , B')	0.91, 2.01	0.98, 2.05	1.06, 2.04	1.19, 2.06	1.22, 2.28	1.30, 2.34	1.36, 2.40	1.41, 2.51	1.49, 2.59	1.55, 2.68	1.65, 2.76	1.71, 2.90	1.79, 3.03	1.85, 3.07	1.90, 3.33	

**REINFORCED CONCRETE HEADWALL**  
Quantities do not include added diagonals and do not consider pipe occupancy.

**NOTE:** Reinforced Concrete:  $f_y = 60,000$  psi  
 $f'_c = 3,600$  psi  
Earth Density: 120 pcf  
Equivalent Fluid Pressure: 36 pcf

RSP D89B DATED OCTOBER 18, 2019 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP D89B**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

REGISTERED CIVIL ENGINEER  
October 18, 2019  
PLANS APPROVAL DATE

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2018 REVISED STANDARD PLAN RSP D89B

**ANNOTATION**

SYMBOL	DESCRIPTION
	ABANDON. IF APPLIED TO CONDUIT, REMOVE CONDUCTORS
	INSTALL PULL BOX IN EXISTING CONDUIT RUN
	PEDESTRIAN BARRICADE, TYPE AS INDICATED ON PLAN
	INSTALL CONDUIT INTO EXISTING PULL BOX
	CONNECT NEW AND EXISTING CONDUIT. REMOVE EXISTING CONDUCTORS AND INSTALL CONDUCTORS AS INDICATED
	CONDUIT TO REMAIN FOR FUTURE USE. REMOVE CONDUCTORS. INSTALL PULL TAPE
	DETECTOR HANDHOLE
	FOUNDATION TO BE ABANDONED
	INSTALL SIGN ON SIGNAL MAST ARM
	NO SLIP BASE ON STANDARD
	PHOTOELECTRIC CONTROL
	PHOTOELECTRIC UNIT
	EQUIPMENT OR MATERIAL TO BE REMOVED AND BECOME THE PROPERTY OF THE CONTRACTOR
	RELOCATE EQUIPMENT
	REMOVE AND REUSE EQUIPMENT
	REMOVE AND SALVAGE EQUIPMENT
	SPLICE NEW TO EXISTING CONDUCTORS
	SERVICE DISCONNECT
	TELEPHONE SERVICE POINT
	SPECIFIC PROJECT NOTES

**SOFFIT AND WALL-MOUNTED LUMINAIRES**

SYMBOL	DESCRIPTION
	PENDANT SOFFIT LUMINAIRE
	FLUSH-MOUNTED SOFFIT LUMINAIRE
	WALL-MOUNTED LUMINAIRE
	EXISTING SOFFIT OR WALL-MOUNTED LUMINAIRE TO REMAIN UNMODIFIED
	EXISTING SOFFIT OR WALL-MOUNTED LUMINAIRE TO BE MODIFIED AS SPECIFIED

**NOTE:**  
Arrow indicates "street side" of luminaire.

**STANDARD**

NEW	EXISTING	TYPE
		15
		15D
		15 STRUCTURE
		15D STRUCTURE
		21
		21D
		21 STRUCTURE
		21D STRUCTURE
		30
		31
		32

**MISCELLANEOUS ELECTROLIERS**

NEW	EXISTING	DESCRIPTION
		LUMINAIRE ON WOOD POLE
		NON-STANDARD ELECTROLIER (SEE PROJECT LEGEND)
		CITY ELECTROLIER
		ELECTROLIER FOUNDATION (FUTURE INSTALLATION)

**NOTE:**

1. Luminaires shall be Roadway 2 when installed on Type 21, 21D, 30, 31 and 32 Standards, unless otherwise specified. Luminaires shall be Roadway 1 when installed on other type standards or poles, unless otherwise specified.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

H.R.F.  
REGISTERED ELECTRICAL ENGINEER

October 19, 2018  
PLANS APPROVAL DATE

Hamid Zolfaghari  
No. E15636  
Exp. 12-31-19  
REGISTERED PROFESSIONAL ENGINEER  
ELECTRICAL  
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

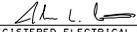
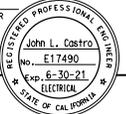
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS (LEGEND)**  
NO SCALE

RSP ES-1A DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-1A DATED MAY 31, 2018 - PAGE 475 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-1A**

2018 REVISED STANDARD PLAN RSP ES-1A

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

  
 REGISTERED ELECTRICAL ENGINEER  
 No. E17490  
 April 17, 2020  
 PLANS APPROVAL DATE  
  
 THE STATE OF CALIFORNIA OR ITS OFFICERS  
 OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
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 COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

- All signal sections shall be 12" unless shown otherwise.
- Signal heads shall be provided with backplates unless shown otherwise.

**OVERHEAD SIGN**

NEW	EXISTING	DESCRIPTION
		SINGLE POST, SINGLE SIGN, BALANCED BUTTERFLY
		SINGLE POST, DOUBLE SIGN, BALANCED BUTTERFLY
		SINGLE POST, SINGLE SIGN, FULL CANTILEVER
		DOUBLE POST, SINGLE SIGN
		SINGLE SIGN MOUNTED ON STRUCTURE
		SINGLE POST, SINGLE SIGN, FULL CANTILEVER WITH ELECTROLIER
		DOUBLE POST, SINGLE SIGN WITH ELECTROLIER

**CONDUIT**

NEW	EXISTING	DESCRIPTION
		LIGHTING CONDUIT, UNLESS OTHERWISE INDICATED OR NOTED
		TRAFFIC SIGNAL CONDUIT
		COMMUNICATION CONDUIT
		TELEPHONE CONDUIT
		FIRE ALARM CONDUIT
		FIBER OPTIC CONDUIT
		CONDUIT TERMINATION
		CONDUIT RISER ATTACHED TO THE STRUCTURE OR SERVICE POLE

**SIGNAL EQUIPMENT**

NEW	EXISTING	DESCRIPTION
		PEDESTRIAN SIGNAL HEAD
		PUSH BUTTON ASSEMBLY POST
		PEDESTRIAN BARRICADE
		VEHICLE SIGNAL HEAD CONSISTING OF RED, YELLOW, AND GREEN SECTIONS
		VEHICLE SIGNAL HEAD WITH ANGLE VISOR
MODIFICATIONS OF BASIC SYMBOL: "L" INDICATES ALL NON-ARROW SECTIONS LOUVERED "LG" INDICATES LOUVERED GREEN SECTION ONLY "PV" INDICATES ALL 12" SECTIONS PROGRAMMED VISIBILITY "8" INDICATES ALL 8" SECTIONS (ONLY WHEN SPECIFIED) "PHBF" INDICATES TYPE MAS-3A FOR PEDESTRIAN HYBRID BEACON FACE		
		VEHICLE SIGNAL HEAD CONSISTING OF RED, YELLOW, AND GREEN LEFT ARROW SECTIONS
		VEHICLE SIGNAL HEAD CONSISTING OF RED AND YELLOW SECTIONS WITH AN UP GREEN ARROW SECTION
		VEHICLE SIGNAL HEAD (5 SECTION) CONSISTING OF RED, YELLOW, AND GREEN SECTIONS WITH YELLOW AND GREEN RIGHT ARROW SECTIONS
		TYPE 15TS STANDARD WITH VEHICLE SIGNAL HEAD, PEDESTRIAN SIGNAL HEAD, AND LUMINAIRE
		TYPE 21TS STANDARD WITH VEHICLE SIGNAL HEAD, PEDESTRIAN SIGNAL HEAD, AND LUMINAIRE
		STANDARD WITH LUMINAIRE AND SIGNAL MAST ARMS AND ATTACHED VEHICLE SIGNAL HEADS
		TYPE 1 STANDARD WITH ATTACHED VEHICLE SIGNAL HEADS
		STANDARD WITH A SIGNAL MAST ARM, ATTACHED VEHICLE SIGNAL HEADS AND STREET NAME SIGN

**SERVICE EQUIPMENT**

NEW	EXISTING	DESCRIPTION
		OVERHEAD LINES
		WOOD POLE, "U" INDICATES UTILITY OWNED
		POLE GUY WITH ANCHOR
		UTILITY TRANSFORMER - GROUND MOUNTED
		SERVICE EQUIPMENT ENCLOSURE TYPE, DOOR INDICATES FRONT OF ENCLOSURE
		TELEPHONE DEMARCATION CABINET

**POLE-MOUNTED SERVICE DESIGNATION**

SYMBOL	DESCRIPTION
	TYPE H SERVICE, 28'-10" POLE HEIGHT ABOVE GRADE

**FLASHING BEACON**

NEW	EXISTING	DESCRIPTION
		FLASHING BEACON (ONE VEHICLE SIGNAL HEAD WITH BACKPLATE AND VISOR) "R" INDICATES RED INDICATION "Y" INDICATES YELLOW INDICATION
		FLASHING BEACON WITH TYPE 15-FBS STANDARD AND A SIGN.
		FLASHING BEACON WITH TYPES 9, 9A OR 9B SIGN UNLESS OTHERWISE SPECIFIED OR INDICATED
		CONTROLLER ASSEMBLY, DOOR INDICATES FRONT OF CABINET
		GUARD POST
		OPTICAL DETECTOR FOR THE EMERGENCY VEHICLE DETECTION

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(LEGEND)**

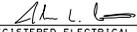
NO SCALE

RSP ES-1B DATED APRIL 17, 2020 SUPERSEDES RSP ES-1B DATED OCTOBER 19, 2018 AND STANDARD PLAN ES-1B DATED MAY 31, 2018 - PAGE 476 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-1B**

2018 REVISED STANDARD PLAN RSP ES-1B

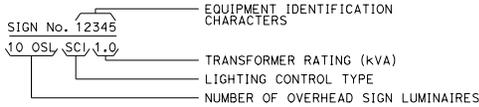
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

  
 REGISTERED ELECTRICAL ENGINEER  
 No. E17490  
 Exp. 6-30-21  
 STATE OF CALIFORNIA

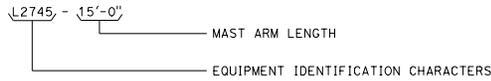
April 17, 2020  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS  
 OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
 THE ACCURACY OR COMPLETENESS OF SCANNED  
 COPIES OF THIS PLAN SHEET.

### EQUIPMENT DESIGNATION

#### SIGN:



#### LIGHTING STANDARD, SIGNAL AND LIGHTING STANDARD:



#### SOFFIT:

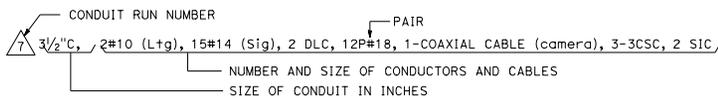


**NOTE:**  
EXISTING EQUIPMENT IDENTIFICATION CHARACTERS ARE SHOWN IN PARENTHESIS

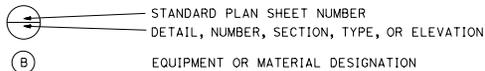
### MISCELLANEOUS EQUIPMENT

NEW	EXISTING	DESCRIPTION
		CHANGEABLE MESSAGE SIGN
		CAMERA
		HIGHWAY ADVISORY RADIO POLE AND ANTENNA
		EXTINGUISHABLE MESSAGE SIGN
		DETECTION DEVICE M = MICROWAVE SENSOR
		DETECTION DEVICE V = VIDEO IMAGE SENSOR
		RADAR SPEED FEEDBACK SIGN

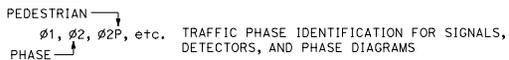
### CONDUIT AND CONDUCTORS



### DETAILS



### PHASE

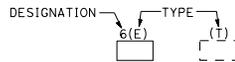


### WIRING COMPONENTS

SYMBOL	DESCRIPTION
	EXTERNAL CONDUCTOR
	CONDUCTOR OR BUS
	TIE POINT
	CONTACTOR COIL
	CONTACTOR, NO CONTACT
	CONTACTOR, NC CONTACT
	ENCLOSURE BOND
	GROUNDING ELECTRODE
	CIRCUIT BREAKER
	RECEPTACLE

### HANDHOLES, PULL BOXES, AND VAULTS

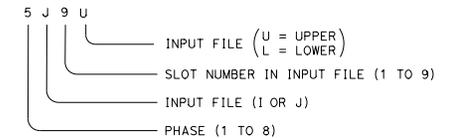
NEW	EXISTING	DESCRIPTION
		DETECTOR HANDHOLE
		PULL BOX, No. 5 UNLESS OTHERWISE INDICATED
		VAULT



**DESIGNATIONS:**  
 3 No. 3 PULL BOX  
 5 No. 5 PULL BOX  
 6 No. 6 PULL BOX  
 7 No. 7 PULL BOX (CEILING)  
 8 No. 8 PULL BOX  
 9 No. 9 PULL BOX (STRUCTURE)  
 9A No. 9A PULL BOX (STRUCTURE)

**TYPE:**  
 (E) EXTENDED PULL BOX  
 (T) TRAFFIC PULL BOX  
 (TR) TAMPER-RESISTANT PULL BOX

### VEHICLE DETECTOR DESIGNATION



### DETECTORS

NEW	EXISTING	DESCRIPTION
		TYPE A LOOP DETECTOR. OUTLINE OF SAW CUT SHOWN
		TYPE B LOOP DETECTOR. OUTLINE OF SAW CUT SHOWN
		TYPE C LOOP DETECTOR. OUTLINE OF SAW CUT SHOWN
		TYPE D LOOP DETECTOR. OUTLINE OF SAW CUT SHOWN
		TYPE E LOOP DETECTOR. OUTLINE OF SAW CUT SHOWN
		TYPE F LOOP DETECTOR. OUTLINE OF SAW CUT SHOWN
		TYPE Q LOOP DETECTOR. OUTLINE OF SAW CUT SHOWN
		MICROWAVE OR VIDEO DETECTION ZONE

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

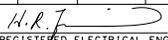
## ELECTRICAL SYSTEMS (LEGEND)

NO SCALE

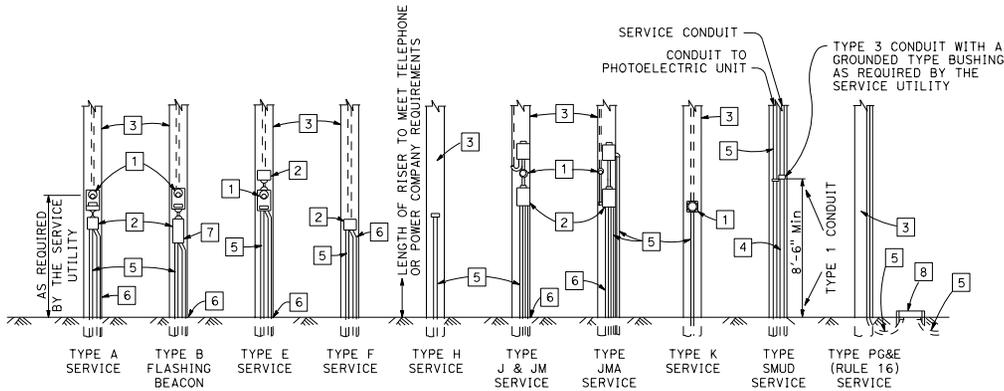
RSP ES-1C DATED APRIL 17, 2020 SUPERSEDES RSP ES-1C DATED OCTOBER 18, 2019  
AND RSP ES-1C DATED OCTOBER 19, 2019 AND STANDARD PLAN ES-1C  
DATED MAY 31, 2018 - PAGE 477 OF THE STANDARD PLANS BOOK DATED 2018.

## REVISED STANDARD PLAN RSP ES-1C

2018 REVISED STANDARD PLAN RSP ES-1C

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
 REGISTERED ELECTRICAL ENGINEER					
October 19, 2018 PLANS APPROVAL DATE					
					
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					

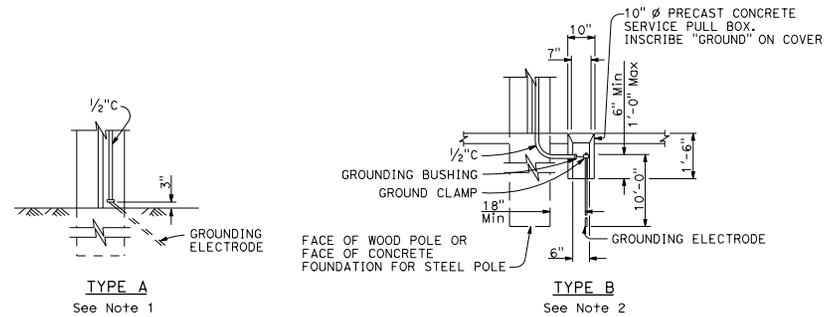
TO ACCOMPANY PLANS DATED \_\_\_\_\_



**POLE MOUNTED SERVICE INSTALLATIONS**

**LEGEND:**

- 1 METER SOCKET.
- 2 SERVICE ENCLOSURE WITH A MINIMUM 60 A RATED MAIN CIRCUIT BREAKER, UNLESS OTHERWISE SHOWN.
- 3 A. UTILITY OWNED POLE. THE SERVICE UTILITY WILL FURNISH AND INSTALL REQUIRED SERVICE RISER, PEU WITH CONDUCTORS AND OTHER EQUIPMENT AS NEEDED.  
B. STATE OWNED POLE. THE CONTRACTOR SHALL FURNISH AND INSTALL REQUIRED SERVICE RISER AND EQUIPMENT.
- 4 2" C. SERVICE CONDUIT MUST HAVE A GROUNDED TYPE BUSHING INSTALLED AT UPPER END OF THE METALLIC POLE RISER CONDUIT. A GROUNDING CONDUCTOR MUST BE ATTACHED TO THE BUSHING, CARRIED THROUGH THE CONDUIT RUN AND ATTACHED TO THE SERVICE EQUIPMENT ENCLOSURE'S GROUNDING ELECTRODE.
- 5 CONDUIT, LENGTH AND SIZE AS REQUIRED.
- 6 1/2" C, 1#6. SEE SERVICE GROUNDING.
- 7 FLASHING BEACON CONTROL ASSEMBLY.
- 8 SERVICE PULL BOX, No. 5 UNLESS OTHERWISE NOTED, FURNISHED AND INSTALLED BY THE CONTRACTOR. SERVICE UTILITY SHALL DETERMINE THE EXACT LOCATION.



**SERVICE GROUNDING**

**NOTES:**

1. Ground clamp and required fittings must be accessible. Conduit must extend to protect grounding electrode conductor from mechanical damage.
2. Use where service utility requires 18" clearance between grounding electrode and the pole or service equipment enclosure. Installation shown is for sidewalk or paved areas. In unpaved areas, omit special service pull box and locate ground clamp above ground or locate ground clamp in nearest pull box.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(SERVICE EQUIPMENT)**

NO SCALE

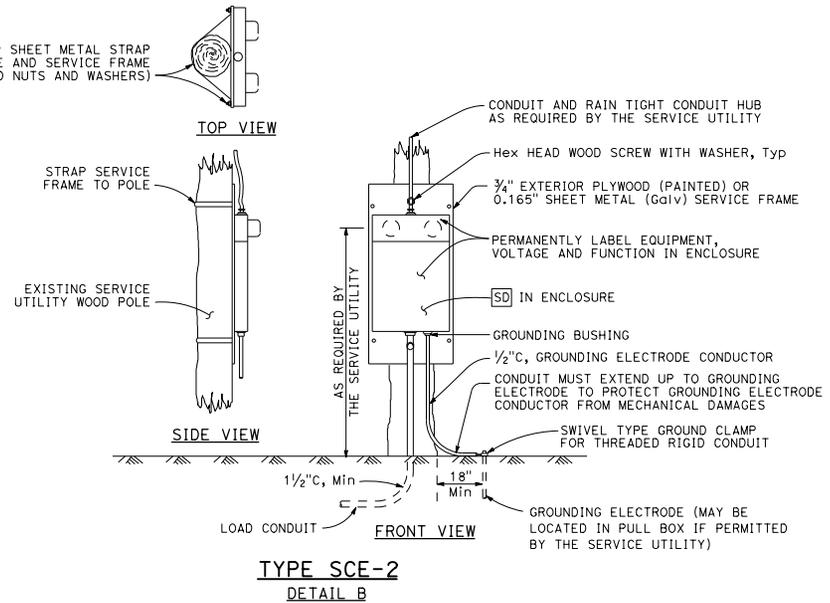
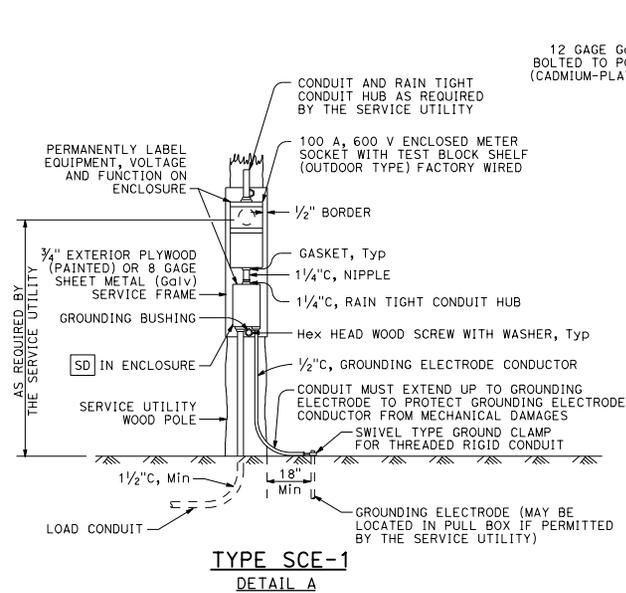
RSP ES-2A DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-2A  
DATED MAY 31, 2018 - PAGE 478 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-2A**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*H.R.F.*  
 REGISTERED ELECTRICAL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 Hamid Zolfaghar  
 No. E15636  
 Exp. 12-31-19  
 REGISTERED PROFESSIONAL ENGINEER  
 ELECTRICAL  
 STATE OF CALIFORNIA  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_



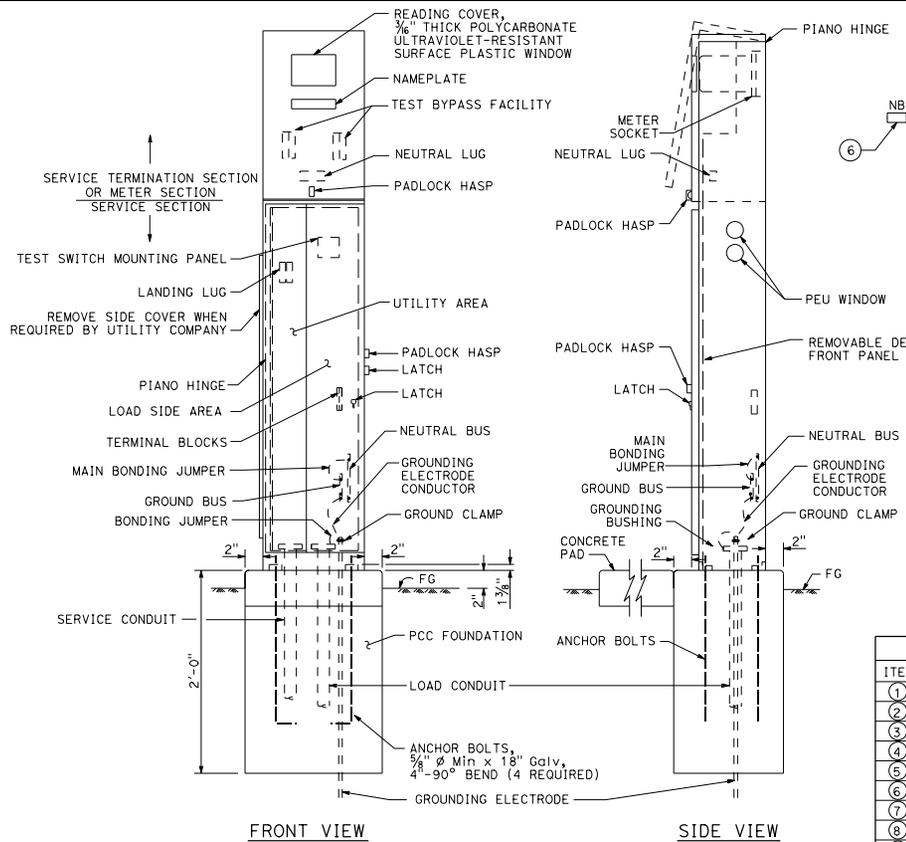
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(SERVICE EQUIPMENT)**

NO SCALE

RSP ES-2B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-2B  
DATED MAY 31, 2018 - PAGE 479 OF THE STANDARD PLANS BOOK DATED 2018.

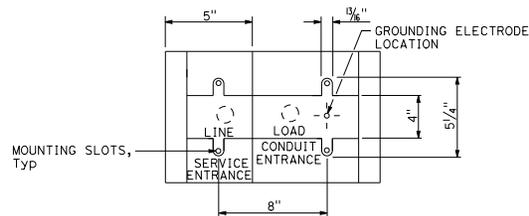
**REVISED STANDARD PLAN RSP ES-2B**

2018 REVISED STANDARD PLAN RSP ES-2B

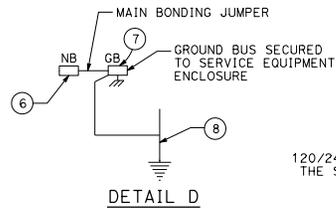


FRONT VIEW SIDE VIEW

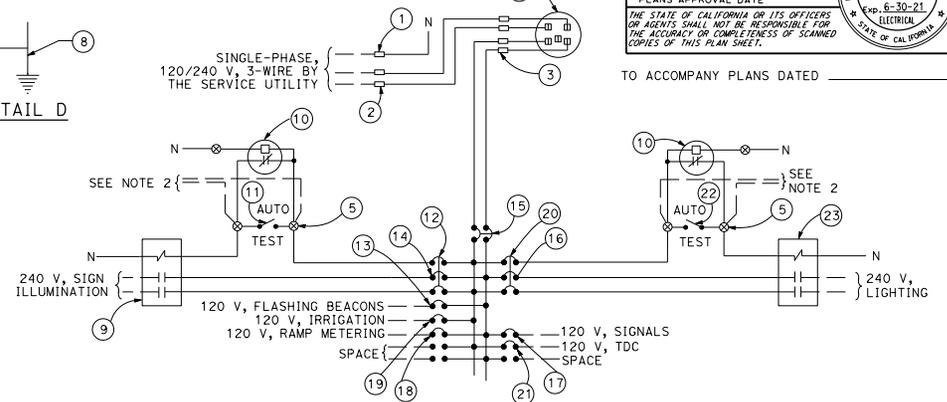
**TYPE III-AF SERVICE EQUIPMENT ENCLOSURE (TYPICAL)**  
DETAIL A



**BASE FOR TYPE III-A SERVICE EQUIPMENT ENCLOSURE**  
DETAIL B



DETAIL D



**120/240 V SERVICE WIRING DIAGRAM (TYPICAL)**  
DETAIL C

TYPE III-A SERVICE EQUIPMENT ENCLOSURE LEGEND (120/240 V)					
ITEM	COMPONENT	NAMEPLATE DESCRIPTION	ITEM	COMPONENT	NAMEPLATE DESCRIPTION
①	NEUTRAL LUG		⑬	15 A, 120 V, 1P, CB	FLASHING BEACON
②	LANDING LUG		⑭	30 A, 240 V, 2P, CB	SIGN ILLUMINATION
③	TEST BYPASS FACILITY		⑮	100 A, 240 V, 2P, CB	MAIN BREAKER
④	METER SOCKET AND SUPPORT		⑯	30 A, 240 V, 2P, CB	LIGHTING
⑤	TERMINAL BLOCKS		⑰	50 A, 120 V, 1P, CB	SIGNALS
⑥	NEUTRAL BUS		⑱	30 A, 120 V, 1P, CB	RAMP METERING
⑦	GROUND BUS		⑲	20 A, 120 V, 1P, CB	IRRIGATION
⑧	GROUNDING ELECTRODE		⑳	15 A, 120 V, 1P, CB	LIGHTING CONTROL
⑨	30 A, 2P, NO CONTACTOR	SIGN ILLUMINATION	㉑	20 A, 120 V, 1P, CB	TELEPHONE DEMARCATION CABINET
⑩	PHOTOELECTRIC UNIT (NOTE 4)	PEU	㉒	15 A, 1P, TEST SWITCH	LIGHTING TEST SWITCH
⑪	15 A, 1P, TEST SWITCH	SIGN ILLUMINATION TEST SWITCH	㉓	60 A, 2P, NO CONTACTOR	LIGHTING
⑫	15 A, 120 V, 1P, CB	SIGN ILLUMINATION CONTROL			

**NOTES:**

- Unless otherwise indicated on the plans, service equipment items shall be provided for each service equipment enclosure as shown.
- Connect to remote test switch mounted on lighting standards, sign post, or structure when required.
- Items ① and ⑥ shall be isolated from the service equipment enclosure.
- Type I photoelectric control shall be used unless otherwise indicated on the plans.
- Item ⑫ and ⑳ shall be ganged operated CB.
- The plan shows the approximate location of devices within the enclosure. Components may be rearranged, however, the "working" clearances within the service equipment enclosure shall be maintained.

D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

REGISTERED ELECTRICAL ENGINEER  
John L. Castro  
No. E17490  
Exp. 6-30-21  
ELECTRICAL ENGINEER  
STATE OF CALIFORNIA

APPROVAL DATE  
April 17, 2020  
PLANS APPROVAL DATE

TO ACCOMPANY PLANS DATED \_\_\_\_\_

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(SERVICE EQUIPMENT ENCLOSURE  
AND TYPICAL WIRING DIAGRAM,  
TYPE III-A SERIES)**

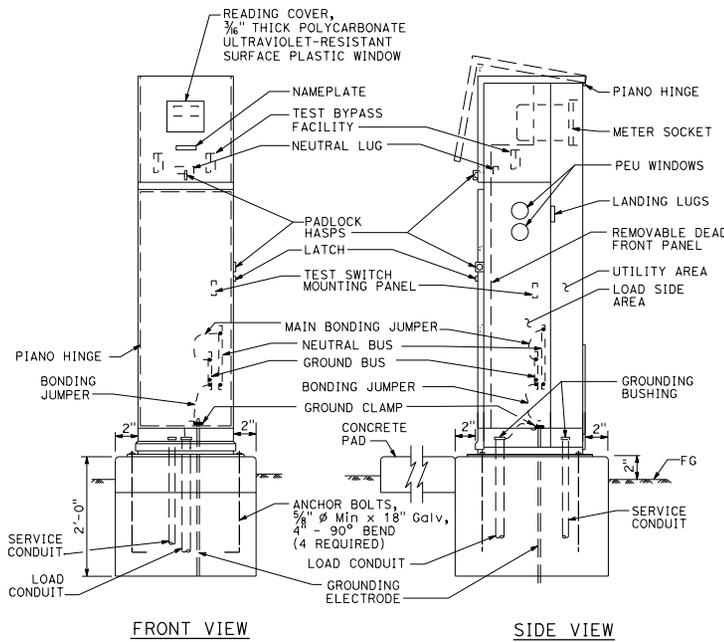
NO SCALE

RSP ES-2D DATED APRIL 17, 2020 SUPERSEDES RSP ES-2D DATED OCTOBER 19, 2018 AND STANDARD PLAN ES-2D DATED MAY 31, 2018 - PAGE 481 OF THE STANDARD PLANS BOOK DATED 2018.

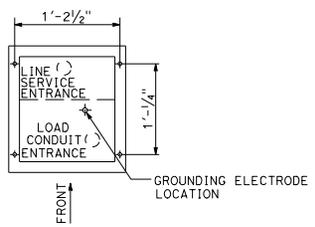
**REVISED STANDARD PLAN RSP ES-2D**

D16#	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

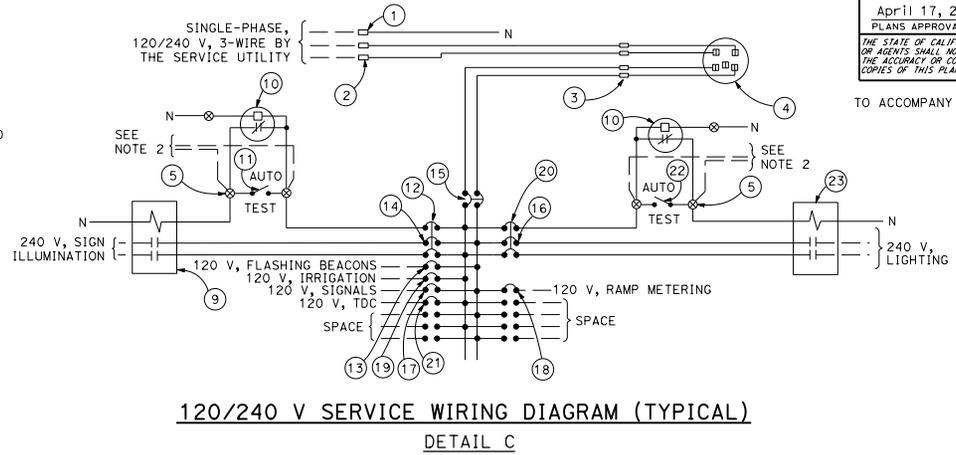

  
 REGISTERED ELECTRICAL ENGINEER  
 April 17, 2020  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



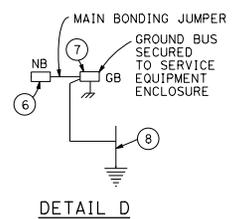
**TYPE III-BF SERVICE EQUIPMENT ENCLOSURE (TYPICAL)**  
DETAIL A



**BASE FOR TYPE III-B SERVICE EQUIPMENT ENCLOSURE**  
DETAIL B



**120/240 V SERVICE WIRING DIAGRAM (TYPICAL)**  
DETAIL C



DETAIL D

TYPE III-B SERVICE EQUIPMENT ENCLOSURE LEGEND (120/240 V)

ITEM	COMPONENT	NAMEPLATE DESCRIPTION	ITEM	COMPONENT	NAMEPLATE DESCRIPTION
①	NEUTRAL LUG		⑬	15 A, 120 V, 1P, CB	FLASHING BEACON
②	LANDING LUG		⑭	30 A, 240 V, 2P, CB	SIGN ILLUMINATION
③	TEST BYPASS FACILITY		⑮	100 A, 240 V, 2P, CB	MAIN BREAKER
④	METER SOCKET AND SUPPORT		⑯	30 A, 240 V, 2P, CB	LIGHTING
⑤	TERMINAL BLOCKS		⑰	50 A, 120 V, 1P, CB	SIGNALS
⑥	NEUTRAL BUS		⑱	30 A, 120 V, 1P, CB	RAMP METERING
⑦	GROUND BUS		⑲	20 A, 120 V, 1P, CB	IRRIGATION
⑧	GROUNDING ELECTRODE		⑳	15 A, 120 V, 1P, CB	LIGHTING CONTROL
⑨	30 A, 2P, NO CONTACTOR	SIGN ILLUMINATION	㉑	20 A, 120 V, 1P, CB	TELEPHONE DEMARCATION CABINET
⑩	PHOTOELECTRIC UNIT (NOTE 4)	PEU	㉒	15 A, 1P, TEST SWITCH	LIGHTING TEST SWITCH
⑪	15 A, 1P, TEST SWITCH	SIGN ILLUMINATION TEST SWITCH	㉓	60 A, 2P, NO CONTACTOR	LIGHTING
⑫	15 A, 120 V, 1P, CB	SIGN ILLUMINATION CONTROL			

**NOTES:**

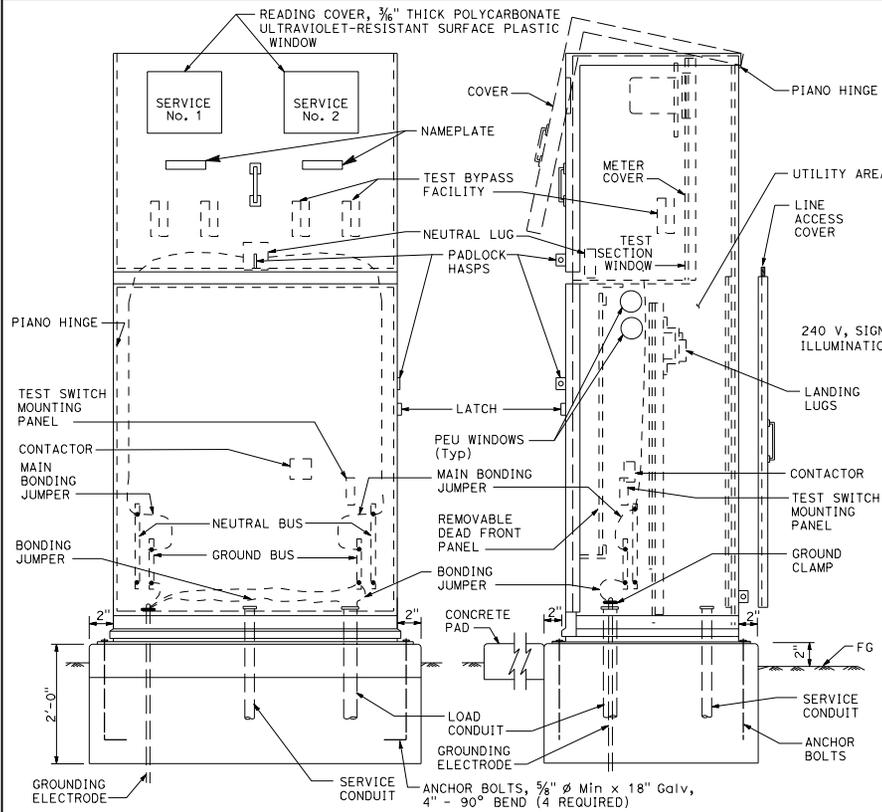
- Unless otherwise indicated on the plans, service equipment items shall be provided for each service equipment enclosure as shown.
- Connect to remote test switch mounted on lighting standards, sign post, or structure when required.
- Items ① and ⑥ shall be isolated from the service equipment enclosure.
- Type I photoelectric control shall be used unless otherwise indicated on the plans.
- Item ⑫ and ⑳ shall be ganged operated CB.
- The plan shows the approximate location of devices within the enclosure. Components may be rearranged, however, the "working" clearances within the service equipment enclosure shall be maintained.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(SERVICE EQUIPMENT ENCLOSURE AND**  
**TYPICAL WIRING DIAGRAM,**  
**TYPE III-B SERIES)**  
 NO SCALE

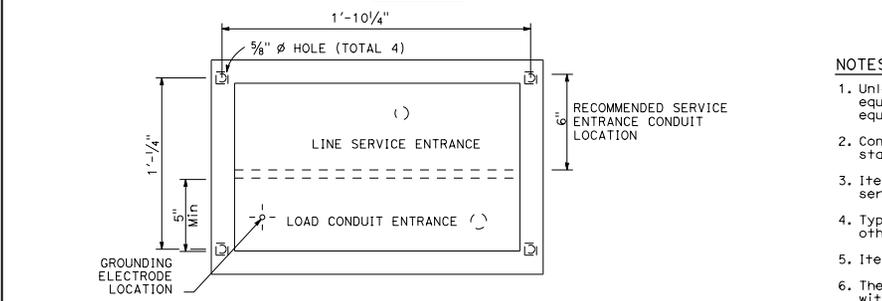
RSP ES-2E DATED APRIL 17, 2020 SUPERSEDES RSP ES-2E DATED OCTOBER 19, 2018 AND STANDARD PLAN ES-2E DATED MAY 31, 2018 - PAGE 482 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-2E**

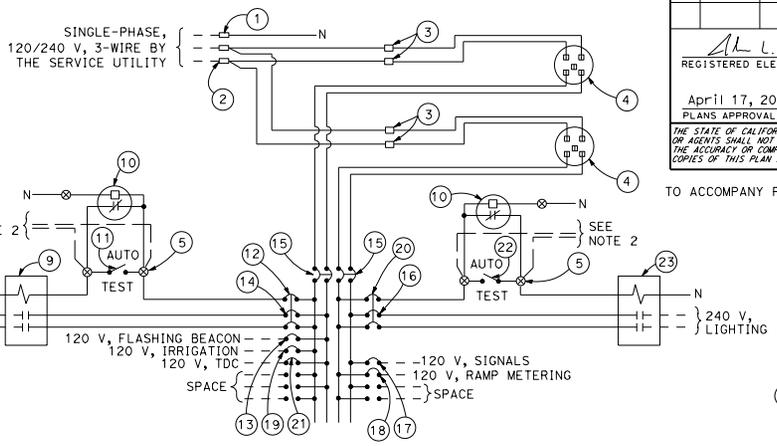
2018 REVISED STANDARD PLAN RSP ES-2E



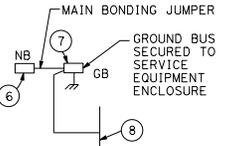
FRONT VIEW  
SIDE VIEW  
**TYPE III-CF SERVICE EQUIPMENT ENCLOSURE (TYPICAL)**  
DETAIL A



**BASE FOR TYPE III-C SERVICE EQUIPMENT ENCLOSURE**  
DETAIL B



**120/240 V SERVICE WIRING DIAGRAM (TYPICAL)**  
DETAIL C



DETAIL D

D16#	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

REGISTERED ELECTRICAL ENGINEER  
*John L. Castro*  
No. E17490  
Exp. 6-30-21  
ELECTRICAL  
STATE OF CALIFORNIA

APPROVAL DATE  
April 17, 2020  
PLANS APPROVAL DATE

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

**TYPE III-C SERVICE EQUIPMENT ENCLOSURE LEGEND (120/240 V)**

ITEM	COMPONENT	NAMEPLATE DESCRIPTION	ITEM	COMPONENT	NAMEPLATE DESCRIPTION
1	NEUTRAL LUG		13	15 A, 120 V, 1P, CB	FLASHING BEACON
2	LANDING LUG		14	30 A, 240 V, 2P, CB	SIGN ILLUMINATION
3	TEST BYPASS FACILITY		15	100 A, 240 V, 2P, CB	MAIN BREAKER
4	METER SOCKET AND SUPPORT		16	30 A, 240 V, 2P, CB	LIGHTING
5	TERMINAL BLOCKS		17	50 A, 120 V, 1P, CB	SIGNALS
6	NEUTRAL BUS		18	30 A, 120 V, 1P, CB	RAMP METERING
7	GROUND BUS		19	20 A, 120 V, 1P, CB	IRRIGATION
8	GROUNDING ELECTRODE		20	15 A, 120 V, 1P, CB	LIGHTING CONTROL
9	30 A, 2P, NO CONTACTOR	SIGN ILLUMINATION	21	20 A, 120 V, 1P, CB	TELEPHONE DEMARCATION CABINET
10	PHOTOELECTRIC UNIT (NOTE 4)	PEU	22	15 A, 1P, TEST SWITCH	LIGHTING TEST SWITCH
11	15 A, 1P, TEST SWITCH	SIGN ILLUMINATION TEST SWITCH	23	60 A, 2P, NO CONTACTOR	LIGHTING
12	15 A, 120 V, 1P, CB	SIGN ILLUMINATION CONTROL			

- NOTES:**
- Unless otherwise indicated on the plans, service equipment items shall be provided for each service equipment enclosure as shown.
  - Connect to remote test switch mounted on lighting standards, sign post, or structure when required.
  - Items 1 and 6 shall be isolated from the service equipment enclosure.
  - Type I photoelectric control shall be used unless otherwise indicated on the plans.
  - Item 12 and 20 shall be ganged operated CB.
  - The plan shows the approximate location of devices within the enclosure. Components may be rearranged, however, the "working" clearances within the service equipment enclosure shall be maintained.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

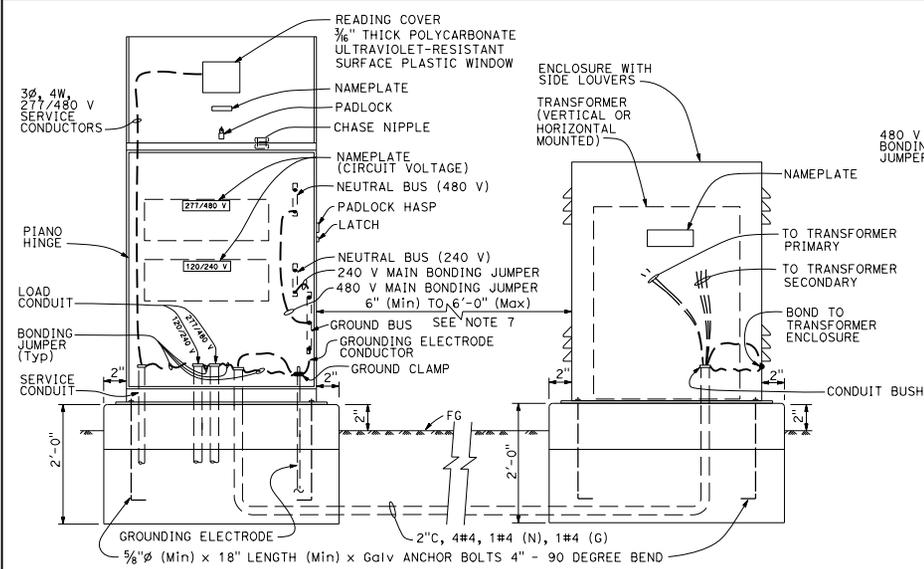
**ELECTRICAL SYSTEMS  
(SERVICE EQUIPMENT ENCLOSURE AND  
TYPICAL WIRING DIAGRAM,  
TYPE III-C SERIES)**

NO SCALE

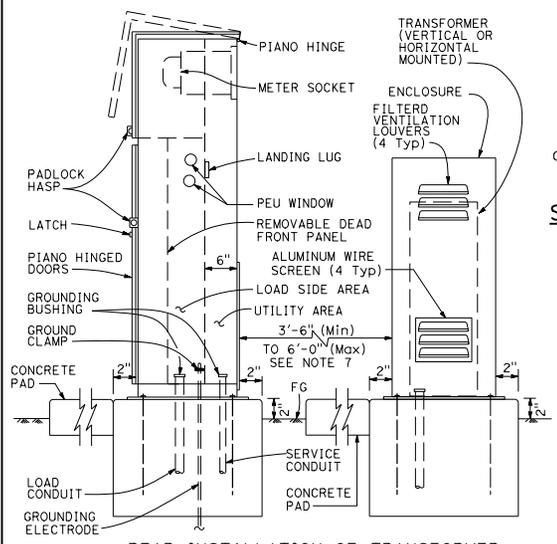
RSP ES-2F DATED APRIL 17, 2020 SUPERSEDES RSP ES-2F DATED OCTOBER 19, 2018 AND STANDARD PLAN ES-2F DATED MAY 31, 2018 - PAGE 483 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-2F**

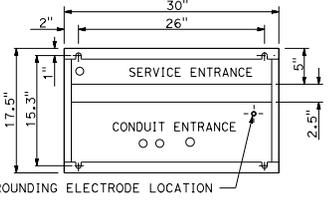
2018 REVISED STANDARD PLAN RSP ES-2F



**SIDE INSTALLATION OF TRANSFORMER**



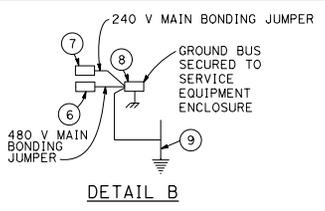
**REAR INSTALLATION OF TRANSFORMER  
TYPE III-DF SERVICE EQUIPMENT ENCLOSURE  
TYPICAL**



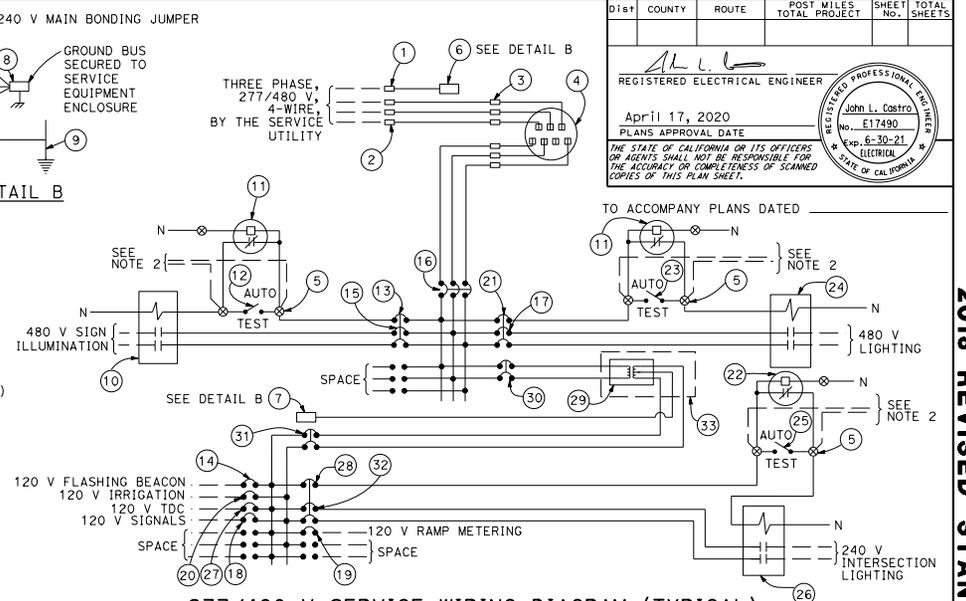
**BASE FOR TYPE III-D  
SERVICE EQUIPMENT ENCLOSURE  
DETAIL A**

**NOTES:**

1. Unless otherwise indicated on the plans, service equipment items shall be provided for each service equipment enclosure as shown.
2. Connect to remote test switch mounted on lighting standards, sign post, or structure when required.
3. Items No. ①, ⑥, and ⑦ shall be isolated from the service equipment enclosure.
4. Type I photoelectric control shall be used unless otherwise indicated on the plans.
5. Color of insulation of the neutral shall be gray for the 277/480 V system and shall be white for the 120/240 V system.
6. Items ⑬, ⑳, and ㉓ shall be ganged operated CB.
7. The enclosure shall be located to the side of the service equipment enclosure unless otherwise indicated on the plans.
8. The base dimension for the enclosure for the transformer shall be as per manufacturer's design.
9. The plan shows the approximate location of devices within the enclosure. Components may be rearranged, however, the "working" clearances within the service equipment enclosure shall be maintained.



**DETAIL B**



**277/480 V SERVICE WIRING DIAGRAM (TYPICAL)  
DETAIL C**

**TYPE III-D SERVICE (277/480 V) EQUIPMENT LEGEND**

ITEM	COMPONENT	NAMEPLATE DESCRIPTION	ITEM	COMPONENT	NAMEPLATE DESCRIPTION
①	NEUTRAL LUG		⑱	50 A, 120 V, 1P, CB	SIGNAL (120 V)
②	LANDING LUG		⑲	30 A, 120 V, 1P, CB	RAMP METERING (120 V)
③	TEST BYPASS FACILITY		⑳	20 A, 120 V, 1P, CB	IRRIGATION (120 V)
④	METER SOCKET AND SUPPORT		㉑	10 A, 277 V, 1P, CB	LIGHTING CONTROL (277 V)
⑤	TERMINAL BLOCKS		㉒	PHOTOELECTRIC UNIT (NOTE 4)	PEU (120/240 V)
⑥	NEUTRAL BUS	NEUTRAL BUS (480 V)	㉓	15 A, 1P, TEST SWITCH	LIGHTING TEST SWITCH (277 V)
⑦	NEUTRAL BUS	NEUTRAL BUS (240 V)	㉔	30 A, 2P, NO CONTACTOR	LIGHTING (480 V)
⑧	GROUND BUS		㉕	15 A, 1P, TEST SWITCH	INTERSECTION LIGHTING TEST SWITCH (120 V)
⑨	GROUNDING ELECTRODE		㉖	30 A, 2P, NO CONTACTOR	INTERSECTION LIGHTING (120 V)
⑩	30 A, 2P, NO CONTACTOR	SIGN ILLUMINATION (480 V)	㉗	20 A, 120 V, 1P, CB	TELEPHONE DEMARCATION CABINET (120 V)
⑪	PHOTOELECTRIC UNIT (NOTE 4)	PEU (277/480 V PEU)	㉘	10 A, 120 V, 1P, CB	INTERSECTION LIGHTING CONTROL (120 V)
⑫	15 A, 1P, TEST SWITCH	SIGN ILLUMINATION TEST SWITCH (277 V)	㉙	15 KVA, 480-120/240 V TRANSFORMER	TRANSFORMER, 15 KVA, 480-240 V
⑬	10 A, 277 V, 1P, CB	SIGN ILLUMINATION CONTROL (277 V)	⑳	40 A, 480 V, 2P, CB	TRANSFORMER PRIMARY (480 V)
⑭	15 A, 120 V, 1P, CB	FLASHING BEACON (120 V)	㉑	80 A, 240 V, 2P, CB	TRANSFORMER SECONDARY (240 V)
⑮	15 A, 480 V, 2P, CB	SIGN ILLUMINATION (480 V)	㉒	30 A, 240 V, 2P, CB	INTERSECTION LIGHTING (240 V)
⑯	100 A, 480 V, 3P, CB	MAIN BREAKER (480 V)	㉓	ENCLOSURE	TRANSFORMER, 15 KVA, 480-240 V
⑰	15 A, 480 V, 2P, CB	LIGHTING (480 V)			

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(SERVICE EQUIPMENT ENCLOSURE AND  
TYPICAL WIRING DIAGRAM, TYPE III-D SERIES)**  
NO SCALE

RSP ES-2G DATED APRIL 17, 2020 SUPERSEDES RSP ES-2G DATED OCTOBER 19, 2018 AND  
STANDARD PLAN ES-2G DATED MAY 31, 2018 - PAGE 484 OF THE STANDARD PLANS BOOK DATED 2018.

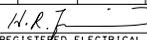
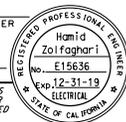
**REVISED STANDARD PLAN RSP ES-2G**

D16*	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

REGISTERED ELECTRICAL ENGINEER  
APRIL 17, 2020  
PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

John L. Castro  
No. E17490  
Exp. 6-30-21  
ELECTRICAL  
STATE OF CALIFORNIA

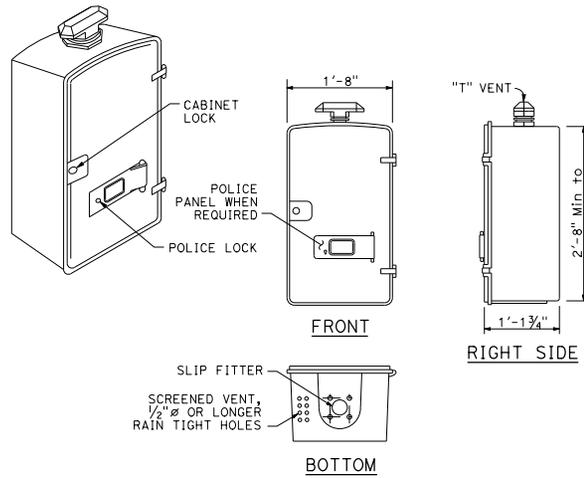
2018 REVISED STANDARD PLAN RSP ES-2G

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
 REGISTERED ELECTRICAL ENGINEER					
October 19, 2018 PLANS APPROVAL DATE					
					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

1. Cabinet dimensions are nominal.
2. Cabinet fan may be installed at an alternate location near the top of the cabinet when approved by the Engineer.



**TYPE G CABINET**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(CONTROLLER CABINET  
DETAILS)**

NO SCALE

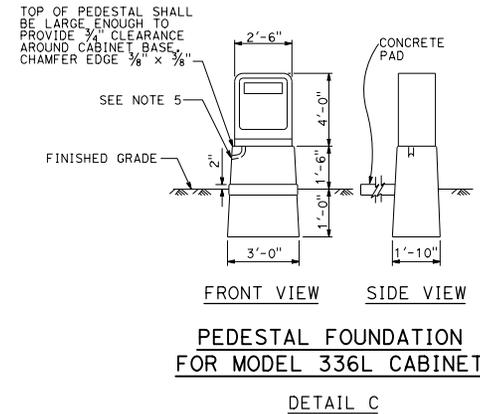
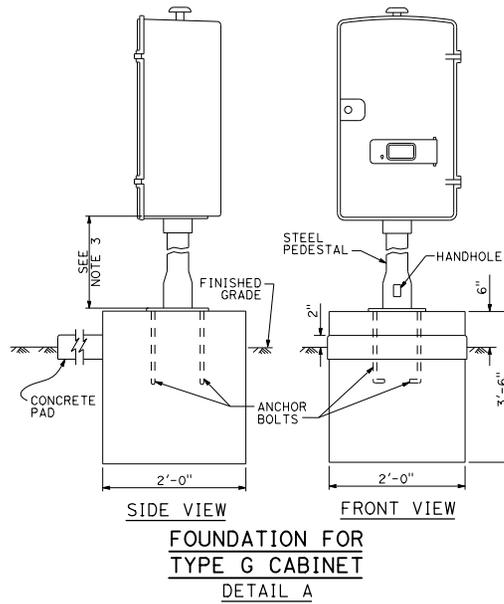
RSP ES-3A DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-3A  
DATED MAY 31, 2018 - PAGE 485 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-3A**

2018 REVISED STANDARD PLAN RSP ES-3A

**NOTES:**

1. Type G and Model 336L cabinets shall be installed with the back toward the nearest lane of traffic.
2. In unpaved areas, a raised portland cement concrete pad shall be constructed in front of each controller cabinet. The pad shall be 3'-0" x 3'-0" x 4" for a Type G cabinet and shall be 3'-0" x 4" thick x width of foundation for Model 336L cabinets.
3. The steel pedestal, base plate, and bolt circle for Type G cabinet shall be the same as that shown for a Type 1-C Standard (see Revised Standard Plan RSP ES-7B). Pedestal shall be 2'-1" to 2'-6" in length. Anchor bolts shall be  $\frac{3}{4}$ "  $\phi$  x 1'-6" with a 2" - 90° bend. Four bolts required per cabinet.
4. Type G cabinet shall be provided with a slipfitter to permit mounting an  $\frac{4}{2}$ " outside diameter pedestal. Slipfitter shall be bolted to bottom of the cabinet.
5. A 1" drain shall be provided through the foundation of a Model 336L cabinet. Drain pipe shall be screened.
6. Cabinet shelves shall be adjustable for vertical spacing and shall be removable.
7. Controller units, plug-mounted equipment, shelf-mounted equipment and wall-mounted equipment shall be located to permit safe and easy removal or replacement without removing any other piece of equipment.
8. Where telephone interconnect is required, a minimum of 5" clear vertical space shall be provided inside the cabinet for the equipment.
9. Telephone interconnect conductors shall be enclosed in a  $\frac{3}{4}$ " C or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets or pedestals.
10. Anchor bolts for Model 336L cabinets shall be  $\frac{3}{4}$ "  $\phi$  x 1'-6" with a 2" - 90° bend.



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
<p><i>H.R.F.</i> REGISTERED ELECTRICAL ENGINEER</p> <p>October 19, 2018 PLANS APPROVAL DATE</p> <p>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</p>					

TO ACCOMPANY PLANS DATED \_\_\_\_\_

2018 REVISED STANDARD PLAN RSP ES-3B

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(CONTROLLER CABINET ADAPTER,  
FOUNDATIONS, AND PAD DETAILS)**

NO SCALE

RSP ES-3B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-3B  
DATED MAY 31, 2018 - PAGE 486 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-3B**

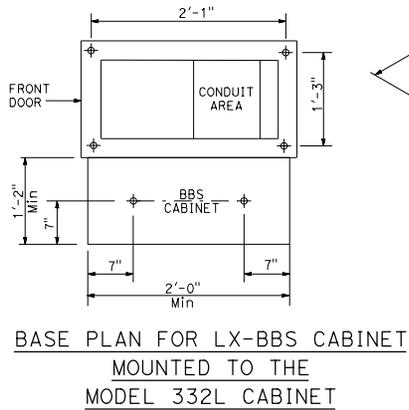
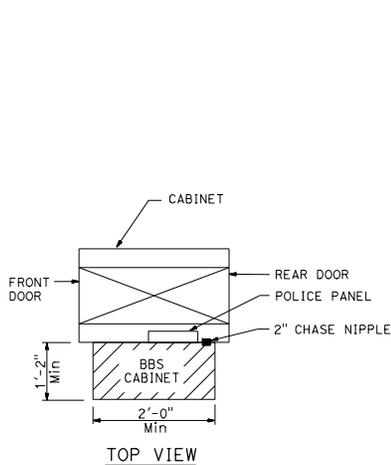
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS


  
 REGISTERED ELECTRICAL ENGINEER  
 John L. Castro  
 No. E17490  
 October 16, 2020  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

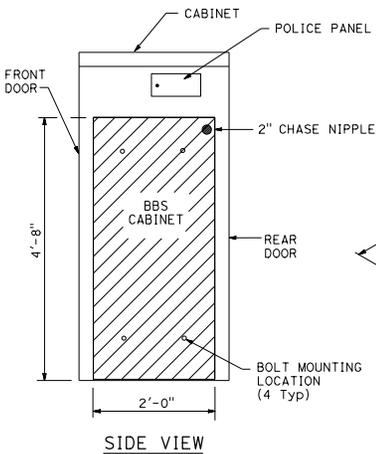
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

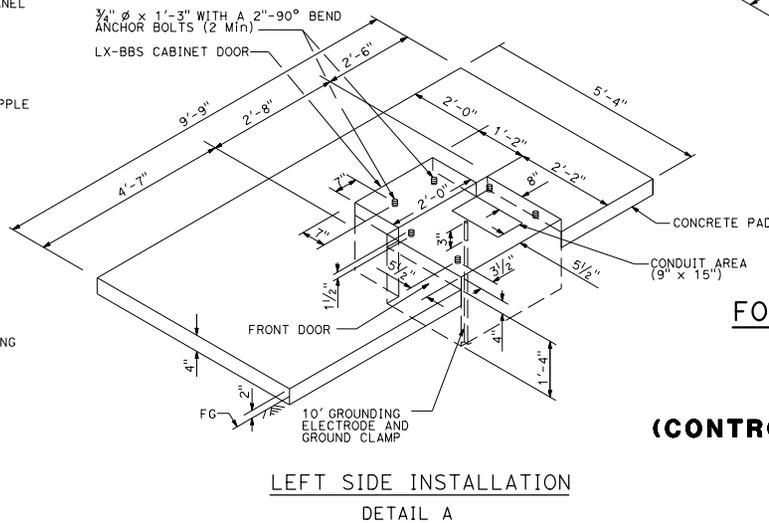
- Where telephone interconnect is required, a minimum of 5" clear vertical space shall be provided inside the cabinet for the equipment.
- Telephone interconnect conductors shall be enclosed in a 3/4" or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets.



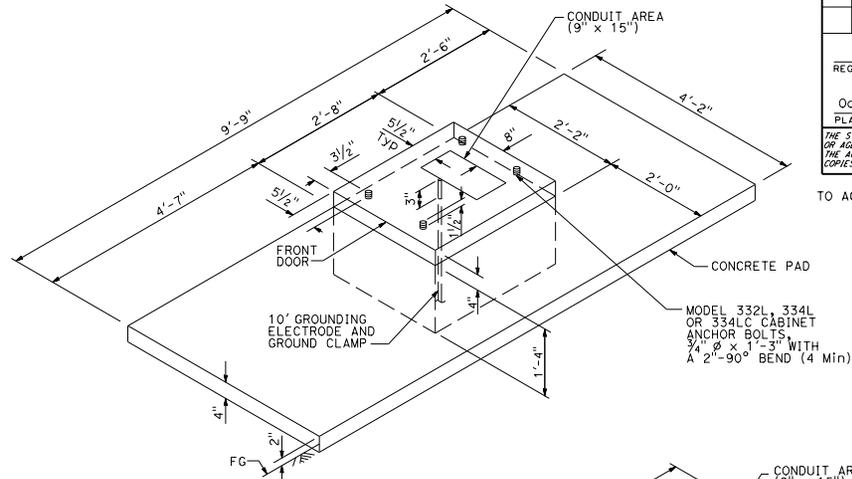
**BASE PLAN FOR LX-BBS CABINET MOUNTED TO THE MODEL 332L CABINET**  
(FOR DIMENSIONS AND DETAILS NOT SHOWN, SEE CABINET HOUSING DETAILS OF THE TRANSPORTATION ELECTRICAL EQUIPMENT SPECIFICATION (TEES))



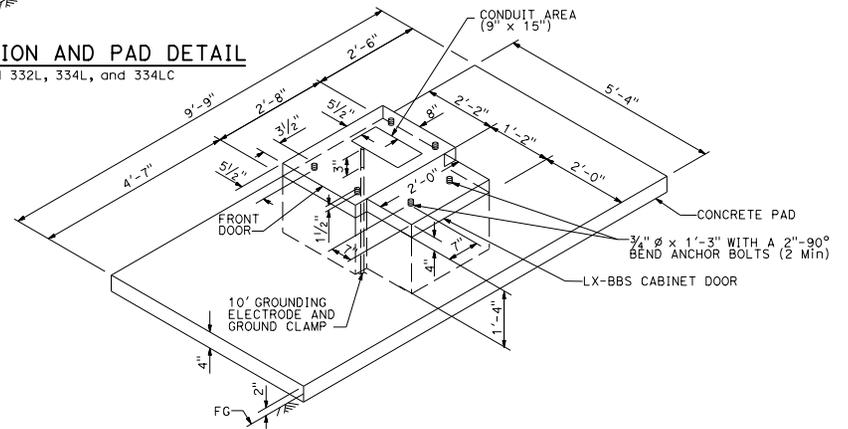
**LX-BBS CABINET MOUNTED TO THE MODEL 332L CABINET**



**LEFT SIDE INSTALLATION DETAIL A**



**FOUNDATION AND PAD DETAIL**  
Model 332L, 334L, and 334LC



**RIGHT SIDE INSTALLATION DETAIL B**  
**MODEL 332L CABINET**  
**FOUNDATION DETAIL WITH LX-BATTERY BACKUP SYSTEM**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(CONTROLLER CABINET FOUNDATION AND PAD DETAILS)**  
NO SCALE

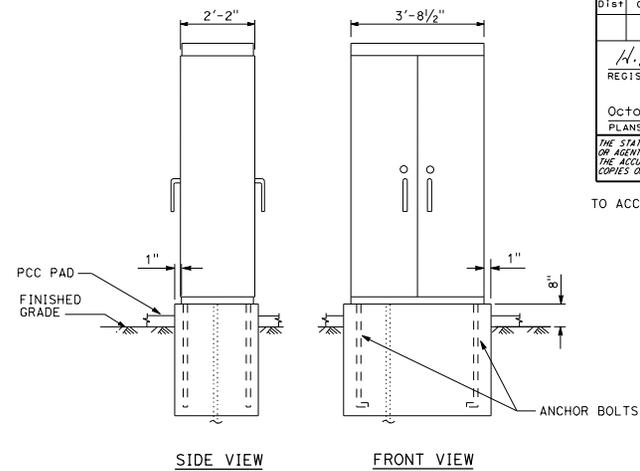
RSP ES-3C DATED OCTOBER 16, 2020 SUPERSEDES RSP ES-3C DATED OCTOBER 19, 2018 AND STANDARD PLAN ES-3C DATED MAY 31, 2018 - PAGE 487 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-3C**

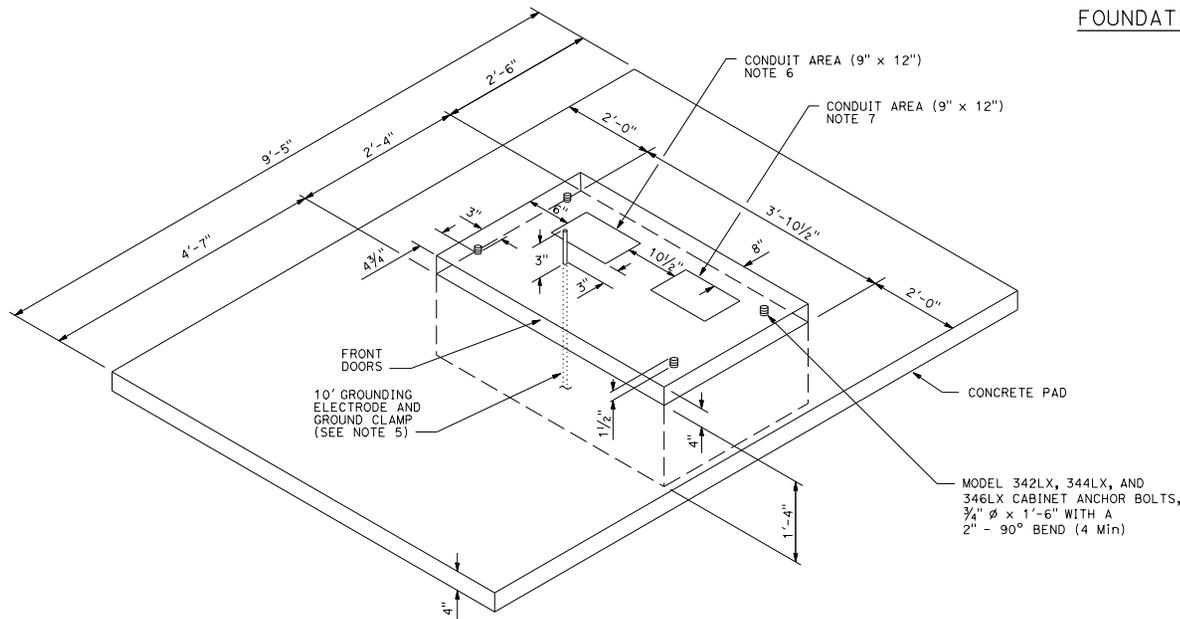
2018 REVISED STANDARD PLAN RSP ES-3C

**NOTES:**

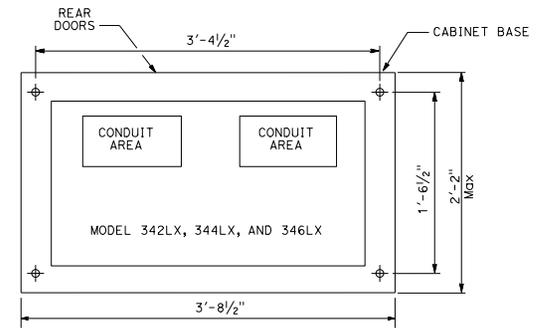
1. Where telephone interconnect is required, a minimum of 5" clear vertical space shall be provided inside the cabinet for the equipment.
2. Telephone interconnect conductors shall be enclosed in a 3/4" or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets.
3. Dimensions are nominal.
4. For Model 342LX, 344LX, and 346LX cabinets details, see "Transportation Electrical Equipment Specifications".
5. Grounding electrode shall be placed 3 inches in front of the service conduit area.
6. Conduit area, to 120 V Service.
7. Conduit area for the controller side of cabinet.



FOUNDATION FOR TYPE LX CABINET  
DETAIL A



FOUNDATION AND PAD DETAIL  
Model 342LX, 344LX, and 346LX  
DETAIL B



BASE PLAN FOR THE MODEL  
342LX, 344LX, AND 346LX CABINET

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(CONTROLLER CABINET  
FOUNDATION AND PAD DETAILS)**

NO SCALE

RSP ES-3C1 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-3C1  
DATED MAY 31, 2018 - PAGE 488 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-3C1**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

H.R.F.  
REGISTERED ELECTRICAL ENGINEER

October 19, 2018  
PLANS APPROVAL DATE

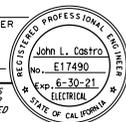
Hamid Zolfaghari  
No. E15636  
EXP. 12-31-19  
ELECTRICAL ENGINEER  
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

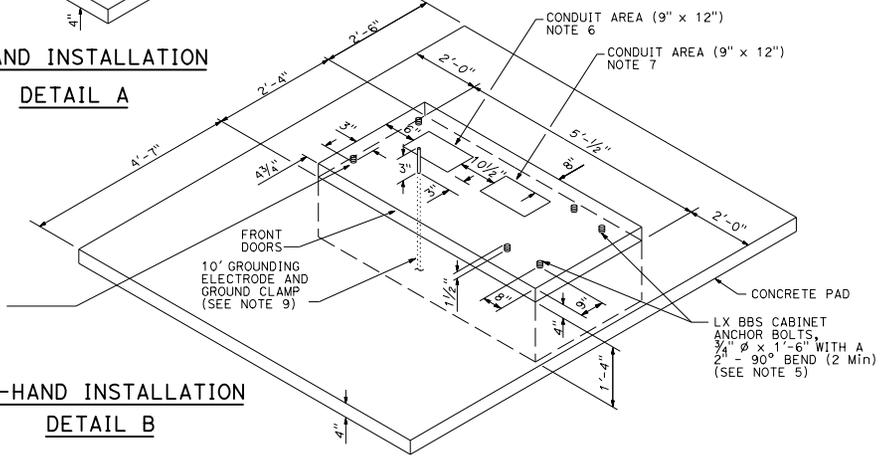
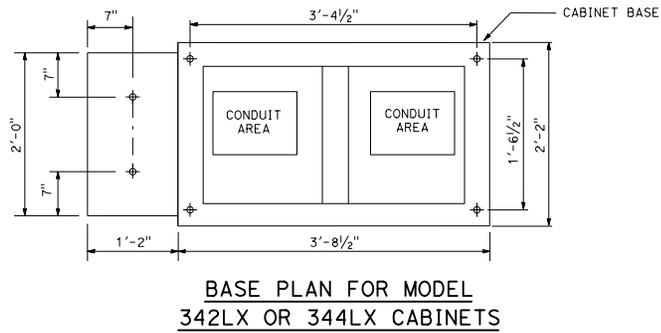
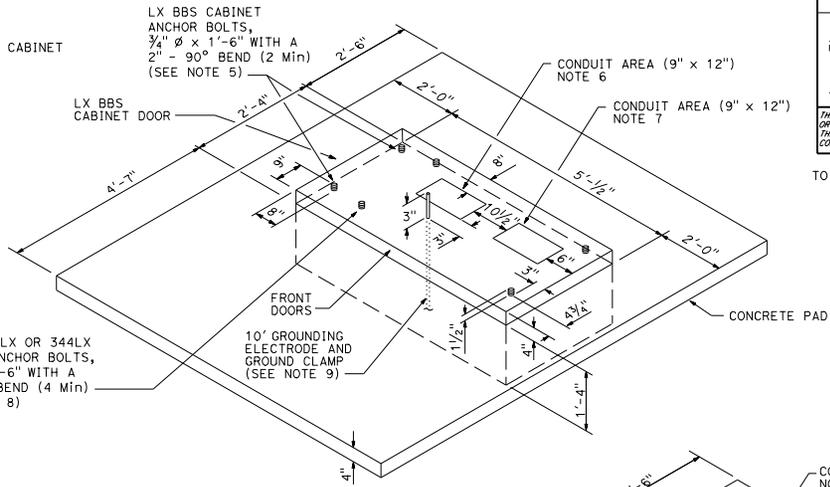
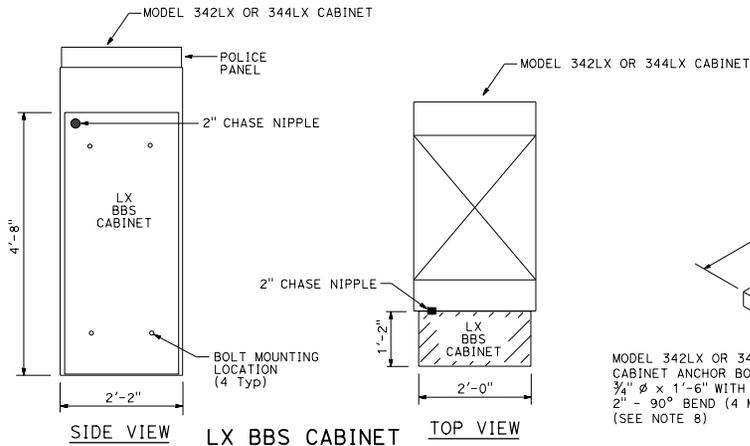
TO ACCOMPANY PLANS DATED \_\_\_\_\_

2018 REVISED STANDARD PLAN RSP ES-3C1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

  
 REGISTERED ELECTRICAL ENGINEER  
 John L. Castro  
 No. E17490  
 PLANS APPROVAL DATE  
 October 16, 2020  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_



- NOTES:
- Where telephone interconnect is required, a minimum of 5" clear vertical space shall be provided inside the cabinet for the equipment.
  - Telephone interconnect conductors shall be enclosed in a 3/4" or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets.
  - The LX BBS cabinet shall be mounted to the Model 342LX or 344LX cabinet with four 18-8 stainless steel hex head, fully-threaded, 3/8"-16 x 1" bolts; two washers per bolt, designed for 3/8" bolts and are 18-8 stainless steel, 1" outside diameter, round, and flat; and one K-Lock nut per bolt that is 18-8 stainless steel and a hex-nut.

- All dimensions are nominal.
- The dimensions of the BBS cabinet shall be verified prior to constructing the foundation of the Model 342LX or 344LX cabinet foundation.
- Conduit area, to 120 V Service.
- Conduit area for the controller side of cabinet.
- For Type LX cabinets details, see "Transportation Electrical Equipment Specifications".
- Grounding electrode shall be placed 3 inches in front of the service conduit area.

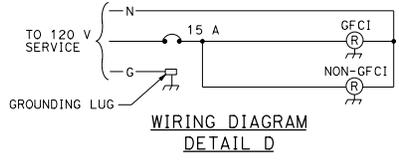
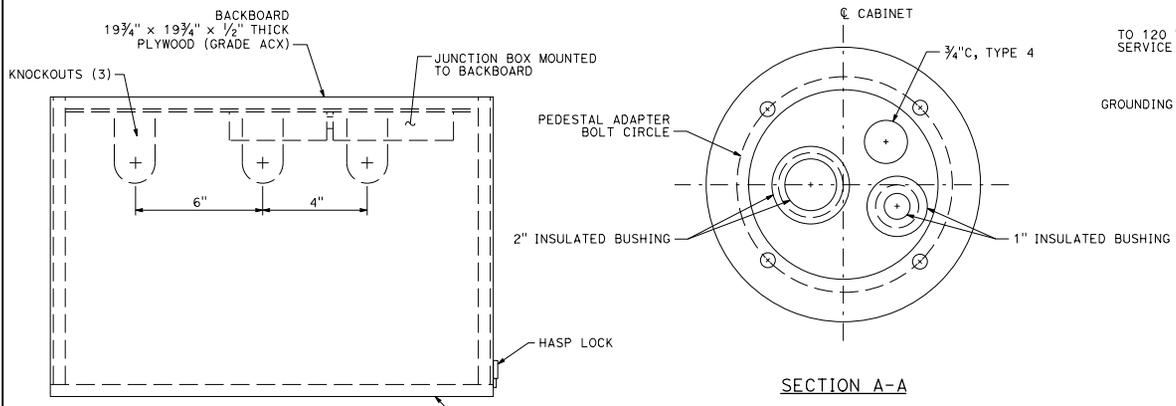
MODEL 342LX OR 344LX CABINET  
FOUNDATION DETAIL WITH BATTERY BACKUP SYSTEM

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(CONTROLLER CABINET  
FOUNDATION DETAILS)**  
NO SCALE

RSP ES-3C2 DATED OCTOBER 16, 2020 SUPERSEDES RSP ES-3C2 DATED OCTOBER 19, 2018 AND STANDARD PLAN ES-3C2 DATED MAY 31, 2018 - PAGE 489 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-3C2**

2018 REVISED STANDARD PLAN RSP ES-3C2



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

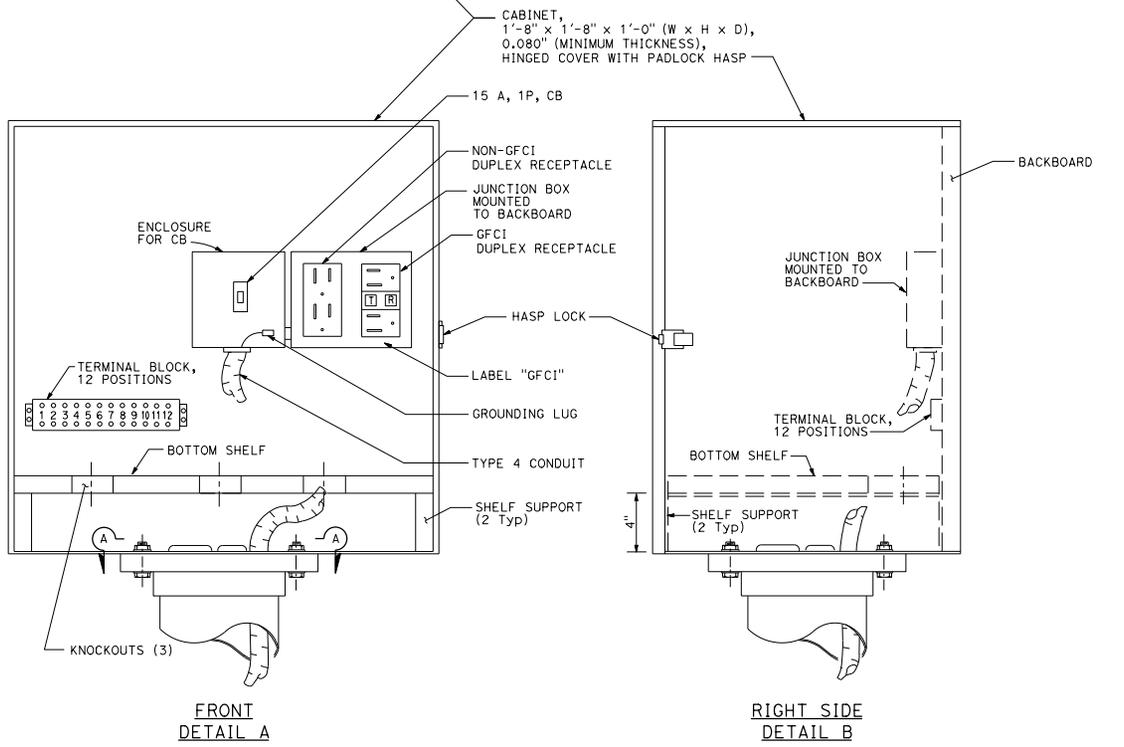
**H.R.F.**  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 ELECTRICAL  
 STATE OF CALIFORNIA

October 19, 2018  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

**NOTES:**

1. Dimensions are nominal.
2. The steel pedestal, base plate, and bolt circle for the telephone demarcation cabinet shall be the same as that shown for a Type 1-C Standard. The steel pedestal shall be 2'-1" to 2'-6" in length. Anchor bolts shall be 3/4" ø x 1'-6" with a 2" - 90° bend. Four bolts required per cabinet.
3. Telephone interconnect conductors shall be enclosed in a 3/4" or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in the cabinet and pedestal.
4. Mount cabinet on Type G cabinet pedestal and foundation (see Revised Standard Plan RSP ES-3B).

TO ACCOMPANY PLANS DATED \_\_\_\_\_



**FASTENER SCHEDULE**

BACKBOARD	4 - 3/4" (LENGTH) WOOD SCREWS
2 SHELF SUPPORTS	4 - 3/4" (LENGTH) WOOD SCREWS
JUNCTION BOX	4 - 1/2" (LENGTH) WOOD SCREWS
TERMINAL BLOCK	4 - 3/4" (LENGTH) WOOD SCREWS

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (TELEPHONE DEMARCATION  
 CABINET, TYPE A)**

NO SCALE

RSP ES-3D DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-3D DATED MAY 31, 2018 - PAGE 490 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-3D**

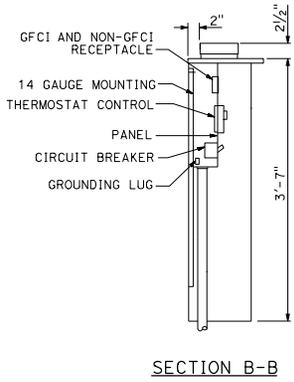
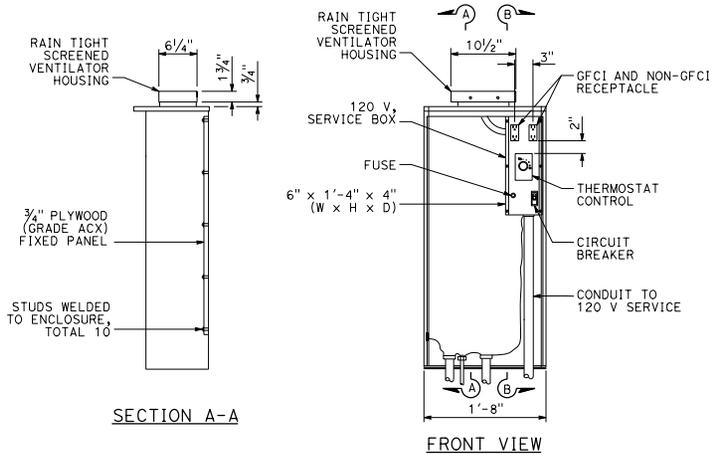
2018 REVISED STANDARD PLAN RSP ES-3D

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

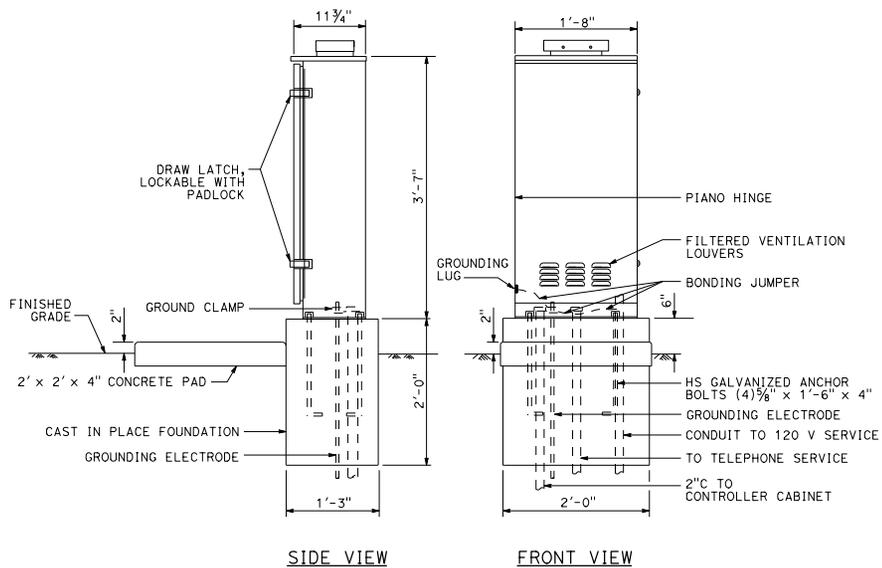
*H.R.F.*  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 PLANS APPROVAL DATE  
 October 19, 2018  
 EXP. 12-31-19  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

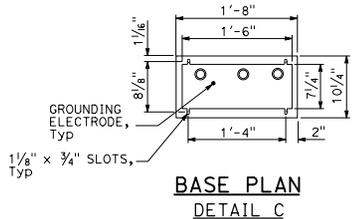
**NOTE:**  
1. Dimensions are nominal.



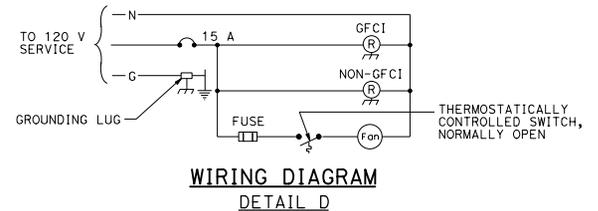
**FRONT VIEW**  
**INTERIOR**  
**DETAIL A**



**SIDE VIEW**  
**FRONT VIEW**  
**EXTERIOR**  
**DETAIL B**



**BASE PLAN**  
**DETAIL C**



**WIRING DIAGRAM**  
**DETAIL D**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(TELEPHONE DEMARCATION**  
**CABINET, TYPE B)**

NO SCALE

RSP ES-3E DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-3E  
DATED MAY 31, 2018 - PAGE 491 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-3E**

**2018 REVISED STANDARD PLAN RSP ES-3E**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

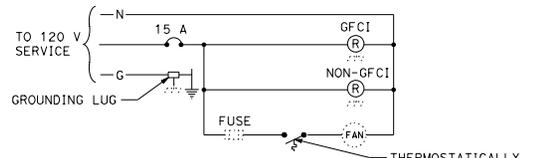
**H.R.F.**  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 PROFESSIONAL ENGINEER  
 STATE OF CALIFORNIA

October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

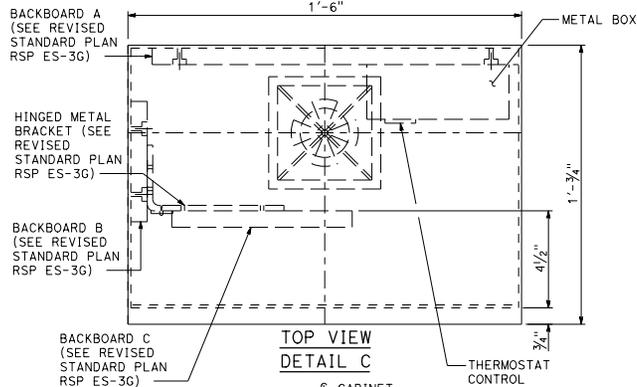
**NOTES:**

- Dimensions are nominal.
- Hardware for fastening of mounting boards:
  - Fasten backboard A and backboard B to telephone demarcation cabinet with  $\frac{3}{16}$ "  $\phi$  x  $\frac{3}{4}$ " stainless steel carriage bolts (8 required).
  - Fasten hinged metal bracket to backboard B and backboard C to hinged metal bracket with No. 10 x  $\frac{3}{4}$ " wood screws (9 required).

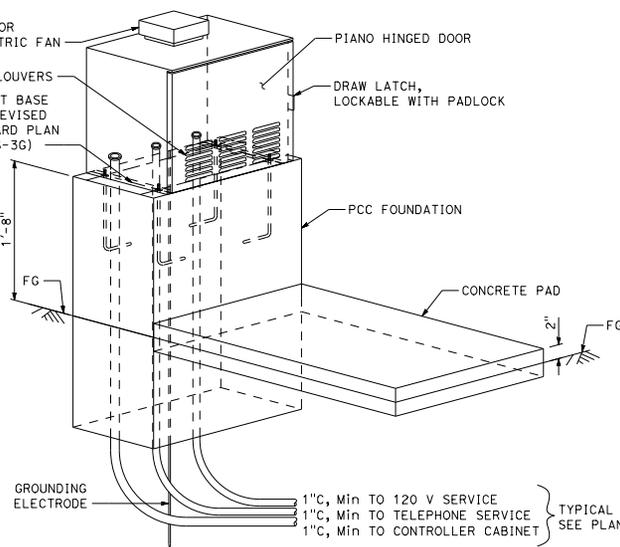


**WIRING DIAGRAM**

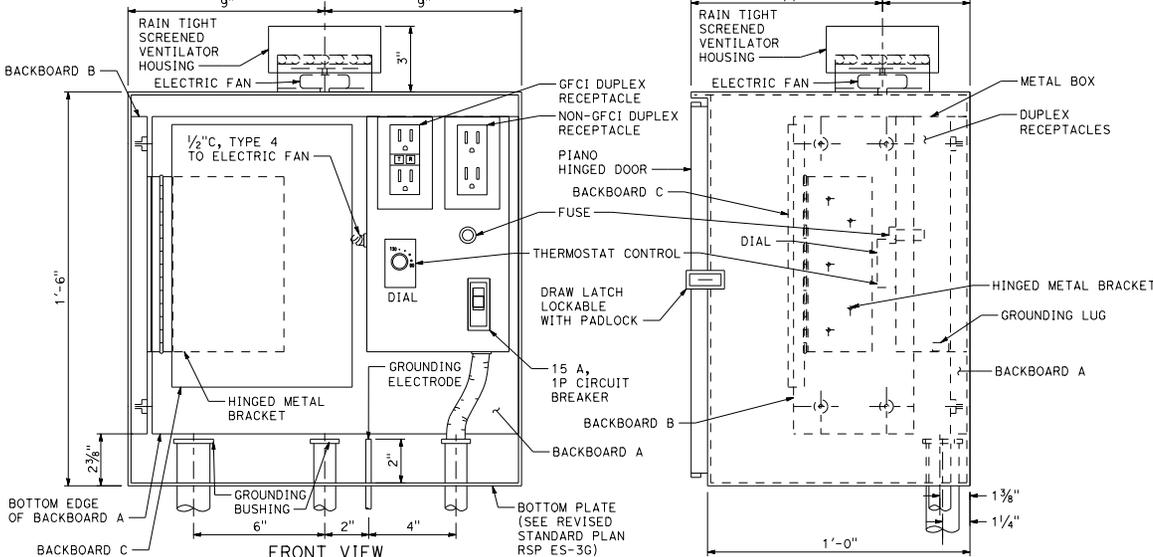
**DETAIL F**



**TOP VIEW  
DETAIL C**



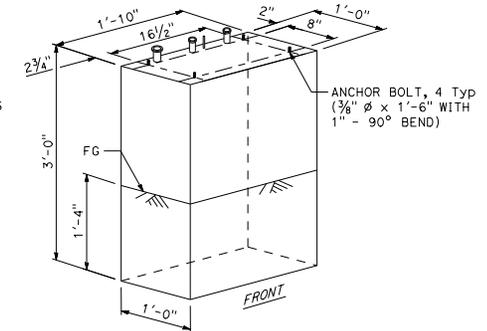
**DETAIL D**



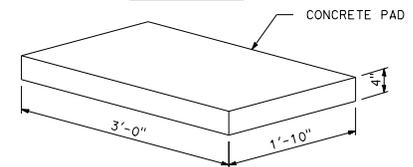
**FRONT VIEW  
DETAIL A**

**SIDE VIEW  
DETAIL B**

Outer door removed for clarity



**FOUNDATION**



**CONCRETE PAD**

**FOUNDATION AND PAD DETAILS**

**DETAIL E**

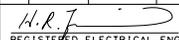
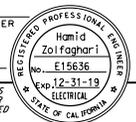
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(TELEPHONE DEMARCATION CABINET, TYPE C)**  
 NO SCALE

RSP ES-3F DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-3F  
DATED MAY 31, 2018 - PAGE 492 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-3F**

2018 REVISED STANDARD PLAN RSP ES-3F

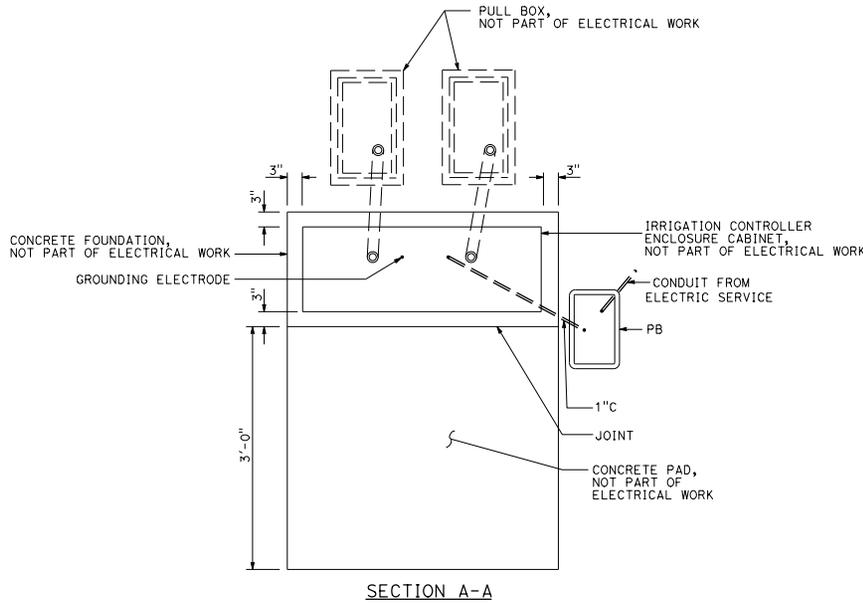


DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
 REGISTERED ELECTRICAL ENGINEER					
October 19, 2018 PLANS APPROVAL DATE					
					
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					

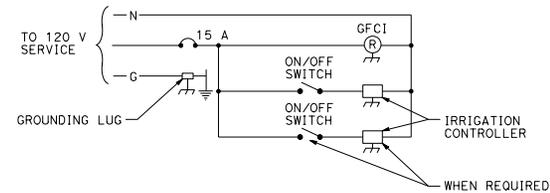
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

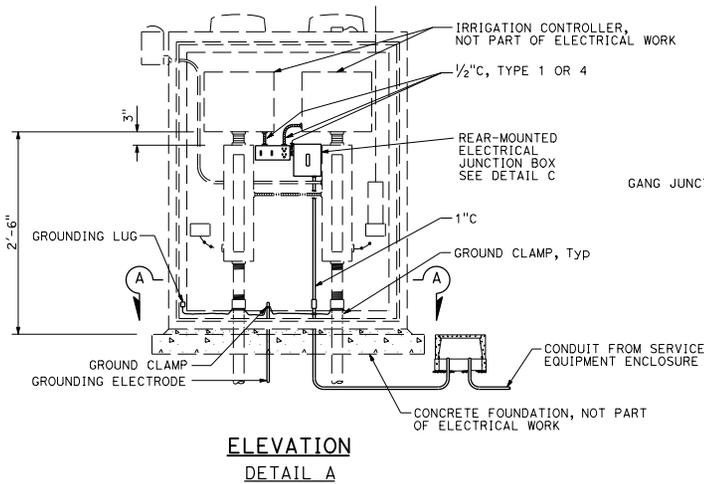
1. See Standard Plan H10 for other details.
2. Underground electrical work done prior to foundation installation.



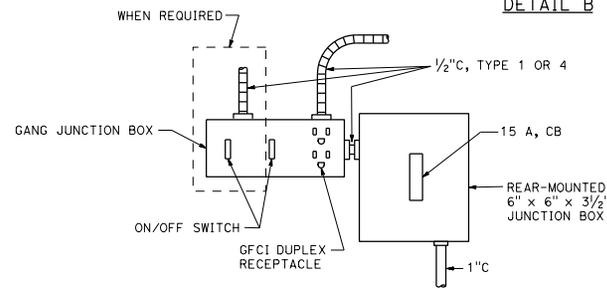
**SECTION A-A**



**IRRIGATION CONTROLLER ENCLOSURE CABINET  
WIRING DIAGRAM (Typ)  
DETAIL B**



**ELEVATION  
DETAIL A**



**ELECTRICAL JUNCTION BOX LAYOUT  
DETAIL C**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(IRRIGATION CONTROLLER  
ENCLOSURE CABINET)**

NO SCALE

RSP ES-3H DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-3H  
DATED MAY 31, 2018 - PAGE 494 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-3H**

2018 REVISED STANDARD PLAN RSP ES-3H

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

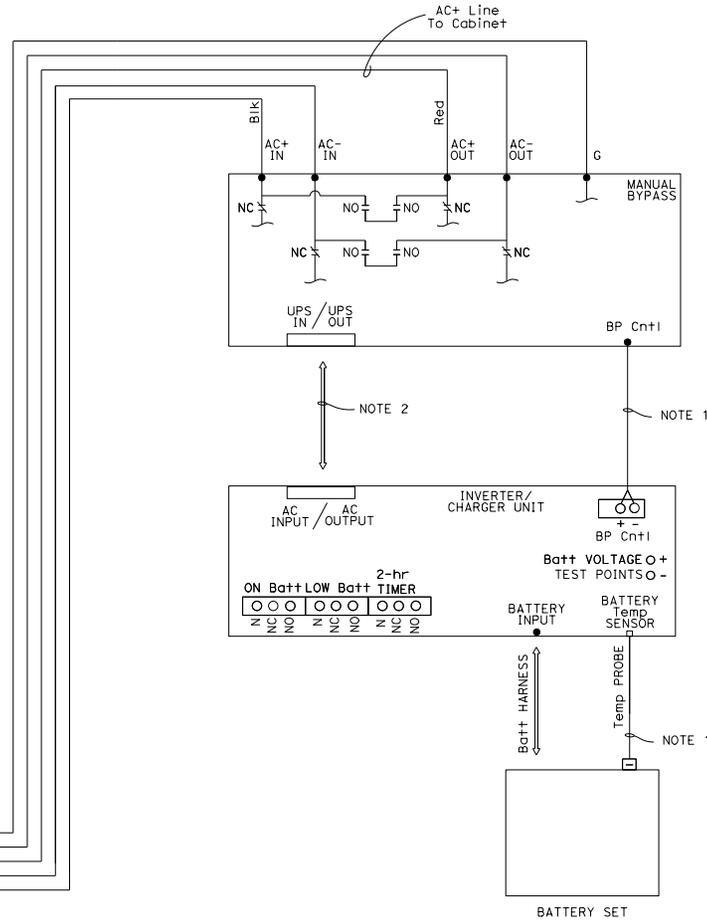
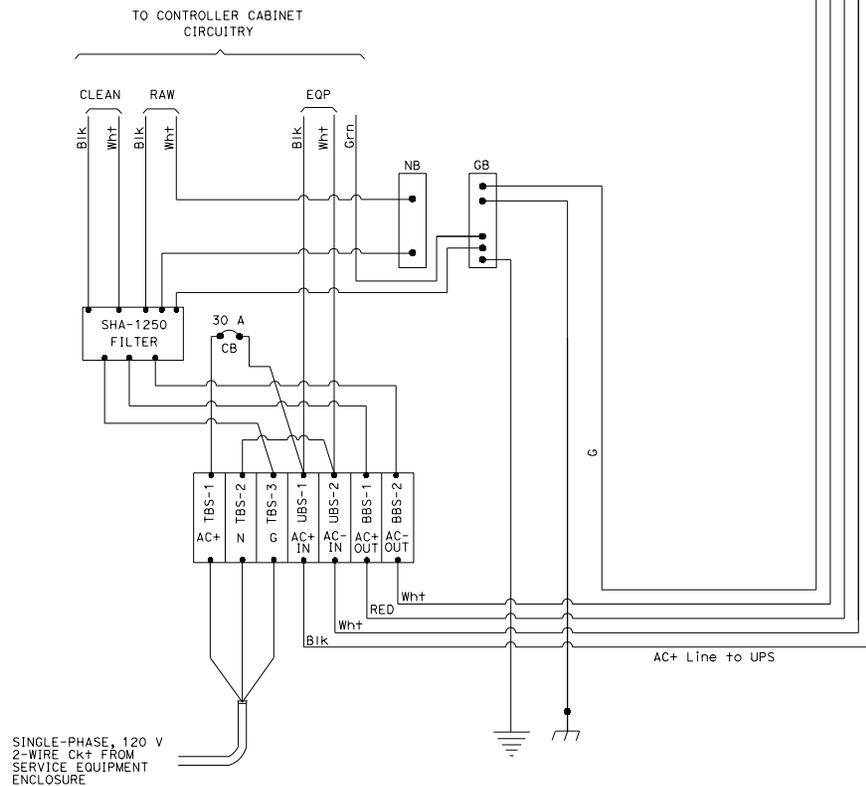
  
 REGISTERED ELECTRICAL ENGINEER  
 October 16, 2020  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

**NOTES:**

1. Install connections when BBS is equipped with this option.
2. Install and connect harness for BBS or GT-BBS.

**ABBREVIATIONS:**

- TBS: Terminal Block Service  
 UBS: Utility to BBS  
 EOP: Equipment Circuit  
 GT: Green Technology

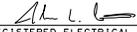


STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (ELECTRONICS ASSEMBLY CONNECTION DIAGRAM)  
 (BATTERY BACKUP SYSTEM)**  
 NO SCALE

RSP ES-3K DATED OCTOBER 16, 2020 SUPERSEDES STANDARD PLAN ES-3K  
 DATED MAY 31, 2018 - PAGE 497 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-3K**

2018 REVISED STANDARD PLAN RSP ES-3K

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
 REGISTERED ELECTRICAL ENGINEER PLANS APPROVAL DATE: April 17, 2020 No. E17490 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					
					

TO ACCOMPANY PLANS DATED \_\_\_\_\_

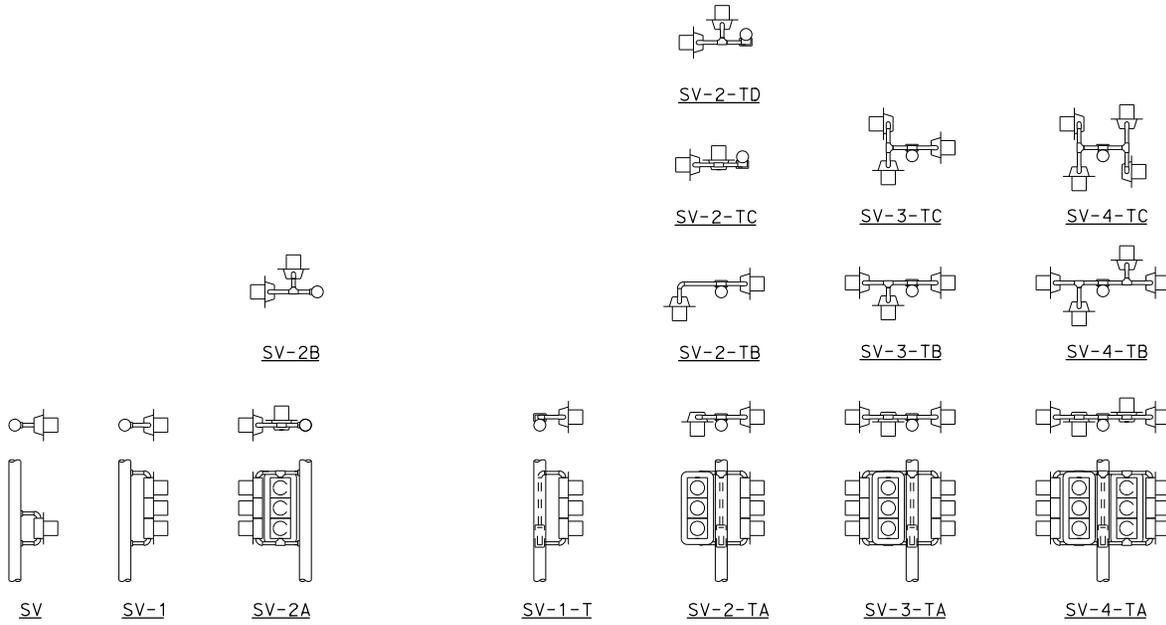
PLAN VIEW OF OTHER  
SIDE MOUNTINGS

**ABBREVIATIONS:**

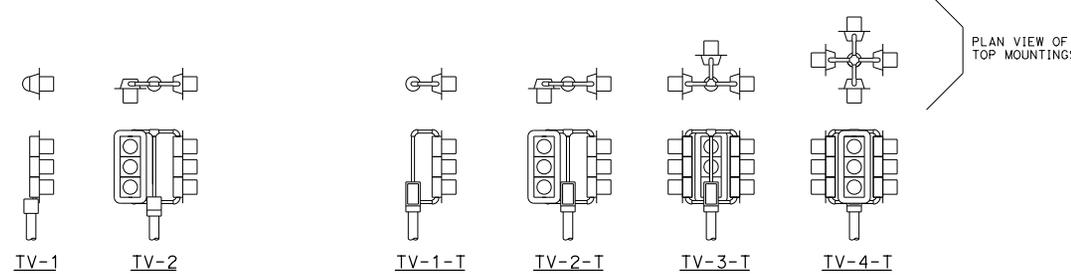
- SV SIDE MOUNTED SIGNAL HEADS
- T TERMINAL COMPARTMENT
- TV TOP MOUNTED SIGNAL HEADS
- 1, 2, 3, 4 NUMBER OF SIGNAL FACES
- A, B, C, D CONFIGURATION OF SIGNALS

**NOTES:**

1. Mountings shall be oriented to provide maximum horizontal clearance to adjacent roadway.
2. See Revised Standard Plans RSP ES-4D and RSP ES-4E for attachment fitting details.



SIDE MOUNTINGS



PLAN VIEW OF  
TOP MOUNTINGS

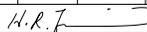
TOP MOUNTINGS

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(SIGNAL HEAD MOUNTING)**  
NO SCALE

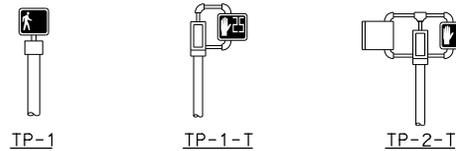
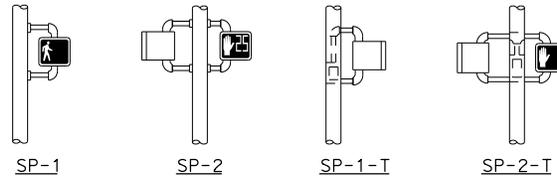
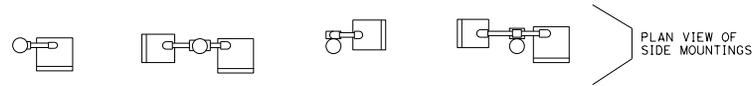
RSP ES-4A DATED APRIL 17, 2020 SUPERSEDES RSP ES-4A DATED OCTOBER 19, 2018 AND  
STANDARD PLAN ES-4A DATED MAY 31, 2018 - PAGE 499 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-4A**

2018 REVISED STANDARD PLAN RSP ES-4A

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
 REGISTERED ELECTRICAL ENGINEER					
October 19, 2018 PLANS APPROVAL DATE					
					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

TO ACCOMPANY PLANS DATED \_\_\_\_\_



**PEDESTRIAN SIGNAL HEAD MOUNTINGS**  
DETAIL A



PERSON WALKING INTERVAL    FLASHING UPRaised HAND INTERVAL    STEADY UPRaised HAND INTERVAL  
**LED COUNTDOWN PEDESTRIAN SIGNAL FACE MODULE**  
 DETAIL B

**NOTES:**

1. Mounting shall be oriented to provide maximum horizontal clearance to adjacent roadway.
2. See Revised Standard Plan RSP ES-4D for attachment fittings details.

**ABBREVIATIONS:**

- 1, 2 NUMBER OF SIGNAL FACES
- SP SIDE MOUNTED PEDESTRIAN SIGNAL
- T TERMINAL COMPARTMENT
- TP TOP MOUNTED PEDESTRIAN SIGNAL

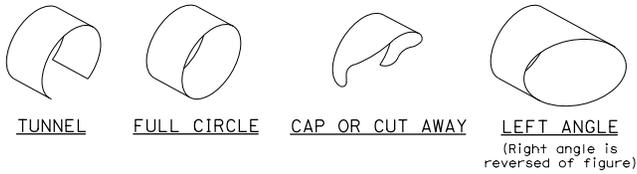
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(PEDESTRIAN SIGNAL HEADS)**

NO SCALE

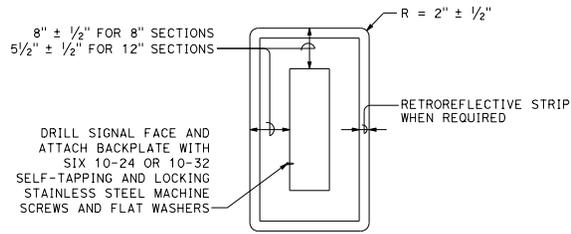
RSP ES-4B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-4B  
 DATED MAY 31, 2018 - PAGE 500 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-4B**

2018 REVISED STANDARD PLAN RSP ES-4B

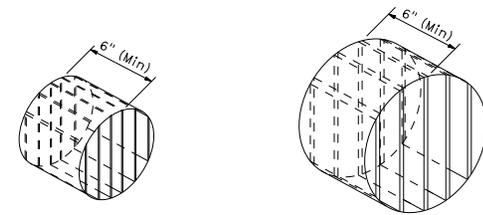


**VISORS**



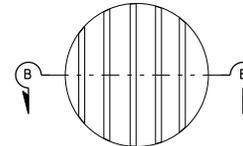
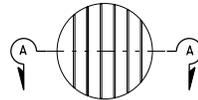
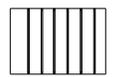
8" AND 12" SECTIONS

**BACKPLATE**



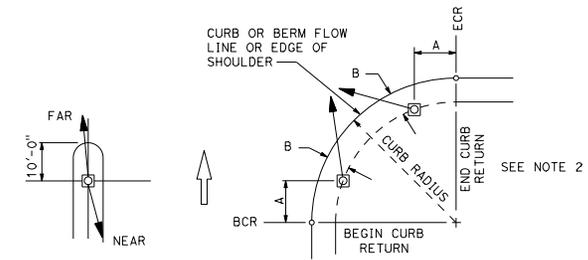
**ISOMETRIC VIEW**

**ISOMETRIC VIEW**



**DIRECTIONAL LOUVER**

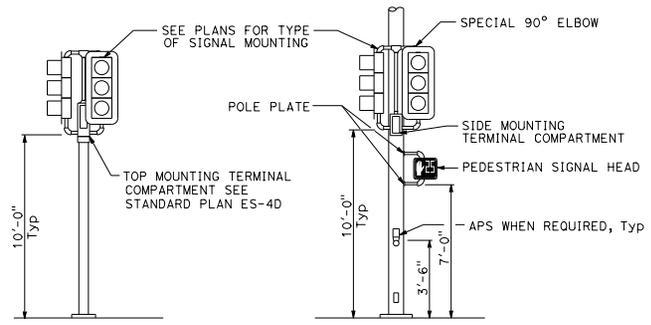
Directional louvers shall be oriented and secured in place with one plated brass machine screw and nut.



**NOTES:**

1. Typical signal pole placement unless dimensioned on plans.
2. For A and B dimensions, see Pole Schedule.

**SIGNAL STANDARD PLACEMENT DIMENSIONS AND EQUIPMENT LOCATIONS**

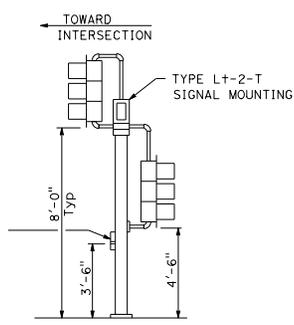


**TOP MOUNTED SIGNALS (TV)**

Type 1-A, 1-B, 1-C and 1-D standard as indicated on the plans

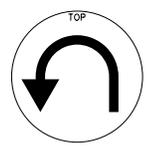
**SIDE MOUNTED SIGNALS (SV AND SP)**

Normally used on standards with luminaire or signal mast arm



**LEFT TURN LANE SIGNAL**

Type 1-A, 1-B, 1-C and 1-D standard as indicated on plans



**SIGNAL FACES**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS (SIGNAL HEADS AND MOUNTINGS)**

NO SCALE

RSP ES-4C DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN ES-4C DATED MAY 31, 2018 - PAGE 501 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-4C**

2018 REVISED STANDARD PLAN RSP ES-4C

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

REGISTERED ELECTRICAL ENGINEER

John L. Castro  
No. E17490  
Exp. 6-30-21

APR 17, 2020  
PLANS APPROVAL DATE

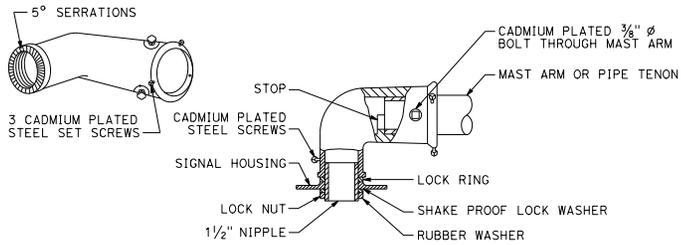
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

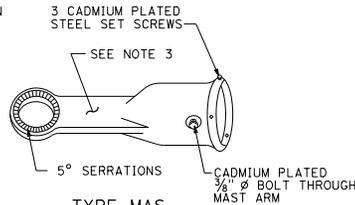
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*H.R.F.*  
 REGISTERED ELECTRICAL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 REGISTERED PROFESSIONAL ENGINEER  
 ELECTRICAL  
 STATE OF CALIFORNIA

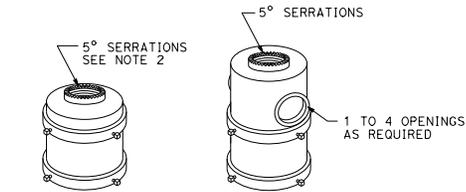
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



**TYPE MAT  
MAST ARM MOUNTING**  
For 2 NPS pipe, see Note 1.

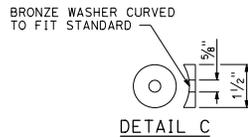


**TYPE MAS  
MAST ARM MOUNTING**  
For 2 NPS pipe, see Note 1.

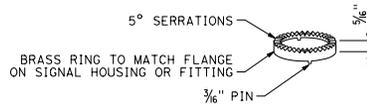


**TOP MOUNTINGS**  
For 4 NPS pipe, see Note 2.

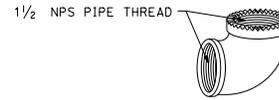
**SIGNAL SLIP FITTERS**



**DETAIL C**



**LOCK RING**  
Use where locking ring is not integral with signal housing or fitting.

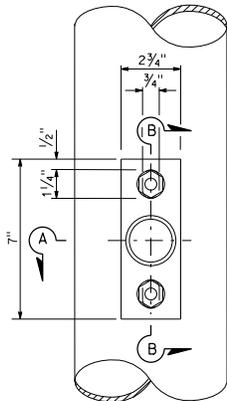


**SPECIAL 90° ELBOW**  
One for each signal head, except those with special slip fitter mounting

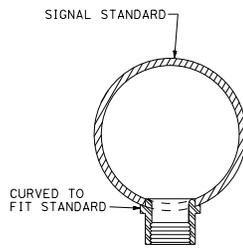
**NOTES:**

1. After mast arm signal has been plumbed and secured, drill  $\frac{1}{8}$ " hole through mast arm tenon in line with slip fitter hole. Place a cadmium plated  $\frac{3}{8}$ "  $\phi$  galvanized bolt with washer under bolt head through hole and secure with washer, nut, and locknut. Seal openings between mast arm mountings and mast arm with mastic.
2. Threaded top mounted slip fitter openings shall be  $\frac{1}{2}$ " NPS. Serrations in fittings shall match those on bottom of signal heads or in lock ring. Top opening shall be offset when backplate is used.
3. Wireway shall have a cross section area of 0.95 square inch minimum. Minimum width of  $\frac{1}{2}$ ".

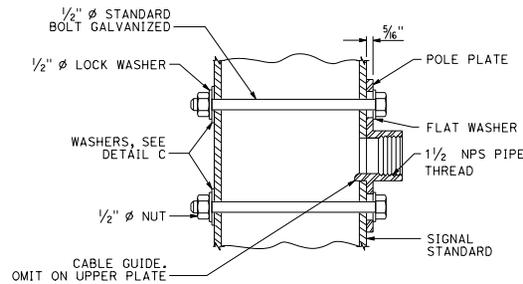
**MISCELLANEOUS MOUNTING HARDWARE**



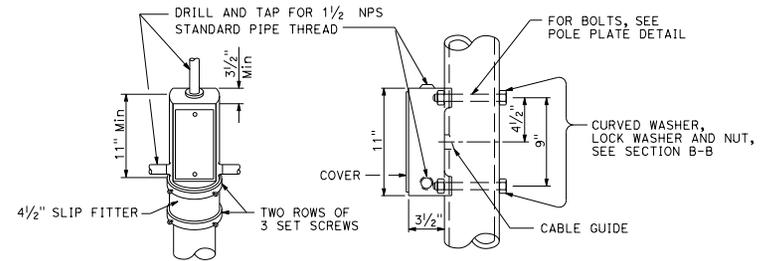
**TOP VIEW**



**SECTION A-A**



**SECTION B-B**



**TOP MOUNTING**

**SIDE MOUNTING**

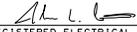
**TERMINAL COMPARTMENT**

**POLE PLATE FOR SIDE MOUNTED SIGNAL HEAD  
WITHOUT TERMINAL COMPARTMENT**

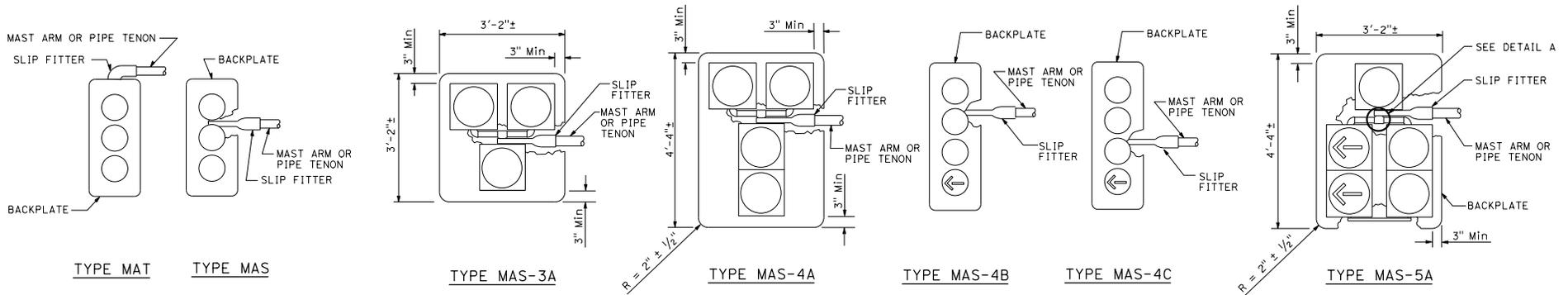
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(SIGNAL HEAD MOUNTING)**  
NO SCALE

RSP ES-4D DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-4D  
DATED MAY 31, 2018 - PAGE 502 OF THE STANDARD PLANS BOOK DATED 2018.

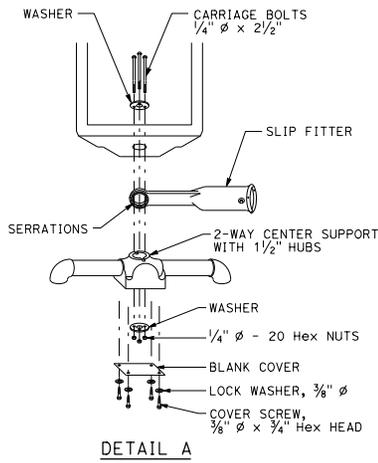
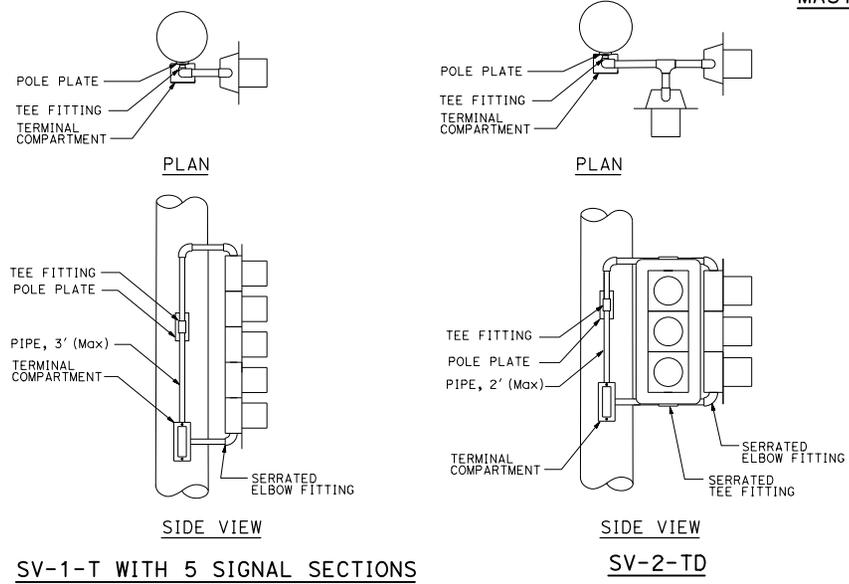
**REVISED STANDARD PLAN RSP ES-4D**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
 REGISTERED ELECTRICAL ENGINEER No. E17490 April 17, 2020 PLANS APPROVAL DATE <small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					
					

TO ACCOMPANY PLANS DATED \_\_\_\_\_



**MAST ARM MOUNTINGS**



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(SIGNAL HEADS AND  
OPTICAL DETECTOR MOUNTING)**  
NO SCALE

**SV-1-T WITH 5 SIGNAL SECTIONS**

**SV-2-TD**

RSP ES-4E DATED APRIL 17, 2020 SUPERSEDES RSP ES-4E DATED OCTOBER 19, 2018 AND STANDARD PLAN ES-4E DATED MAY 31, 2018 - PAGE 503 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-4E**

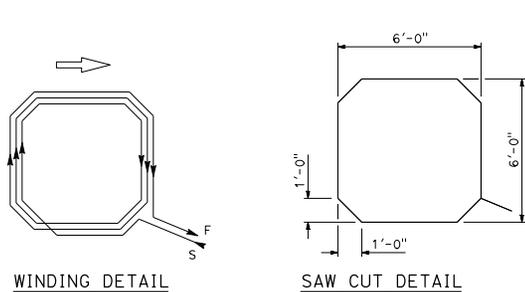
2018 REVISED STANDARD PLAN RSP ES-4E

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
					
REGISTERED ELECTRICAL ENGINEER October 19, 2018 PLANS APPROVAL DATE THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					

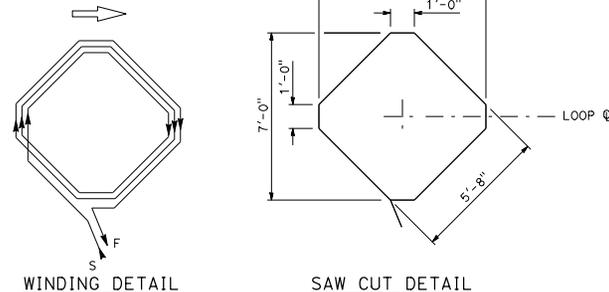
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

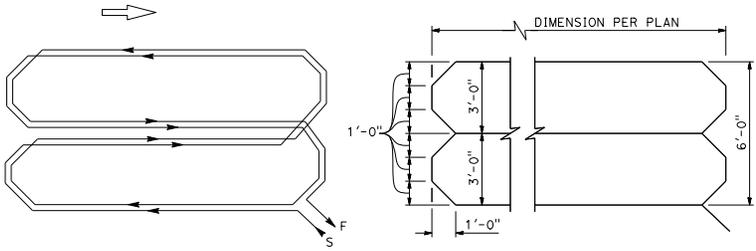
1. Round corners of acute angle saw cuts to prevent damage to conductors.
2. Typical distance separating loops from edge is 10' for Type A, B, D, E, and F installation in single lane.
3. Use Type D and F loops for limit line detection and bicycle lanes.



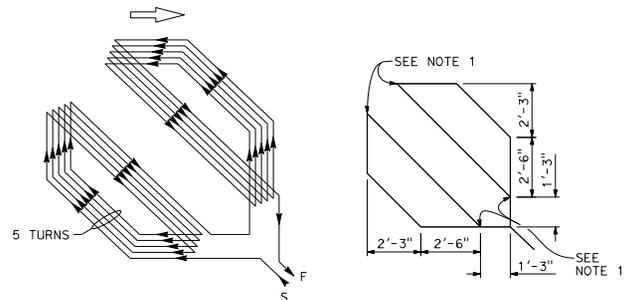
WINDING DETAIL  
SAW CUT DETAIL  
**TYPE A LOOP DETECTOR CONFIGURATION**



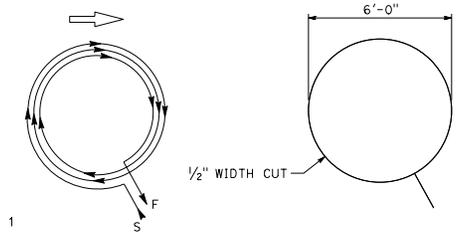
WINDING DETAIL  
SAW CUT DETAIL  
**TYPE B LOOP DETECTOR CONFIGURATION**



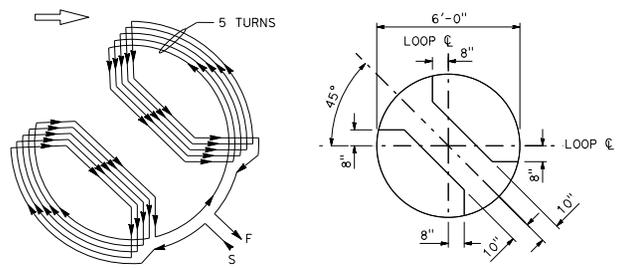
WINDING DETAIL  
SAW CUT DETAIL  
**TYPE C LOOP DETECTOR CONFIGURATION**



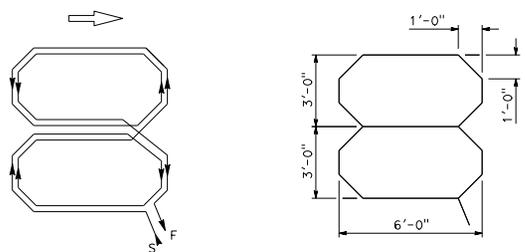
WINDING DETAIL  
SAW CUT DETAIL  
**TYPE D LOOP DETECTOR CONFIGURATION**



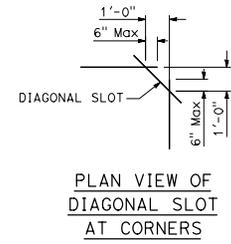
WINDING DETAIL  
SAW CUT DETAIL  
**TYPE E LOOP DETECTOR CONFIGURATION**



WINDING DETAIL  
SAW CUT DETAIL  
**TYPE F LOOP DETECTOR CONFIGURATION**



WINDING DETAIL  
SAW CUT DETAIL  
**TYPE Q LOOP DETECTOR CONFIGURATION**



PLAN VIEW OF  
DIAGONAL SLOT  
AT CORNERS

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(DETECTORS)**

NO SCALE

RSP ES-5B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-5B  
DATED MAY 31, 2018- PAGE 505 OF THE STANDARD PLANS BOOK DATED 2018.

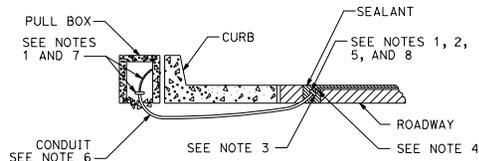
**REVISED STANDARD PLAN RSP ES-5B**

2018 REVISED STANDARD PLAN RSP ES-5B

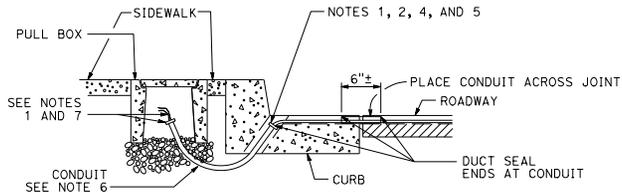
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

H.R.F.  
 REGISTERED ELECTRICAL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 REGISTERED PROFESSIONAL ENGINEER  
 ELECTRICAL  
 STATE OF CALIFORNIA

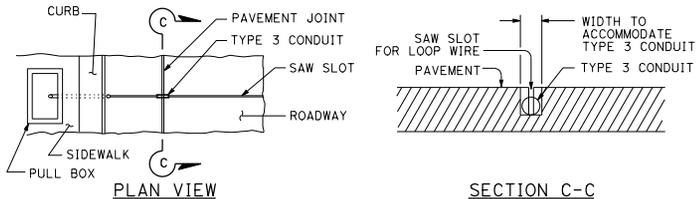
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



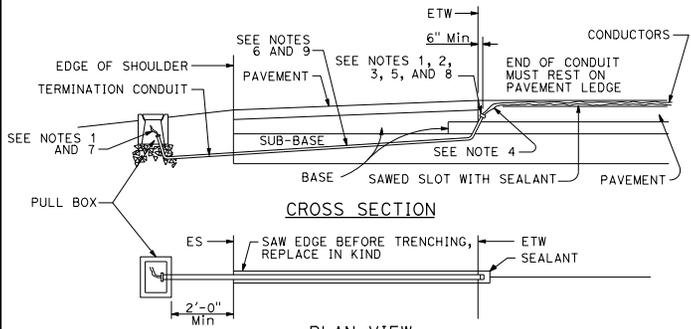
**TYPE A**  
**CURB TERMINATION DETAIL**



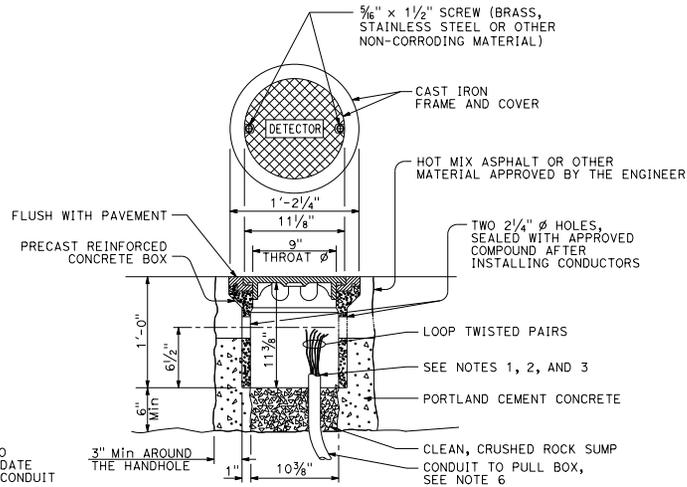
**CROSS SECTION**



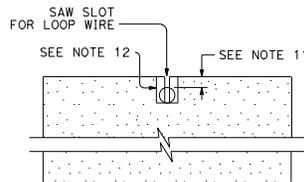
**TYPE B**  
**CURB TERMINATION DETAIL**



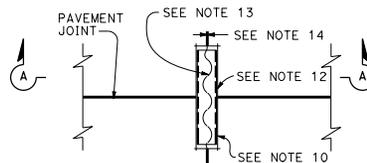
**CROSS SECTION**  
**PLAN VIEW**  
**SHOULDER TERMINATION DETAILS**



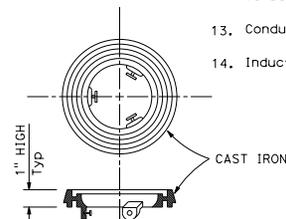
**DETECTOR HANDHOLE DETAIL**



**SECTION A-A**



**PLAN VIEW**  
**TYPICAL LOOP LEAD-IN DETAIL**  
**AT PAVEMENT JOINT**



**LOCKING GRADE RING**

**NOTES:**

- Bushing shall be used at end of conduit.
- Tape detector conductors 3" each side of bushings.
- Install duct seal compound to each end of termination conduit before installing sealant.
- Round all sharp edges where detector conductors have to pass.
- End of conduit shall be 3/8" below roadway surface.
- Conduit size      Loop conductors  
1" C minimum      1 to 2 pairs  
1 1/2" C minimum    3 to 4 pairs  
2" C minimum      5 or more pairs
- Splice detector conductors to detector lead-in-cable.
- Location of detector handhole when shown on plans.
- When the shoulder and traveled way are paved with the same material and there is no joint between them, the conduit shall extend only 2'-0" into the shoulder pavement.
- 3/4" C, Type 3 conduit 6" long minimum, plug both ends with duct compound to keep out sealant.
- 1/2" Minimum between top of conduit and pavement surface.
- Sawcut shall not exceed 1" in width and 1/8" longer than conduit to be installed.
- Conductors with 1/2" minimum slack inside conduit.
- Inductive loop detector saw slot.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS**  
**(CURB AND SHOULDER TERMINATION,**  
**TRENCH, AND HANDHOLE DETAILS)**

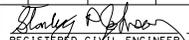
NO SCALE

RSP ES-5D DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-5D  
DATED MAY 31, 2018 - PAGE 507 OF THE STANDARD PLANS BOOK DATED 2018.

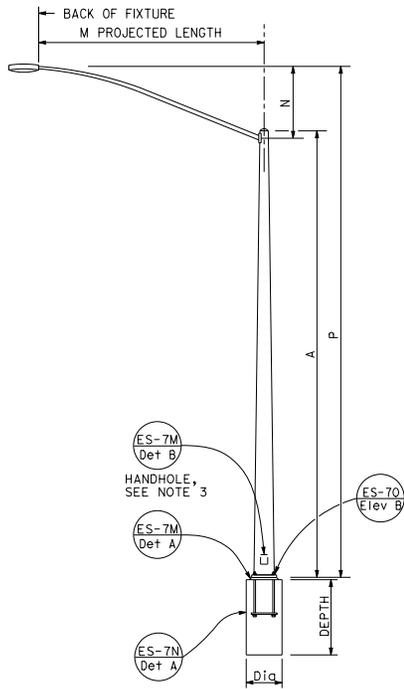
**REVISED STANDARD PLAN RSP ES-5D**

2018 REVISED STANDARD PLAN RSP ES-5D

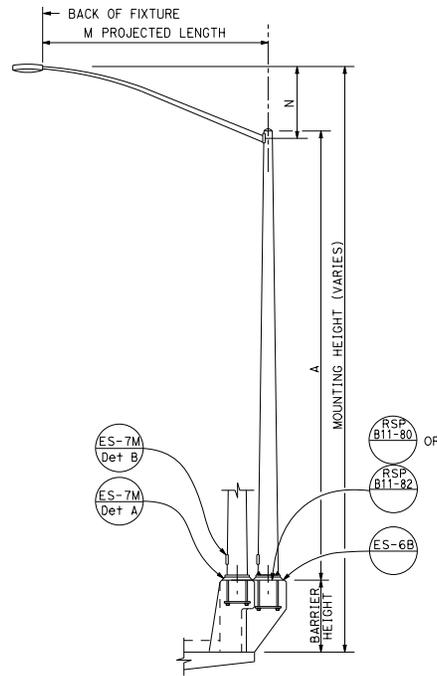
D16*	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

  
 REGISTERED CIVIL ENGINEER  
 October 18, 2019  
 PLANS APPROVAL DATE  
 No. C51793  
 Exp. 3-31-20  
 CIVIL  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

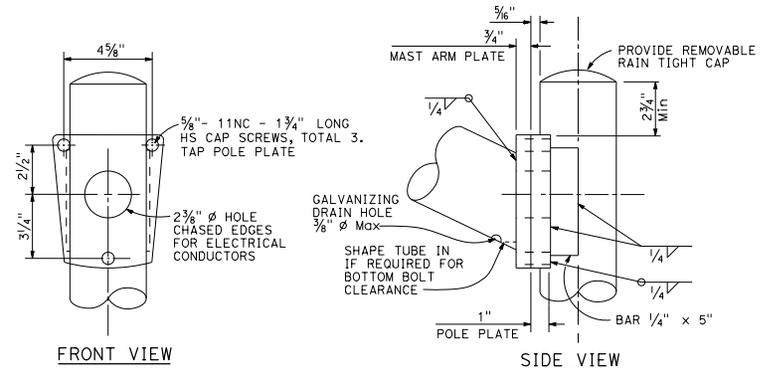
TO ACCOMPANY PLANS DATED \_\_\_\_\_



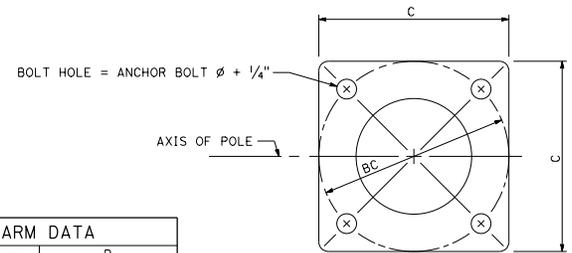
**TYPE 15 AND TYPE 21**  
ELEVATION A



**TYPE 15 AND TYPE 21 BARRIER RAIL MOUNTED**  
ELEVATION B



**LUMINAIRE MAST ARM CONNECTION**  
DETAIL R



**BASE PLATE**  
DETAIL A

POLE TYPE	POLE DATA				BASE PLATE DATA				CIDH PILE FOUNDATION	
	A HEIGHT	Min OD		WALL THICKNESS	C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	Dia	DEPTH
15	30'-0"	8"	3 1/8"	0.1196"	1'-0"	1'-0"	1 1/2"	1" Ø x 36" *	2'-6"	6'-0"
21	35'-0"	8 5/8"	3 3/8"	0.1793"			2"	1 1/4" Ø x 36" *		7'-0"

\* FOR BARRIER RAIL BOLTS, SEE STANDARD PLAN ES-6B.

LUMINAIRE MAST ARM DATA					
M PROJECTED LENGTH	N RISE	Min OD AT POLE	NOMINAL THICKNESS	P	
				TYPE 15	TYPE 21
6'-0"	2'-0"±	3/4"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3/2"		32'-0"±	37'-0"±
10'-0"	3'-3"±	3 3/8"		32'-9"±	37'-9"±
12'-0"	4'-3"±			33'-9"±	38'-9"±
15'-0"	4'-9"±	4 1/4"		34'-3"±	39'-3"±

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(LIGHTING STANDARD,**  
**TYPES 15 AND 21)**  
NO SCALE

**NOTES:**

- Indicates mast arm length to be used unless otherwise noted on the plans.
- For Type 15-SB, use Type 15 standard with Type 30 slip base plate details, see Standard Plan ES-6F.
- Handhole shall be located on the downstream side of traffic.
- For additional notes and details, see Standard Plans ES-7M and ES-7N.

RSP ES-6A DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN ES-6A  
DATED MAY 31, 2018 - PAGE 508 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-6A**

2018 REVISED STANDARD PLAN RSP ES-6A

LUMINAIRE MAST ARM DATA			
M PROJECTED LENGTH	N RISE	Min OD AT POLE	NOMINAL THICKNESS
15'-0"	4'-9"±	4 1/2"	0.1196"
20'-0"	2'-6"±	5"	0.1793"

POLE DATA				
POLE EXTENSION TYPE	HEIGHT "H"	Min OD		THICKNESS
		BASE	TOP	
5	5'-0"	6 1/2"	5 1/8"	0.1793"
10	10'-0"	7 1/4"		

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

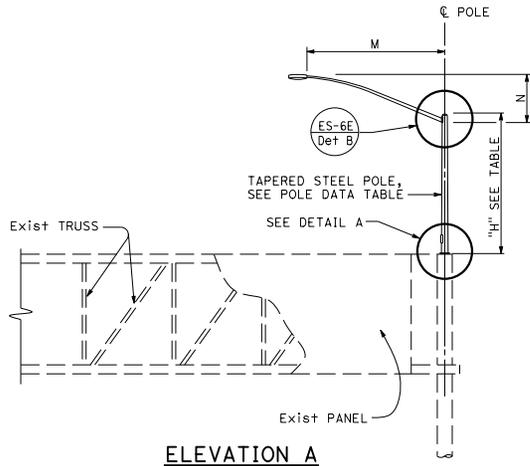
*Stanley P. Johnson*  
 REGISTERED CIVIL ENGINEER  
 No. 05795  
 Exp. 3-31-20  
 CIVIL  
 STATE OF CALIFORNIA

October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

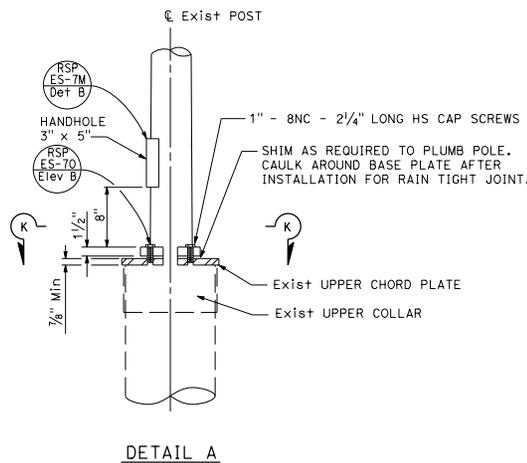
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

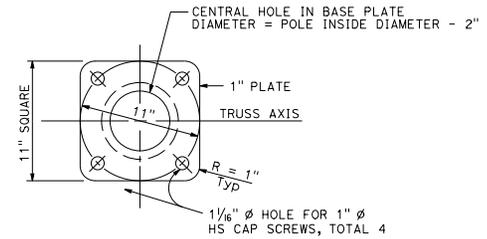
- The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.
- Bolt hole locations may vary at the discretion of the Engineer.
- For Wind Loading see Revised Standard Plan RSP ES-7M.
- See Standard Plan S13.
- Materials (Structural Steel):
  - fy = 55,000 psi tapered steel tube (pole)
  - fy = 50,000 psi unless otherwise noted



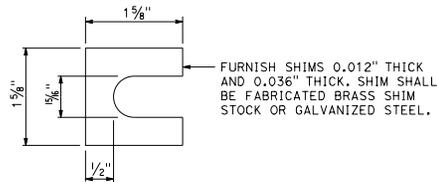
**ELEVATION A**



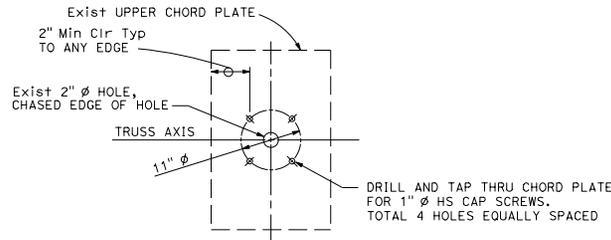
**DETAIL A**



**SECTION K-K**



**SHIM DETAIL  
DETAIL B**



**UPPER CHORD PLATE  
DETAIL C**  
See Note 4

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (LIGHTING STANDARD,  
 TYPES 5 AND 10,  
 OVERHEAD SIGN MOUNTED)**  
 NO SCALE

RSP ES-6C DATED MAY 31, 2018 SUPERSEDES STANDARD PLAN ES-6C  
 DATED MAY 31, 2018 - PAGE 510 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-6C**

2018 REVISED STANDARD PLAN RSP ES-6C

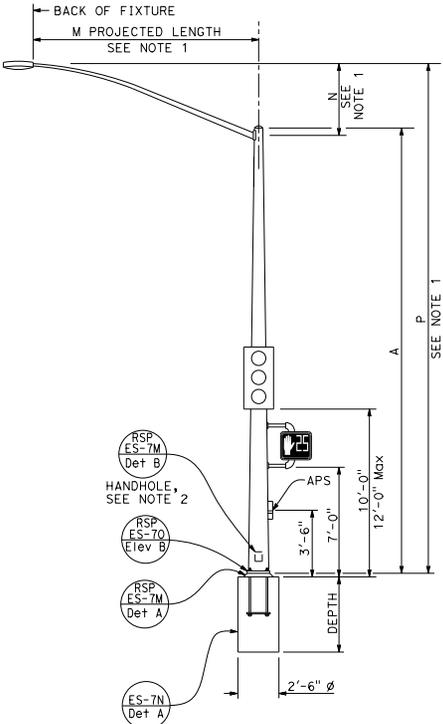


**NOTES:**

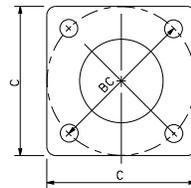
1. For additional notes, details and data for Type 15TS and Type 21TS Standards, see Standard Plan ES-6A.
2. Handhole shall be located on the downstream side of traffic.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
 REGISTERED CIVIL ENGINEER					
October 19, 2018 PLANS APPROVAL DATE					
					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

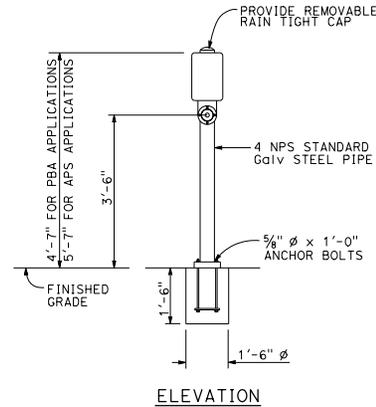
TO ACCOMPANY PLANS DATED \_\_\_\_\_



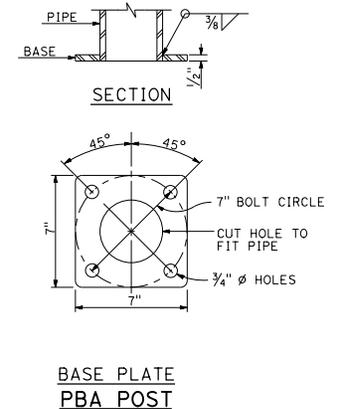
**TYPE 15TS AND 21TS STANDARD**  
ELEVATION A  
(See Note 1)



**BASE PLATE**  
TYPE 15TS AND 21TS  
DETAIL A



**PUSH BUTTON ASSEMBLY POST**  
DETAIL B



POLE TYPE	POLE DATA			WALL THICKNESS	BASE PLATE DATA			ANCHOR BOLT SIZE	DEPTH
	A HEIGHT	Min OD	TOP		C	BC = BOLT CIRCLE	THICKNESS		
15TS	30'-0"	8"	3 1/8"	0.1793"	1'-1 1/2"	1'-0"	2"	1 1/2" ø x 42"	7'-6"
21TS	35'-0"	9 3/8"	3 3/8"		1'-3"	1'-2"			8'-6"

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(SIGNAL AND LIGHTING STANDARD, TYPE TS,  
AND PUSH BUTTON ASSEMBLY POST)**

NO SCALE

RSP ES-7A DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-7A  
DATED MAY 31, 2018 - PAGE 515 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-7A**

2018 REVISED STANDARD PLAN RSP ES-7A

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

*Stanley P. Johnson*  
 REGISTERED CIVIL ENGINEER  
 No. C67395  
 Exp. 3-31-20  
 CIVIL  
 REGISTERED PROFESSIONAL ENGINEER  
 No. C67395  
 Exp. 3-31-20  
 CIVIL  
 STATE OF CALIFORNIA

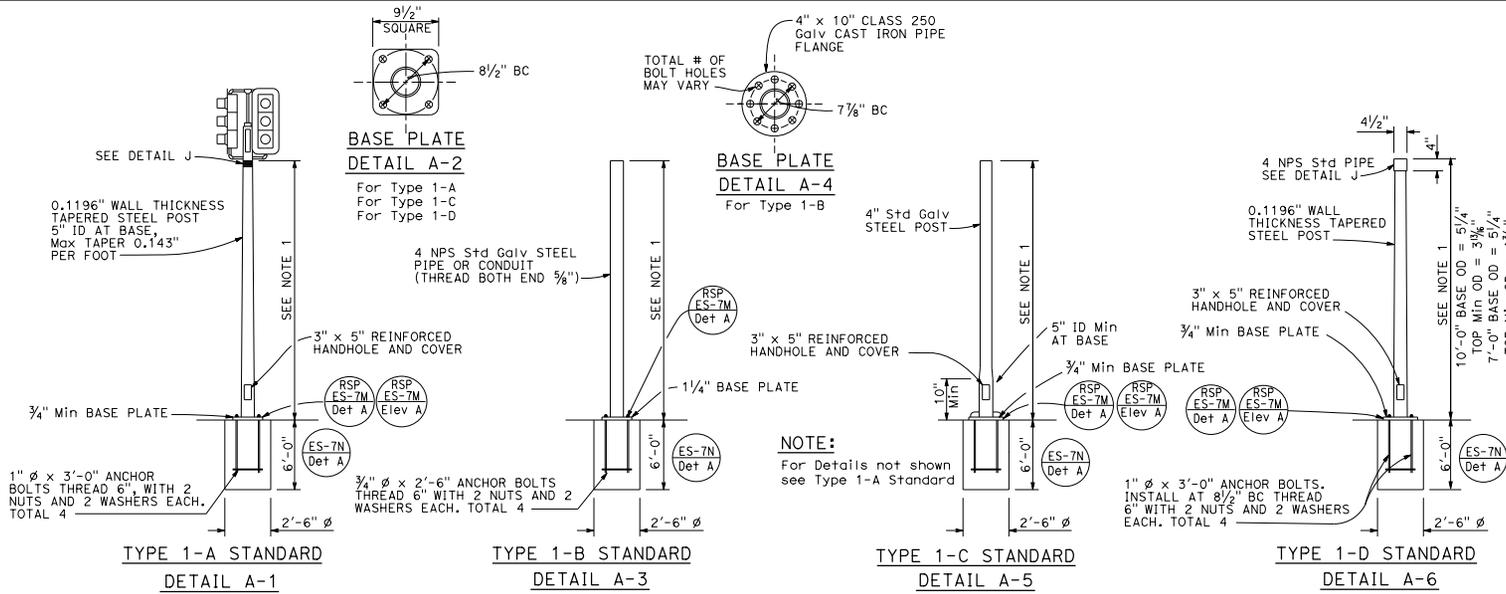
October 19, 2018  
 PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

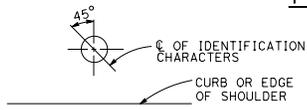
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

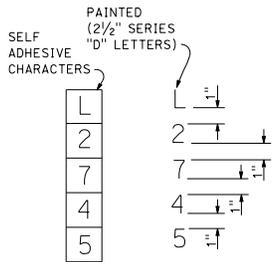
- Standards shall be 12'-0"±2" for flashing beacons, 10'-0"±2" for vehicle signals, and 7'-0"±2" for pedestrian signals unless shorter pole is noted on project plans.
- Top of standards shall be 4" OD.
- Conduits shall extend 2" maximum above finished surface of foundation and for Types 1-A, 1-C and 1-D shall be sloped toward handhole.
- Anchor bolts shall be bonded to conduit or grounding conductor.
- For additional notes and details, see Revised Standard Plan RSP ES-7M, and Standard Plan ES-7N.
- Pour foundation concrete against undisturbed soil.
- For standards with handhole, locate in the downstream side of traffic.
- Coupling nuts to be used only when shown or specified on project plans.



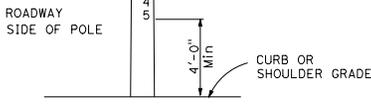
**TYPE 1 SIGNAL STANDARDS  
DETAIL A**



**DETAIL B-3**

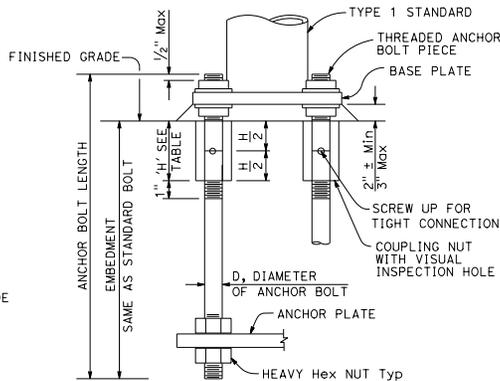


**IDENTIFICATION CHARACTER DETAIL  
DETAIL B-1**

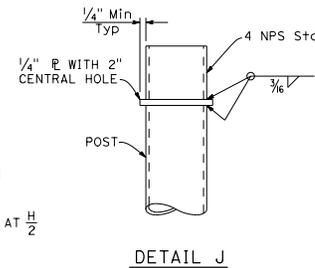


**TYPICAL IDENTIFICATION CHARACTER FORMAT  
DETAIL B-2**

**LOCATION OF EQUIPMENT IDENTIFICATION CHARACTERS ON STANDARDS AND POSTS  
DETAIL B**



**ANCHOR BOLTS WITH SLEEVE NUTS  
DETAIL C  
(See Note 8)**



**DETAIL J**

BOLT DIAMETER	NUT TABLE THICKNESS 'H'
3/4"	2 1/4"
1"	3"

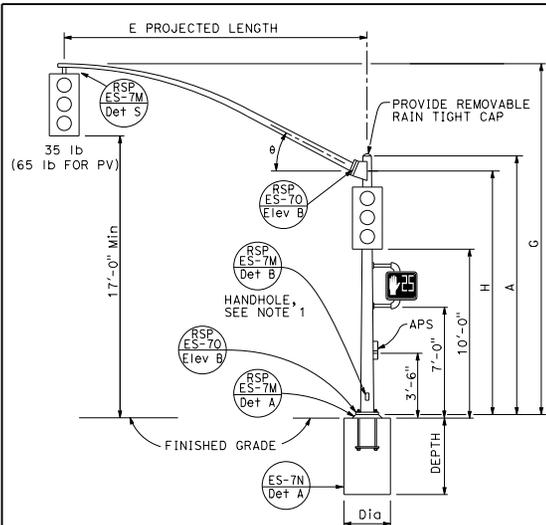
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(SIGNAL AND LIGHTING STANDARD, TYPE 1  
AND EQUIPMENT IDENTIFICATION CHARACTERS)**

NO SCALE

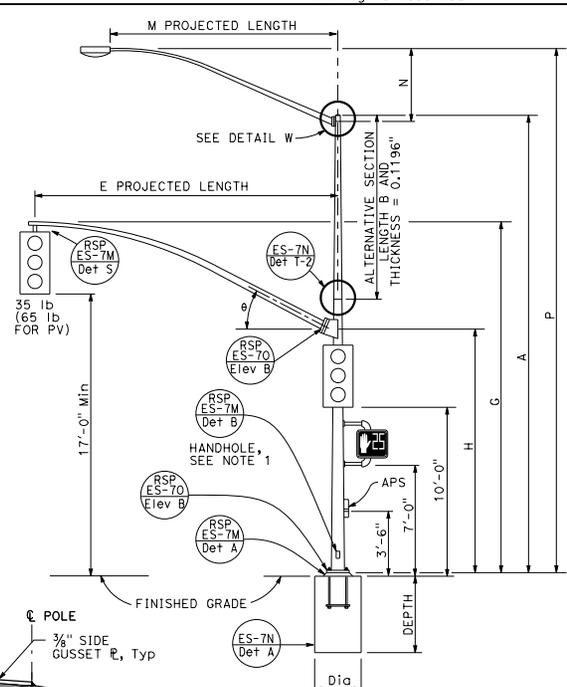
RSP ES-7B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-7B DATED MAY 31, 2018 - PAGE 516 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-7B**

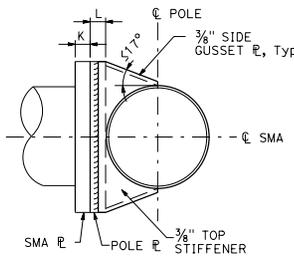
2018 REVISED STANDARD PLAN RSP ES-7B



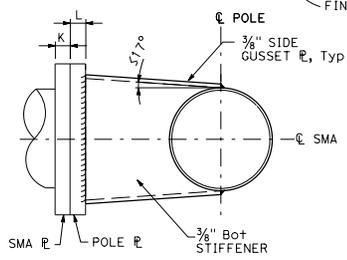
**TYPE 16-1-100, 18-1-100**  
ELEVATION A



**TYPE 19-1-100, 19A-1-100**  
ELEVATION B



SECTION B-B



SECTION C-C

SIGNAL MAST ARM DATA										
E PROJECTED LENGTH	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	I BOLT CIRCLE	HS CAP SCREWS	J PLATE SIZE	K MAST ARM R THICKNESS	L POLE R THICKNESS	θ
15'-0"	21'-8"±	17'-6"	7 3/8"	0.1793"	12"	1 1/4"-7NC-3"	1'-1"	1/4"	1/2"	23°
20'-0"			8"							
25'-0"	22'-8"±	16'-0"	9"							
30'-0"	23'-0"±		10"							

LUMINAIRE MAST ARM DATA					
M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT	
				30'-0" POLE	35'-0" POLE
6'-0"	2'-0"±	3/4"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3/2"		32'-0"±	37'-0"±
10'-0"	3'-3"±			32'-9"±	37'-9"±
12'-0"	4'-3"±	3 7/8"		33'-9"±	38'-9"±
15'-0"	4'-9"±	4 1/4"		34'-3"±	39'-3"±

POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	POLE DATA				BASE PLATE DATA				LUMINAIRE MAST ARM		SIGNAL MAST ARM		CIDH PILE FOUNDATION			
			A HEIGHT	Min OD		THICKNESS	ALTERNATIVE SECTION B			C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	LUMINAIRE MAST ARM	SIGNAL MAST ARM	Dia	DEPTH	
				BASE	TOP		B LENGTH	BOTTOM	TOP									
16-1-100	1	100	18'-6"	12"	9 3/8"	0.2391"	None			1'-6"	1'-4"	2"	1 3/4" ø x 42"	NONE	15'-0", [20'-0"]	3'-0"	9'-0"	
18-1-100			17'-0"			None								NONE				
19-1-100			30'-0"	14"	9 3/4"	OR 0.25"	10'-0"	11 1/8"	9 3/4"	9"	1'-10"	1'-8"	2 1/2"	2" ø x 42"	6'-15" [12'-0"]			25'-0", [30'-0"]
19A-1-100			35'-0"		9"		15'-0"	11 1/8"	9"						6'-15" [15'-0"]			

□ INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

- NOTES:**
- Handhole shall be located on the downstream side of traffic.
  - Δ = Luminaire mast arm skew -90° or +90° default 0°

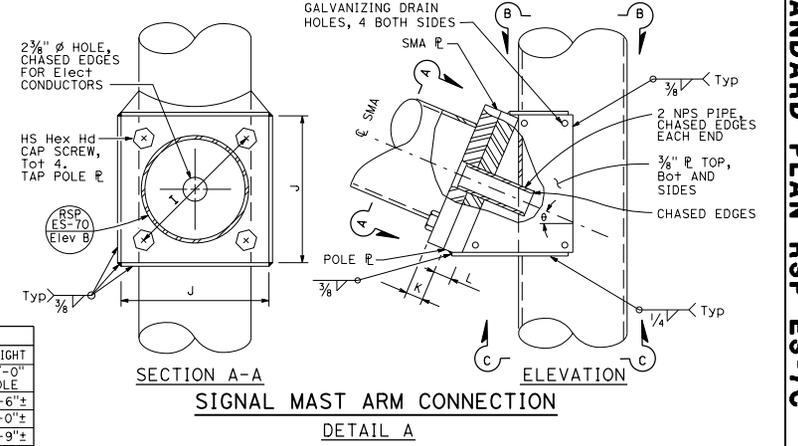
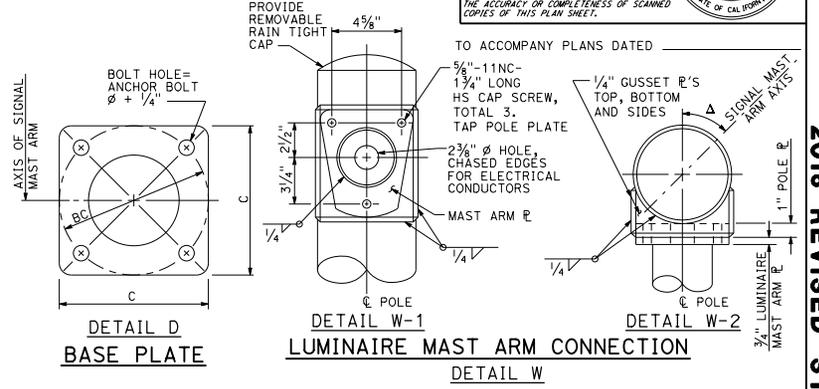
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

October 19, 2018  
PLANS APPROVAL DATE

Stanley P. Johnson  
REGISTERED CIVIL ENGINEER  
No. C51793  
Exp. 3-31-20  
CIVIL

TO ACCOMPANY PLANS DATED \_\_\_\_\_

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



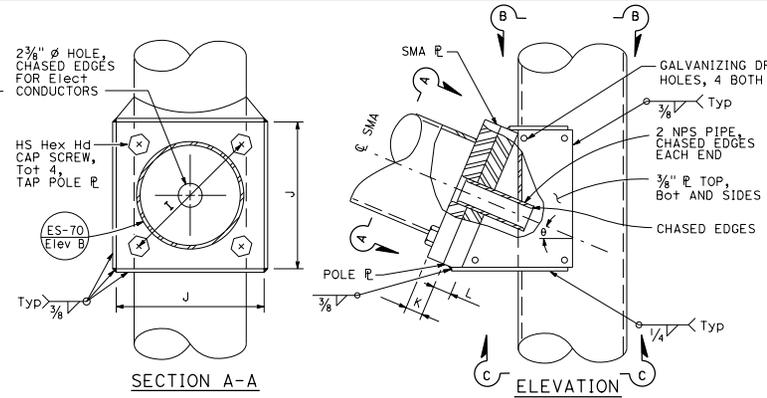
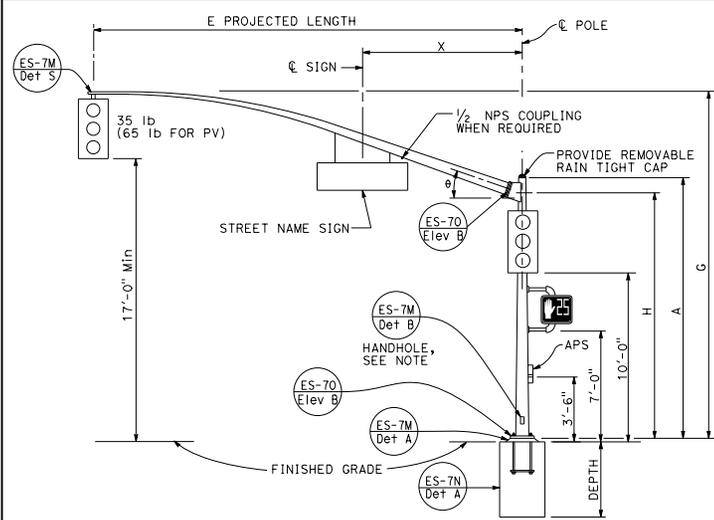
**ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, CASE 1 SIGNAL MAST ARM LOADING, WIND VELOCITY = 100 MPH AND SIGNAL MAST ARM LENGTHS 15' TO 30')**

NO SCALE

RSP ES-7C DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-7C DATED MAY 31, 2018 - PAGE 517 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-7C**

2018 REVISED STANDARD PLAN RSP ES-7C

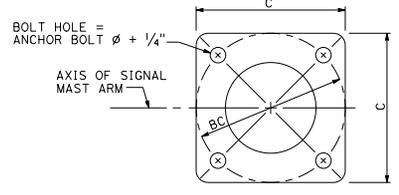


SIGNAL MAST ARM CONNECTION

DETAIL A

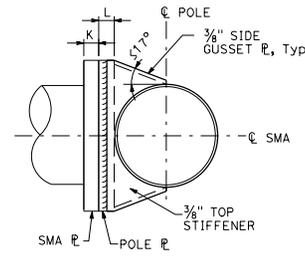
TYPE 16-2-100, 18-2-100

ELEVATION A

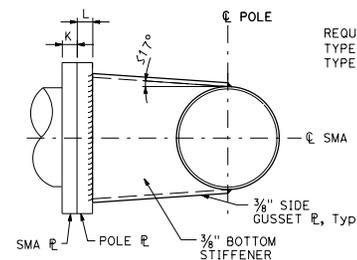


BASE PLATE

DETAIL B



SECTION B-B



SECTION C-C

SIGNAL MAST ARM DATA										
E PROJECTED LENGTH	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	I BOLT CIRCLE	HS CAP SCREWS	J PLATE SIZE	K MAST ARM THICKNESS	L POLE THICKNESS	θ X Max
15'-0"	21'-8"±	17'-6"	7 3/8"	0.1793"	12"	1 1/4"-7NC-3"	1'-1"	1/4"	1 1/2"	23° 10'-6"
20'-0"	21'-8"±	8"	1'-3"							
25'-0"	22'-8"±	9"								
30'-0"	23'-0"±	10"	0.2391"							

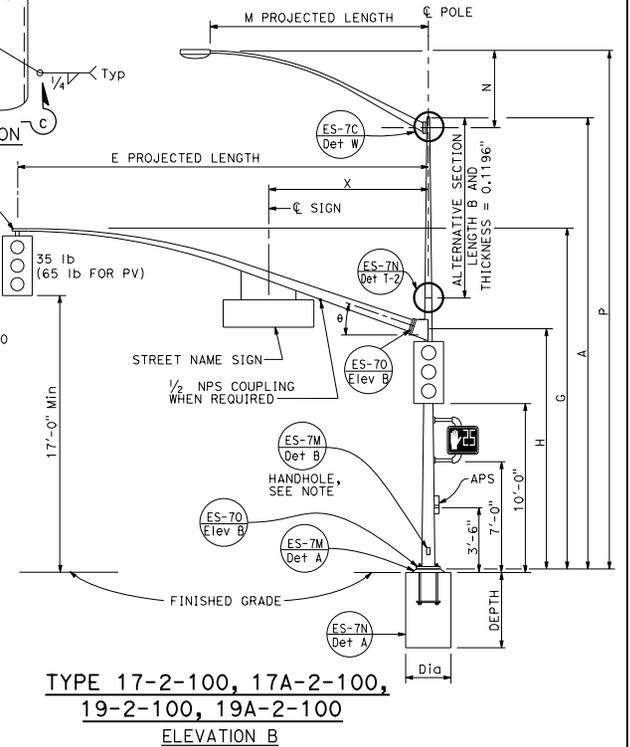
LUMINAIRE MAST ARM DATA					
M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT	
6'-0"	2'-0"±	3/4"	0.1196"	30'-0" POLE	35'-0" POLE
8'-0"	2'-6"±	3/2"		31'-6"±	36'-6"±
10'-0"	3'-3"±	3 1/2"		32'-0"±	37'-0"±
12'-0"	4'-3"±	3 3/4"		32'-9"±	37'-9"±
15'-0"	4'-9"±	4 1/4"		33'-9"±	38'-9"±
				34'-3"±	39'-3"±

POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	POLE DATA				BASE PLATE DATA				LUMINAIRE MAST ARM	SIGNAL MAST ARM	CIDH PILE FOUNDATION			
			A HEIGHT	Min OD BASE	Min OD TOP	THICKNESS	B LENGTH	BOTTOM	TOP	C			BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	Dia
16-2-100	2	100	18'-6"	11 3/8"	0.2391" OR 0.25"	10'-0"	11 1/8"	9 3/4"	1'-10"	1'-8"	2 1/2"	2"Ø x 42"	None	15'-0", 20'-0"	3'-6"	10'-0"
17-2-100			30'-0"	9 3/4"												
17A-2-100			35'-0"	9"												
18-2-100			17'-0"	11 3/8"												
19-2-100			30'-0"	9 3/4"												
19A-2-100			35'-0"	11"												

INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
Stanley P. Johnson REGISTERED CIVIL ENGINEER No. 051793 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA					
April 17, 2020 PLANS APPROVAL DATE THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					

NOTE: TO ACCOMPANY PLANS DATED  
Handhole shall be located on the downstream side of traffic.



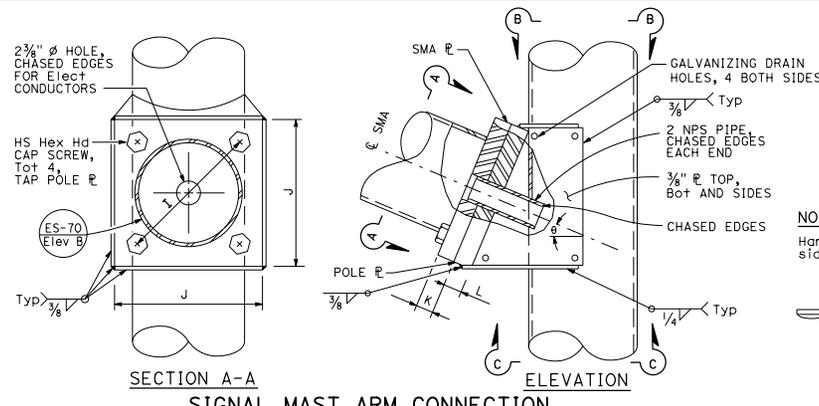
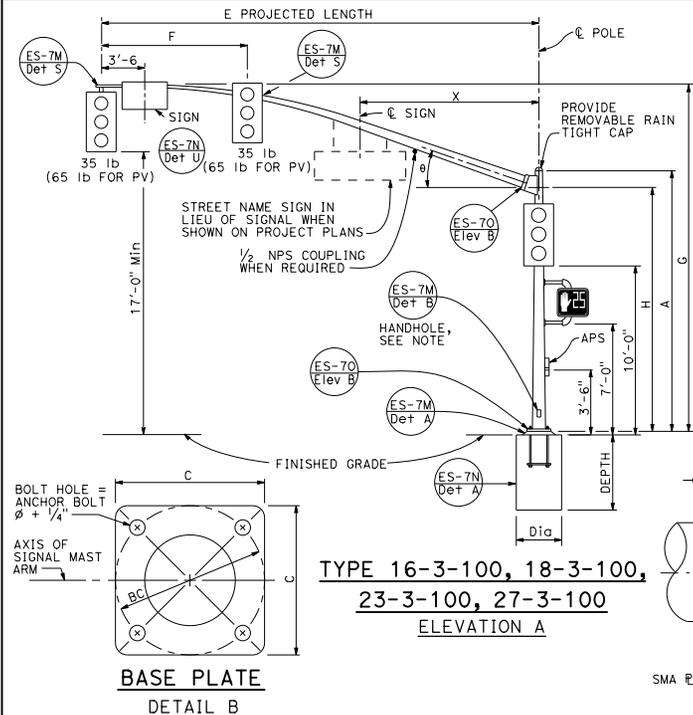
TYPE 17-2-100, 17A-2-100, 19-2-100, 19A-2-100  
ELEVATION B

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(SIGNAL AND LIGHTING STANDARD,**  
**CASE 2 SIGNAL MAST ARM LOADING,**  
**WIND VELOCITY=100 MPH AND SIGNAL**  
**MAST ARM LENGTHS 15' TO 30')**  
NO SCALE

RSP ES-7D DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN ES-7D  
DATED MAY 31, 2018 - PAGE 518 OF THE STANDARD PLANS BOOK DATED 2018.

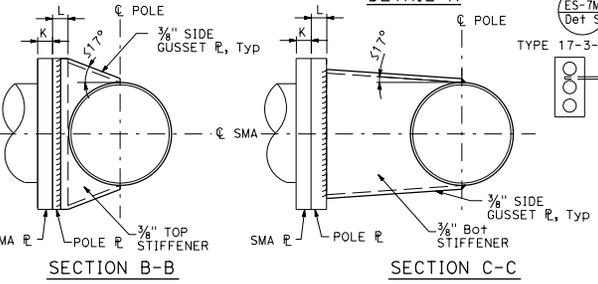
**REVISED STANDARD PLAN RSP ES-7D**

2018 REVISED STANDARD PLAN RSP ES-7D



SIGNAL MAST ARM CONNECTION

TYPE 16-3-100, 18-3-100, 23-3-100, 27-3-100  
ELEVATION A



SIGNAL MAST ARM DATA											
E PROJECTED LENGTH	F Min SPACING	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	I BOLT CIRCLE	HS CAP SCREWS	J PLATE SIZE	K MAST ARM THICKNESS	L POLE THICKNESS	X Max
15'-0"	8'-0"	21'-8"	17'-6"	7 7/8"	0.1793"	12"		1'-3"	1 1/4"	1 1/2"	-
20'-0"		21'-8"		7 3/8"							
25'-0"	12'-0"	22'-8"		8"	0.2391"		1 1/4"-7NC-3"				10'-6"
30'-0"				8 3/4"					1 1/2"	1 3/4"	21°
35'-0"	14'-0"	23'-0"	16'-0"	9 3/8"		13"		1'-5"		1 5/8"	15°
40'-0"	15'-0"			9 3/8"							13'-0"
45'-0"		23'-8"		10 1/8"							

LUMINAIRE MAST ARM DATA					
M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT	
				30'-0" POLE	35'-0" POLE
6'-0"	2'-0"	3/4"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"	3/2"		32'-0"±	37'-0"±
10'-0"	3'-3"	3 3/4"		32'-9"±	37'-9"±
12'-0"	4'-3"	3 3/4"		33'-9"±	38'-9"±
15'-0"	4'-9"	4 1/4"		34'-3"±	39'-3"±

POLE DATA				BASE PLATE DATA				LUMINAIRE MAST ARM		SIGNAL MAST ARM		CIDH PILE FOUNDATION	
POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	A HEIGHT	THICKNESS	ALTERNATIVE SECTION		C BOLT CIRCLE	ANCHOR BOLT SIZE	NONE	NONE	DiA	DEPTH	
			Min OD BASE		Min OD TOP	B LENGTH							TOP
16-3-100	3	100	18'-6"	0.2391" OR 0.25"	10'-0"	13 3/8"	11 3/4"	2 1/4" ø x 42"	6'-15' [12'-0"]	15'-0"	3'-6"	12'-0"	
17-3-100			30'-0"	13 3/8"	11 3/4"	6'-15' [12'-0"]	20'-0"						
18-3-100			17'-0"	13 3/8"	11 3/4"	6'-15' [12'-0"]	25'-0"						
19-3-100			30'-0"	13 3/8"	11 3/4"	6'-15' [15'-0"]	30'-0"						
19A-3-100			35'-0"	11"	11"	6'-15' [15'-0"]	30'-0"						
23-3-100			17'-0"	0.2391" OR 0.25"	11"	6'-15' [12'-0"]	35'-0"						
24-3-100			30'-0"	11 3/4"	11 3/4"	6'-15' [12'-0"]	35'-0"						
24A-3-100			35'-0"	11"	11"	6'-15' [15'-0"]	35'-0"						
26-3-100			30'-0"	13 3/4"	13 3/4"	6'-15' [12'-0"]	40'-0"						
26A-3-100			35'-0"	13"	13"	6'-15' [12'-0"]	45'-0"						
27-3-100			17'-0"	15 5/8"	13"	NONE	NONE						

INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

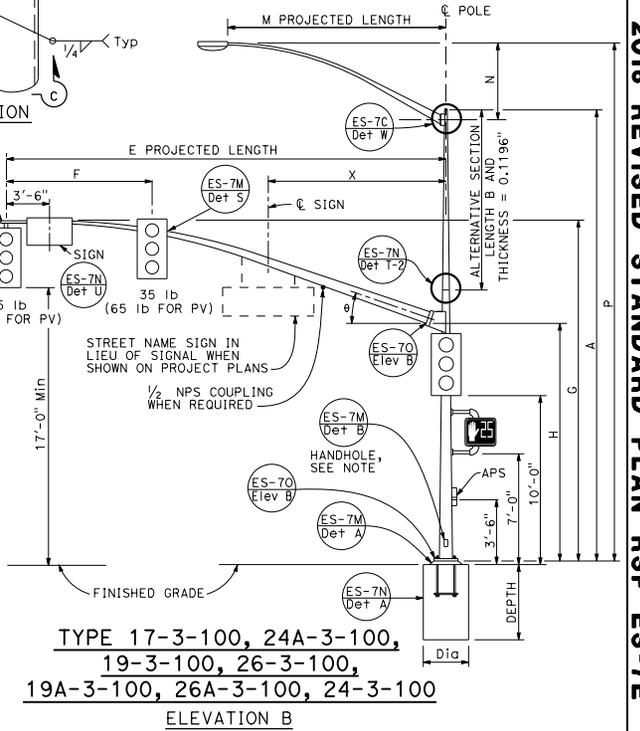
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

Stanley P. Johnson  
REGISTERED CIVIL ENGINEER  
No. C61793  
EXPIRES 3-31-22  
CIVIL  
STATE OF CALIFORNIA

April 17, 2020  
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:  
Handhole shall be located on the downstream side of traffic.



TYPE 17-3-100, 24A-3-100, 19-3-100, 26-3-100, 19A-3-100, 26A-3-100, 24-3-100  
ELEVATION B

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

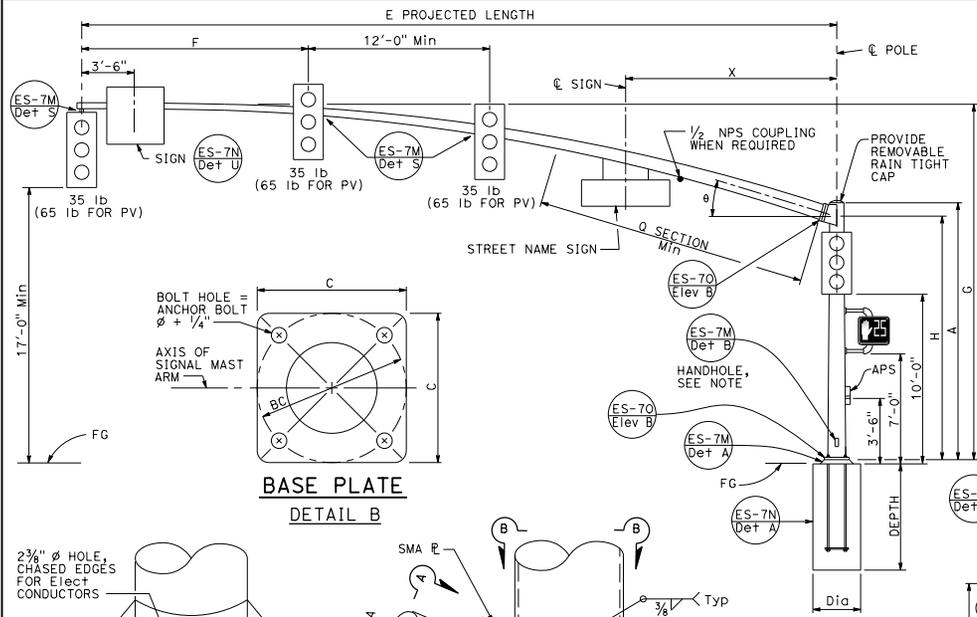
**ELECTRICAL SYSTEMS  
(SIGNAL AND LIGHTING STANDARD,  
CASE 3 SIGNAL MAST ARM LOADING,  
WIND VELOCITY=100 MPH AND SIGNAL  
MAST ARM LENGTHS 15' TO 45')**  
NO SCALE

RSP ES-7E DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN ES-7E DATED MAY 31, 2018 - PAGE 519 OF THE STANDARD PLANS BOOK DATED 2018.

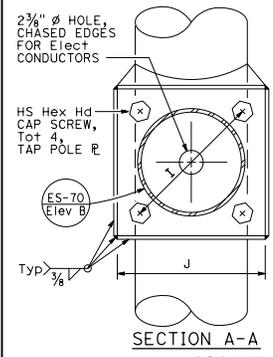
REVISED STANDARD PLAN RSP ES-7E

2018 REVISED STANDARD PLAN RSP ES-7E

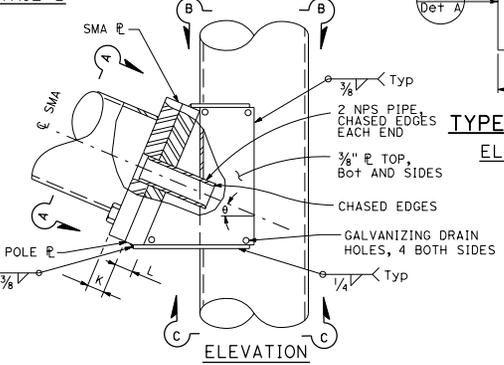




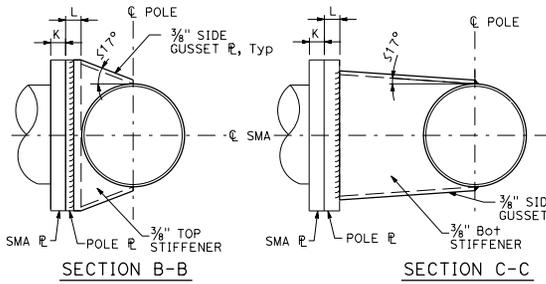
**BASE PLATE  
DETAIL B**



**SIGNAL MAST ARM CONNECTION  
DETAIL A**

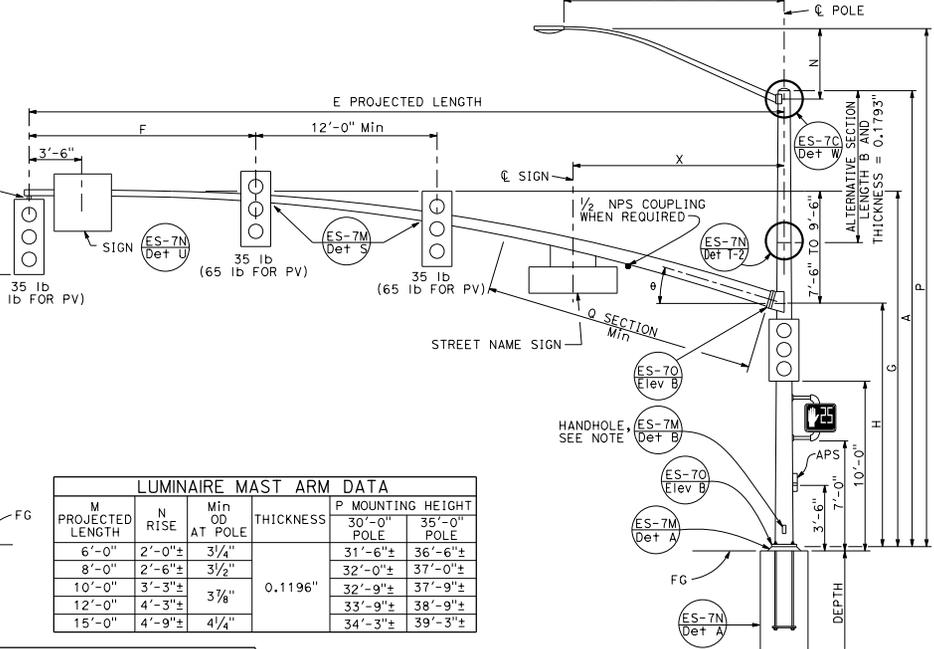


**TYPE 28-5-100  
ELEVATION A**



**SECTION B-B**

**SECTION C-C**



M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT
6'-0"	2'-0"±	3 1/4"	0.1196"	30'-0" POLE 31'-6"±
8'-0"	2'-6"±	3 1/2"		35'-0" POLE 32'-0"±
10'-0"	3'-3"±	3 3/4"		36'-6"±
12'-0"	4'-3"±	4"		37'-0"±
15'-0"	4'-9"±	4 1/4"		37'-9"±

**TYPE 29-5-100, 29A-5-100  
ELEVATION B**

E PROJECTED LENGTH	F Min SPACING	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	I BOLT CIRCLE	J HS CAP SCREWS	K J PLATE SIZE	L MAST ARM THICKNESS	M POLE R THICKNESS	θ	Q SECTION LENGTH	X Max	
50'-0" 55'-0"	15'-0"	23'-7 1/2" TO 25'-7 1/2"±	16'-0"	11 1/8" 1'-1/4"	0.1793"	16"	1 1/2"-6NC-3/4"	1'-9"	1 3/4"	1 3/4"	15°	18'-0" 23'-0"	0.2391"	14'-0"

POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	POLE DATA				BASE PLATE DATA				LUMINAIRE MAST ARM	SIGNAL MAST ARM	CIDH PILE FOUNDATION			
			A HEIGHT	Min OD BASE	Min OD TOP	THICKNESS	ALTERNATIVE SECTION B LENGTH	SECTION TOP	C	BC = BOLT CIRCLE			THICKNESS	ANCHOR BOLT SIZE	Di	DEPTH
28-5-100	5	100	17'-0"	19 3/8"	0.375"	10'-0"	19 1/8"	17 3/4"	2'-6"	2'-4"	3"	2 1/4"φ x 42"	NONE	50'-0", 55'-0"	4'-0"	14'-0"
29-5-100			30'-0"	17 3/4"												
29A-5-100			35'-0"	17"												

□ INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

Dist COUNTY ROUTE POST MILES TOTAL PROJECT SHEET TOTAL NO. SHEETS

Stanley P. Johnson  
REGISTERED CIVIL ENGINEER  
No. C51793  
Exp. 3-31-22  
CIVIL

April 17, 2020  
PLANS APPROVAL DATE

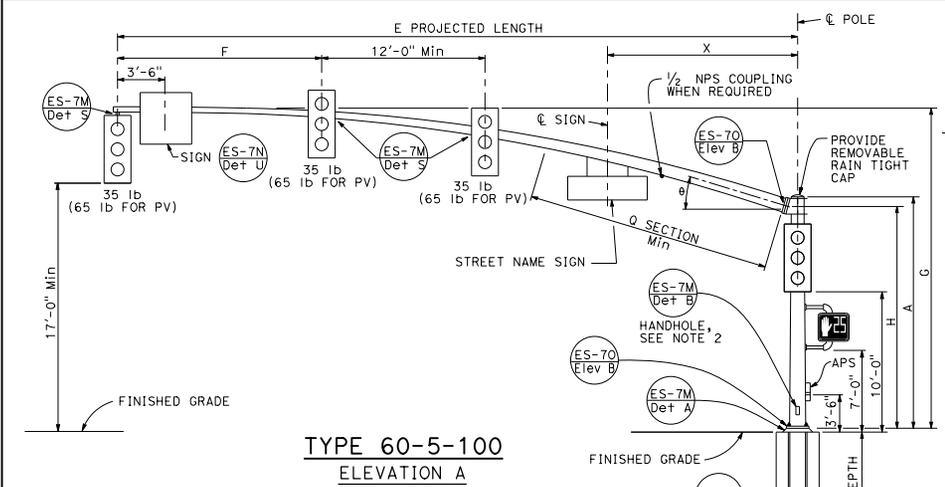
TO ACCOMPANY PLANS DATED \_\_\_\_\_

NOTE:  
Handhole shall be located on the downstream side of traffic.

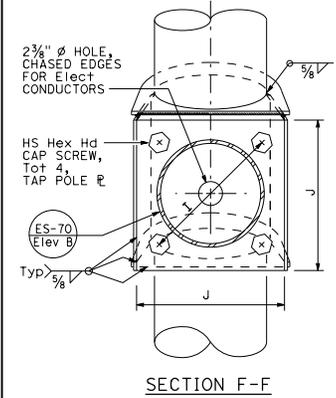
**ELECTRICAL SYSTEMS  
(SIGNAL AND LIGHTING STANDARD,  
CASE 5 SIGNAL MAST ARM LOADING,  
WIND VELOCITY=100 MPH AND SIGNAL  
MAST ARM LENGTHS 50' TO 55')**

NO SCALE  
RSP ES-7G DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN ES-7G  
DATED MAY 31, 2018 - PAGE 521 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP ES-7G**

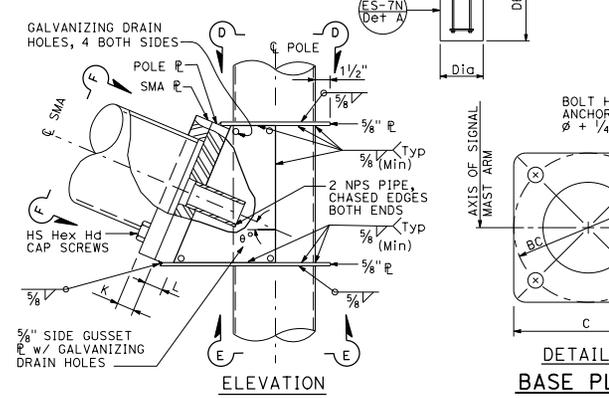
2018 REVISED STANDARD PLAN RSP ES-7G



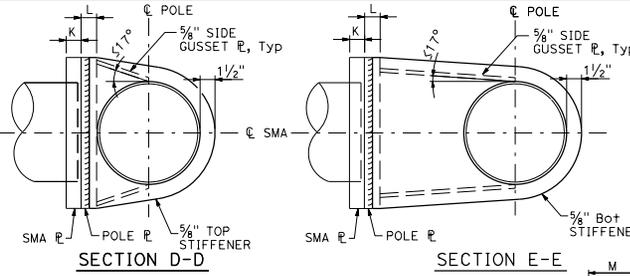
**TYPE 60-5-100  
ELEVATION A**



**SECTION F-F**

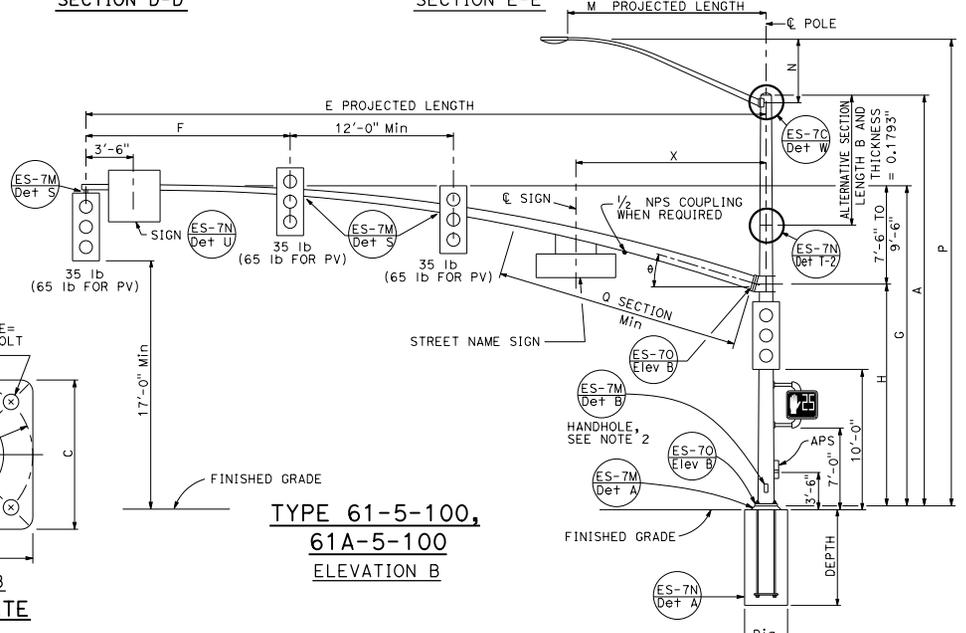


**DETAIL B  
BASE PLATE**



**SECTION D-D**

**SECTION E-E**



**TYPE 61-5-100,  
61A-5-100  
ELEVATION B**

E PROJECTED LENGTH	F Min SPACING	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	I BOLT CIRCLE	HS CAP SCREWS	J PLATE SIZE	K MAST ARM THICKNESS	L POLE THICKNESS	Q SECTION LENGTH THICKNESS	X Max
60'-0"	15'-0"	23'-7" TO 25'-7"	16'-0"	1'-1 1/2"	0.1793" / 0.2391"	20"	1 1/2"-6NC-4"	2'-0"	2"	2"	24'-0" / 29'-0" / 0.2391" / 0.3125"	14'-0"

M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT
6'-0"	2'-0"±	3/4"	0.1196"	30'-0" POLE / 35'-0" POLE
8'-0"	2'-6"±	3/2"		31'-6"± / 36'-6"± / 32'-0"± / 37'-0"±
10'-0"	3'-3"±	3 7/8"		32'-9"± / 37'-9"± / 33'-9"± / 38'-9"±
15'-0"	4'-9"±	4 1/4"		34'-3"± / 39'-3"±

POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	POLE DATA				BASE PLATE DATA				LUMINAIRE MAST ARM	SIGNAL MAST ARM	CIDH PILE FOUNDATION			
			A HEIGHT	Min OD BASE	Min OD TOP	THICKNESS	ALTERNATIVE SECTION B LENGTH	ALTERNATIVE SECTION TOP	C	BC BOLT CIRCLE			THICKNESS	ANCHOR BOLT SIZE	Di	DEPTH
60-5-100	5	100	17'-0"	22"	19 3/8"	0.375"				2'-6"	2'-4"		NONE	60'-0"	4'-0"	14'-0"
61-5-100			30'-0"	25"	20 3/4"		10'-0"	22 1/8"	20 3/4"	2'-11"	2'-9"	3"	3"ø x 60"	6'-15' [15'-0"]	4'-6"	14'-0"
61A-5-100			35'-0"		20"		15'-0"		20"					[65'-0"]		15'-0"

□ INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

- NOTES:**
- The radial separation between the face of the pole and the adjacent insides of the top and bottom gusset plates shall not exceed 1/16". Fillet weld size to be increased by amount of gap.
  - Handhole shall be located on the downstream side of traffic.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(SIGNAL AND LIGHTING STANDARD,  
CASE 5 SIGNAL MAST ARM LOADING,  
WIND VELOCITY=100 MPH AND SIGNAL  
MAST ARM LENGTHS 60' TO 65')**

NO SCALE

RSP ES-7H DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN ES-7H DATED MAY 31, 2018 - PAGE 522 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-7H**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

Stanley P. Johnson  
REGISTERED CIVIL ENGINEER  
No. C61793  
Exp. 3-31-22  
CIVIL  
STATE OF CALIFORNIA

APRIL 17, 2020  
PLANS APPROVAL DATE

TO ACCOMPANY PLANS DATED \_\_\_\_\_

2018 REVISED STANDARD PLAN RSP ES-7H

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

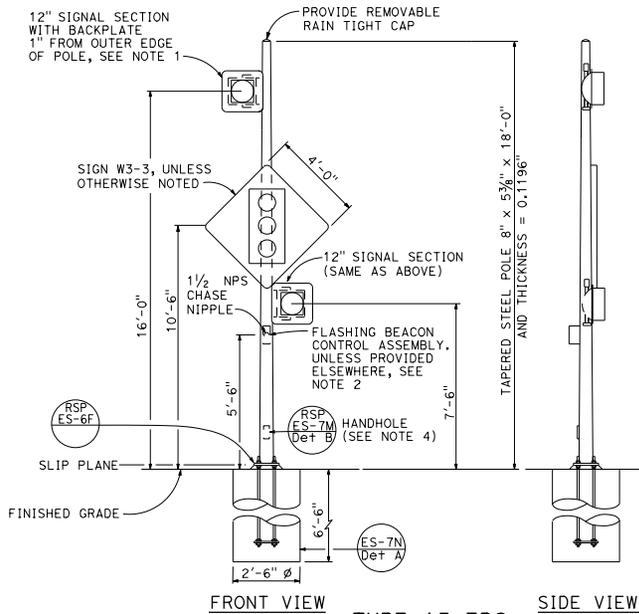
**Stanley P. Johnson**  
 REGISTERED CIVIL ENGINEER  
 No. C61793  
 Exp. 3-31-20  
 CIVIL  
 STATE OF CALIFORNIA

October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS  
 OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
 THE ACCURACY OR COMPLETENESS OF SCANNED  
 COPIES OF THIS PLAN SHEET.

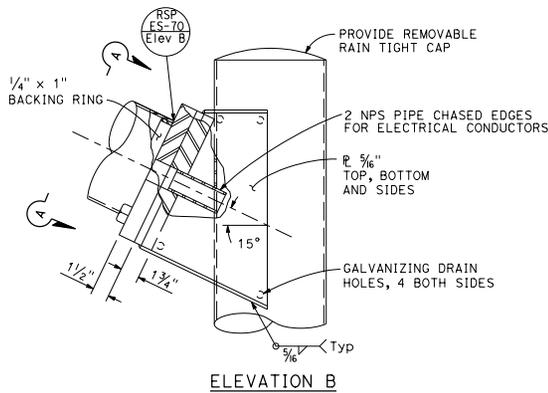
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

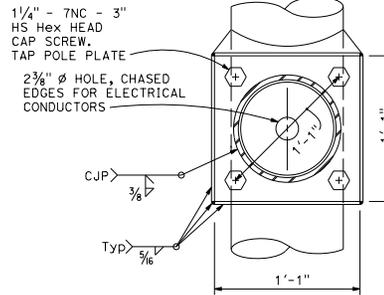
1. See Standard Plan ES-4A and Revised Standard Plan RSP ES-4D for attachment fitting details.
2. For wiring diagram, see Revised Standard Plan RSP ES-14B.
3. For additional notes and details, see Revised Standard Plan RSP ES-7M and Standard Plan ES-7N.
4. Handhole shall be located on the downstream side of traffic.
5. See project plans for type of standard to be installed.



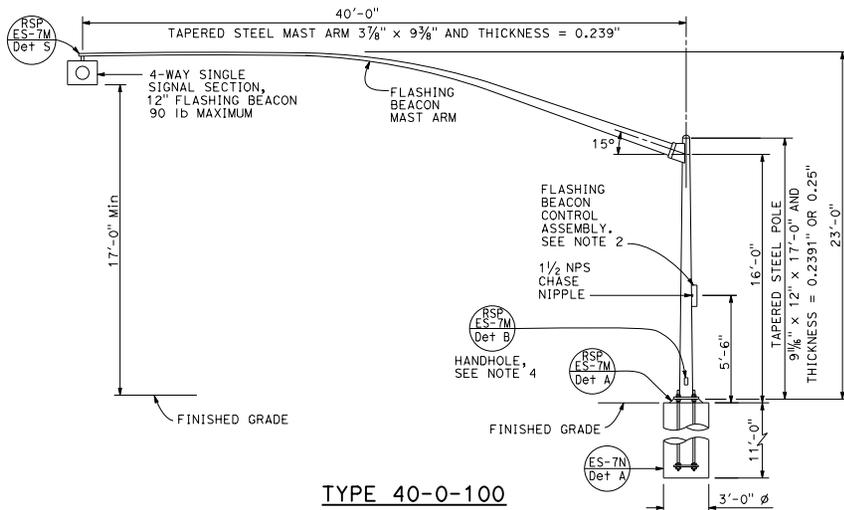
**TYPE 15-FBS**  
**FLASHING BEACON WITH SLIP BASE INSTALLATION**  
DETAIL A



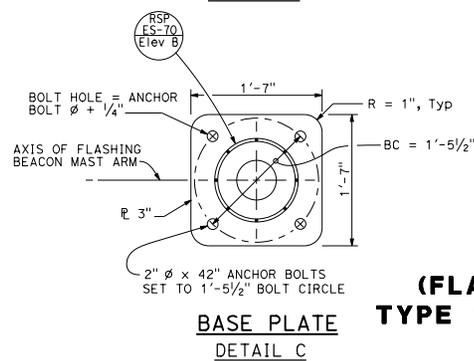
**ELEVATION B**



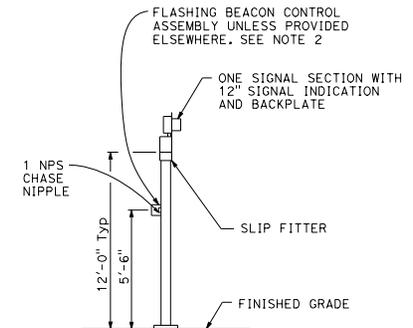
**VIEW A-A**  
**FLASHING BEACON MAST ARM**  
**CONNECTION DETAIL**  
DETAIL B



**TYPE 40-0-100**  
**ELEVATION A**



**BASE PLATE**  
**DETAIL C**



**TYPE 1-A, 1-C, AND 1-D**  
**FLASHING BEACON INSTALLATION**  
DETAIL D  
See Note 5

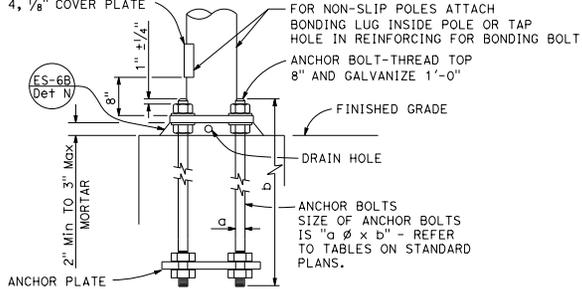
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(FLASHING BEACON ON A TYPE 1,**  
**TYPE 15-FBS, AND TYPE 40 STANDARD)**  
NO SCALE

RSP ES-7J DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-7J  
DATED MAY 31, 2018 - PAGE 523 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-7J**

2018 REVISED STANDARD PLAN RSP ES-7J

4" x 6 1/2" ROUNDED RECTANGLE HANDHOLE REINFORCED WITH RING WELDED TO OUTSIDE OF POLE. SEE NOTE 4, 1/8" COVER PLATE



**HANDHOLE AND ANCHORAGE**

DETAIL A

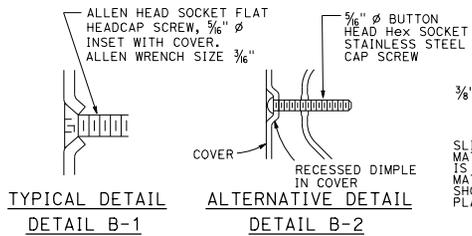
**IDENTIFICATION NUMBER**

1. Attach a stamped metal tag with pole's identification number above the handhole. 1/4" high number, minimum.
2. Attach a stamped metal tag with mast arm's identification number to the bottom of the signal mast arm near the pole plate. 1/4" high number, minimum.

26A - 3 - 100 - 45 - 10 - F or FB

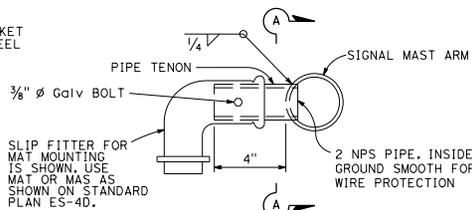
Type Load case (Use SL for special load case) Design wind velocity (mph) Signal mast arm length (ft) (near handhole; Maximum signal mast arm length) Standard plan year Only for poles or most arms using Detail F Only for poles or most arms using RSP ES-70

**SAMPLE IDENTIFICATION NUMBER**

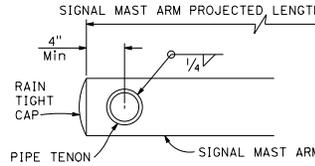


TYPICAL DETAIL  
DETAIL B-1

ALTERNATIVE DETAIL  
DETAIL B-2



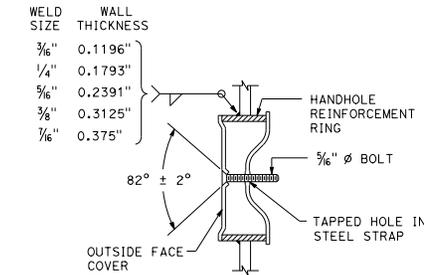
SIDE TENON  
DETAIL S-1



SECTION A-A

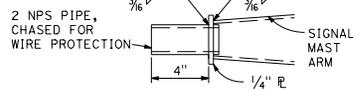
**NOTES:**

1. Provide a Hex nut, leveling nut and 2 washers for each bolt.
2. Luminaire mast arms shall be round, tapered steel tubes, taper of 0.1375" to 0.143-inch per foot with an end section 2 3/8" OD for mounting hardware. Extensions of 2 NPS Standard pipe and 7" long may be used at the option of the manufacturer. When low pressure sodium luminaires are required, the extension shall be 1'-3".
3. Signal mast arms shall be round, tapered steel tubes, maximum taper 0.143-inch per foot.
4. Handhole reinforcement ring shall be 1/4" x 2" for 0.1196" to 0.2391" thick poles, 3/8" x 2" for 0.3125" to 0.375" thick poles.
5. Handholes shall be located on the downstream side of traffic.
6. Detail F, fatigue resistant weld, is required at socket welded signal mast arm plate and pole base plate.
7. Cap screws shall be tightened by the turn-of-nut method 1/3 turn from a snug tight condition. No washer will be required.
8. Outside diameter, wall thickness, and corresponding section properties of poles and mast arms as shown in the Standard Plans are minimums. Unless otherwise specified, alternative sections shall require approval by the Engineer.
9. Design: AASHTO Standard Specifications for Structural Support for Highway Signs, Luminaires, and Traffic Signals, 6th Edition. Basic Wind Speed = 100 mph (3 seconds gust). Yearly Mean Wind Velocity = 15.6 mph.
10. Materials (Structural steel):  
fy = 55,000 psi (tapered steel tube and anchor bolts)  
fy = 50,000 psi (unless otherwise noted)
11. Materials (Reinforced concrete):  
f'c = 3,625 psi  
fy = 60,000 psi



**TAMPER RESISTANT HANDHOLE COVER**

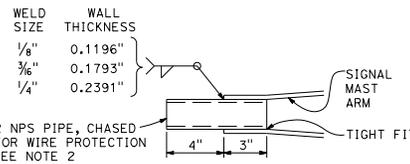
DETAIL B



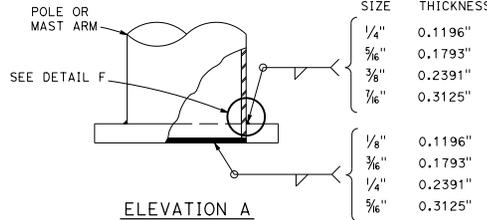
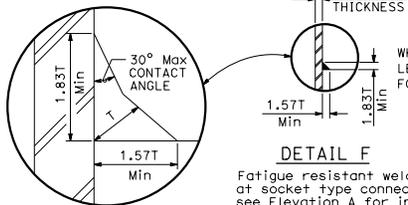
TIP TENON  
DETAIL TL

This detail supersedes Detail S when so designated

**PIPE TENONS  
DETAIL S**



TIP TENON  
DETAIL TS



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(SIGNAL AND LIGHTING STANDARD,  
DETAIL No. 1)**

NO SCALE

RSP ES-7M DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-7M  
DATED MAY 31, 2018 - PAGE 526 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-7M**

2018 REVISED STANDARD PLAN RSP ES-7M

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER  
Stanley P. Johnson  
No. C6793  
Exp. 3-31-20  
CIVIL  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF CALIFORNIA

October 19, 2018  
PLANS APPROVAL DATE

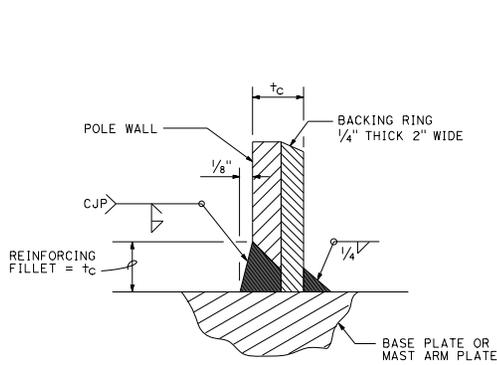
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

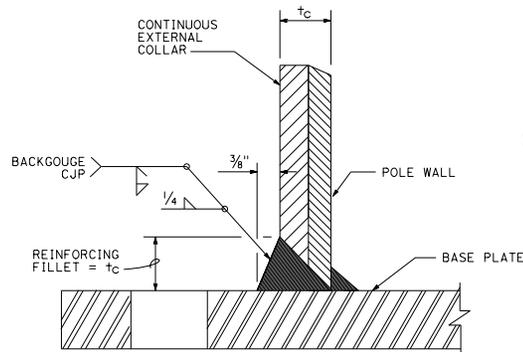
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

*Stanley P. Johnson*  
 REGISTERED CIVIL ENGINEER  
 No. 05795  
 Exp. 3-31-20  
 STATE OF CALIFORNIA

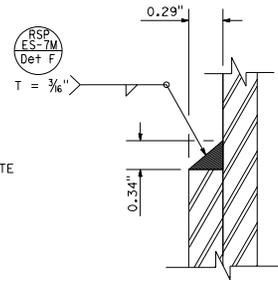
October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



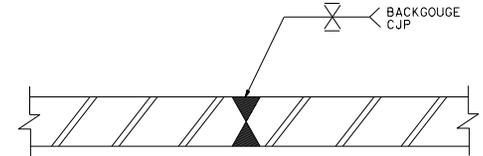
DETAIL B



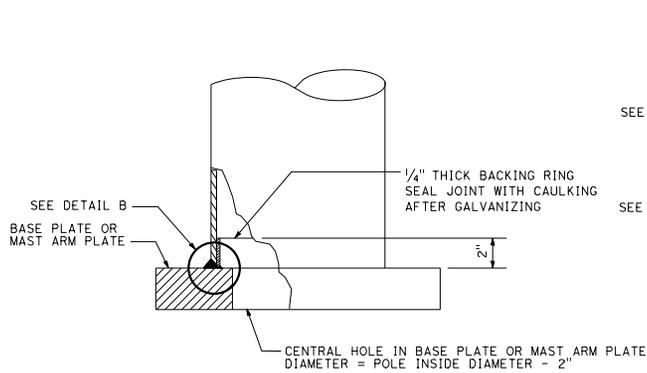
DETAIL C1



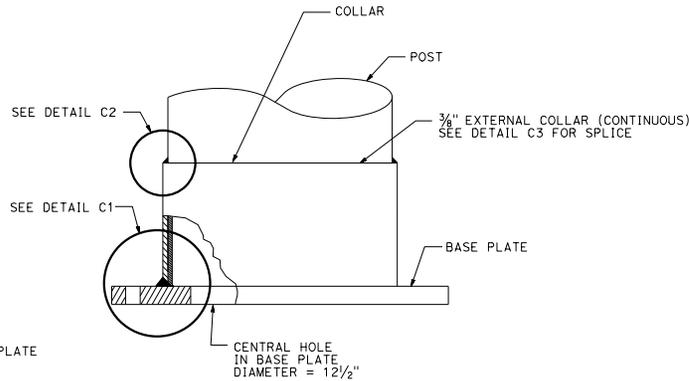
DETAIL C2



DETAIL C3

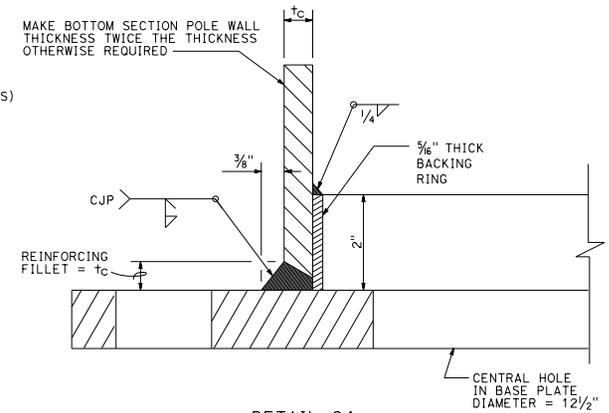


ELEVATION B



ELEVATION C

For alternative base, see Detail C4



DETAIL C4

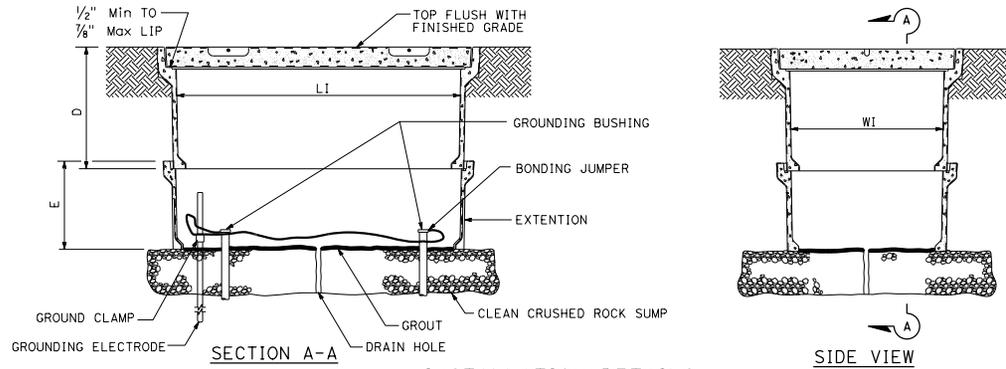
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(SIGNAL AND LIGHTING STANDARD,**  
**DETAIL No. 3)**

NO SCALE

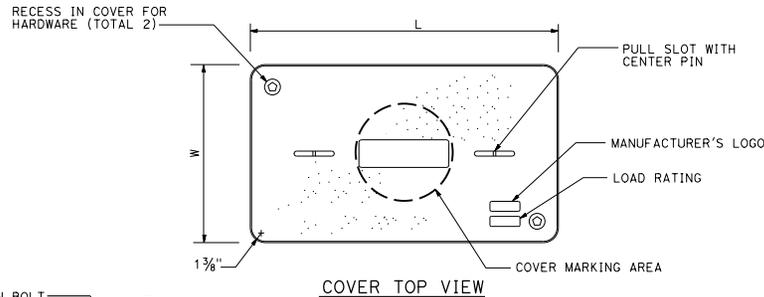
RSP ES-70 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-70  
 DATED MAY 31, 2018 - PAGE 528 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-70**

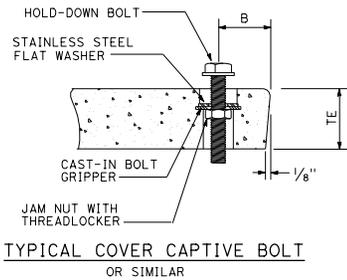
2018 REVISED STANDARD PLAN RSP ES-70



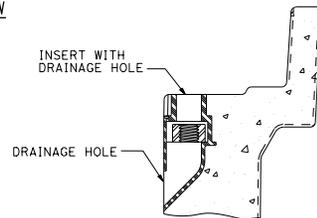
**INSTALLATION DETAILS**  
**DETAIL A**



**COVER TOP VIEW**



**TYPICAL COVER CAPTIVE BOLT**  
**OR SIMILAR**



**TYPICAL THREADED INSERT**  
**OR SIMILAR**

**NOMINAL DIMENSIONS TABLE**

PULL BOX TYPE	PULL BOX				COVER					
	MINIMUM DEPTH BOX (D)	MINIMUM DEPTH EXTENSION (E)	MAXIMUM WEIGHT	L1 Min	W1 Min	TE	B	L	W	MAXIMUM WEIGHT
No. 3/2	12"	N/A	40 lb	1' - 2 3/8"	9"	1 5/8" - 1 3/4"	1 3/4"	1' - 3 1/4" - 1' - 3 3/8"	10" - 10 1/8"	30 lb
No. 5	12"	10"	65 lb	1' - 8"	11"	2"	1 3/4"	1' - 11 1/4"	1' - 1 3/4"	60 lb
No. 6	12"	10"	70 lb	2' - 4 1/4"	1' - 3 1/4"	2"	2"	2' - 6 1/2"	1' - 5 1/2"	95 lb

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

*H.R.F.*  
 REGISTERED ELECTRICAL ENGINEER  
 October 18, 2019  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 ELECTRICAL  
 STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED \_\_\_\_\_

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(NON-TRAFFIC PULL BOX)**  
NO SCALE

RSP ES-8A DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN ES-8A  
DATED MAY 31, 2018 - PAGE 532 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-8A**

2018 REVISED STANDARD PLAN RSP ES-8A

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

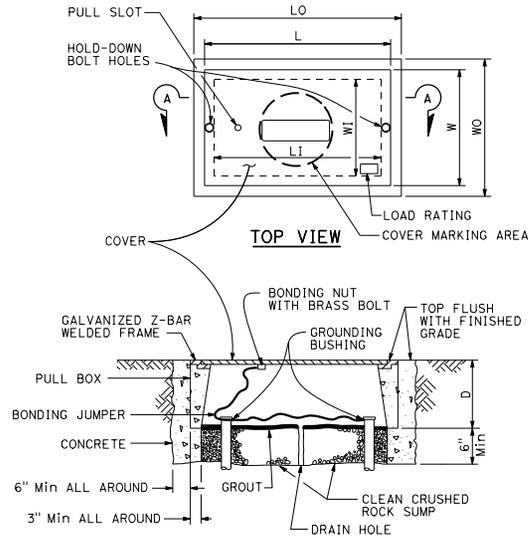
H.R.F.  
REGISTERED ELECTRICAL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

Hamid Zolfaghari  
No. E15636  
Exp. 12-31-19  
ELECTRICAL

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TO ACCOMPANY PLANS DATED \_\_\_\_\_



SECTION A-A

No. 3 1/2(T), No. 5(T), AND No. 6(T)  
TRAFFIC PULL BOX

NOMINAL DIMENSIONS TABLE								
PULL BOX						COVER		
PULL BOX TYPE	MINIMUM THICKNESS	MINIMUM DEPTH D	LO	LI	WO	WI	L	W
No. 3 1/2(T)	1 1/2"	1'-0"	1'-10" - 1'-11"	1'-5" - 1'-6 1/2"	1'-3" - 1'-4"	10" - 1'-0"	1'-8" - 1'-8 1/2"	1'-1" - 1'-2"
No. 5(T)	1 3/4"	1'-0"	2'-5" - 2'-6"	2'-0" - 2'-1"	1'-6" - 1'-7"	1'-1" - 1'-2"	2'-3" - 2'-3 1/2"	1'-4" - 1'-4 1/2"
No. 6(T)	2"	1'-0"	2'-11" - 3'-1"	2'-6" - 2'-7"	1'-10" - 2'-0"	1'-5" - 1'-6"	2'-9" - 2'-9 1/2"	1'-8" - 1'-8 1/2"

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(TRAFFIC PULL BOX)**  
NO SCALE

RSP ES-8B DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN ES-8B  
DATED MAY 31, 2018 - PAGE 533 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-8B**

2018 REVISED STANDARD PLAN RSP ES-8B

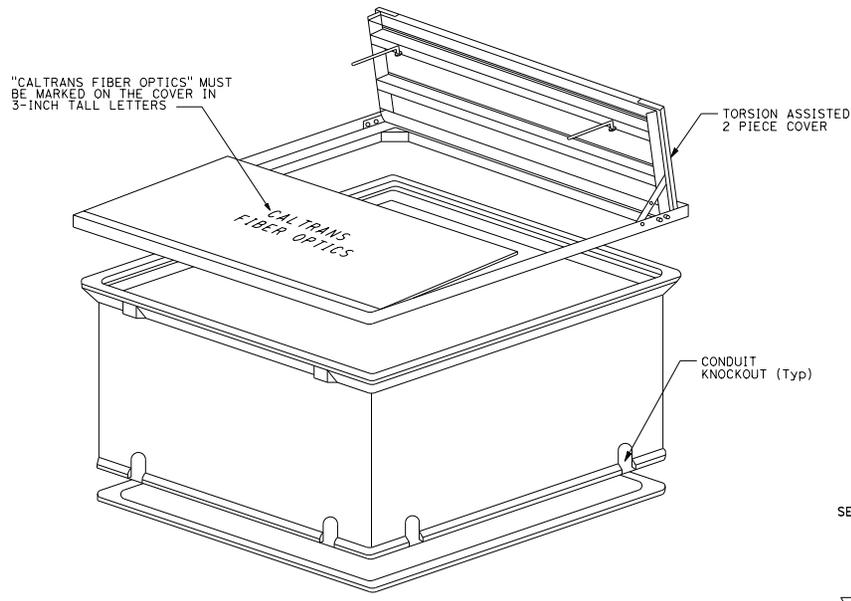
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*H.R.F.*  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 PROFESSIONAL ENGINEER  
 ELECTRICAL  
 STATE OF CALIFORNIA

April 19, 2019  
 PLANS APPROVAL DATE

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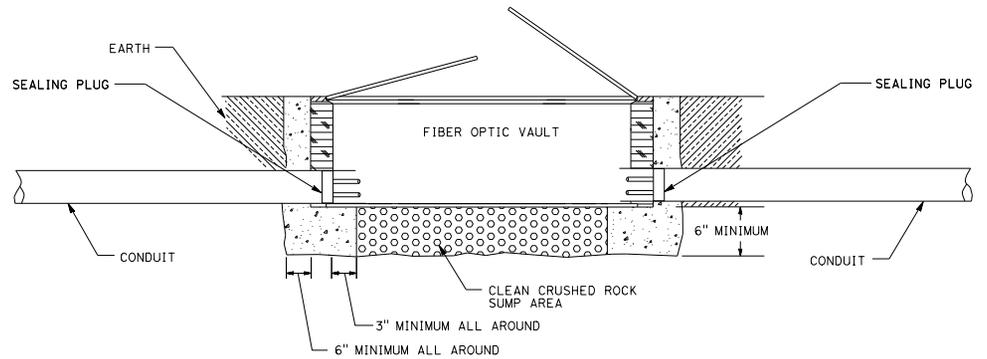
TO ACCOMPANY PLANS DATED \_\_\_\_\_



**VAULT-ISOMETRIC VIEW**



**TOP VIEW**



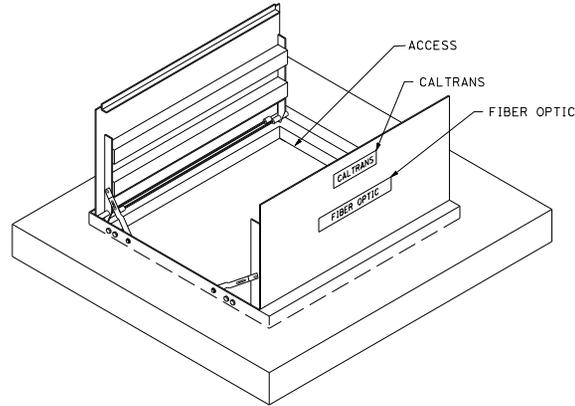
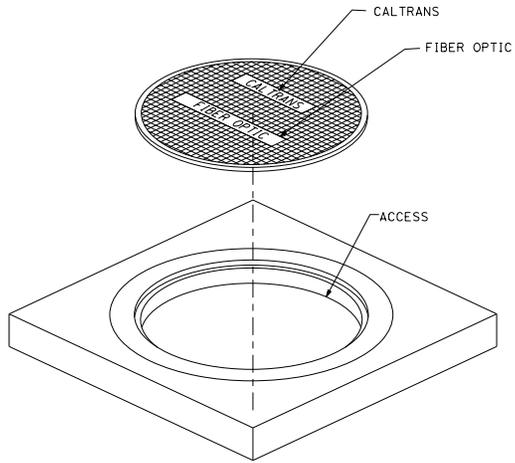
**SECTION A-A**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (VAULTS)**  
 NO SCALE

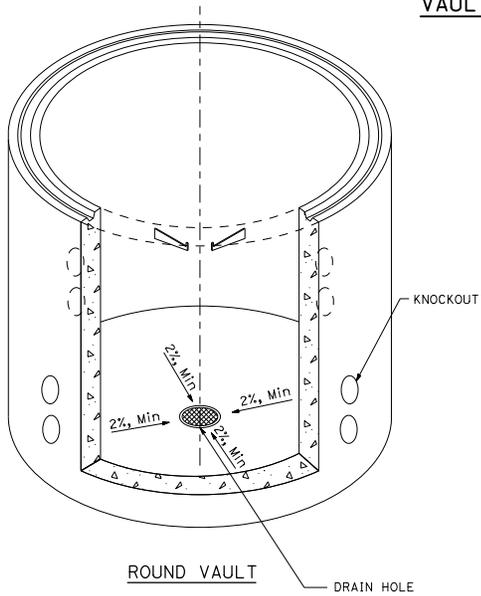
RSP ES-8C DATED APRIL 19, 2019 SUPERSEDES RSP ES-8C DATED OCTOBER 19, 2018 AND STANDARD PLAN ES-8C DATED MAY 31, 2018 - PAGE 534 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-8C**

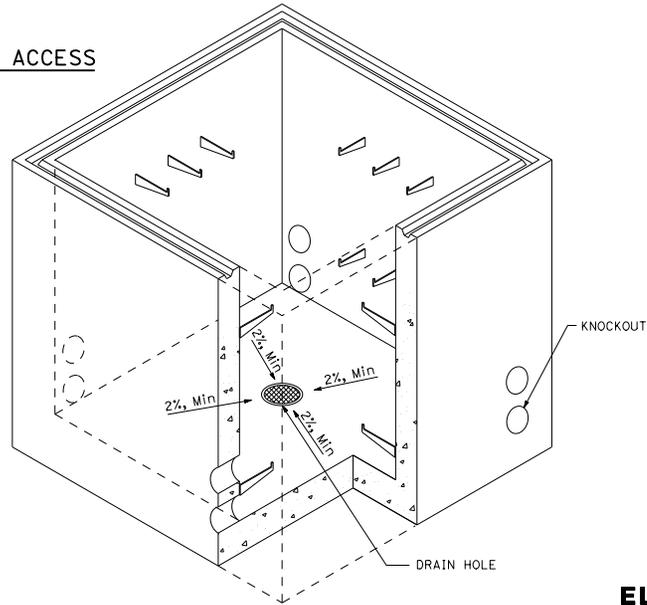
2018 REVISED STANDARD PLAN RSP ES-8C



VAULT COVER AND ACCESS



ROUND VAULT



BOX VAULT

VAULT BODY

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*H.R.F.*  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 PROFESSIONAL ENGINEER  
 ELECTRICAL  
 STATE OF CALIFORNIA

October 19, 2018  
 PLANS APPROVAL DATE  
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 THE ACCURACY OR COMPLETENESS OF SCANNED  
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TO ACCOMPANY PLANS DATED \_\_\_\_\_

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (VAULTS)**  
 NO SCALE

RSP ES-8D DATED OCTOBER 19, 2018 SUPERSEDES THE STANDARD PLANS BOOK DATED 2018.

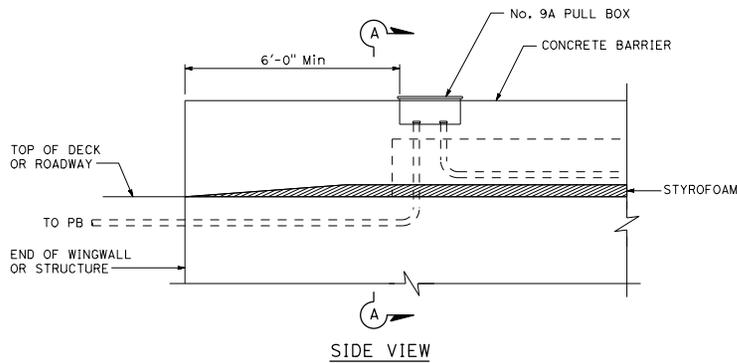
**REVISED STANDARD PLAN RSP ES-8D**

2018 REVISED STANDARD PLAN RSP ES-8D

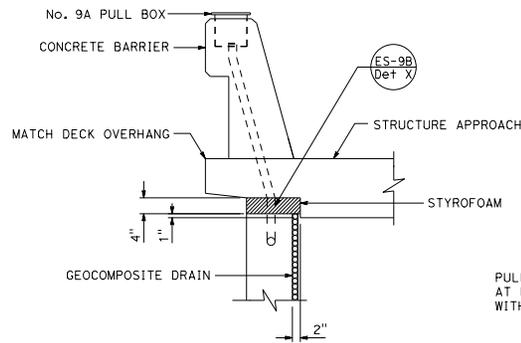
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS


  
 REGISTERED ELECTRICAL ENGINEER  
 October 16, 2020  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS  
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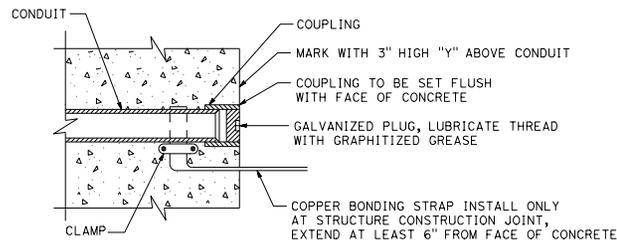
TO ACCOMPANY PLANS DATED \_\_\_\_\_



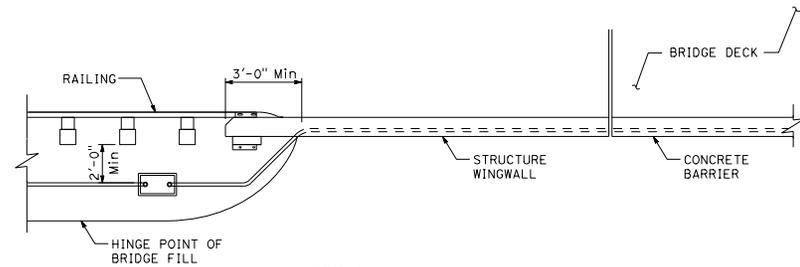
SIDE VIEW



SECTION A-A  
CONDUIT TERMINATION  
DETAIL A

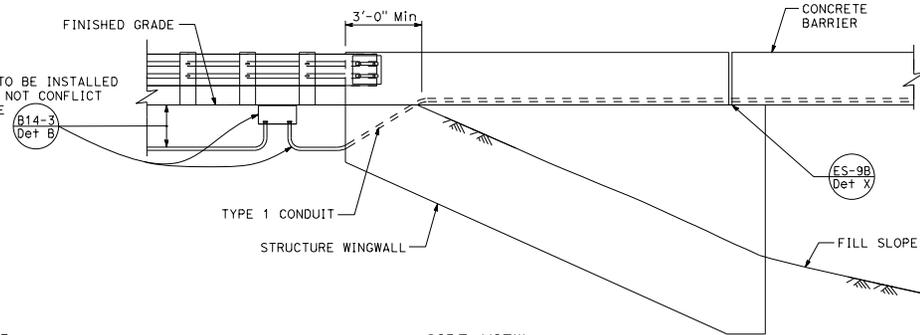


CONDUIT TERMINATION  
DETAIL C



TOP VIEW

PULL BOX AND CONDUIT TO BE INSTALLED AT LOCATION THAT DOES NOT CONFLICT WITH GUARD RAILING, SEE 814-3 Det B



SIDE VIEW  
CONDUIT TERMINATION  
DETAIL 1

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(STRUCTURE PULL BOX INSTALLATIONS)**

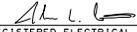
NO SCALE

RSP ES-9A DATED OCTOBER 16, 2020 SUPERSEDES STANDARD PLAN ES-9A  
DATED MAY 31, 2018 - PAGE 535 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-9A**

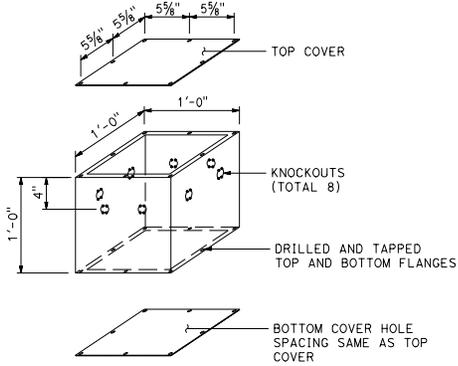
2018 REVISED STANDARD PLAN RSP ES-9A

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

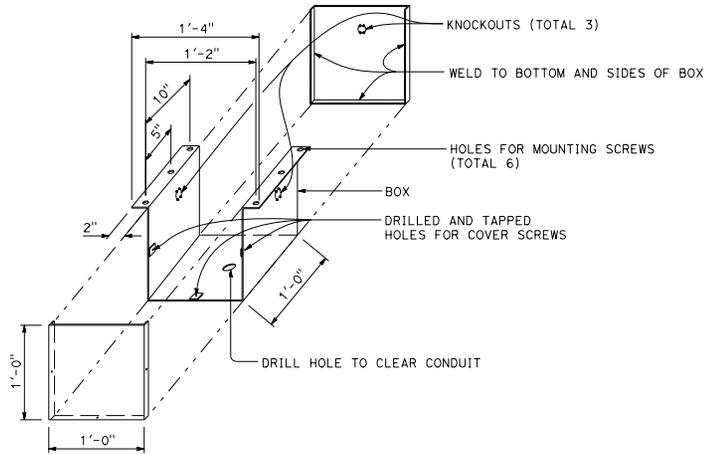
  
 REGISTERED ELECTRICAL ENGINEER  
 No. E17490  
 October 16, 2020  
 PLANS APPROVAL DATE  
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 REGISTERED PROFESSIONAL ENGINEER  
 No. E17490  
 Exp. 6-30-21  
 STATE OF CALIFORNIA

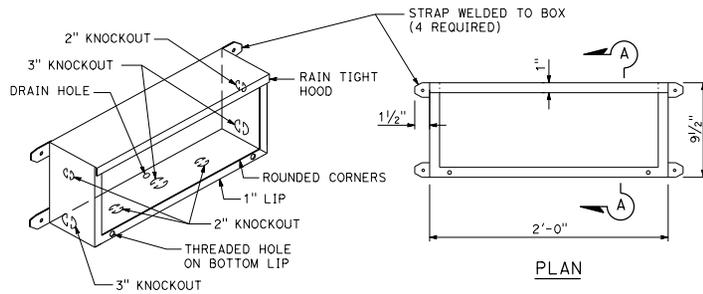
TO ACCOMPANY PLANS DATED \_\_\_\_\_



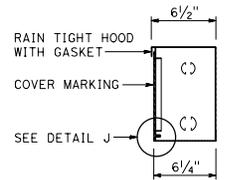
**No. 7 PULL BOX**



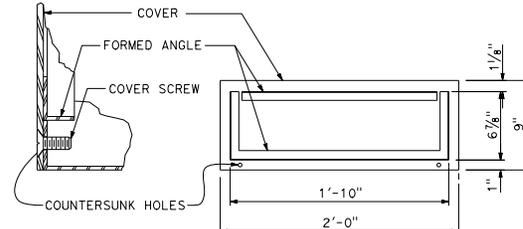
**No. 8 PULL BOX**



**PLAN**



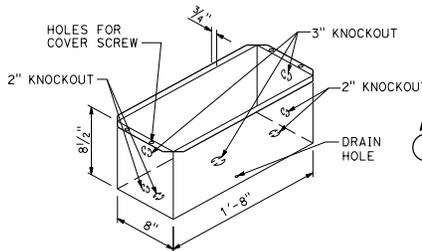
**SECTION A-A**



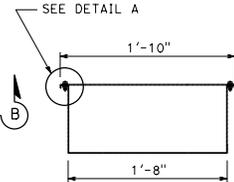
**DETAIL J**

**COVER DETAIL**

**No. 9 PULL BOX**

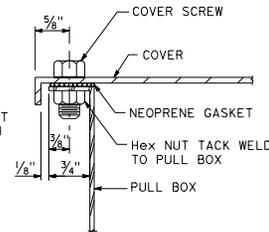


**PLAN**

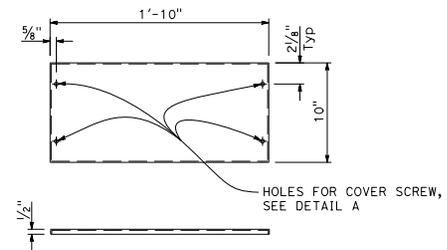


**SECTION B-B**

**No. 9A PULL BOX**



**DETAIL A**



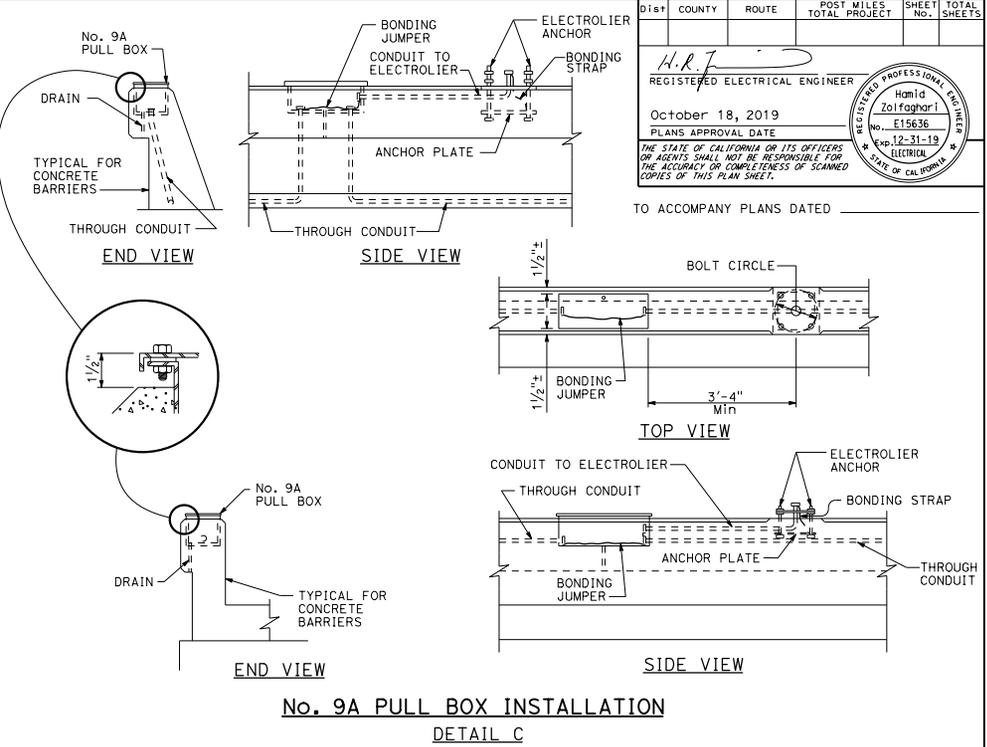
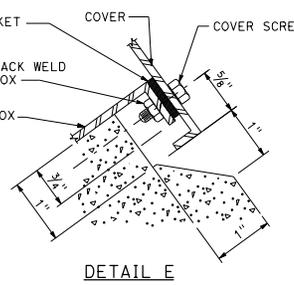
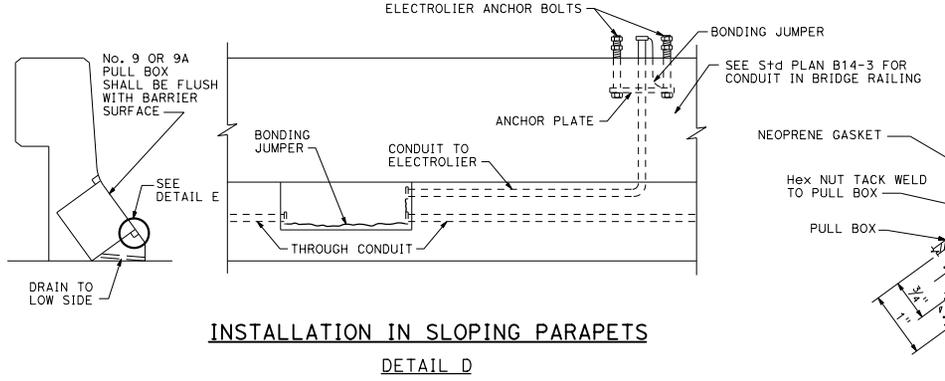
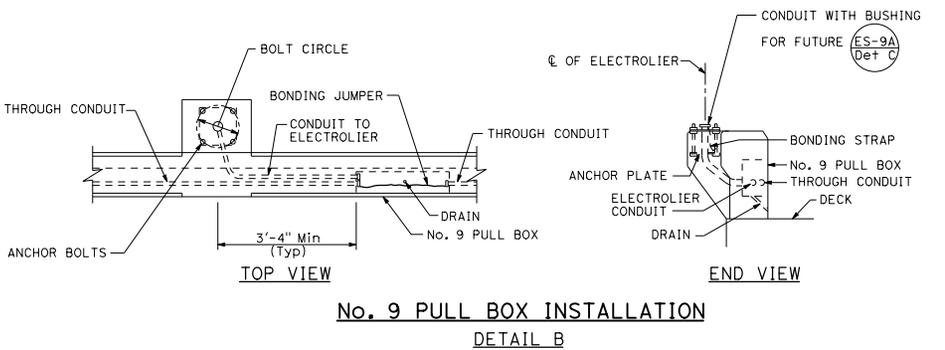
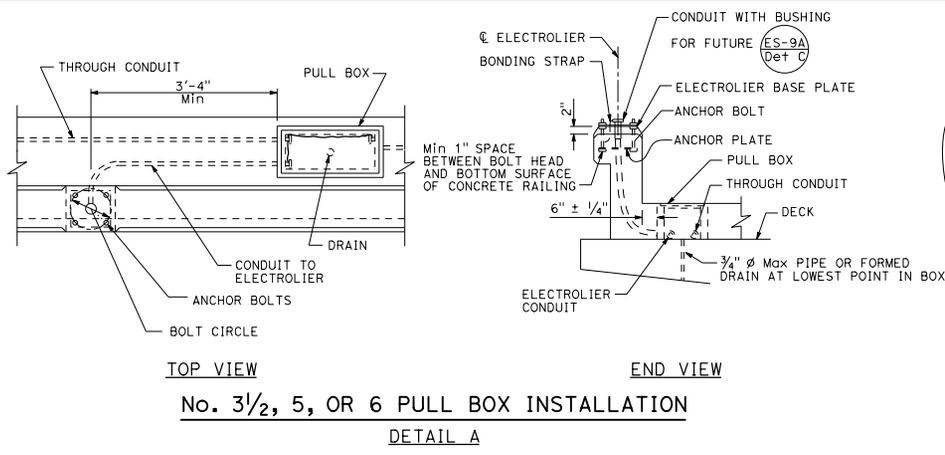
**COVER DETAIL**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (STRUCTURE PULL BOX)**  
 NO SCALE

RSP ES-9C DATED OCTOBER 16, 2020 SUPERSEDES RSP ES-9C DATED OCTOBER 18, 2019 AND STANDARD PLAN ES-9C DATED MAY 31, 2018 - PAGE 537 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-9C**

2018 REVISED STANDARD PLAN RSP ES-9C

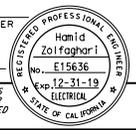


DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED ELECTRICAL ENGINEER  
October 18, 2019  
PLANS APPROVAL DATE

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TO ACCOMPANY PLANS DATED \_\_\_\_\_



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(STRUCTURE PULL BOX  
INSTALLATIONS)**  
NO SCALE

RSP ES-9D DATED OCTOBER 18, 2019 SUPERSEDES RSP ES-9D DATED OCTOBER 19, 2018 AND STANDARD PLAN ES-9D DATED MAY 31, 2018 - PAGE 538 OF THE STANDARD PLANS BOOK DATED 2018.

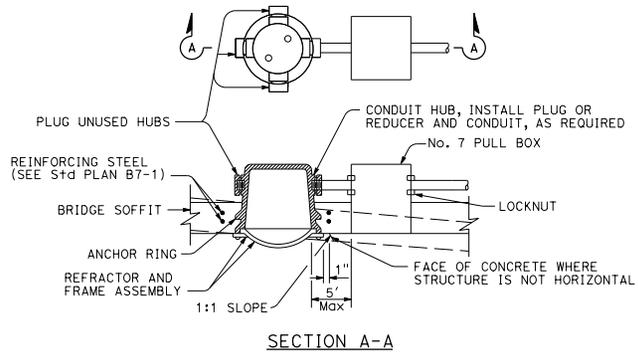
**REVISED STANDARD PLAN RSP ES-9D**

2018 REVISED STANDARD PLAN RSP ES-9D

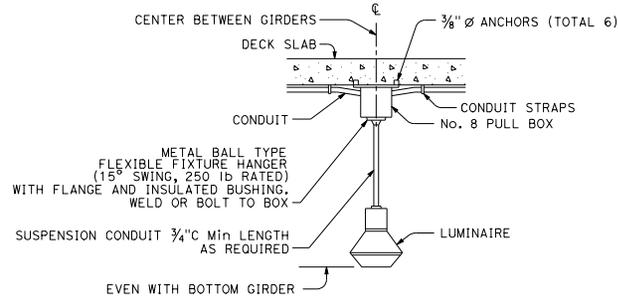
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*H.R.F.*  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 PROFESSIONAL ENGINEER  
 ELECTRICAL  
 STATE OF CALIFORNIA

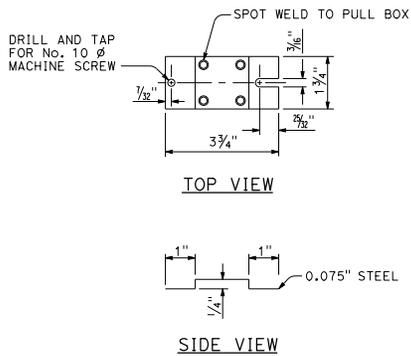
April 19, 2019  
 PLANS APPROVAL DATE  
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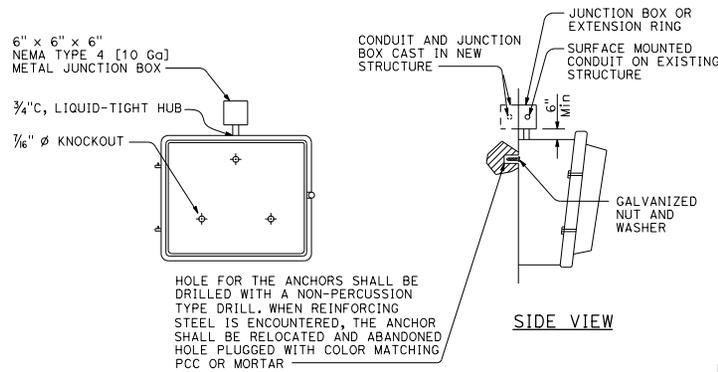
**FLUSH-MOUNTED SOFFIT LUMINAIRE INSTALLATION**  
DETAIL F



**PENDANT SOFFIT LUMINAIRE INSTALLATION**  
DETAIL P



**TERMINAL BLOCK MOUNTING BRACKET**  
DETAIL T



**WALL-MOUNTED LUMINAIRE INSTALLATION**  
DETAIL W

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(FLUSH-MOUNTED SOFFIT,**  
**PENDANT SOFFIT**  
**AND WALL-MOUNTED LUMINAIRE**  
**STRUCTURE INSTALLATIONS)**

NO SCALE

RSP ES-9E DATED APRIL 19, 2019 SUPERSEDES RSP ES-9E DATED OCTOBER 19, 2018 AND STANDARD PLAN ES-9E DATED MAY 31, 2018 - PAGE 539 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-9E**

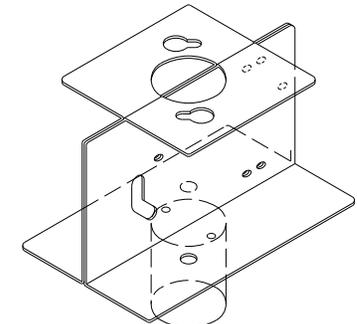
2018 REVISED STANDARD PLAN RSP ES-9E

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

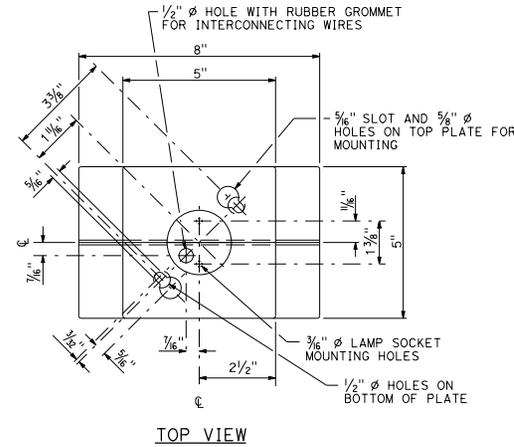
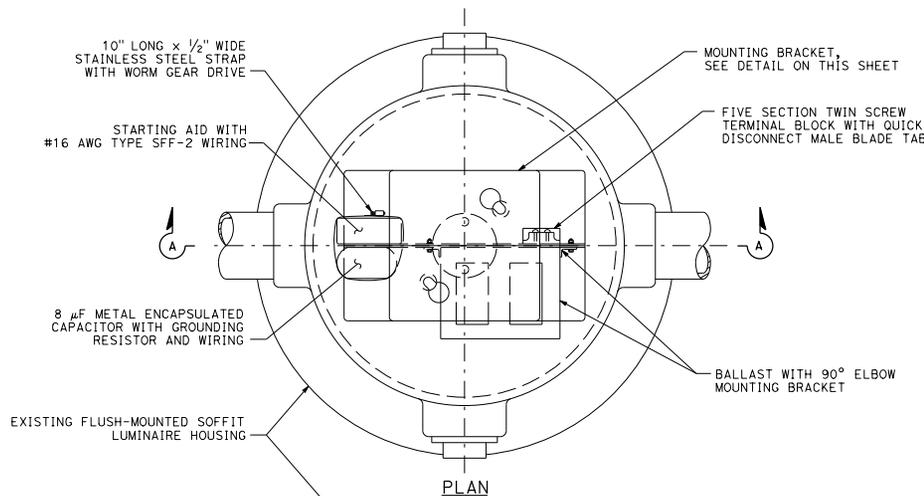
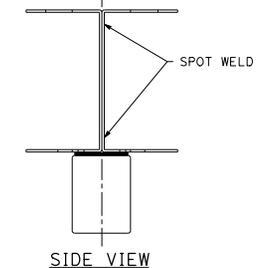
**H.R.F.**  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 ELECTRICAL

October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

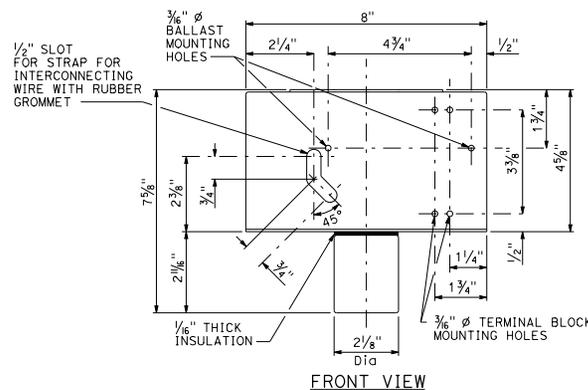
TO ACCOMPANY PLANS DATED \_\_\_\_\_



PREFORM TWO SHEETS 1/16" MILD STEEL AS SHOWN, SPOTWELD TOGETHER IN EACH CORNER WITH FOUR SPOTWELDS.

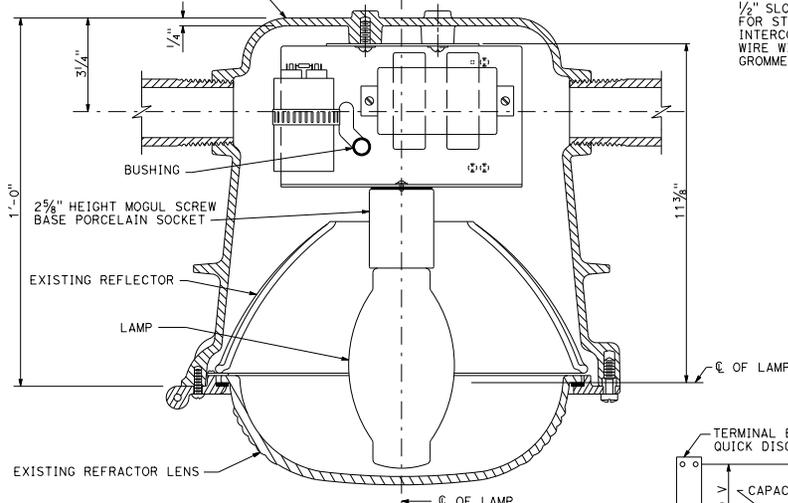


TOP VIEW



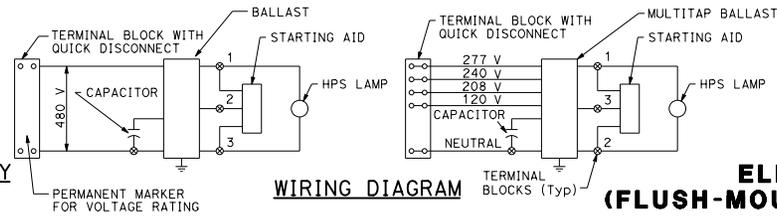
FRONT VIEW

MOUNTING BRACKET DETAILS



SECTION A-A

FLUSH-MOUNTED SOFFIT LUMINAIRE ASSEMBLY



WIRING DIAGRAM

**NOTE:**  
 1. Use No. 8 Ø machine screws, lockwashers and nuts for mounting ballast and terminal strips.

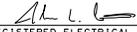
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(FLUSH-MOUNTED SOFFIT LUMINAIRE DETAILS)**

NO SCALE  
 RSP ES-9F DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-9F DATED MAY 31, 2018 - PAGE 540 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-9F**

2018 REVISED STANDARD PLAN RSP ES-9F

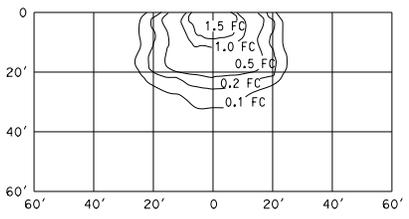
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

  
 REGISTERED ELECTRICAL ENGINEER  
 October 16, 2020  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

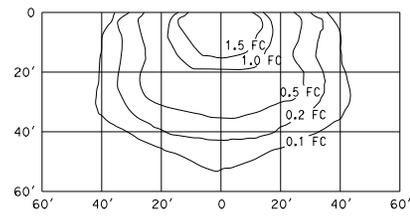


TO ACCOMPANY PLANS DATED \_\_\_\_\_

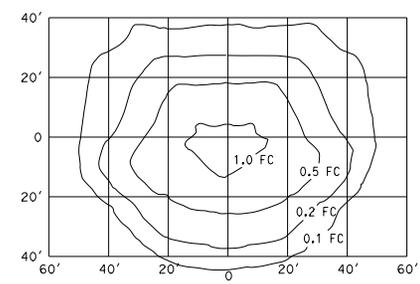
**NOTE:**  
Curves represent the minimum maintained illuminance (FC).



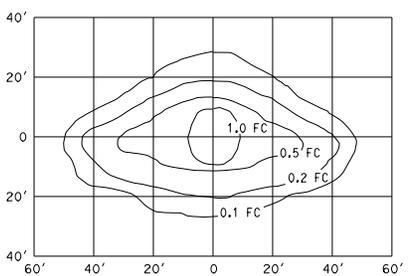
**WALL-MOUNTED**  
15' Mounting Height  
ANSI Designation S62  
Lamp operated at 5,800 lm  
70 W (Max)



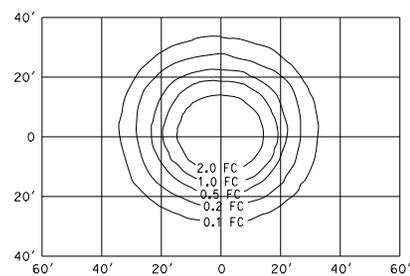
**WALL-MOUNTED**  
15' Mounting Height  
ANSI Designation S52  
Lamp operated at 9,500 lm  
100 W (Max)



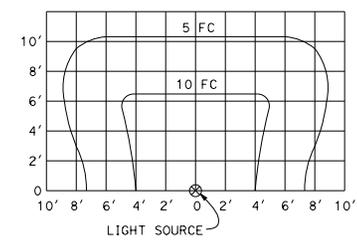
**FLUSH-MOUNTED SOFFIT**  
17' Mounting Height  
ANSI Designation S62  
Lamp operated at 5,800 lm  
70 W (Max)



**PENDANT SOFFIT**  
**TYPE III SHORT**  
17' Mounting Height  
ANSI Designation S62  
Lamp operated at 5,800 lm  
70 W (Max)



**PENDANT SOFFIT**  
17' Mounting Height  
ANSI Designation S62  
Lamp operated at 5,800 lm  
70 W (Max)



**OVERHEAD SIGN LUMINAIRE**  
60 W (Max)

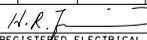
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(ISOFOOTCANDLE CURVES)**  
NO SCALE

RSP ES-10B DATED OCTOBER 16, 2020 SUPERSEDES RSP ES-10B DATED APRIL 19, 2019 AND RSP ES-10B DATED OCTOBER 19, 2018 AND STANDARD PLAN ES-10B DATED MAY 31, 2018 - PAGE 542 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-10B**

2018 REVISED STANDARD PLAN RSP ES-10B

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

  
 REGISTERED ELECTRICAL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER

Hamid Zolfaghari

No. E15636

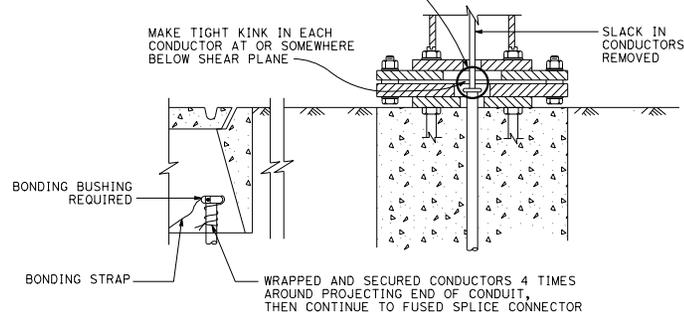
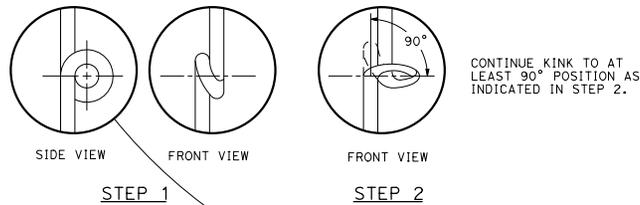
Exp. 12-31-19

ELECTRICAL

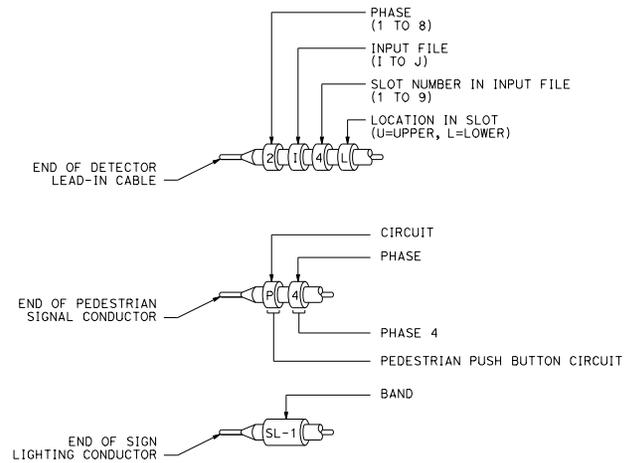
STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED \_\_\_\_\_

2018 REVISED STANDARD PLAN RSP ES-13B



**KINKING DETAIL FOR  
SLIP BASE STANDARDS  
DETAIL A**



**TYPICAL BANDING DETAILS  
DETAIL B**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (KINKING AND BANDING DETAIL)**

NO SCALE

RSP ES-13B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-13B DATED MAY 31, 2018 - PAGE 545 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-13B**

**NOTES:**

1. Sheet metal shall be 1/8".
2. Welds shall be continuous.
3. Powder coat all internal and external surfaces black.
4. The door frame shall utilize two gas spring lift arms and two latching devices to maintain an open position.
5. See Wiring Notes and Symbols on Revised Standard Plan RSP ES-14B, Detail A.

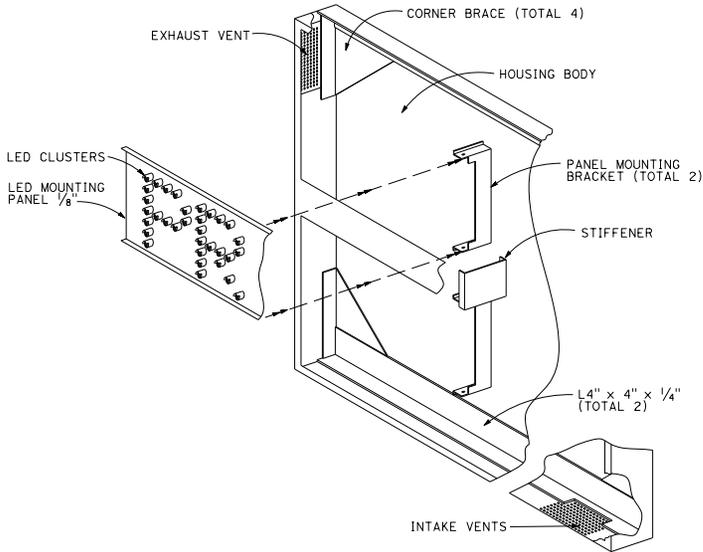
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*H.R.F.*  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 ELECTRICAL  
 STATE OF CALIFORNIA

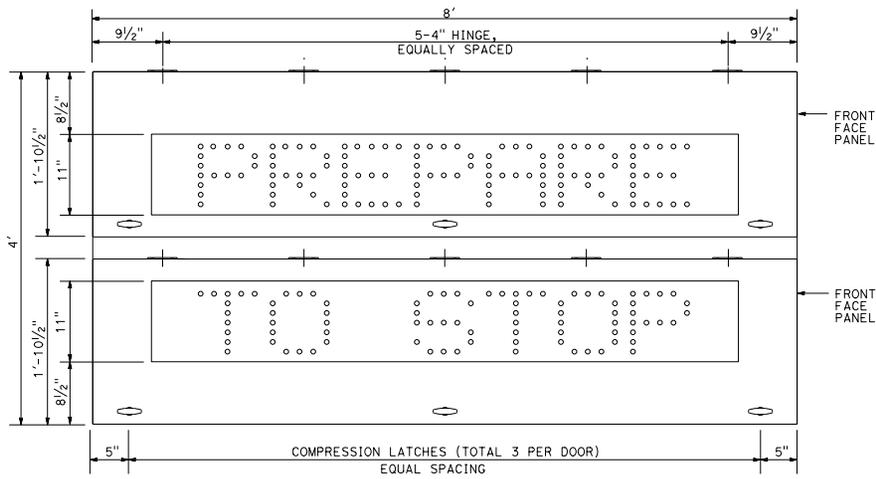
October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

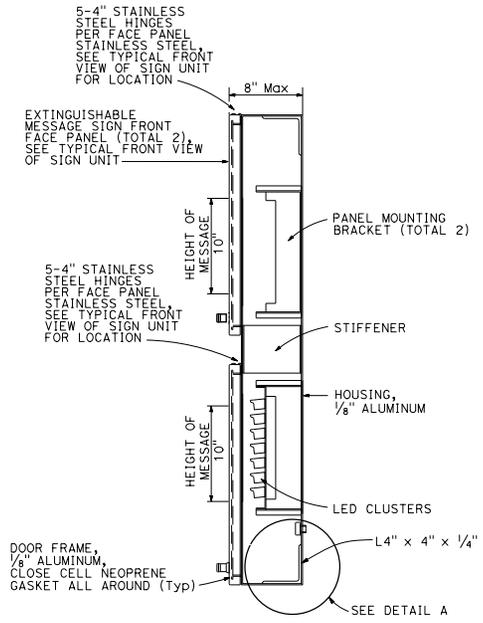
2018 REVISED STANDARD PLAN RSP ES-14A



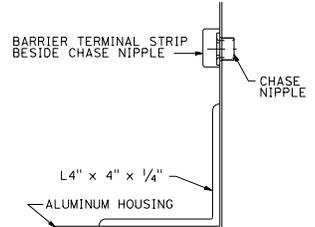
ISOMETRIC VIEW



TYPICAL FRONT VIEW OF SIGN UNIT



CROSS-SECTION OF SIGN



DETAIL A

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(EXTINGUISHABLE MESSAGE SIGN  
10" LETTERS)**

NO SCALE

RSP ES-14A DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-14A  
DATED MAY 31, 2018 - PAGE 546 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-14A**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
------	--------	-------	-----------------------------	--------------	-----------------

  
 REGISTERED ELECTRICAL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 ELECTRICAL  
 STATE OF CALIFORNIA

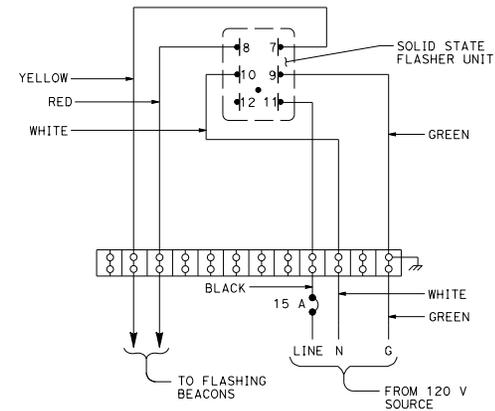
TO ACCOMPANY PLANS DATED \_\_\_\_\_

THE FLASHER SHALL MATE WITH A CINCH-JONES SOCKET S-406-SB OR EQUAL AND CONNECTED AS FOLLOWS:

PIN	CIRCUIT	PIN	CIRCUIT
7	LOAD	10	NEUTRAL
8	LOAD	11	LINE
9	CHASSIS GROUND	12	NOT USED

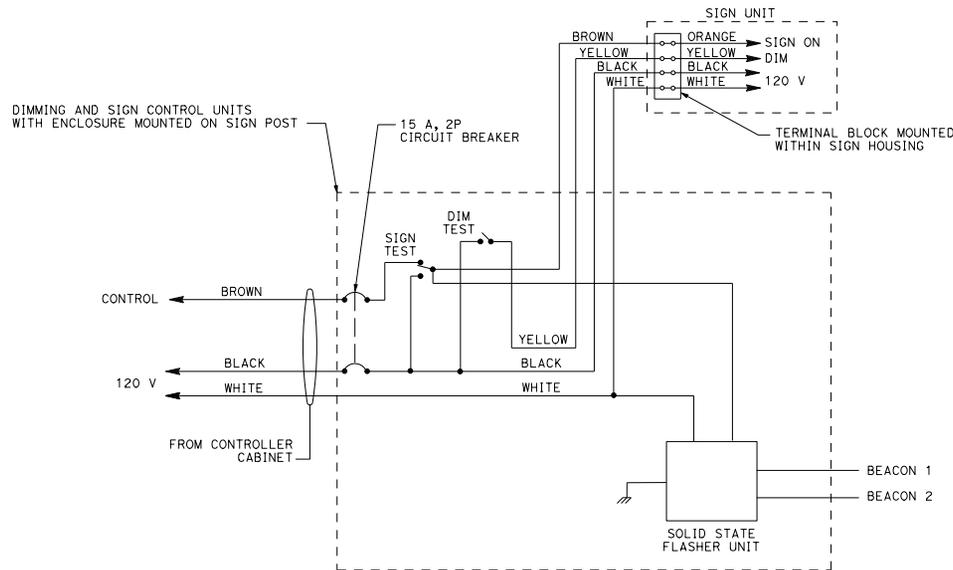


**CONNECTOR SOCKET  
SOLID STATE FLASHER UNIT**



**WIRING DIAGRAM  
FLASHING BEACON CONTROL ASSEMBLY**

DETAIL B



**WIRING DIAGRAM  
EXTINGUISHABLE MESSAGE SIGN**

DETAIL A

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(EMS AND FBCA  
WIRING DIAGRAMS)**

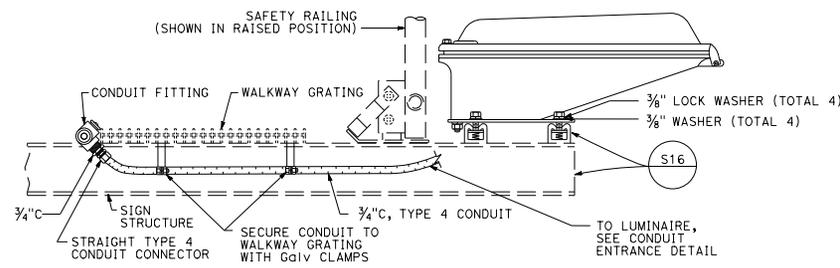
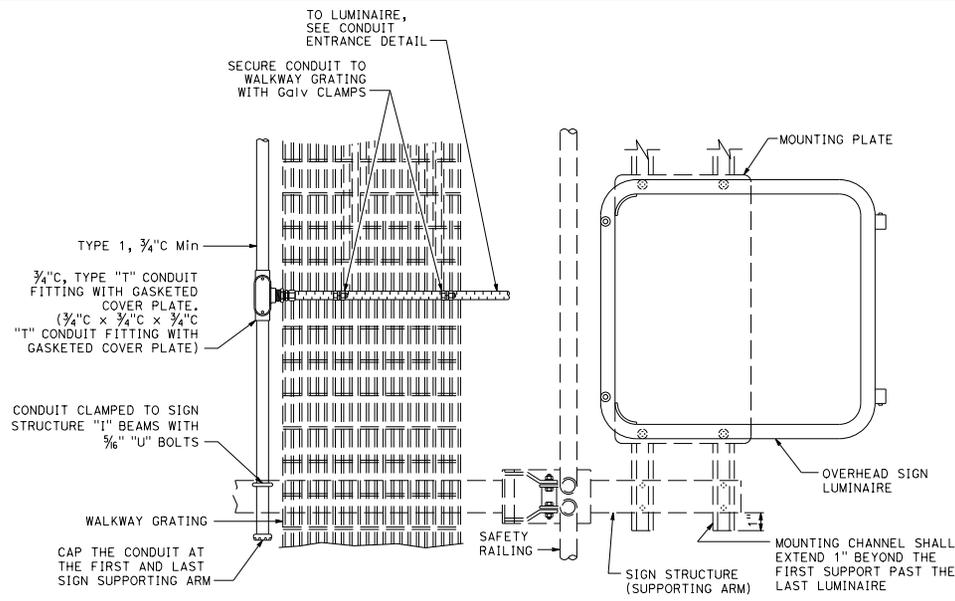
NO SCALE

RSP ES-14B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-14B  
DATED MAY 31, 2018 - PAGE 547 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-14B**

2018 REVISED STANDARD PLAN RSP ES-14B

LENGTH OF SIGN PANEL	NUMBER OF OVERHEAD SIGN LUMINAIRE (EACH)	OVERHEAD SIGN LUMINAIRE SPACING SEE NOTES	
5'-0"	1	2'-6"	
6'-0"		3'-0"	
7'-0"		3'-6"	
8'-0"		4'-0"	
9'-0"		4'-6"	
10'-0"		5'-0"	
11'-0"		5'-6"	
12'-0"		6'-0"	
13'-0"		6'-6"	
14'-0"		7'-0"	
15'-0"		7'-6"	
16'-0"		8'-0"	
17'-0"		2	4'-3":8'-6"
18'-0"			4'-6":9'-0"
19'-0"			4'-9":9'-6"
20'-0"			5'-0":10'-0"
21'-0"			5'-3":10'-6"
22'-0"	5'-6":11'-0"		
23'-0"	5'-9":11'-6"		
24'-0"	6'-0":12'-0"		
25'-0"	6'-3":12'-6"		
26'-0"	6'-6":13'-0"		
27'-0"	6'-9":13'-6"		
28'-0"	7'-0":14'-0"		
29'-0"	7'-3":14'-6"		
30'-0"	7'-6":15'-0"		
31'-0"	7'-9":15'-6"		
32'-0"	8'-0":16'-0"		
33'-0"	3		5'-6":11'-0"
34'-0"		5'-8":11'-4"	
35'-0"		5'-10":11'-8"	
36'-0"		6'-0":12'-0"	
37'-0"		6'-2":12'-4"	
38'-0"		6'-4":12'-8"	
39'-0"		6'-6":13'-0"	
40'-0"		6'-8":13'-4"	
41'-0"		6'-10":13'-8"	
42'-0"		7'-0":14'-0"	
43'-0"		7'-2":14'-4"	
44'-0"		7'-4":14'-8"	
45'-0"		7'-6":15'-0"	
46'-0"		7'-8":15'-4"	
47'-0"		7'-10":15'-8"	
48'-0"		8'-0":16'-0"	
49'-0"		4	6'-11/2":12'-3"
50'-0"	6'-3":12'-6"		
51'-0"	6'-4/2":12'-9"		
52'-0"	6'-6":13'-0"		
53'-0"	6'-7/2":13'-3"		
54'-0"	6'-9":13'-6"		
55'-0"	6'-10/2":13'-9"		
56'-0"	7'-0":14'-0"		
57'-0"	7'-1/2":14'-3"		
58'-0"	7'-3":14'-6"		
59'-0"	7'-4/2":14'-9"		
60'-0"	7'-6":15'-0"		
61'-0"	7'-7/2":15'-3"		
62'-0"	7'-9":15'-6"		
63'-0"	7'-10/2":15'-9"		
64'-0"	8'-0":16'-0"		



**OVERHEAD SIGN LUMINAIRE MOUNTING DETAIL (TYPICAL)**

ALL BOLTS, NUTS, WASHERS AND OTHER HARDWARE SHALL BE SAE GRADE 5 AND CADMIUM-PLATED.

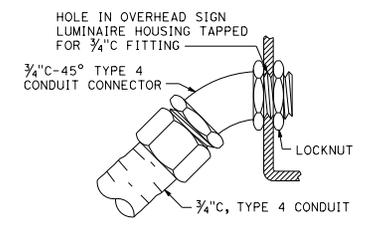
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

**H.R.F.**  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghar  
 No. E15636  
 Exp. 12-31-19  
 CALIFORNIA PROFESSIONAL ENGINEERS  
 ELECTRICAL

October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

- NOTES:**
- The first number listed is the dimension from the edge of the sign panel to the center of the end-most sign luminaire. The second number listed is the dimension between centers of successive sign luminaire.
  - Where adjacent sign panels are spaced 1'-0" or less the combination of these panels (and spaces) shall be considered a single panel.
  - Physical configuration and mounting details may vary from what is shown.



**CONDUIT ENTRANCE DETAIL**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(SIGN ILLUMINATION EQUIPMENT)**  
NO SCALE

RSP ES-15A DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-15A DATED MAY 31, 2018 - PAGE 549 OF THE STANDARD PLANS BOOK DATED 2018.

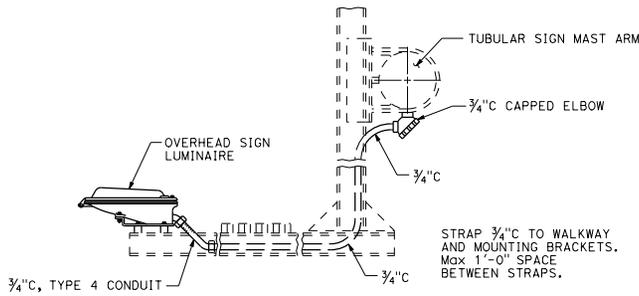
**REVISED STANDARD PLAN RSP ES-15A**

2018 REVISED STANDARD PLAN RSP ES-15A

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

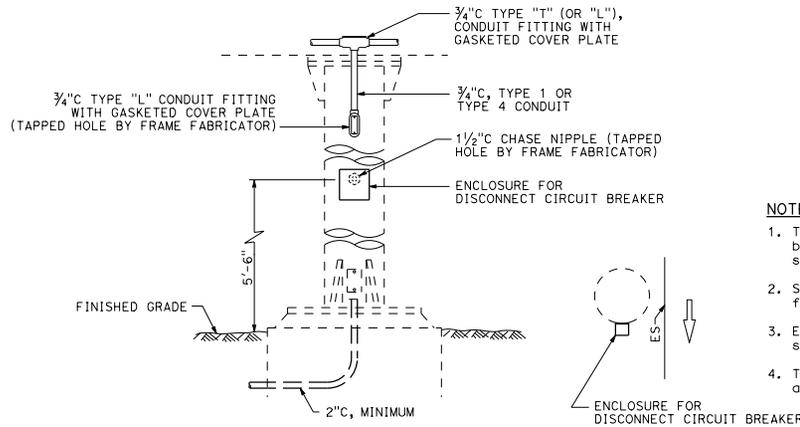
*H.R.F.*  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 REGISTERED PROFESSIONAL ENGINEER  
 ELECTRICAL  
 STATE OF CALIFORNIA

October 19, 2018  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



**TYPICAL SIGN ILLUMINATION EQUIPMENT  
INSTALLATION FOR OVERHEAD SIGNS TUBULAR**

DETAIL A



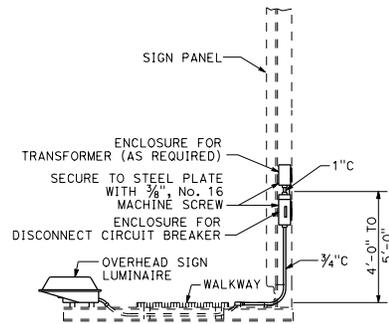
**TYPICAL SIGN ILLUMINATION EQUIPMENT  
INSTALLATION FOR OVERHEAD SIGNS ROUND POST**

DETAIL B

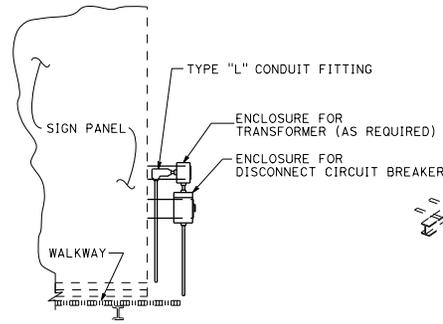
**NOTES:**

1. Type 4 conduit shall be secured to the nearest walkway bracket using one-hole galvanized malleable iron or steel straps and brass machine screws tapped into the bracket.
2. See Overhead Signs Standard Plans for overhead signs and frame juncture details for photoelectric unit installation.
3. Enclosures and straps shall be secured by 3/8" maximum size screws.
4. The contactor and test switch enclosures shall be readily accessible from the sign walkway.

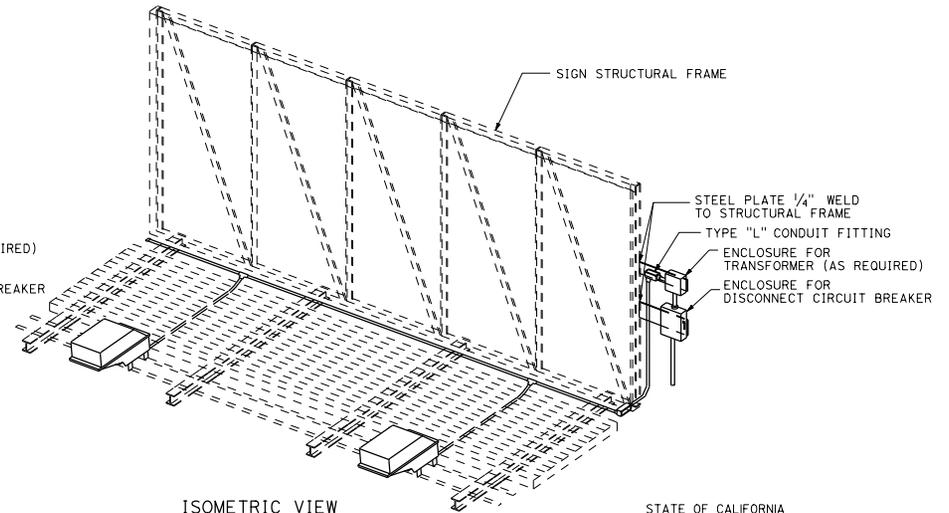
TO ACCOMPANY PLANS DATED \_\_\_\_\_



SIDE VIEW



FRONT VIEW



ISOMETRIC VIEW

**TYPICAL SIGN ILLUMINATION EQUIPMENT  
INSTALLATION FOR OVERHEAD SIGNS  
BRIDGE MOUNTED**

DETAIL C

See Note 4

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(SIGN ILLUMINATION EQUIPMENT)**

NO SCALE

RSP ES-15C DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-15C  
DATED MAY 31, 2018 - PAGE 550 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-15C**

2018 REVISED STANDARD PLAN RSP ES-15C

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

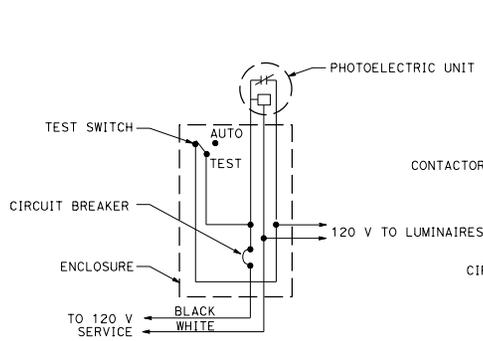
*H.R.F.*  
 REGISTERED ELECTRICAL ENGINEER  
 Hamid Zolfaghari  
 No. E15636  
 Exp. 12-31-19  
 PROFESSIONAL ENGINEER  
 ELECTRICAL  
 STATE OF CALIFORNIA

October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

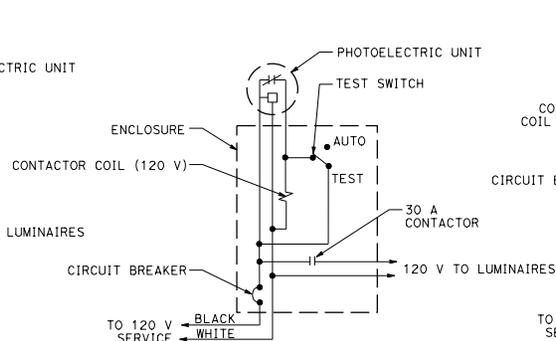
**NOTE:**

1. Type SC1A, SC2A, SC3A controls are similar to Types SC1, SC2 and SC controls respectively except test switch and wiring are not required.



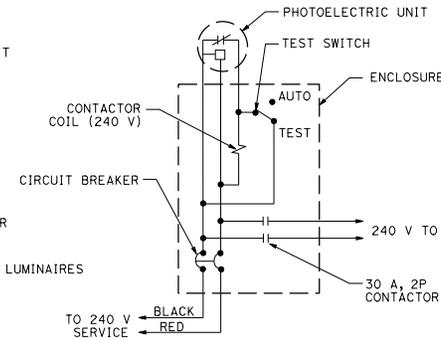
**TYPE LC1 CONTROL**

For 120 V unswitched circuit with no more than 1000 W load.



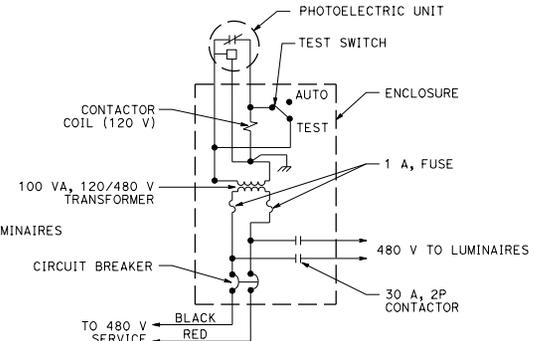
**TYPE LC2 CONTROL**

For 120 V unswitched circuit



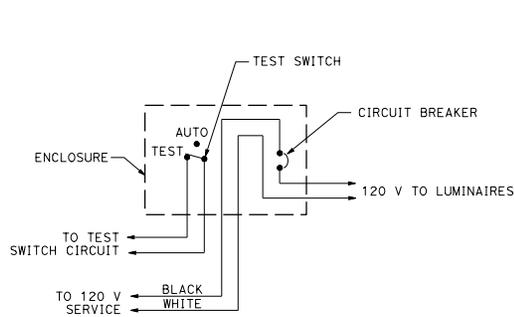
**TYPE LC3 CONTROL**

For 240 V unswitched circuits



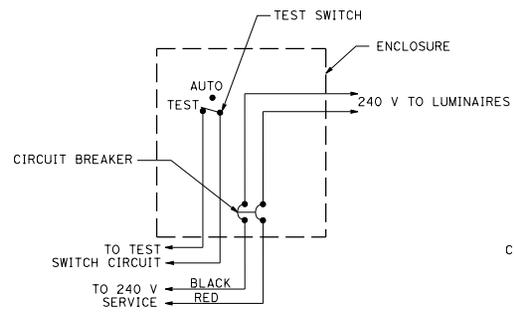
**TYPE LC4 CONTROL**

For 480 V unswitched circuits



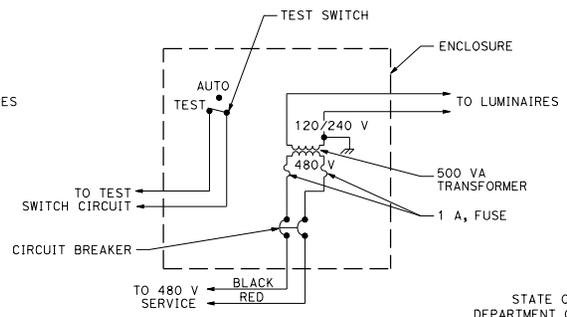
**TYPE SC1 CONTROL**

For 120 V switched circuit, see Note 1 for Type SC1A



**TYPE SC2 CONTROL**

For 240 V switched circuit, see Note 1 for Type SC2A



**TYPE SC3 CONTROL**

For 480 V switched sign circuit, see Note 1 for Type SC3A

**ELECTRICAL SYSTEMS  
(LIGHTING AND SIGN  
ILLUMINATION CONTROL)**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

NO SCALE

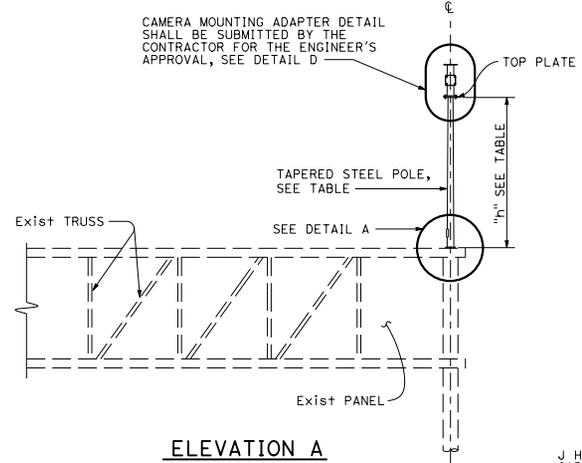
RSP ES-15D DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-15D  
DATED MAY 31, 2018 - PAGE 551 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-15D**

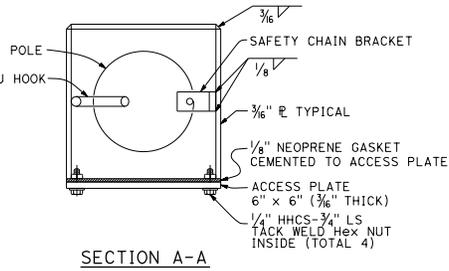
2018 REVISED STANDARD PLAN RSP ES-15D

POLE EXTENSION TYPE	POLE DATA				HANDHOLE SIZE
	HEIGHT "h"	Min OD		THICKNESS	
		BASE	TOP		
CAMERA POLE 5	5'	4 $\frac{3}{16}$ "		0.1793"	3" x 5"
CAMERA POLE 10	10'	5 $\frac{1}{4}$ "	3 $\frac{3}{4}$ "		
CAMERA POLE 15	15'	5 $\frac{5}{16}$ "			

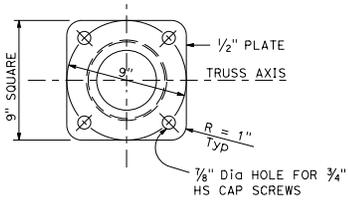
CAMERA MOUNTING ADAPTER DETAIL SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE ENGINEER'S APPROVAL, SEE DETAIL D



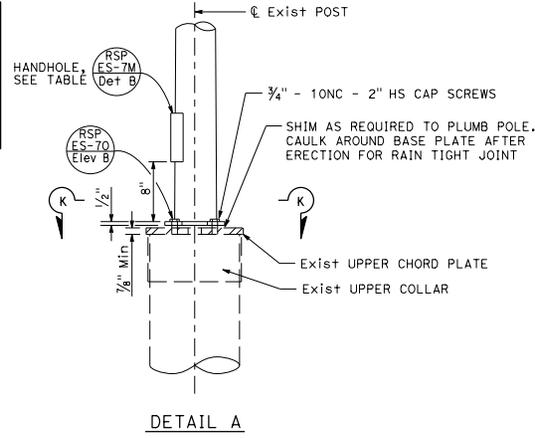
**ELEVATION A**



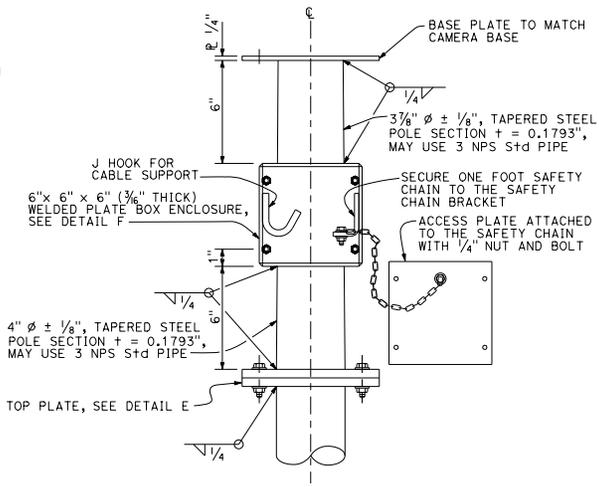
**SECTION A-A**



**SECTION K-K**



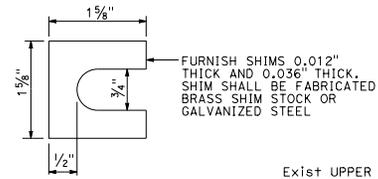
**DETAIL A**



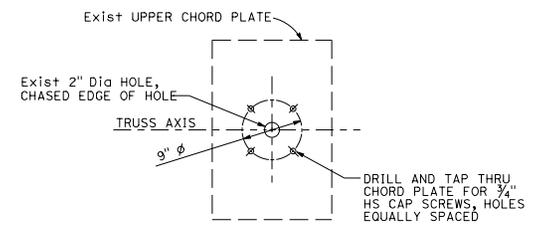
**CAMERA MOUNTING ADAPTER  
DETAIL D**

**NOTES:**

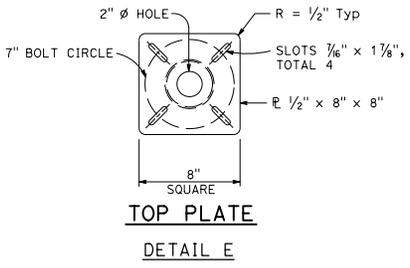
1. Verify controlling field dimensions before ordering or fabricating any material.
2. Bolt hole locations may vary at the discretion of the Engineer.
3. See Std Plan S13.
4. For wind loading see Revised Standard Plan RSP ES-7M.
5. Materials (Structural Steel):
  - a. fy = 55,000 psi (tapered steel tube)
  - b. fy = 50,000 psi (unless otherwise noted)



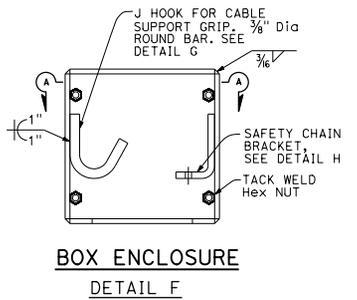
**SHIM  
DETAIL B**



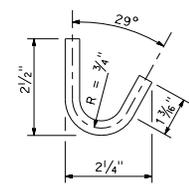
**UPPER CHORD PLATE  
DETAIL C**  
See Note 3



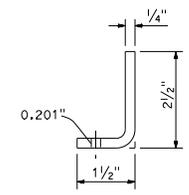
**TOP PLATE  
DETAIL E**



**BOX ENCLOSURE  
DETAIL F**



**J HOOK  
DETAIL G**



**SAFETY CHAIN BRACKET  
DETAIL H**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

*Stanley P. Johnson*  
 REGISTERED CIVIL ENGINEER  
 No. C61793  
 Exp. 3-31-20  
 CIVIL  
 STATE OF CALIFORNIA

October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (CAMERA POLE 5' TO 15'  
 OVERHEAD SIGN MOUNTED)**  
 NO SCALE

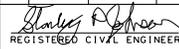
RSP ES-16A DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-16A  
 DATED MAY 31, 2018 - PAGE 552 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-16A**

2018 REVISED STANDARD PLAN RSP ES-16A

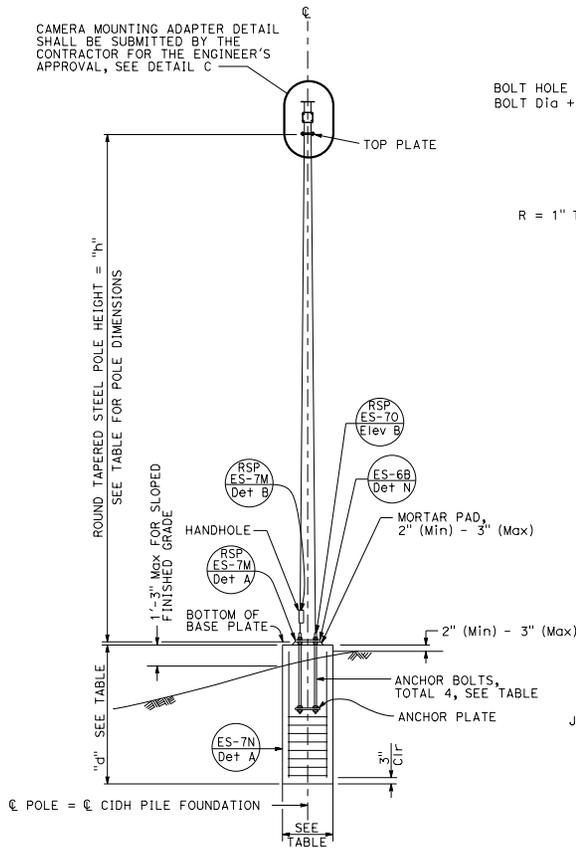
POLE TYPE	POLE DATA				BASE PLATE DATA				CIDH	
	HEIGHT "h"	Min OD		THICKNESS	"c"	THICKNESS	ANCHOR BOLT SIZE	BC = BOLT CIRCLE	Dia	"d"
		BASE	TOP							
CAMERA POLE 25	25'	7 3/8"	3 3/4"	0.1793"	1'-1"	1"	1 1/2" $\phi$ x 36"	1 1/2"	2'-6"	7'-0"
CAMERA POLE 30	30'	8"			1'-1 1/2"			1'-0"		7'-6"
CAMERA POLE 35	35'	8 5/8"			1'-2"			1'-1"		8'-0"
CAMERA POLE 40	40'	9 3/8"			1'-1 1/2"			1'-1 1/2"		8'-0"
CAMERA POLE 45	45'	10"			1'-3"			1'-2"		8'-6"

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

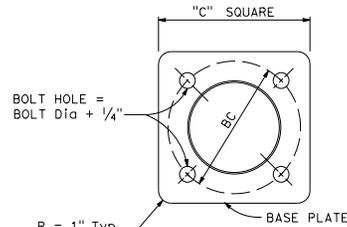
  
 REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 No. C6793  
 Exp. 3-31-20  
 CIVIL  
 REGISTERED PROFESSIONAL ENGINEER  
 STATE OF CALIFORNIA

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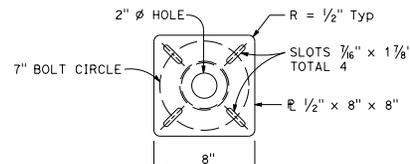
TO ACCOMPANY PLANS DATED \_\_\_\_\_



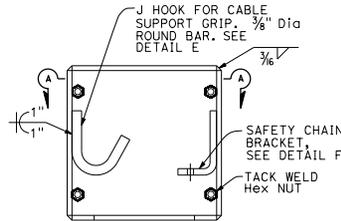
ELEVATION A



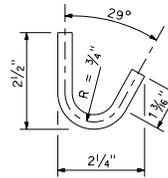
BASE PLATE  
DETAIL A



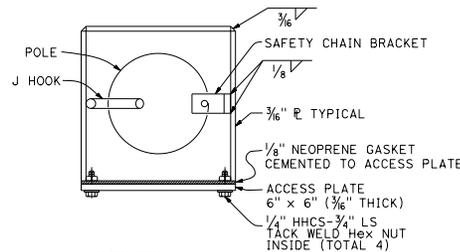
TOP PLATE  
DETAIL B



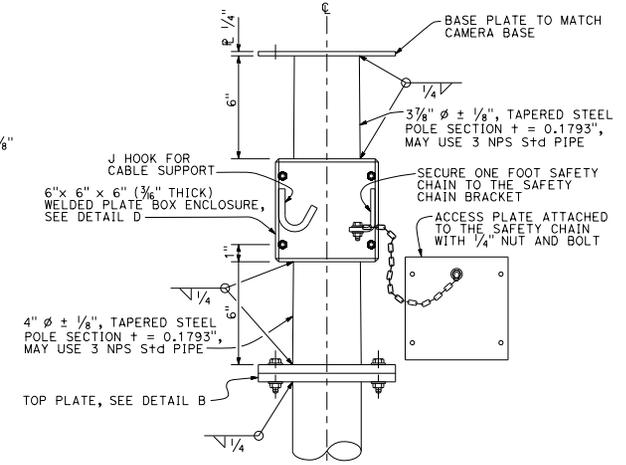
BOX ENCLOSURE  
DETAIL D



J HOOK  
DETAIL E



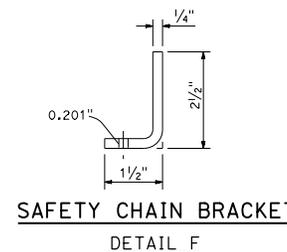
SECTION A-A



CAMERA MOUNTING ADAPTER  
DETAIL C

NOTES:

- Verify controlling field dimensions before ordering or fabricating any material.
- During pole installation, the post shall be raked as necessary with the use of leveling nuts to provide a plumb pole axis.
- For wind loading see Revised Standard Plan RSP ES-7M.
- Materials (Structural Steel):  
a. fy = 55,000 psi (tapered steel tube and anchor bolts)  
b. fy = 50,000 psi (unless otherwise noted)
- Materials (Reinforced Concrete):  
a. f'c = 3,625 psi  
b. fy = 60,000 psi



SAFETY CHAIN BRACKET  
DETAIL F

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(CAMERA POLE 25' TO 45')**

NO SCALE

RSP ES-16B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-16B DATED MAY 31, 2018 - PAGE 553 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-16B**

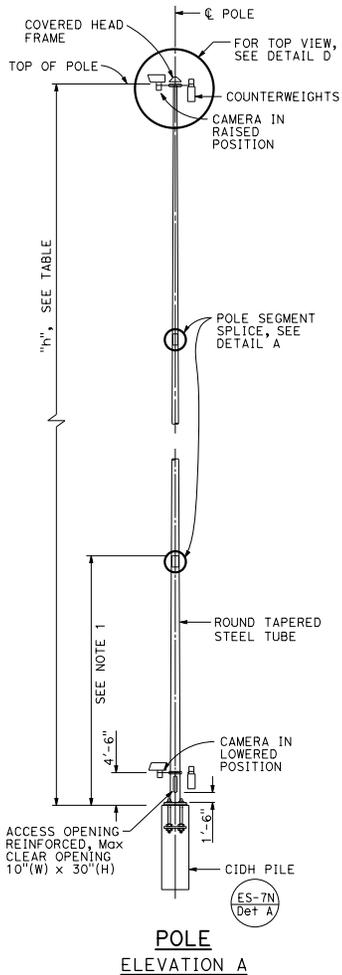
2018 REVISED STANDARD PLAN RSP ES-16B

POLE TYPE	POLE DATA				BASE PLATE DATA				CIDH PILE DATA			
	HEIGHT "H"	Min OD		THICKNESS BOTTOM SEGMENT (Min 25' LONG)	Min THICKNESS UPPER SEGMENT(S)	Dia	THICKNESS	ANCHOR BOLT SIZE		BC = BOLT CIRCLE	"D"	"L"
		BASE	TOP					TOTAL	"d"			
HM CAMERA POLE 50	50'	18"	10 7/8"	0.3125"	0.1875"	32"	2"	12	2 1/4"	25"	3'-6"	13'-0"
HM CAMERA POLE 60	60'		9 1/2"									
HM CAMERA POLE 70	70'	22"	12"	0.375"	0.25"	36"	3"	12	3"	29"	4'-0"	14'-0"
HM CAMERA POLE 80	80'	22"	11 5/8"									
HM CAMERA POLE 90	90'	25"	17 1/8"			46"				37"	6'-0"	15'-0"

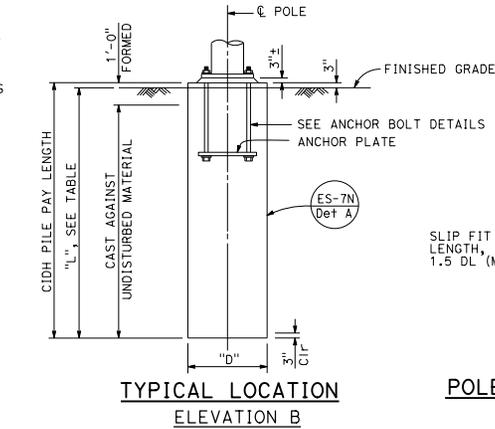
D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS


  
 Stanley P. Johnson  
 REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
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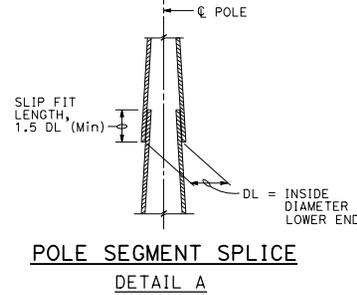
TO ACCOMPANY PLANS DATED \_\_\_\_\_



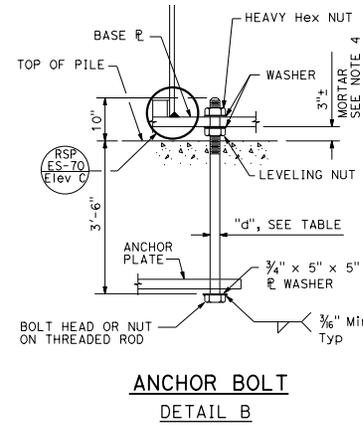
**POLE**  
ELEVATION A



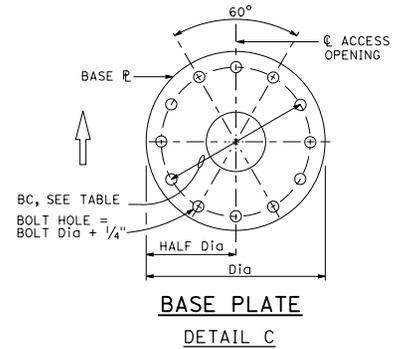
**TYPICAL LOCATION**  
ELEVATION B



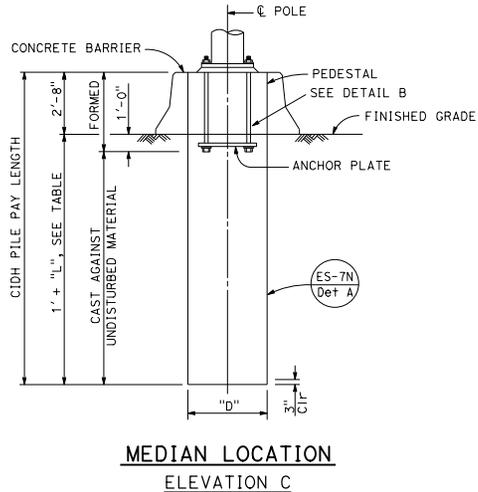
**POLE SEGMENT SPLICE**  
DETAIL A



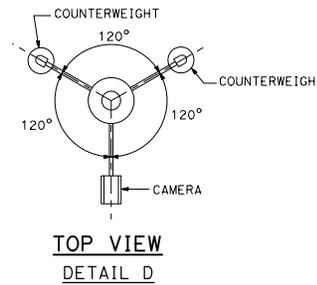
**ANCHOR BOLT**  
DETAIL B



**BASE PLATE**  
DETAIL C



**MEDIAN LOCATION**  
ELEVATION C



**NOTES:**

1. Pole details shall suit the lowering device and this foundation plan. Pole details shall be submitted to the Engineer for approval.
2. Access opening shall be located on the downstream side of traffic unless otherwise determined by the Engineer.
3. Foundation design is based on a 3-second wind gust of 100 mph.
4. For central void and drain holes in mortar, see Standard Plan ES-6B detail N.
5. For wind loading see Revised Standard Plan RSP ES-7M.
6. Materials (Structural Steel):  
 fy = 55,000 psi (tapered steel tube)  
 fy = 50,000 psi (unless otherwise noted)

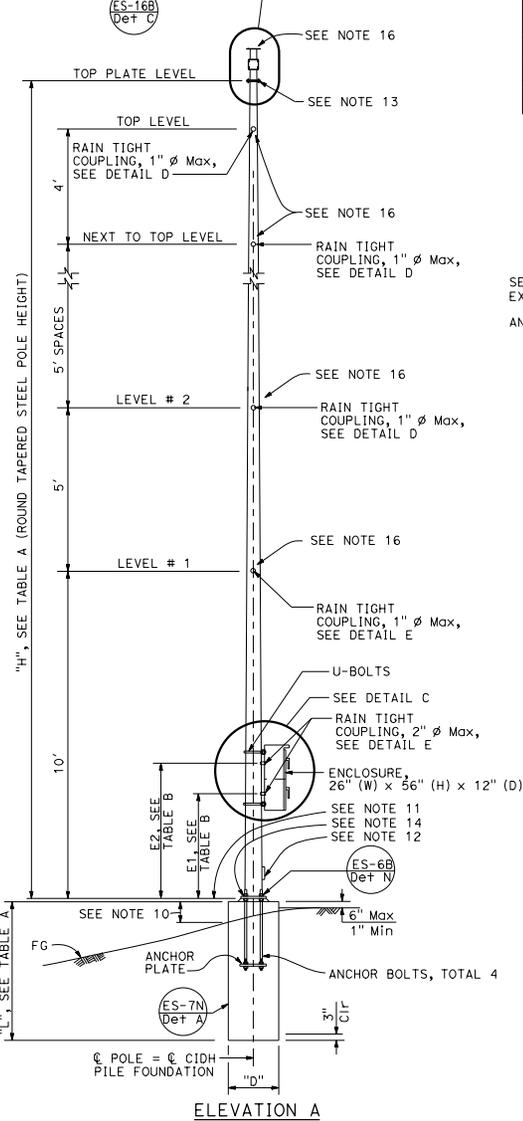
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(HIGH MAST CAMERA POLE 50' TO 90')**  
 NO SCALE

RSP ES-16C DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-16C  
 DATED MAY 31, 2018 - PAGE 554 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-16C**

2018 REVISED STANDARD PLAN RSP ES-16C

WHEN A CAMERA IS REQUIRED, THE CAMERA MOUNTING ADAPTER DETAIL SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE ENGINEER'S APPROVAL, SEE 



POLE TYPE	POLE DATA				BASE PLATE DATA				CIDH PILE DATA			
	HEIGHT "H"	Min OD		THICKNESS	"C"	THICKNESS	ANCHOR BOLTS SIZE	BC = BOLT CIRCLE	"D"	"L"		
		BASE	TOP							LEVEL GROUND	UP TO 2:1	
VDS 30	30'	8"	3 3/8"	0.1793"	1'-1 1/2"	1 1/2"	1 1/2" $\phi$ x 3'-0"	1'-0"	2'-6"	6'-0"	8'-0"	
VDS 35	35'	8 3/4"	3 3/8"	0.1793"	1'-6"	2"	1 1/2" $\phi$ x 3'-0"	1'-4"	3'-0"	7'-0"	9'-0"	
VDS 40	40'	12"	5 5/8"	0.1793"	1'-6"	2"	1 1/2" $\phi$ x 3'-0"	1'-4"	3'-0"	9'-0"	11'-0"	

POLE TYPE	COUPLING	
	E1(Max)	E2(Max)
VDS 30		
VDS 35	3'-6"	4'-9"
VDS 40		

SPREAD FOOTING		
GROUND	FOOTING SIZE (LENGTH x WIDTH x DEPTH)	REINFORCEMENT TOP & BOTTOM
LEVEL	8'-6" x 8'-6" x 2'-0"	12 - #5 EW
UP TO 2:1	10'-0" x 10'-0" x 2'-0"	15 - #5 EW

LOCATION	MAXIMUM TOTAL EPA PER LEVEL (SQARE FEET)	MAXIMUM TOTAL WEIGHT (lb)
LEVEL #1		
LEVEL #2	14	200
LEVEL #3	10 ***	
LEVEL #4 (VDS 35 AND VDS 40 ONLY)		
LEVEL #5 (VDS 40 ONLY)	2.5	50
NEXT TO TOP LEVEL		
TOP LEVEL		
ON TOP PLATE LEVEL **		

\* MAXIMUM HORIZONTAL EXTENT BEYOND POLE FACE IS 4 FEET.  
\*\* MAXIMUM EXTENT ABOVE TOP PLATE IS 3 FEET.  
\*\*\* 14 IF LEVEL #1 IS ZERO.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

October 19, 2018  
PLANS APPROVAL DATE

Stanley P. Johnson  
No. C61793  
Exp. 3-31-20  
CIVIL

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTES:

- All steel shall be galvanized after fabrication.
- The foundation shall be treated as level ground condition if the slope inclination is flatter than 4 : 1 (Horizontal : Vertical)
- For devices mounted and mounting heights, see TABLE B.
- For wind loading see Revised Standard Plan RSP ES-7M.
- Materials (Structural Steel):  
a. fy = 55,000 psi (tapered steel tube)  
b. fy = 50,000 psi (unless otherwise noted)
- Anchor bolts: fy = 55,000 psi
- Materials (Reinforced Concrete):  
a. f'c = 3,600 psi  
b. fy = 60,000 psi
- Verify all controlling field dimension before ordering of fabricating any material.
- When no barriers are used, the enclosure shall be located on the downstream side and perpendicular to the roadway.
- 1'-3" (Max) for sloped finished grade.
- Bottom of base plate.
- Handhole.  
- Top plate. Install a blank flange on the top plate when camera is not used.
- 
- U-channel with bracket.
- Use the manufacturer's Effective Projected Area (EPA) for attachments. Assign attachments to nearest level and sum each level, see Table D for limitations.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(VEHICLE DETECTION SYSTEM POLE  
30' TO 40')**

NO SCALE

RSP ES-16D DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-16D  
DATED MAY 31, 2018 - PAGE 555 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-16D**

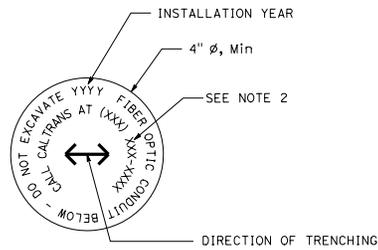
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS


  
 REGISTERED ELECTRICAL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

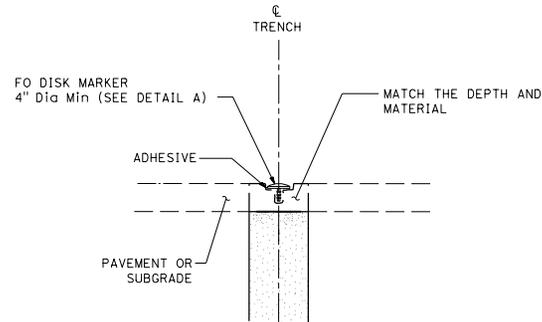
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

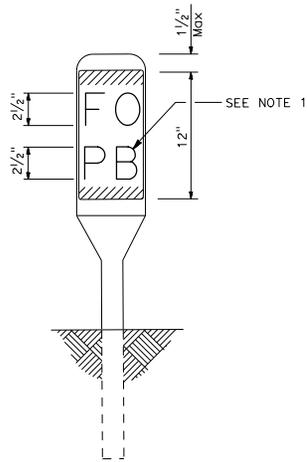
1. "PB" for Pull Box or "VT" for Vault.
2. Telephone number as specified.
3. 1" black text.
4. 1/2" black text.



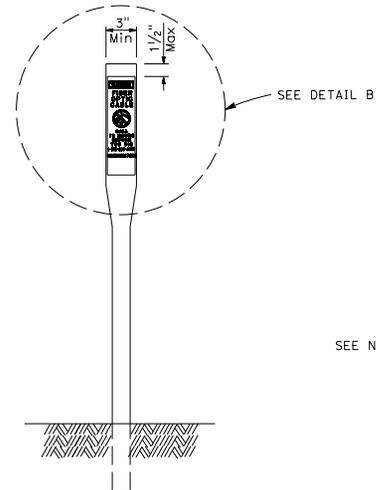
**DISK MARKER ETCHING  
DETAIL A**



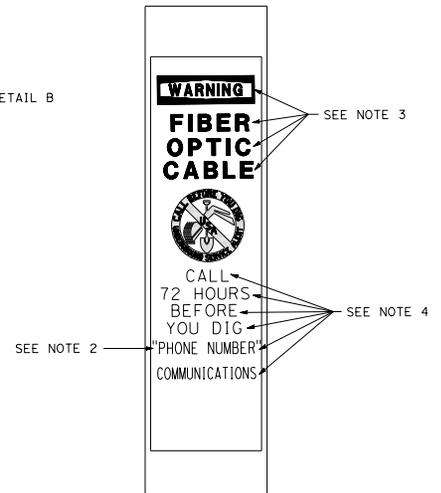
**FIBER OPTIC MARKER  
FOR PAVED AREAS**



**FIBER OPTIC MARKER  
FOR VAULTS AND PULL BOXES**



**FIBER OPTIC MARKER  
FOR UNPAVED AREAS**



**DETAIL B**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(FIBER OPTIC MARKER DETAILS)**  
NO SCALE

RSP ES-17A DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-17A  
DATED MAY 31, 2018 - PAGE 556 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-17A**

2018 REVISED STANDARD PLAN RSP ES-17A

**LEGEND**

- Wood Pole No Attachments
- A Wood Pole with Attachments
- OH- Overhead Bundle

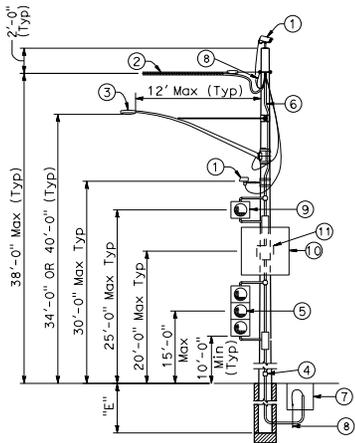
**POLE SELECTION TABLE**

OVERHEAD BUNDLE HORIZONTAL SPAN (Max)	MAXIMUM $d_p$	CASE 1N				CASE 2N				CASE 3N				CASE 4N				CASE 5N
		1"	1.5"	2.0"	2.5"	1"	1.5"	2.0"	2.5"	1.0"	1.5"	2.0"	2.5"	1"	1.5"	2.0"	2.5"	
50'	MINIMUM POLE CLASS	H-1	H-2	H-2	H-2	4	3	2	1	H-2	H-2	H-3	H-3	H-4	H-4	H-4	H-5	CLASS 1 E = 10'
100'	POLE EMBEDMENT (E)	11'				10'				11'				12'				
150'	MINIMUM POLE CLASS	H-2	H-3	H-4	H-5	1	H-1	H-2	H-3	H-4	H-5	H-5	H-6	H-5	H-5	H-6		
200'	POLE EMBEDMENT (E)	12'				11'				12'				12'				
	MINIMUM POLE CLASS	H-4	H-5	H-6	H-1	H-2	H-3	H-5	H-6				H-6					
	POLE EMBEDMENT (E)	12'				12'				12'				12'				
	MINIMUM POLE CLASS	H-5	H-6		H-2	H-3	H-5											
	POLE EMBEDMENT (E)	12'				12'				12'				12'				

- ① Camera or vehicle detection system
- ② Overhead bundle consisting of a 3/8"  $\phi$  messenger wire, overhead conductors, and lashing wire
- ③ Luminaire with mast arm
- ④ Pedestrian push button or accessible push button
- ⑤ Signal face with 3 indications or single sheet sign panel (10 SOFT Max)
- ⑥ Riser with weather head as required
- ⑦ Pull box as required
- ⑧ Grounding as required
- ⑨ Single flashing beacon or single sheet sign panel (4 SOFT Max)
- ⑩ Single sheet sign panel (4' x 4' Max) or signal face with 3 indications
- ⑪ Flashing beacon control assembly
- ⑫ Enclosure, 26"(W) x 56"(H) x 12"(D) Max dimensions. Max weight including batteries, 450 lbs
- ⑬ 25' SOFT Max total photovoltaic panels mounted as shown as required
- ⑭ 2-12" flashing beacons

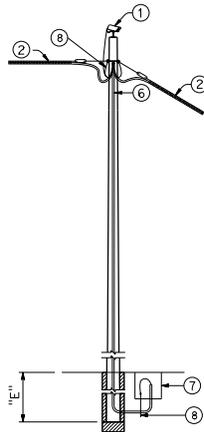
**NOTES:**

1. In addition to other restrictions on maximum horizontal span, this horizontal span must not exceed 100'.
2. Cases 1N, 3N and 4N may substitute the attachments shown in Case 5N if the photovoltaic panel is not included.
3. For Case 1N without an overhead bundle (item ②) use minimum pole class H-1 with E=11'.

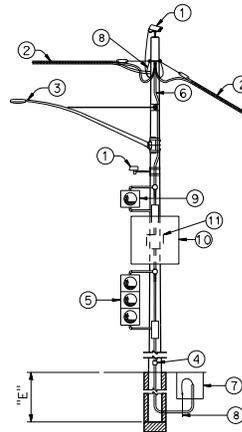


**CASE 1N  
POLE AT DEAD END  
WITH ATTACHMENTS**

See Note 2

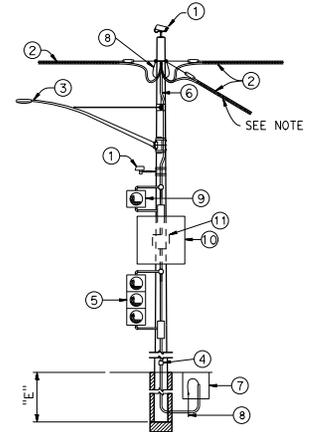


**CASE 2N  
POLE AT TANGENT  
WITHOUT ATTACHMENTS**



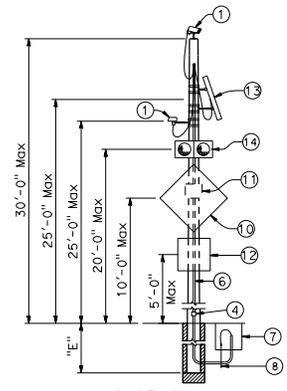
**CASE 3N  
POLE AT TANGENT OR CORNER  
WITH ATTACHMENTS**

See Note 2



**CASE 4N  
POLE AT JUNCTION  
WITH ATTACHMENTS**

See Note 2



**CASE 5N  
POLE WITHOUT OVERHEAD BUNDLE  
WITH ATTACHMENTS**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY WOOD POLES  
NON-GUYED - NO SIGNALS ON SPANS**

NO SCALE

RSP ES-188 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-188  
DATED MAY 31, 2018 - PAGE 558 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-188**

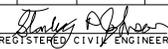
Dist#	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

  
 REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 Stanley P. Johnson  
 No. C51793  
 Exp. 3-31-20  
 CIVIL  
 STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

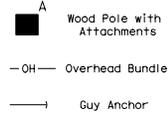
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

  
 REGISTERED CIVIL ENGINEER  
 No. CS1793  
 Exp. 3-31-20  
 CIVIL  
 STATE OF CALIFORNIA

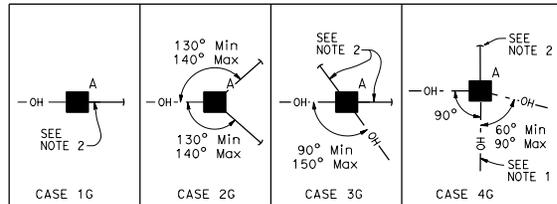
October 19, 2018  
 PLANS APPROVAL DATE  
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TO ACCOMPANY PLANS DATED \_\_\_\_\_

**LEGEND**



**POLE SELECTION TABLE**

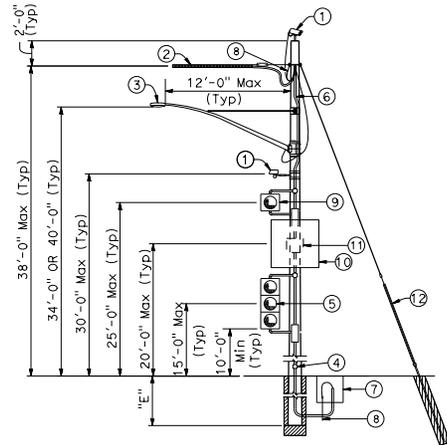


OVERHEAD BUNDLE HORIZONTAL SPAN (Max)	MAXIMUM d <sub>p</sub>	1"				1.5"				2.0"				2.5"			
		1"	1.5"	2.0"	2.5"	1"	1.5"	2.0"	2.5"	1"	1.5"	2.0"	2.5"	1"	1.5"	2.0"	2.5"
50'	MINIMUM POLE CLASS	H-1	H-1	H-2	H-2	1	1	1	1	1	1	1	H-1	H-2	H-2	H-3	H-3
	POLE EMBEDMENT (E)	10'				9'				9'				11'			
100'	MINIMUM POLE CLASS	H-2	H-2	H-3	H-4	1	H-1	H-1	H-1	1	H-1	H-2	H-2	H-3	H-3	H-4	H-4
	POLE EMBEDMENT (E)	11'				9'				9'				12'			
150'	MINIMUM POLE CLASS	H-3	H-3	H-4	H-5	H-1	H-1	H-2	H-2	H-2	H-3	H-3	H-3	H-4	H-5	H-5	H-6
	POLE EMBEDMENT (E)	11'				9'				9'				12'			
200'	MINIMUM POLE CLASS	H-4	H-4	H-5	H-6	H-1	H-2	H-3	H-3	H-3	H-3	H-4	H-4	H-5	H-6		
	POLE EMBEDMENT (E)	11'				9'				9'				12'			

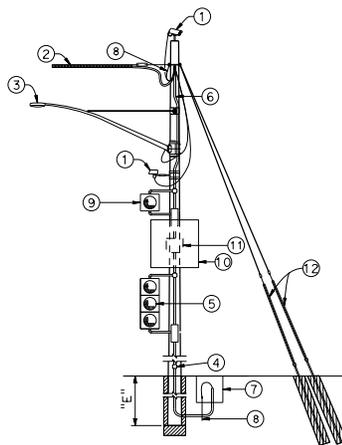
- ① Camera or vehicle detection system
- ② Overhead bundle consisting of a 3/8" Ø messenger wire, overhead conductors, and lashing wire
- ③ Luminaire with mast arm
- ④ Pedestrian push button or accessible push button
- ⑤ Signal face with 3 indications or single sheet sign panel (10 SOFT Max)
- ⑥ Riser with weather head as required
- ⑦ Pull box as required
- ⑧ Grounding as required
- ⑨ Single flashing beacon or single sheet sign panel (4 SOFT Max)
- ⑩ Single sheet sign panel (4' x 4' Max) or signal face with 3 indications
- ⑪ Flashing beacon control assembly
- ⑫ 1/2" Ø guy wire with white guy marker and strain insulator (for anchorage see "TEMPORARY WOOD POLES-DETAILS No. 2" sheet)

**NOTES:**

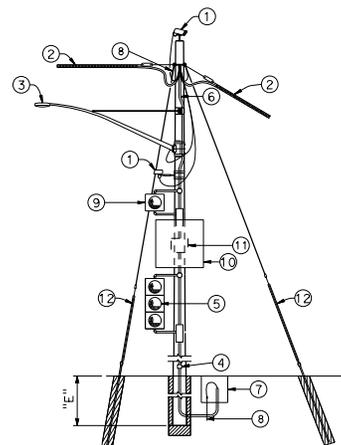
1. In addition to other restrictions on maximum horizontal span, this horizontal span must not exceed 100'.
2. Guy wire in line with opposing span ± 5°.



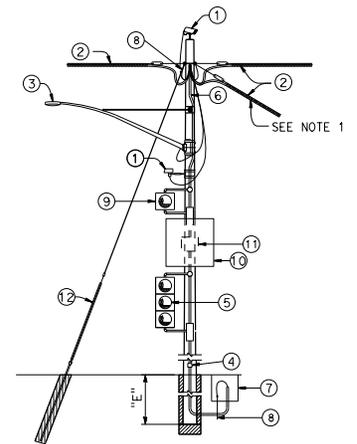
**CASE 1G  
POLE AT DEAD END  
WITH ATTACHMENTS**



**CASE 2G  
POLE AT DEAD END  
WITH ATTACHMENTS**



**CASE 3G  
POLE AT CORNER  
WITH ATTACHMENTS**



**CASE 4G  
POLE AT JUNCTION  
WITH ATTACHMENTS**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY WOOD POLES  
GUYED - NO SIGNALS ON SPANS**

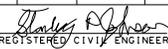
NO SCALE

RSP ES-18C DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-18C  
DATED MAY 31, 2018 - PAGE 559 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-18C**

2018 REVISED STANDARD PLAN RSP ES-18C

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

  
 REGISTERED CIVIL ENGINEER  
 No. CS1793  
 Exp. 3-31-20  
 CIVIL  
 STATE OF CALIFORNIA

October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

**LEGEND**

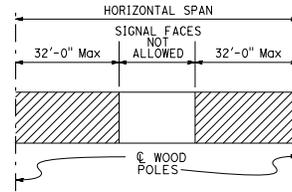
-  Wood Pole with Attachments
- TS- Overhead Bundle with Signal Faces (See Note 2)
- OH- Overhead Bundle
-  Guy Anchor

**POLE SELECTION TABLE**

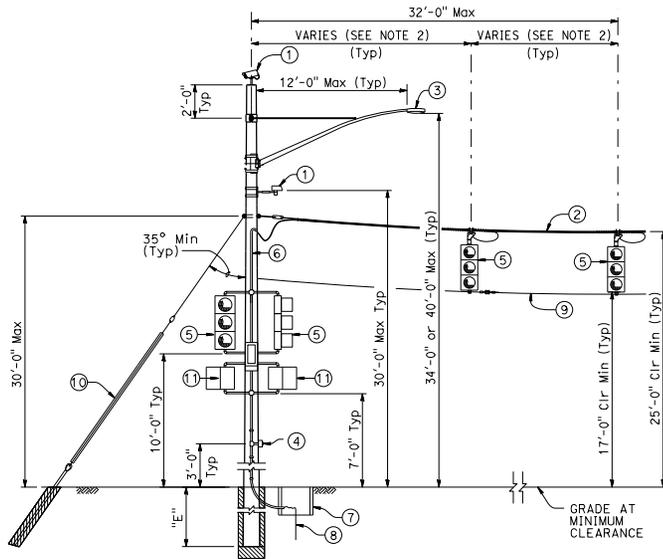
OVERHEAD BUNDLE HORIZONTAL SPAN Max	MAXIMUM dp	CASE 1GT			CASE 2GT			CASE 3GT		
		1"	1.5"	2.0"	1"	1.5"	2.0"	1"	1.5"	2.0"
50'	MINIMUM POLE CLASS	H-2	H-3	H-3	H-2	H-2	H-2	H-3	H-4	H-4
	POLE EMBEDMENT (E)	10'			10'			11'		
100'	MINIMUM POLE CLASS	H-3	H-3	H-4	H-2	H-3	H-3	H-4	H-4	H-5
	POLE EMBEDMENT (E)	11'			10'			11'		
150'	MINIMUM POLE CLASS	H-3	H-4	H-4	H-2	H-3	H-4	H-4	H-5	H-5
	POLE EMBEDMENT (E)	11'			10'			11'		

**NOTES:**

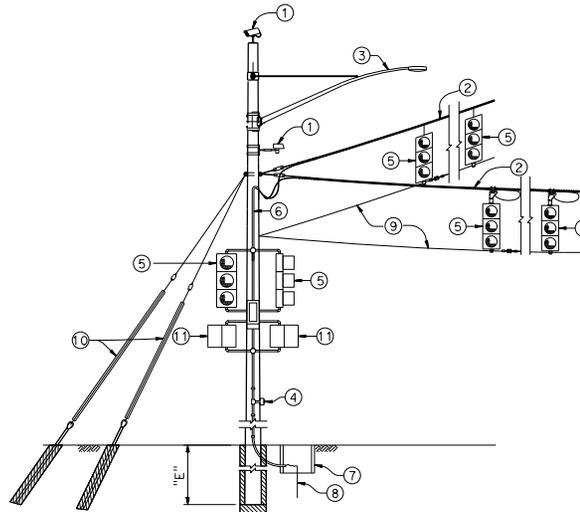
- In addition to other restrictions on maximum horizontal span, this horizontal span must not exceed 100'.
- Maximum of 2 SIGNAL FACES per span within the hatched regions indicated by "LOCATION OF SIGNAL FACES".
- Guy wire in line with opposing span  $\pm 5^\circ$ .



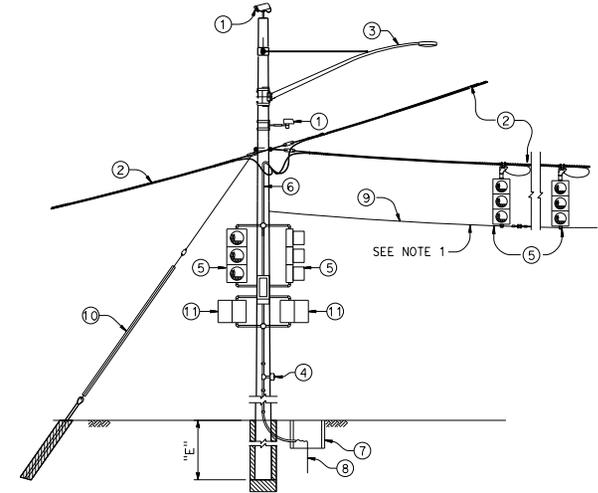
**LOCATION OF SIGNAL FACES**



**CASE 1GT  
POLE AT DEAD END  
WITH ATTACHMENTS**



**CASE 2GT  
POLE AT CORNER  
WITH ATTACHMENTS**



**CASE 3GT  
POLE AT JUNCTION WITH ATTACHMENTS**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY WOOD POLES  
GUYED - WITH SIGNAL FACES ON SPANS**

NO SCALE

RSP ES-180 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-180  
DATED MAY 31, 2018 - PAGE 560 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-180**

- TO ACCOMPANY PLANS DATED \_\_\_\_\_
- Camera or vehicle detection system
  - Overhead bundle consisting of  $\frac{3}{8}$ "  $\phi$  messenger wire and overhead conductors and lashing wire
  - Luminaire with mast arm
  - Pedestrian push button or accessible push button
  - Signal face with 3 indications or single sheet sign panel (10 SOFT Max)
  - Riser with weather head as required
  - Pull box as required
  - Grounding as required
  - $\frac{3}{8}$ "  $\phi$  tether wire
  - $\frac{1}{2}$ "  $\phi$  guy wire with white guy marker and strain insulator. For anchorage see "TEMPORARY WOOD POLES-DETAILS No. 2" sheet
  - Pedestrian signal head

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

  
 REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS  
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Stanley P. Johnson  
 No. CS1793  
 Exp. 3-31-20  
 CIVIL  
 STATE OF CALIFORNIA

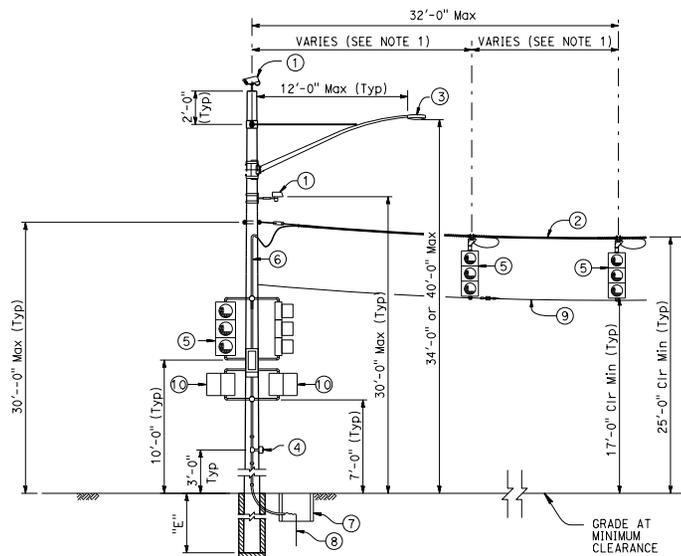
**LEGEND**

- A Wood Pole with Attachments
- TS — Overhead Bundle with Signal Faces (See Note 1)

**POLE SELECTION TABLE**

		CASE 1NT			
OVERHEAD BUNDLE HORIZONTAL SPAN (Max)	75'	MAXIMUM $d_p$	1"	1.5"	2.0"
		MINIMUM POLE CLASS	H-5	H-6	H-6
		POLE EMBEDMENT (E)	13'		

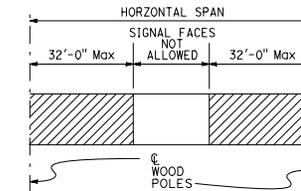
- ① Camera or vehicle detection system
- ② Overhead bundle consisting of a  $\frac{3}{8}$ "  $\phi$  messenger wire and overhead conductors and lashing wire
- ③ Luminaire with mast arm
- ④ Pedestrian push button or accessible push button
- ⑤ Signal face with 3 indications or single sheet sign panel (10 SQFT Max)
- ⑥ Riser with weather head as required
- ⑦ Pull box as required
- ⑧ Grounding as required
- ⑨  $\frac{3}{8}$ "  $\phi$  tether wire
- ⑩ Pedestrian signal head



CASE 1NT  
**POLE AT DEAD END  
WITH ATTACHMENTS**

**NOTE:**

1. Maximum of 2 SIGNAL FACES per span within the hatched regions indicated by "LOCATION OF SIGNAL FACES".



**LOCATION OF SIGNAL FACES**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

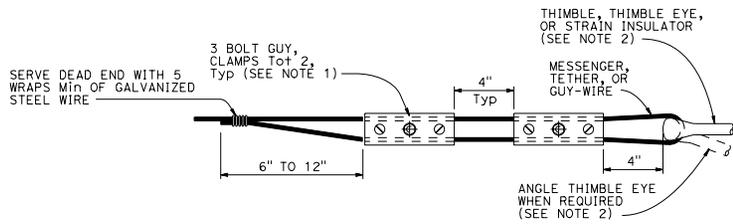
**TEMPORARY WOOD POLES  
NON-GUYED-WITH SIGNAL FACES ON SPAN**

NO SCALE

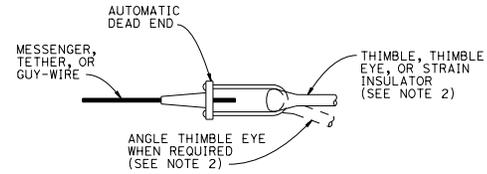
RSP ES-18E DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-18E  
DATED MAY 31, 2018 - PAGE 561 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-18E**

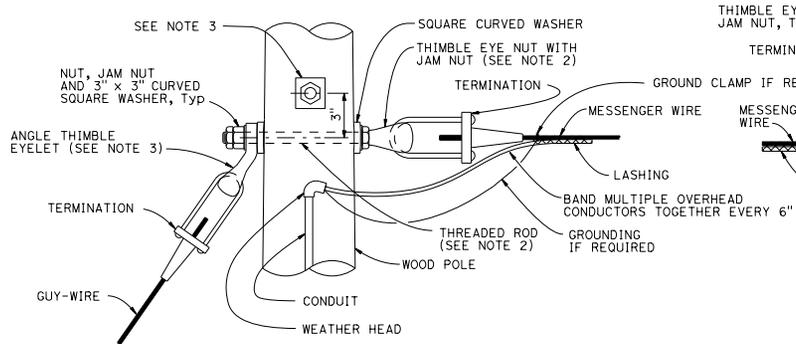
**2018 REVISED STANDARD PLAN RSP ES-18E**



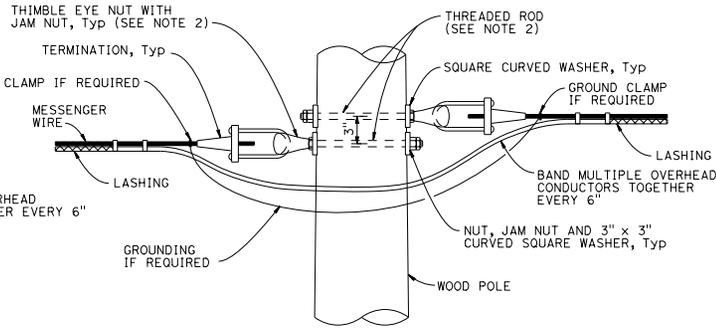
**ALTERNATIVE TERMINATION OF MESSENGER WIRES USING GUY CLAMPS**



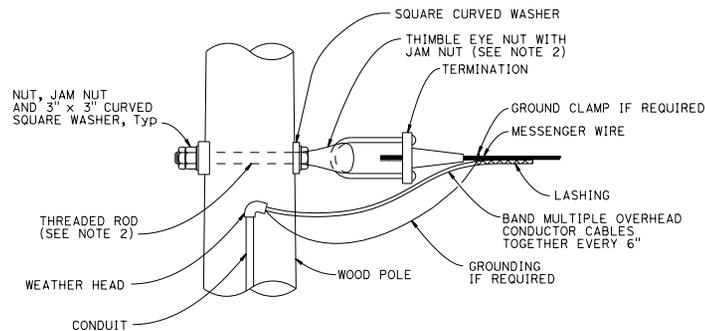
**TERMINATION OF WIRES USING AUTOMATIC DEAD END**



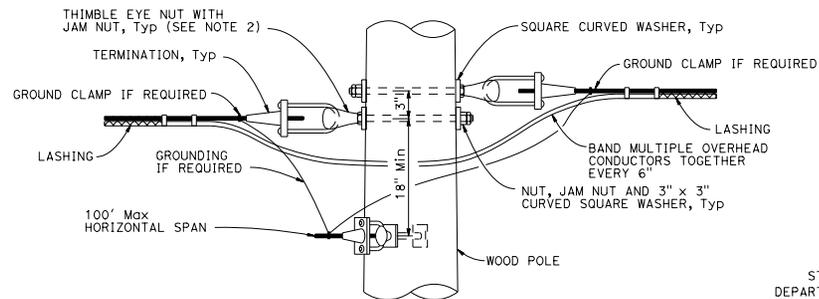
**POLE AT DEAD END WITH GUY-WIRE CONNECTION**



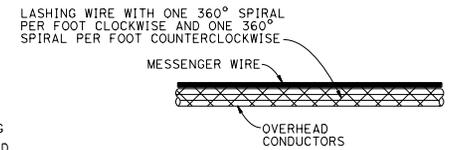
**POLE AT TANGENT OR CORNER CONNECTION**



**POLE AT DEAD END CONNECTION**

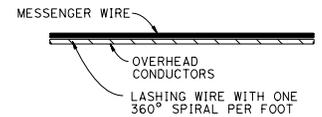


**POLE AT JUNCTION CONNECTION**



**DOUBLE LASHING DETAIL**

USE IF  $d_p$  IS GREATER THAN  $1/2$ "



**TYPICAL LASHING DETAIL**

USE IF  $d_p$  IS  $1/2$ " OR LESS

**NOTES:**

1. For guy wires use 3 clamps.
2. Use  $5/8$ "  $\phi$  except  $3/4$ "  $\phi$  at guyed wires
3. Install additional angle thimble eyelet at poles with two guy wires.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY WOOD POLES  
DETAILS No. 1**

NO SCALE

9RSP ES-19A DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-19A  
DATED MAY 31, 2018 - PAGE 562 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-19A**

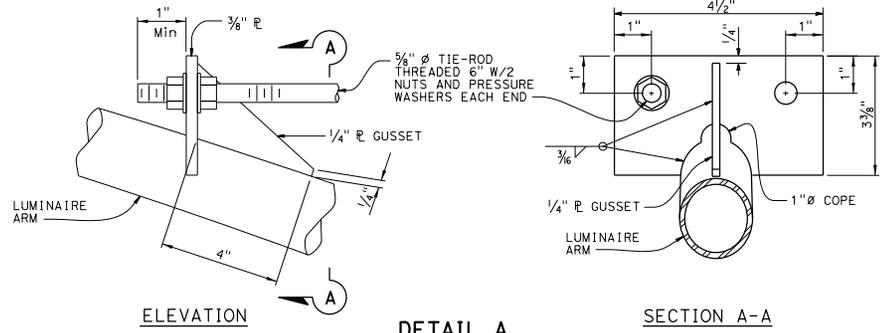
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Stanley P. Johnson*  
 REGISTERED CIVIL ENGINEER  
 No. C61793  
 Exp. 3-31-20  
 CIVIL  
 STATE OF CALIFORNIA

October 19, 2018  
 PLANS APPROVAL DATE  
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TO ACCOMPANY PLANS DATED \_\_\_\_\_

2018 REVISED STANDARD PLAN RSP ES-19A



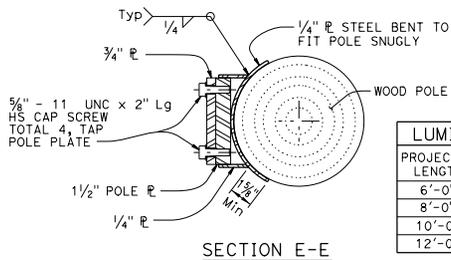
**ELEVATION**  
**DETAIL A**  
**TIE-ROD AT LUMINAIRE ARM**  
**SECTION A-A**

- NOTES:**
1. Luminaire mast arms must be in compliance with Standard Plan ES-6D with noted modifications.
  2. Verify pole dimensions at tie-rod attachment height. Fabricate 9" flat bar with "L" dimension to maintain an open gap between flanges in finished installation.
  3. Not all screw heads and bolt heads are shown for clarity.
  4. Mast arm not shown for clarity.

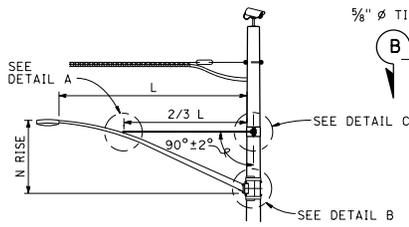
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
------	--------	-------	--------------------------	-----------	--------------

Stanley P. Johnson  
 REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
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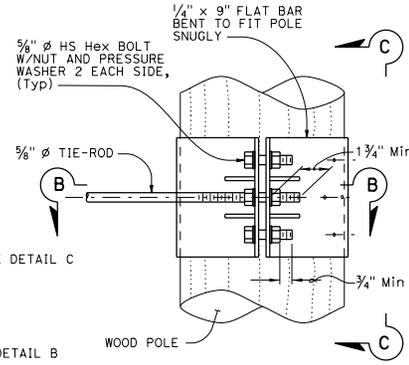
TO ACCOMPANY PLANS DATED \_\_\_\_\_



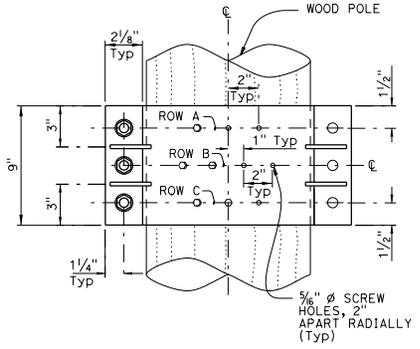
PROJECTED LENGTH	N RISE AT POLE	MIN OD	NOMINAL THICKNESS
6'-0"	2'-0"±	3 1/4"	0.1196"
8'-0"	2'-6"±	3 1/2"	
10'-0"	3'-3"±	3 3/4"	
12'-0"	4'-3"±	3 3/4"	



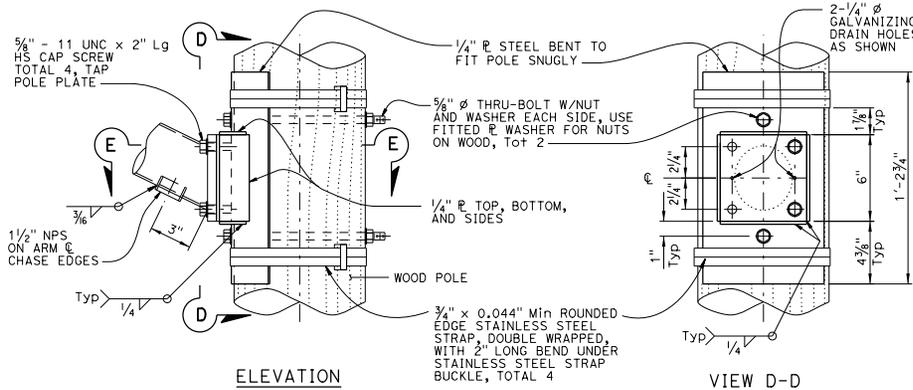
**LUMINAIRE MAST ARM**



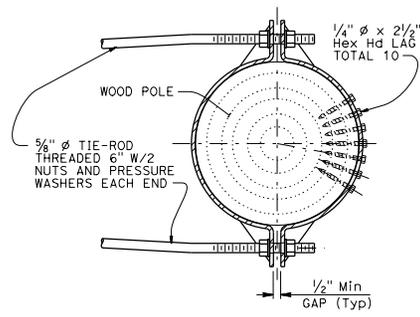
**ELEVATION**



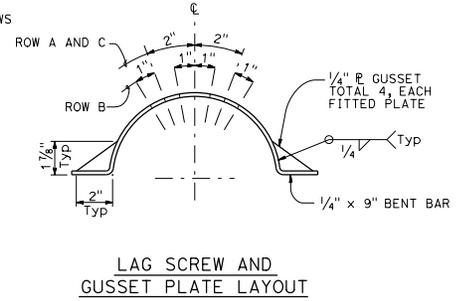
**VIEW C-C**



**ELEVATION**  
**DETAIL B**  
**ARM CONNECTION DETAILS**  
**VIEW D-D**



**SECTION B-B**



**DETAIL C**  
**TIE-ROD AT POLE**

**LAG SCREW AND GUSSET PLATE LAYOUT**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**TEMPORARY WOOD POLES**  
**DETAILS No. 3**  
NO SCALE

9RSP ES-19C DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-19C DATED MAY 31, 2018 - PAGE 564 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-19C**

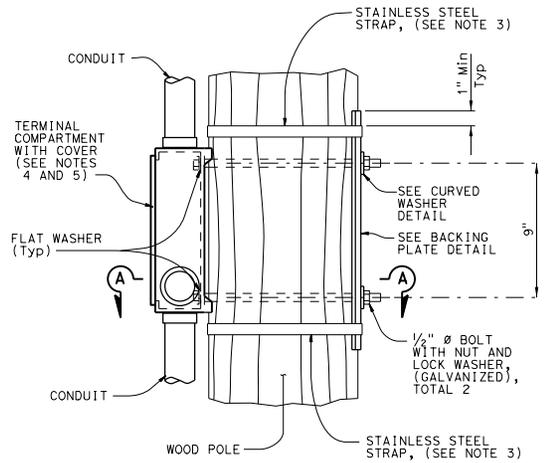
2018 REVISED STANDARD PLAN RSP ES-19C

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
 REGISTERED CIVIL ENGINEER					
October 19, 2018 PLANS APPROVAL DATE					
					
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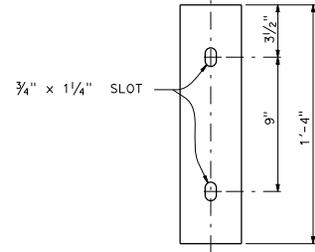
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

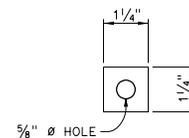
1. Verify pole dimensions at terminal compartment for fabrication of backing plate and curved washer.
2. Backing plate to be galvanized after fabrication.
3. 3/4" x 0.044" minimum, rounded edge stainless steel straps, double wrapped with 2" long bend under stainless steel strap buckle.
4. For miscellaneous details for signal mounting not shown see Revised Standard Plan RSP ES-4D.
5. If the terminal compartment has a cable entry guide on the rear face, remove the cable entry guide to a level that will not interfere with the wood post. Close any unused cable entry locations with raintight cap.



ELEVATION



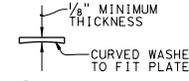
ELEVATION



ELEVATION



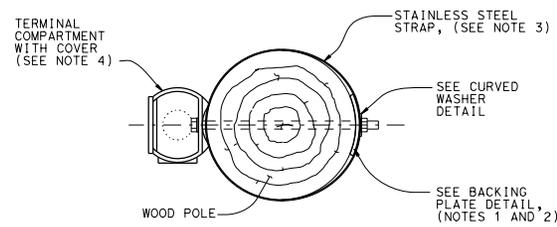
PLAN



PLAN

BACKING PLATE  
DETAIL

CURVED WASHER  
DETAIL



SECTION A-A

SIDE MOUNTING  
TERMINAL COMPARTMENT

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY WOOD POLES  
DETAILS No. 4**

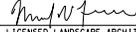
NO SCALE

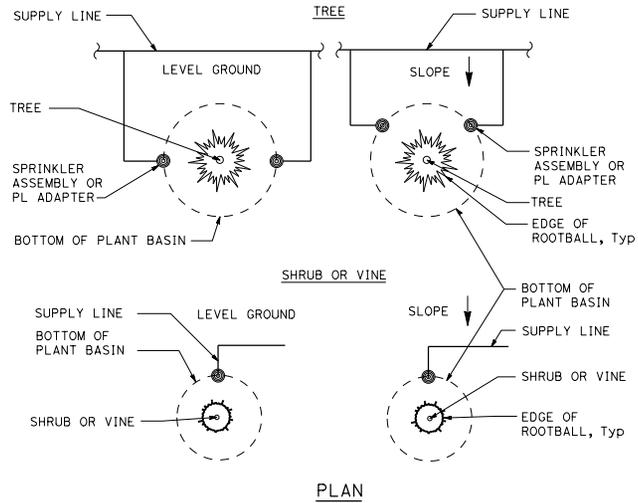
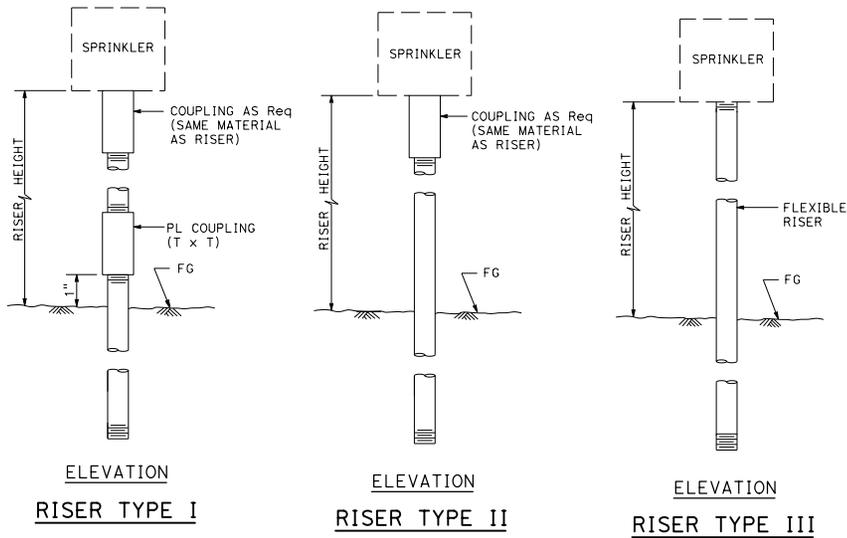
RSP ES-19D DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-19D  
DATED MAY 31, 2018 - PAGE 965 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP ES-19D**

2018 REVISED STANDARD PLAN RSP ES-19D

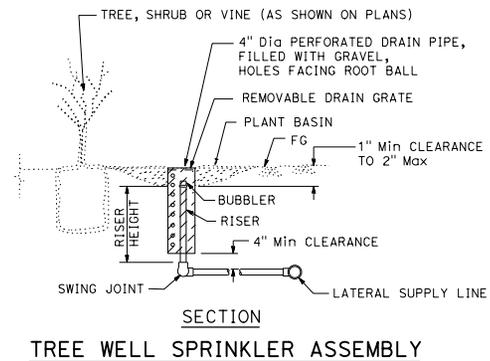
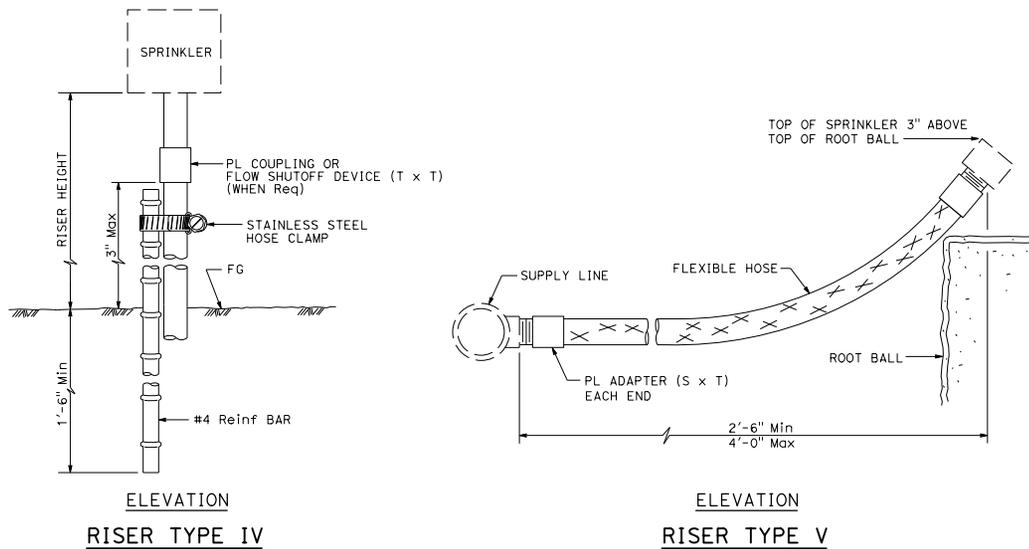
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

  
 LICENSED LANDSCAPE ARCHITECT  
 April 19, 2019  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TO ACCOMPANY PLANS DATED \_\_\_\_\_

- NOTES:**
1. See Project Plans for type and quantity of sprinklers.
  2. Refer to plant legend and Standard Plan H2 for plant basin dimensions.

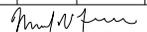


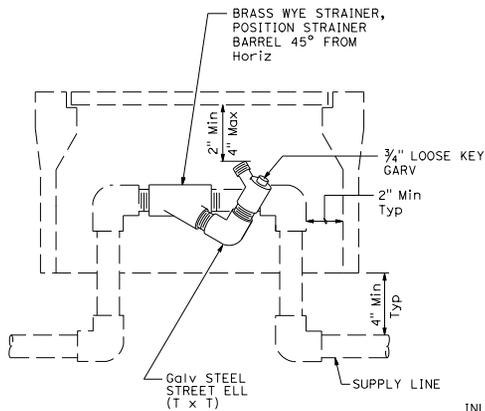
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**LANDSCAPE DETAILS  
(SPRINKLER ASSEMBLY)**  
NO SCALE

RSP H4 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN H4  
DATED MAY 31, 2018 - PAGE 269 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP H4**

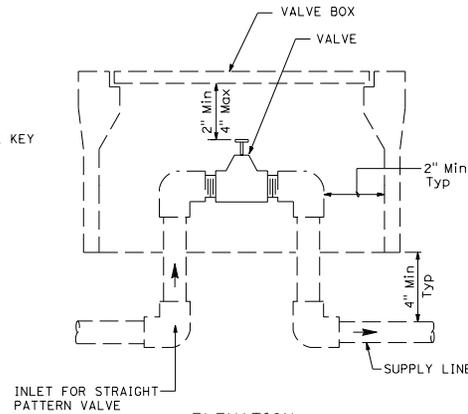
2018 REVISED STANDARD PLAN RSP H4

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

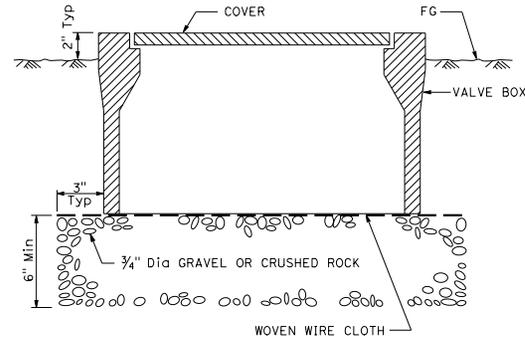
  
 LICENSED LANDSCAPE ARCHITECT  
 April 19, 2019  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



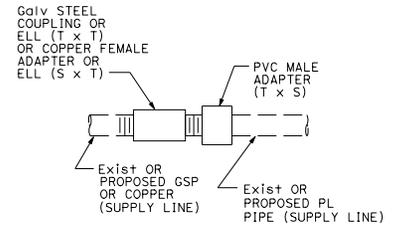
**ELEVATION**  
**WYE STRAINER ASSEMBLY**



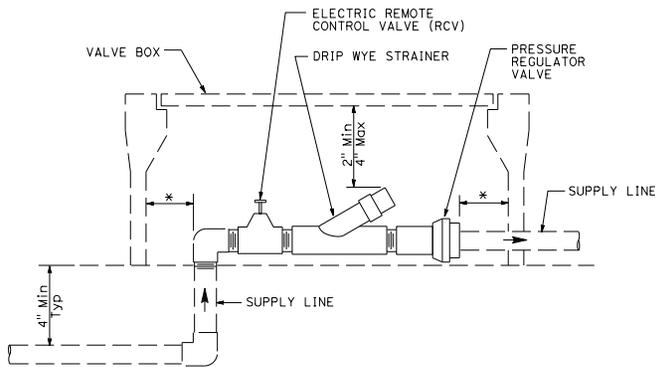
**ELEVATION**  
**VALVE**



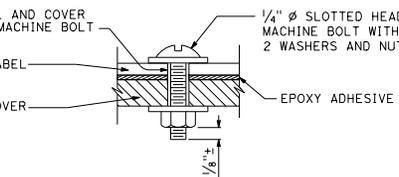
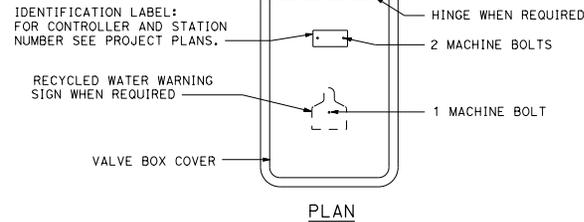
**SECTION**  
**VALVE BOX**



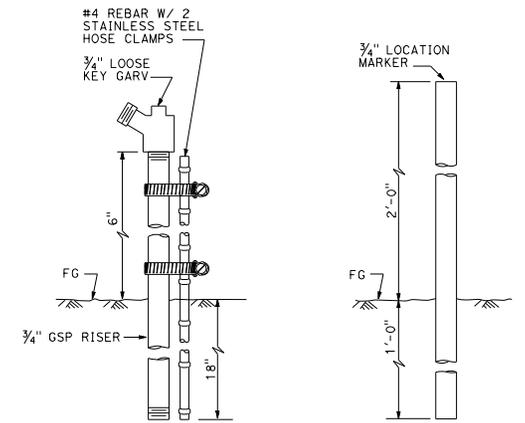
**GALVANIZED OR COPPER PIPE  
CONNECTION TO PLASTIC PIPE**



**ELEVATION**  
**DRIP VALVE ASSEMBLY**



**SECTION**  
**VALVE BOX IDENTIFICATION**



**ELEVATION**  
**GARDEN VALVE ASSEMBLY**

**ELEVATION**  
**LOCATION MARKER**

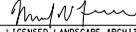
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**LANDSCAPE DETAILS**  
NO SCALE

RSP H6 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN H6  
DATED MAY 31, 2018 - PAGE 271 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP H6**

2018 REVISED STANDARD PLAN RSP H6

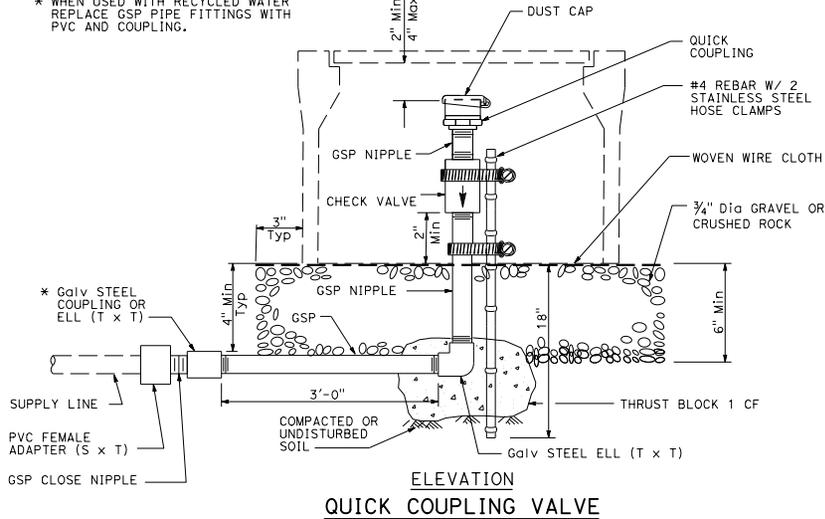
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

  
 LICENSED LANDSCAPE ARCHITECT  
 April 19, 2019  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



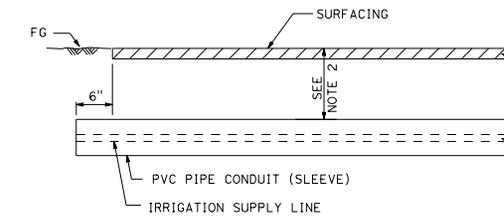
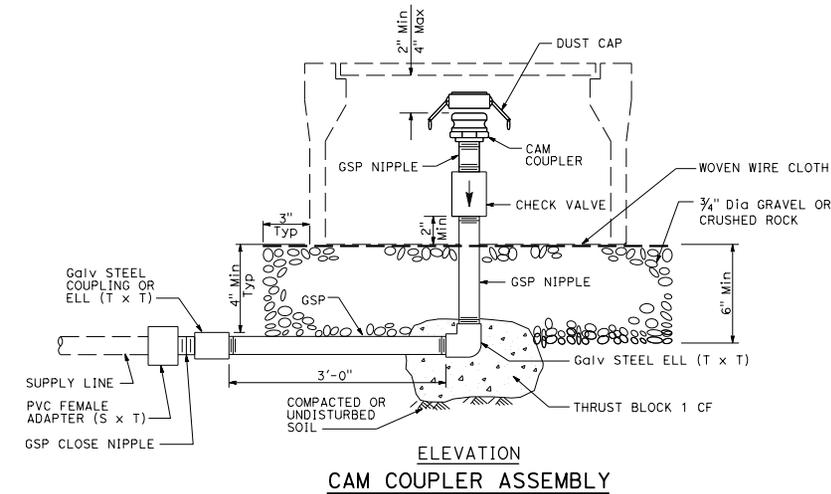
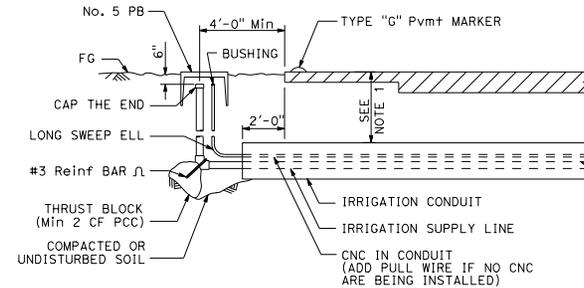
TO ACCOMPANY PLANS DATED \_\_\_\_\_

\* WHEN USED WITH RECYCLED WATER REPLACE GSP PIPE FITTINGS WITH PVC AND COUPLING.



**NOTES:**

1. 40" - 50"
2. 12" downstream of RCV  
18" upstream of RCV



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**LANDSCAPE DETAILS**

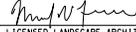
NO SCALE

RSP H8 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN H8  
DATED MAY 31, 2018 - PAGE 273 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP H8**

2018 REVISED STANDARD PLAN RSP H8

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

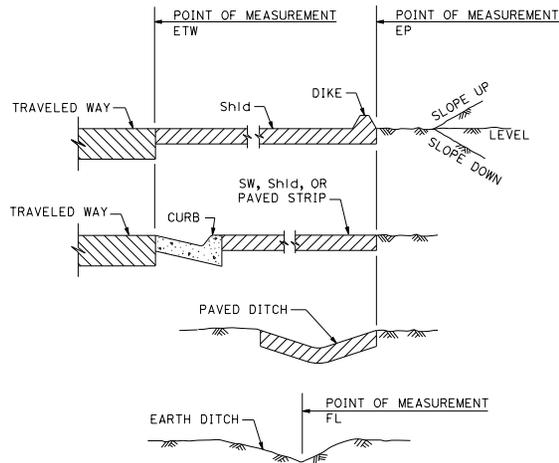
  
 LICENSED LANDSCAPE ARCHITECT  
 October 16, 2020  
 PLANS APPROVAL DATE: \_\_\_\_\_  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



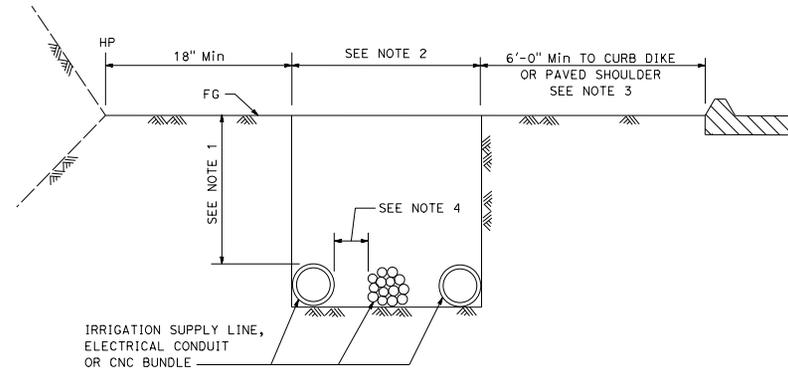
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

1. 12" downstream of RCV  
18" upstream of RCV
2. Width sufficient to allow snaking of pipe and CNC bundles without stacking.
3. 1 ft minimum to back of sidewalk.
4. 2" Min or Dia of largest pipe in trench.



**SECTION  
POINTS OF MEASUREMENT**



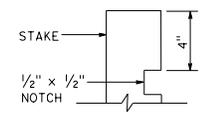
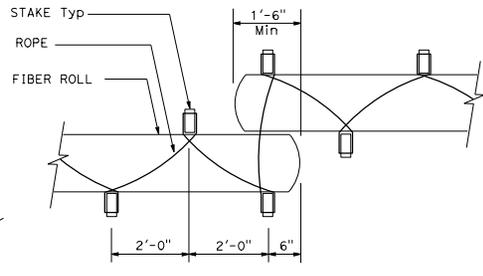
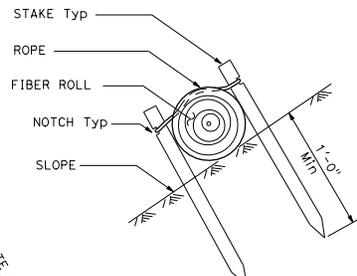
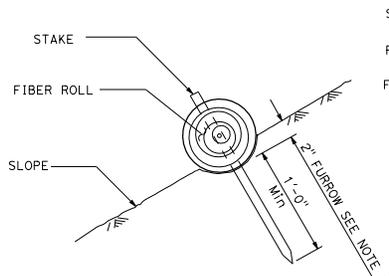
**SECTION  
IRRIGATION TRENCH DETAIL**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**LANDSCAPE DETAILS**  
NO SCALE

RSP H9 DATED OCTOBER 16, 2020 SUPERSEDES STANDARD PLAN H9  
DATED MAY 31, 2018 - PAGE 274 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP H9**

2018 REVISED STANDARD PLAN RSP H9

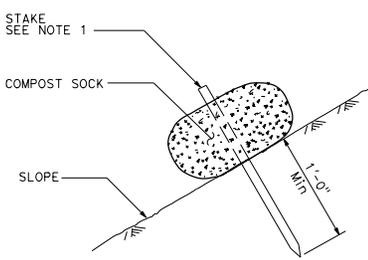


STAKE NOTCH DETAIL

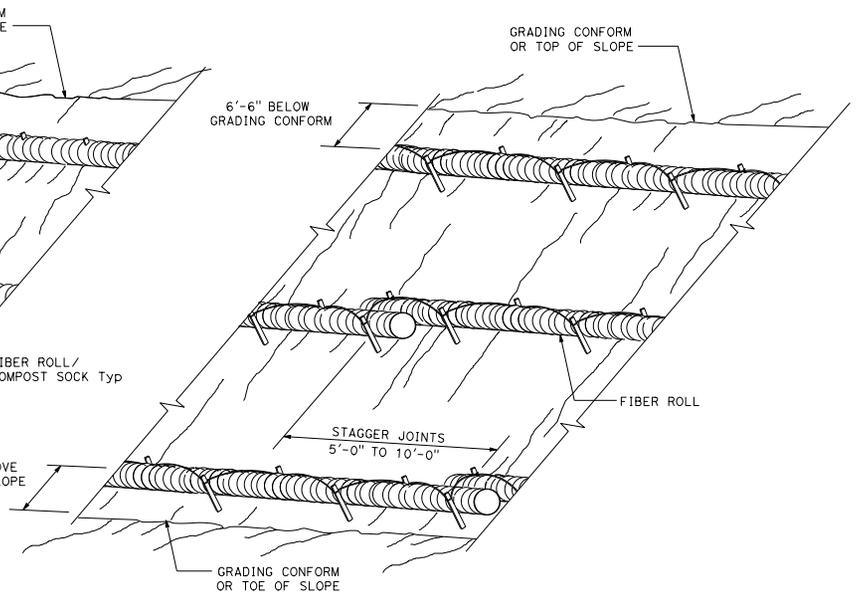
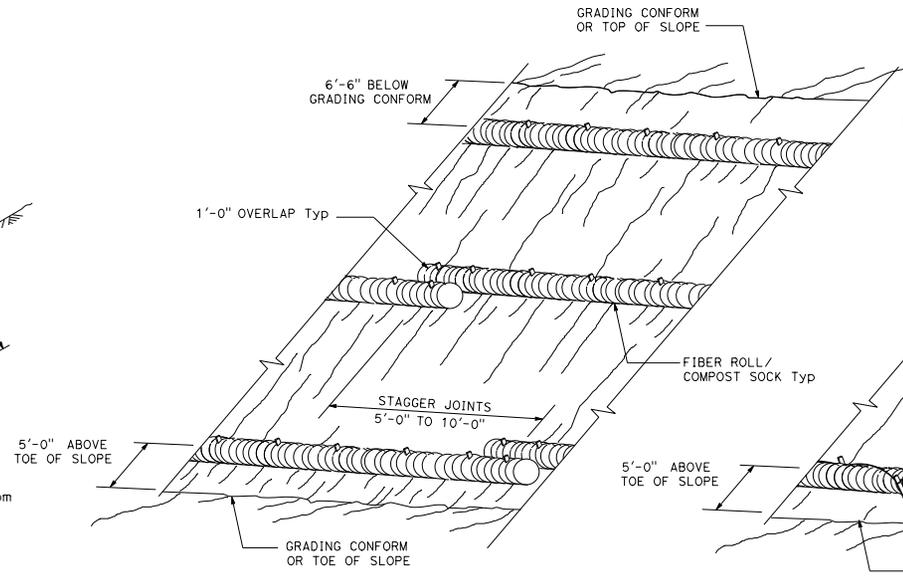
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

LICENSED LANDSCAPE ARCHITECT  
 October 18, 2019  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:  
1. Installations shown in the perspectives are for slope inclination of 10:1 (Horiz:Vert) and steeper.



NOTE:  
1. May install stake adjacent to bottom edge of compost sock.



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**EROSION CONTROL DETAILS**  
**FIBER ROLL AND COMPOST SOCK**  
NO SCALE

RSP H51 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN H51  
DATED MAY 31, 2018 - PAGE 276 OF THE STANDARD PLANS BOOK DATED 2018.  
**REVISED STANDARD PLAN RSP H51**

2018 REVISED STANDARD PLAN RSP H51

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

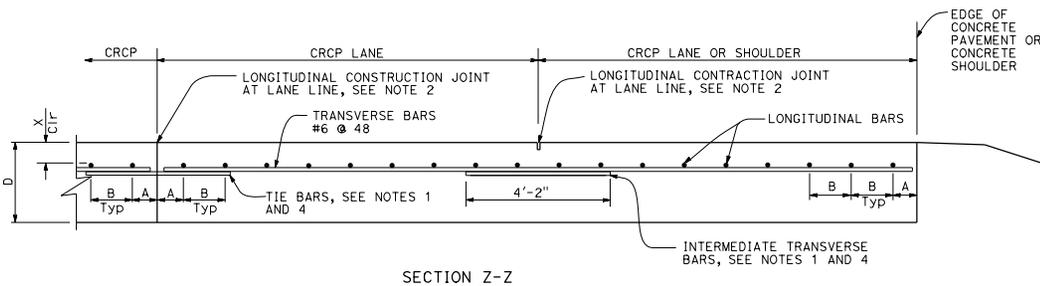
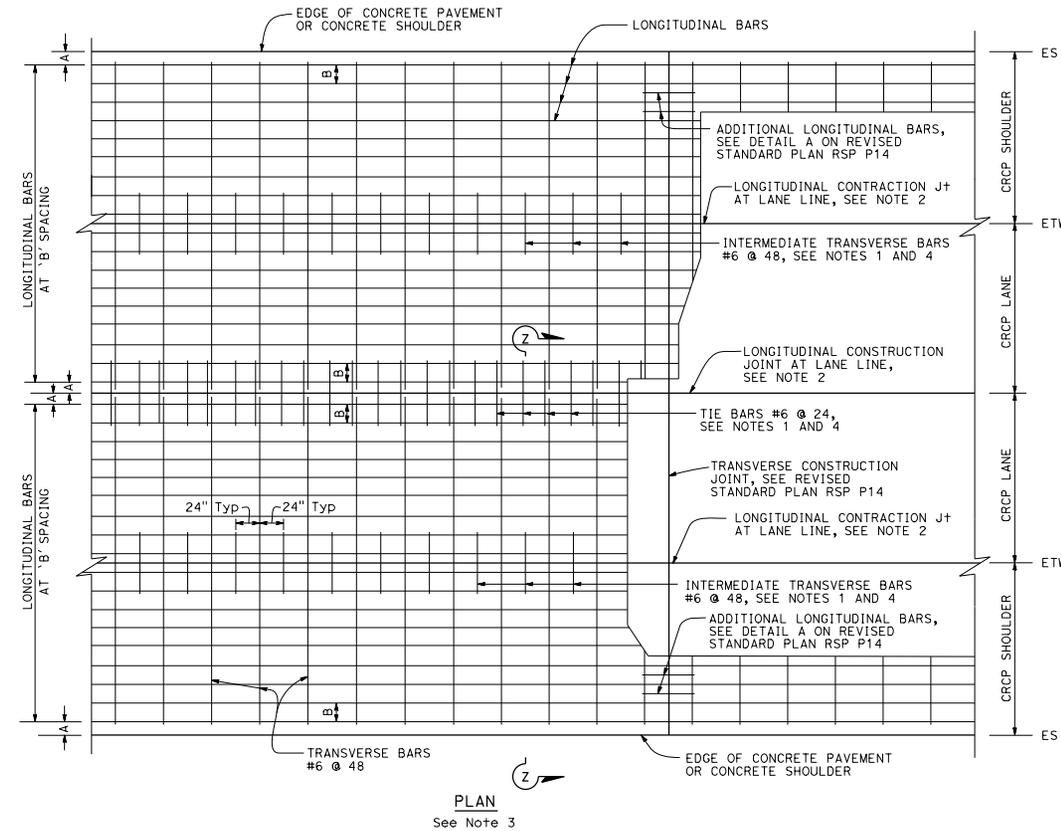
*Dulce Rufino Feldman*  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

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TO ACCOMPANY PLANS DATED \_\_\_\_\_



SLAB THICKNESS AND BAR SIZE		FIRST SPACING AT EDGE OR JOINT	REGULAR BARS	ADDITIONAL BARS AT TRANSVERSE CONSTRUCTION JOINT	Cir
D	BAR SIZE	SPACING A	SPACING B	SPACING 2 x B	X
.75'	#6	3" TO 4"	7.0"	14"	4"
.80'	#6	3" TO 4"	6.5"	13"	4"
.85'	#6	3" TO 4"	6.0"	12"	4"
.90'	#6	3" TO 4"	5.5"	11"	4"
.95'	#6	3" TO 4"	5.25"	10.5"	4"
1.00'	#6	3" TO 4"	5.0"	10"	5"
1.05'	#7	3" TO 4"	6.5"	13"	5"
1.10'	#7	3" TO 4"	6.25"	12.5"	5.5"

**NOTES:**

1. Place tie bars and intermediate transverse bars parallel to and in the same plane as transverse bars.
2. For longitudinal contraction and construction joint details, see Standard Plan P16.
3. For curved lane layout see Standard Plan P16.
4. For tie bar and intermediate transverse bar details, see Standard Plan P16.

**ABBREVIATION:**

D = Thickness of CRCP

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CONTINUOUSLY REINFORCED  
CONCRETE PAVEMENT**

NO SCALE

RSP P4 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN P4  
DATED MAY 31, 2018 - PAGE 158 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP P4**



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Dulce Rufino Delmon*  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

*Dulce Rufino Delmon*  
REGISTERED PROFESSIONAL ENGINEER  
No. 081459  
Exp. 9-30-21  
CIVIL  
STATE OF CALIFORNIA

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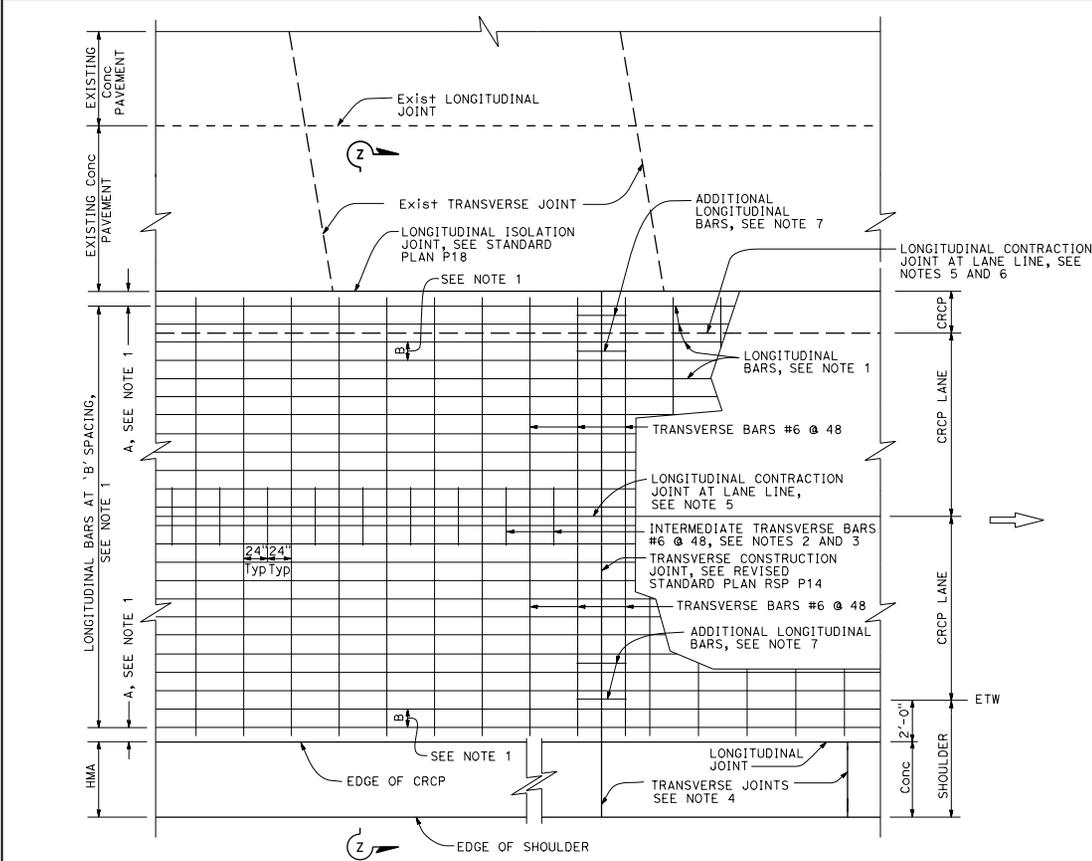
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

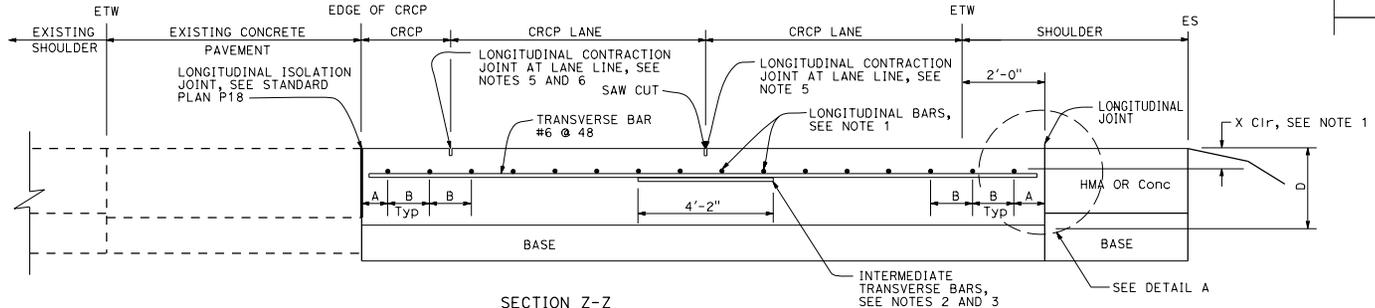
- For longitudinal bar size, spacing and clearances, see Revised Standard Plan RSP P4.
- For tie bar and intermediate transverse bar details, see Standard Plan P16.
- Place Intermediate transverse bars parallel to and in the same plane as transverse bars.
- Construct transverse joints at right angle to the longitudinal joints in adjacent CRCP. Space joints at no less than 10' intervals and no more than 14' intervals. Match location of JPCP transverse joint with CRCP transverse construction joint or expansion joint. Omit dowel bars.
- For longitudinal contraction joint details, see Standard Plan P16.
- Do not construct longitudinal contraction joint when edge of new CRCP is less than 3'-3" from lane line.
- For additional longitudinal bars detail, see Detail A on Revised Standard Plan RSP P14.
- For longitudinal construction joint plan layout not shown, see Revised Standard Plan RSP P4. For tie bar details at longitudinal construction joint, see Standard Plan P16.
- For limits of rumble strips, see Project Plans.

**ABBREVIATION:**

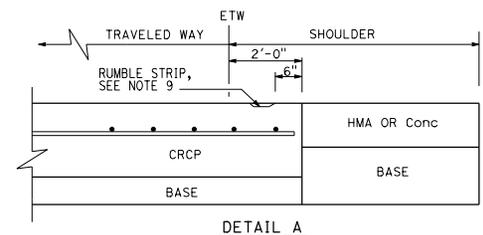
D = Thickness of CRCP



**PLAN**  
See Note 8



**SECTION Z-Z**



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CONTINUOUSLY REINFORCED  
CONCRETE PAVEMENT  
(WIDENED LANE)  
LANE AND SHOULDER  
ADDITION OR REPLACEMENT**  
NO SCALE

RSP P5B DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN P5B  
DATED MAY 31, 2018 - PAGE 160 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP P5B**

2018 REVISED STANDARD PLAN RSP P5B

**NOTES:**

1. For transverse and longitudinal bar sizes, spacing and clearances, see Table 1 on Revised Standard Plan RSP P4.
2. For tie bars in longitudinal construction joint, see Standard Plan P16.
3. Place additional longitudinal bars parallel to and in the same plane as the longitudinal bars.
4. Place additional longitudinal bars symmetrically about longitudinal construction joint.

**ABBREVIATION**

D = Thickness of CRCP

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

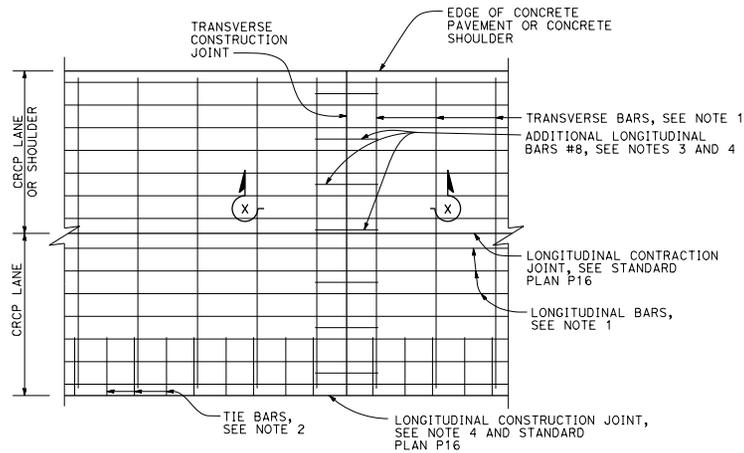
*Dulce Rufino Feldman*  
REGISTERED CIVIL ENGINEER

October 18, 2019  
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

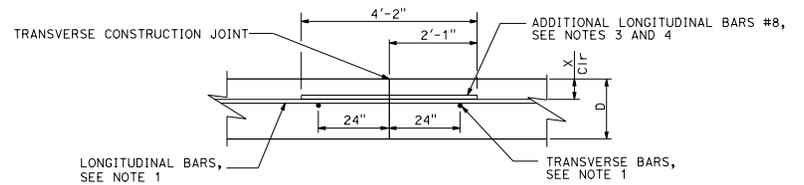
REGISTERED PROFESSIONAL ENGINEER  
Dulce Rufino Feldman  
No. C81459  
Exp. 9-30-21  
CIVIL  
STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED \_\_\_\_\_



**DETAIL A**

Additional longitudinal bars at transverse construction joint

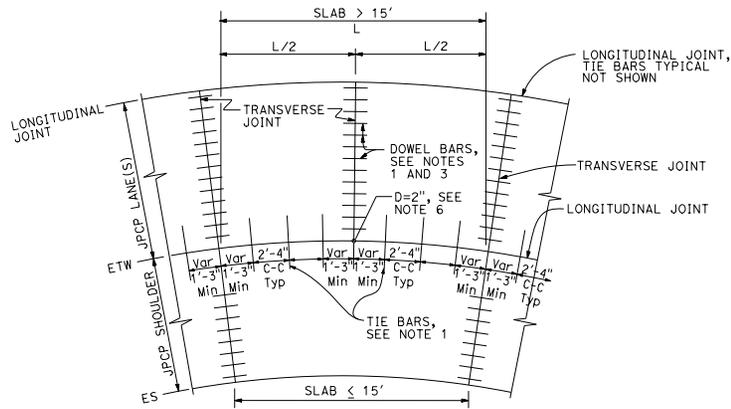


**SECTION X-X  
TRANSVERSE CONSTRUCTION JOINT**

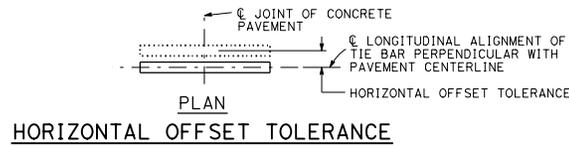
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CONTINUOUSLY REINFORCED  
CONCRETE PAVEMENT  
TRANSVERSE CONSTRUCTION JOINT**  
NO SCALE

RSP P14 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN P14  
DATED MAY 31, 2018 - PAGE 167 OF THE STANDARD PLANS BOOK DATED 2018.

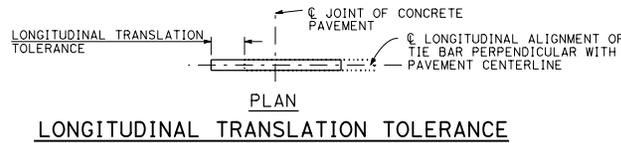
**REVISED STANDARD PLAN RSP P14**



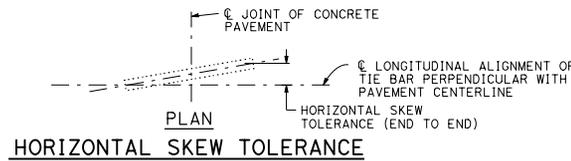
**TIE BAR LAYOUT IN CURVED LANES**



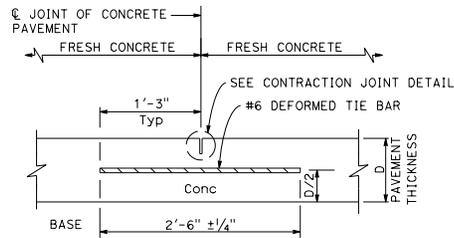
**HORIZONTAL OFFSET TOLERANCE**



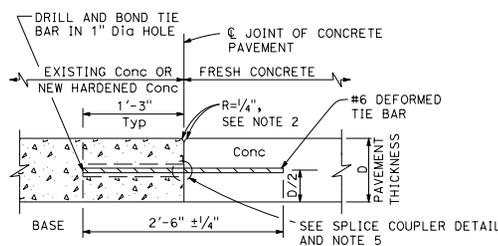
**LONGITUDINAL TRANSLATION TOLERANCE**



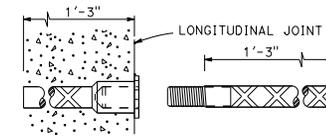
**HORIZONTAL SKEW TOLERANCE**



**LONGITUDINAL CONTRACTION JOINT**



**LONGITUDINAL CONSTRUCTION JOINT**

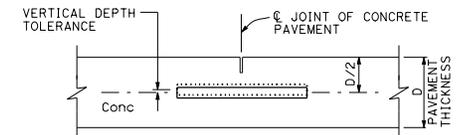


**ALTERNATIVE SPLICE COUPLER**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

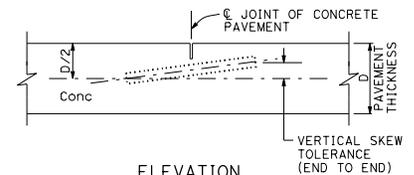
*Dulce Rufino Feldman*  
 REGISTERED CIVIL ENGINEER  
 October 18, 2019  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_



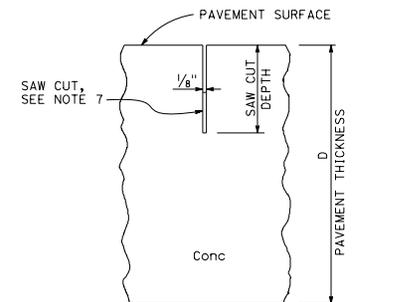
**ELEVATION**

**VERTICAL DEPTH TOLERANCE**



**ELEVATION**

**VERTICAL SKEW TOLERANCE**



**CONTRACTION JOINT DETAIL**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**CONCRETE PAVEMENT-TIE BAR DETAILS**

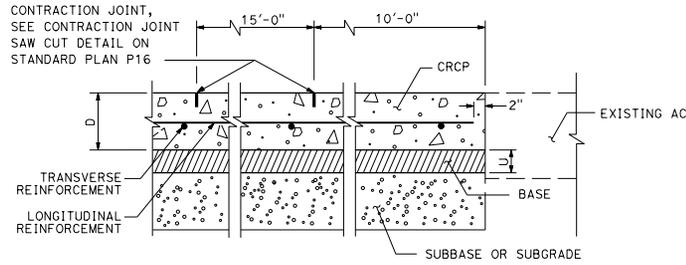
NO SCALE

**NOTES:**

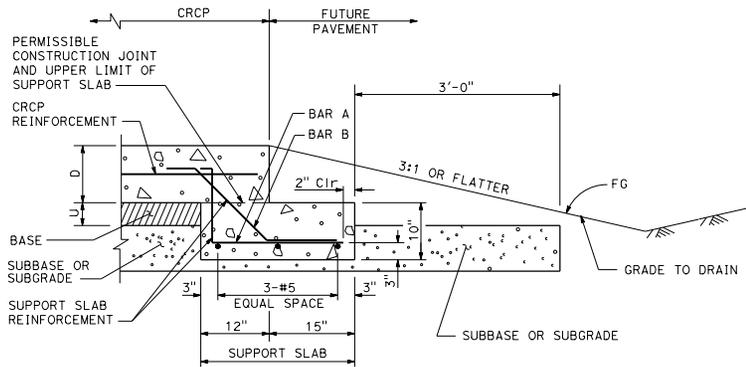
1. See Standard Plan P1 for typical dowel bar and tie bar placement and locations.
2. Where new pavement is placed against existing concrete pavement, rounding the corner is not required.
3. For dowel bar sizes, See Standard Plan P10.
4. Tie bar details apply to inside widenings.
5. Use either drill and bond or splice couplers.
6. Full depth drilled hole. Fill hole with filler material.
7. The bottom of the saw cut must be at least 0.5" clear of any dowel bar, tie bar and bar reinforcement.

RSP P15 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN P15  
DATED MAY 31, 2018 - PAGE 168 OF THE STANDARD PLANS BOOK DATED 2018.

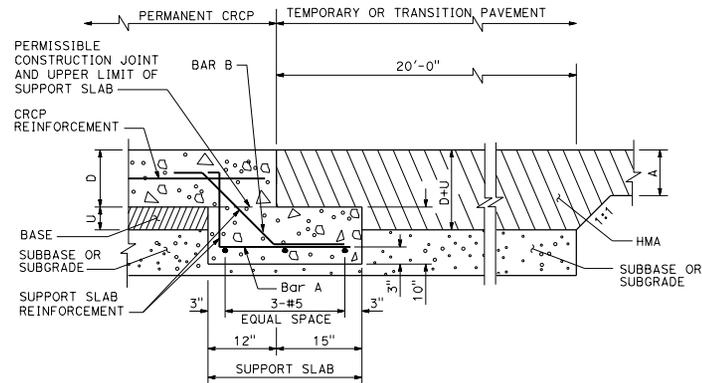
**REVISED STANDARD PLAN RSP P15**



**TERMINAL JOINT TYPE A**  
(For Existing AC)



**TERMINAL JOINT TYPE B**  
(For Future Pavement)



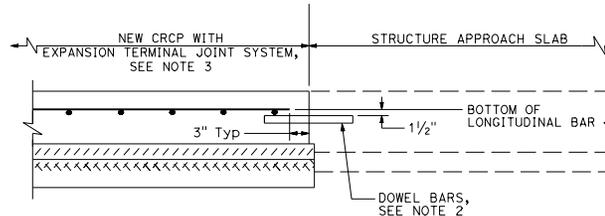
**TERMINAL JOINT TYPE C**  
(For Temporary HMA Pavement)

**NOTES:**

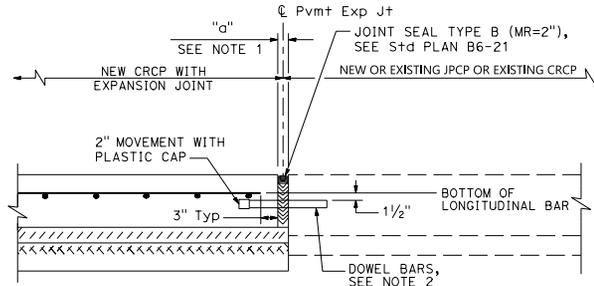
1. See Standard Plan B6-21 for "a".
2. For layout, tolerances, and other details not shown, see Standard Plan P10.
3. See Revised Standard Plan RSP P32.

**ABBREVIATIONS**

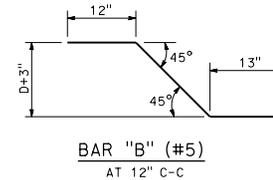
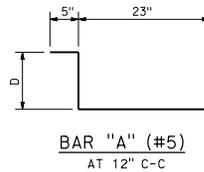
- D = Thickness of CRCP  
A = Depth of HMA as shown on Project Plans  
U = Thickness of Base



**TERMINAL JOINT TYPE F**  
(For Structure Approach Slabs)



**TERMINAL JOINT TYPE G**  
(For New or Existing JPCP or Existing CRCP)



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CONTINUOUSLY REINFORCED  
CONCRETE PAVEMENT  
TERMINAL JOINT DETAILS**

NO SCALE

RSP P31A DATED APRIL 17, 2020 SUPERSEDES RSP P31A DATED OCTOBER 18, 2019 AND STANDARD PLAN P31A DATED MAY 31, 2018 - PAGE 174 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP P31A**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Dulce Rufino Feldman*  
REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

No. C81459  
Exp. 9-30-21  
CIVIL

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

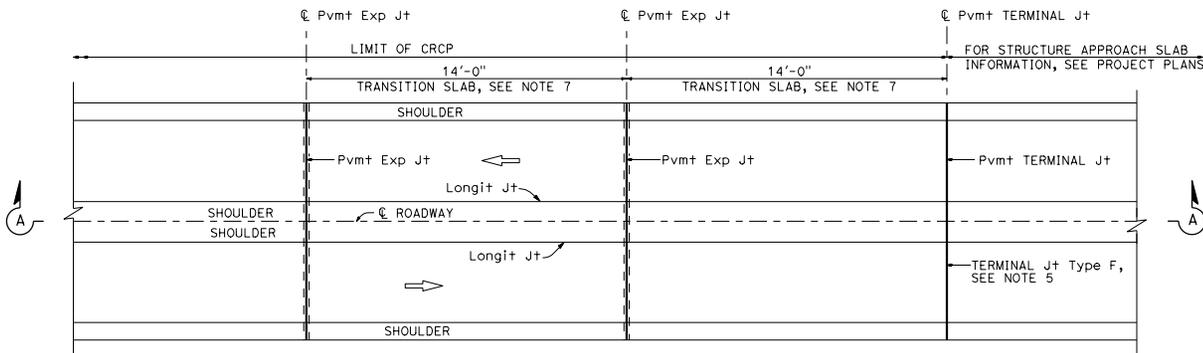
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Dulce Rufino Feldman*  
REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

*Dulce Rufino Feldman*  
No. 081459  
Exp. 9-30-21  
CIVIL  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF CALIFORNIA

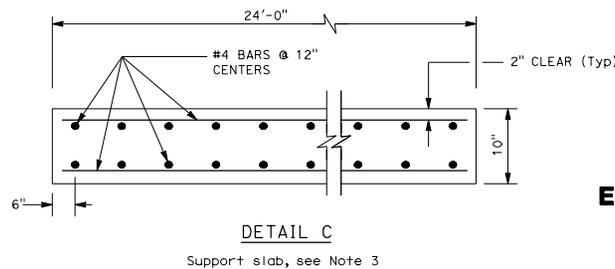
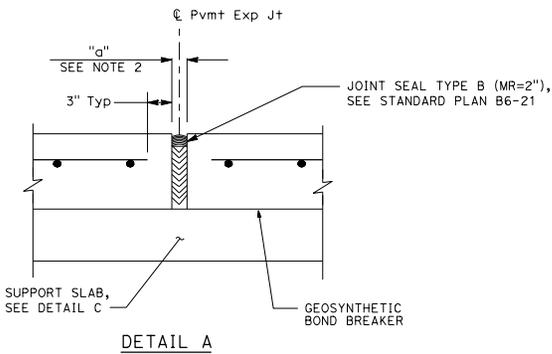
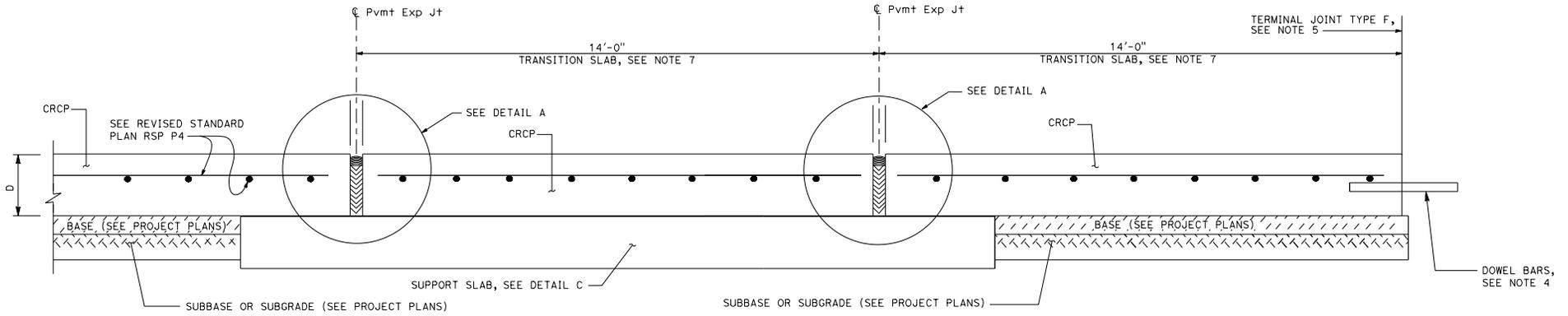
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



**NOTES:**

1. D = Thickness of CRCP (See Project Plans).
2. See Standard Plan B6-21 for "a".
3. Extend support slab 2'-0" beyond the outside edges of CRCP.
4. For layout, tolerances, and other details not shown, see Standard Plan P10.
5. For the Pavement Terminal Joint Type F Detail, See Revised Standard Plan RSP P31A.
6. No bar splices allowed within 14'-0" of expansion joints.
7. No bar splices allowed in transition slabs.

TO ACCOMPANY PLANS DATED \_\_\_\_\_



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**CONTINUOUSLY REINFORCED  
CONCRETE PAVEMENT -  
EXPANSION TERMINAL JOINT SYSTEM**

NO SCALE

RSP P32 DATED APRIL 17, 2020 SUPERSEDES RSP P32 DATED OCTOBER 18, 2019 THAT  
SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP P32**

2018 REVISED STANDARD PLAN RSP P32

**INSTRUCTIONS TO FABRICATOR**

**PROJECT PLANS SHOW:**

1. Sign structure location.
2. Length of structure frame.
3. Panel size and locations on structure.
4. Walkway length for two post signs.
5. Post type and height to bottom of frame.
6. Base plate elevation.
7. Footing elevation or location of pile foundation.
8. Photoelectric unit location if required.

REFER TO THE FOLLOWING STANDARD PLANS FOR DETAILS NOT SHOWN ON PROJECT PLANS:

Sheet No.	SHEET NAME
S1	Overhead Signs-Truss, Instructions and Examples
S2	Overhead Signs-Truss, Single Post Type, Post Types II to IX
S3	Overhead Signs-Truss, Single Post Type, Base Plate and Anchorage Details
S4	Overhead Signs-Truss, Single Post Type, Structural Frame Members Details No. 1
S5	Overhead Signs-Truss, Single Post Type, Structural Frame Members Details No. 2
S6	Overhead Signs-Truss, Gusset Plate Details
S8	Overhead Signs-Truss, Single Post Type, Round Pedestal Pile Foundation
S9	Overhead Signs-Truss, Two Post Type, Post Types I-S through VII-S
S10	Overhead Signs-Truss, Two Post Type, Base Plate and Anchorage Details
S11	Overhead Signs-Truss, Two Post Type, Structural Frame Members
S12	Overhead Signs-Truss, Structural Frame Details
S13	Overhead Signs-Truss, Frame Juncture Details
S15	Overhead Signs-Truss, Two Post Type, Round Pedestal Pile Foundation
S16	Overhead Signs, Walkway Details No. 1
S17	Overhead Signs, Walkway Details No. 2
S17A	Overhead Signs, Walkway Details No. 3
S18	Overhead Signs, Walkway Safety Railing Details
S19	Overhead Signs-Truss, Sign Mounting Details, Laminated Panel-Type A
S20	Overhead Signs, Steel Frames, Removable Sign Panel Frames
S21	Overhead Signs, Removable Sign Panel Frames, Mounting Details
S22	Overhead Signs-Truss, Removable Sign Panel Frames, 9'-2" and 10'-0" Sign Panels

**WALKWAY BRACKETS:**

Space all walkway brackets maintaining uniform spacing where possible. Maximum spacing shall not exceed 5'-6".

**OVERHEAD SIGN LUMINAIRE MOUNTING CHANNELS:**

Where distance from walkway bracket to end of sign panel exceeds 1'-4", extend overhead sign luminaire mounting channels to next walkway bracket. See Example No. 2.

**WALKWAY AND SAFETY RAILING:**

Walkway to be continuous for entire length of frame for single post signs. For two post signs, see Project Plans. Safety railing to protect entire walkway, but continuous for no more than 11'-0" in one unit.

**GENERAL NOTES:**

**LOADING:**

**WIND LOADING:**

Normal to face of sign: 40.3 psf on 100% Truss surface area (i.e. 100% panel coverage).  
Transverse to face of sign: 20% of normal force.

**WALKWAY LOADING:**

Dead load +500 LB concentrated live load.

**UNIT STRESSES:**

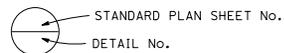
STRUCTURAL STEEL:  $f_y = 36,000$  psi  
REINFORCED CONCRETE:  $f_y = 60,000$  psi  
 $f'_c = 3,600$  psi  
FOOTING SOIL PRESSURE: 2.5 ksf (spread footing)

**MINIMUM CLEARANCE**

Vertical roadway clearance 18'-0" (bottom of walkway system)

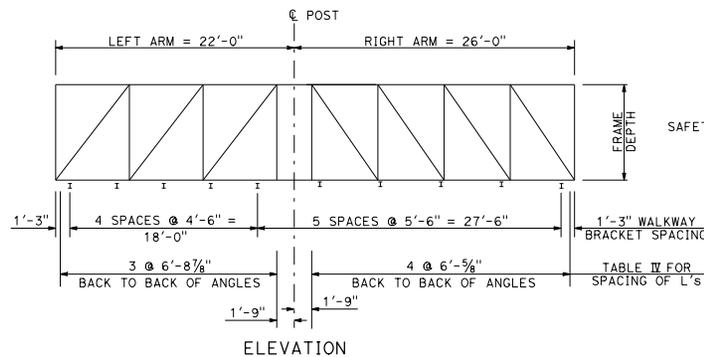
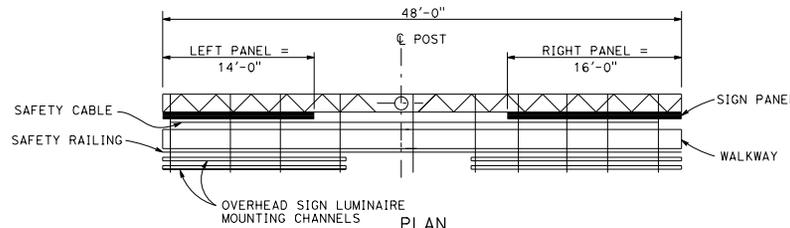
**WELDING:**

All welding continuous unless otherwise noted on the plans.



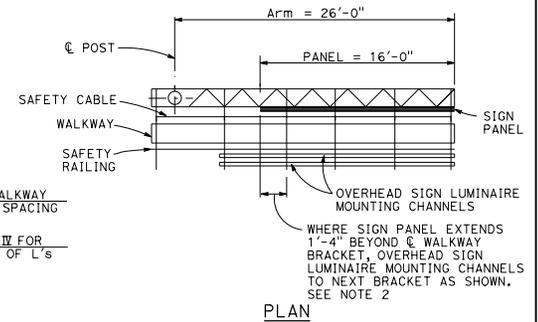
**NOTES:**

1. Signs are shown and dimensioned looking in the direction of traffic. Double faced signs are shown and dimensioned looking ahead along stationing.
2. Mandatory dimension limit.



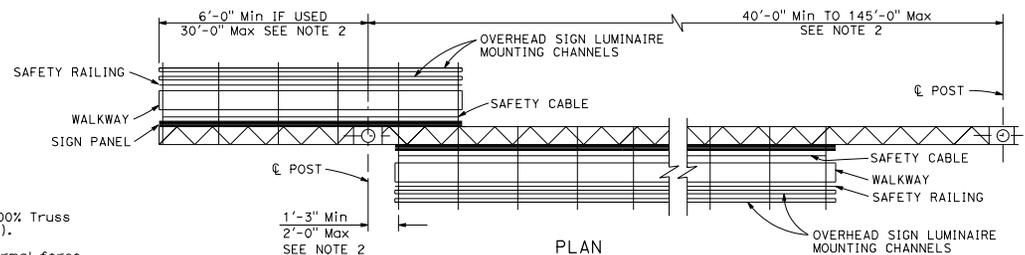
**UNBALANCED SINGLE POST TYPE**

Example No. 1



**CANTILEVER SINGLE POST TYPE**

Example No. 2



**TWO POST TYPE WITH CANTILEVER (PART DOUBLE-FACED)**

Example No. 3

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**OVERHEAD SIGNS-TRUSS INSTRUCTIONS AND EXAMPLES**

NO SCALE

RSP S1 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN S1  
DATED MAY 31, 2018 - PAGE 409 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP S1**

2018 REVISED STANDARD PLAN RSP S1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

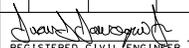
REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

TABLE XV

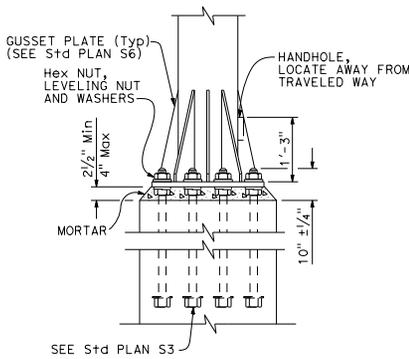
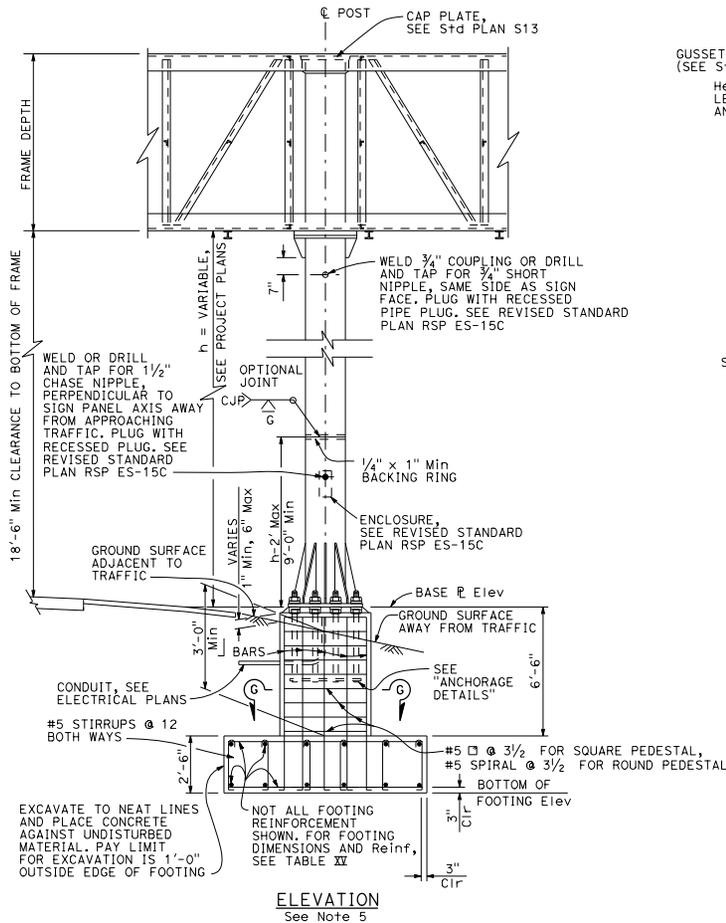
POST TYPE	PIPE NPS	PIPE THICKNESS	CAP PLATE SIZE FOR CHORD L's 5 x 5		CAP PLATE SIZE FOR CHORD L's 6 x 6		ROUND PEDESTAL					SQUARE PEDESTAL					SPREAD FOOTING							
			PEDESTAL SIZE Dia	VERTICAL EQUALLY SPACED TOTAL	J-BARS BAR SIZE	SPIRAL BAR SIZE	PITCH	PEDESTAL SIZE SQUARE	VERTICAL EQUALLY SPACED TOTAL	J-BARS BAR SIZE	# OF BARS EA FACE	HOOP BAR SIZE	SPACING	(SEE NOTE 2)										
														WIDTH		LONGITUDINAL		FOOTING STIRRUPS						
												TOP	BOTTOM	TOP	BOTTOM	TOP	BOTTOM							
II	14	1/2"	2'-0" x 2'-0"	2'-0" x 1"	2'-2" x 2'-2"	2'-2" x 1"	5'-3"	16	#10	#5	3/2"	5'-3"	16	#10	5	#5	3/2"	12'-0" x 14'-0"	14'-0" x 2'-6"	14-#6	14-#7	13-#9	13-#9	#5 @ 12
III	16		2'-2" x 2'-2"	2'-2" x 1"	2'-4" x 2'-4"	2'-4" x 1"												12'-0" x 14'-0"	14'-0" x 2'-6"	15-#6	15-#7			
IV	18		2'-4" x 2'-4"	2'-4" x 1"	2'-6" x 2'-6"	2'-6" x 1"												12'-0" x 14'-0"	14'-0" x 2'-6"	15-#6	15-#7			
V	20		2'-6" x 2'-6"	2'-6" x 1"	2'-8" x 2'-8"	2'-8" x 1"												13'-0" x 14'-0"	14'-0" x 2'-6"	15-#6	15-#7	14-#9	14-#9	
VI	24		2'-10" x 2'-10"	2'-10" x 1"	3'-0" x 3'-0"	3'-0" x 1"	5'-9"			#11								13'-0" x 16'-0"	16'-0" x 2'-6"	17-#7	17-#7		14-#11	
VII	24	3/4"																13'-0" x 17'-0"	17'-0" x 2'-6"	18-#7	18-#7			
VIII	24	3/32"																13'-0" x 18'-0"	18'-0" x 2'-6"	19-#7	19-#7			
IX	24	3/32"																13'-0" x 18'-0"	18'-0" x 2'-6"	19-#7	19-#7			

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

  
 REGISTERED CIVIL ENGINEER  
 No. C63939  
 Exp. 9-30-20  
 CIVIL  
 STATE OF CALIFORNIA

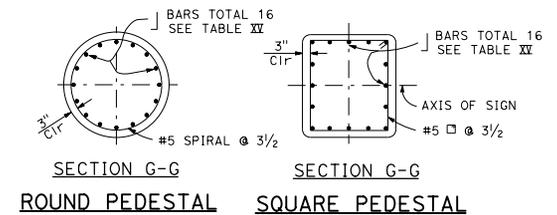
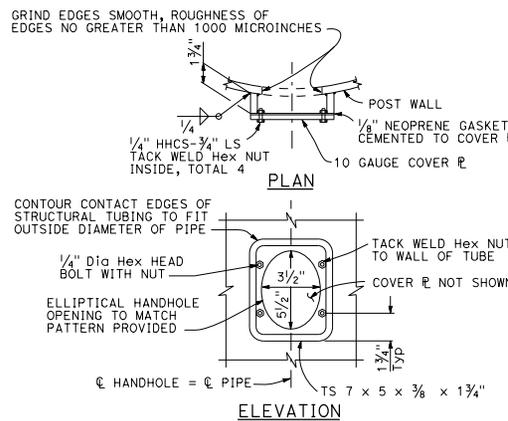
October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED \_\_\_\_\_



NOTES:

- For "General Notes", see Revised Standard Plan RSP S1.
- Longer side of footing (longitudinal) shall be normal to axis of sign.
- Backfill shall be in place prior to erection of post.
- Thread upper 10" of anchor bolts and galvanize upper 1'-0".
- Spread footing with square pedestal foundation shown, use Pile Foundation when shown on the Project Plans. For pile foundation details, see Standard Plan S8.
- Anchor plates may be retained with hexagon nut or formed head as alternatives to details shown.
- On single post sign structures, the post shall be raked out of plumb, with the use of the leveling nuts to make the bottom of the sign frame level.
- At final position of post all top and bottom nuts shall be tightened against base plate.
- When foundation is located on a steep slope with exposed face of concrete adjacent to traffic, see "Detail C" on Standard Plan S8, as applicable.
- Slope protection required when indicated on the Project Plans.



STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**OVERHEAD SIGNS-TRUSS  
 SINGLE POST TYPE  
 POST TYPES II THROUGH IX**  
 NO SCALE

RSP S2 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN S2  
 DATED MAY 31, 2018 - PAGE 410 OF THE STANDARD PLANS BOOK DATED 2018.

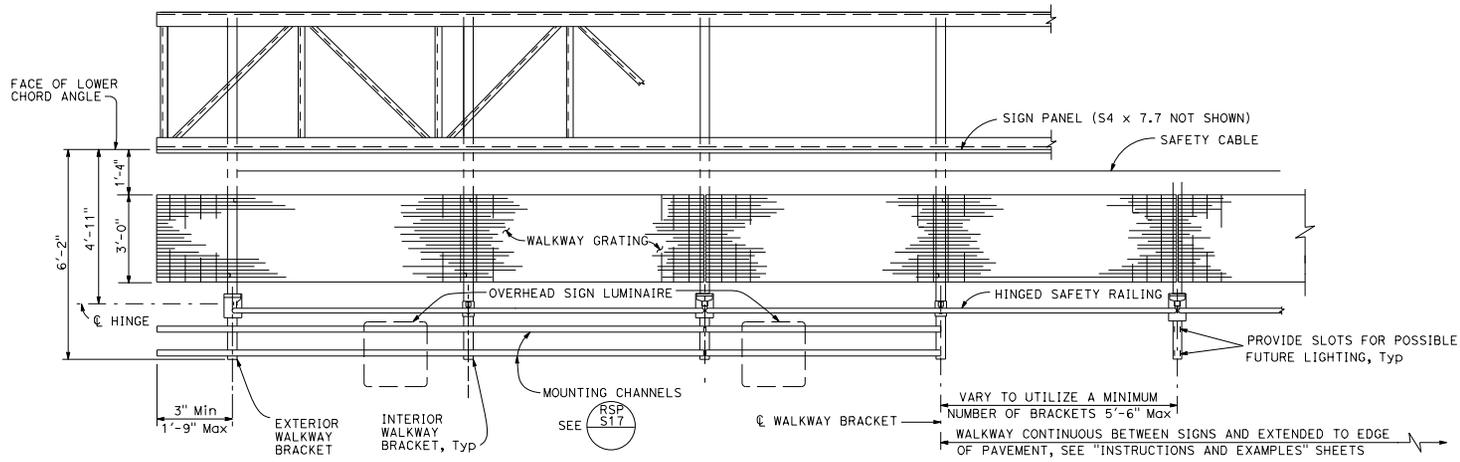
**REVISED STANDARD PLAN RSP S2**

2018 REVISED STANDARD PLAN RSP S2

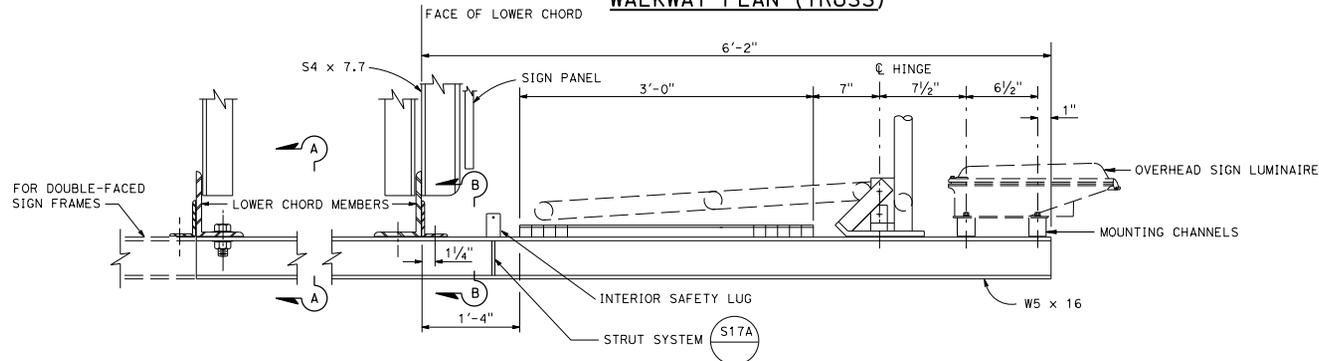
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS


  
 REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 No. C63939  
 Exp. 9-30-20  
 CIVIL  
 STATE OF CALIFORNIA

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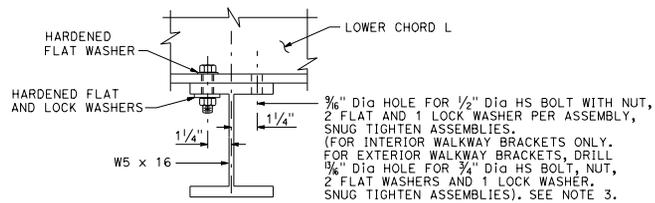


**WALKWAY PLAN (TRUSS)**

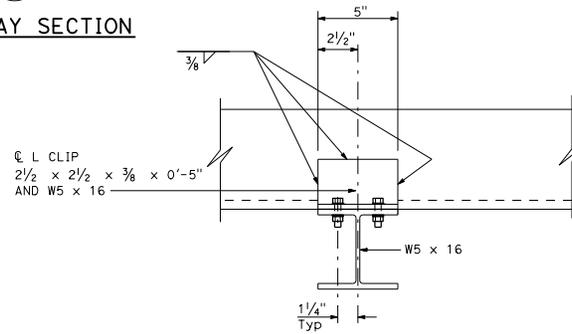


**TRUSS**

**TYPICAL WALKWAY SECTION**

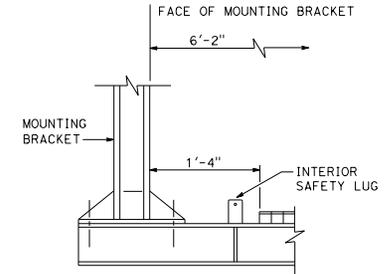


**SECTION A-A**

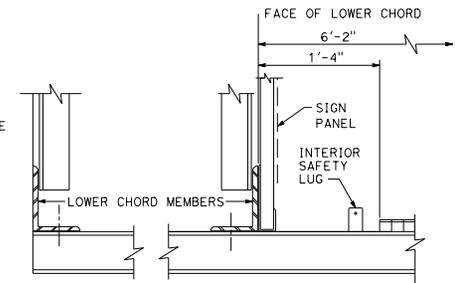


**SECTION B-B**

TO ACCOMPANY PLANS DATED \_\_\_\_\_



**TUBULAR AND BRIDGE MOUNTED**



**BOX BEAM  
CLOSED TRUSS**

**NOTES:**

1. For spacing of overhead sign luminaire, see Revised Standard Plan RSP ES-15A.
2. For safety lug details, see Revised Standard Plan RSP S17.
3. For double faced sign frames with double walkways, use a total 8 bolt assemblies per bracket.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**OVERHEAD SIGNS  
 WALKWAY DETAILS No. 1**  
 NO SCALE

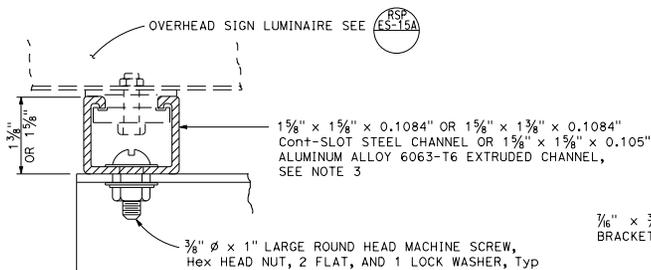
RSP S16 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN S16  
 DATED MAY 31, 2018 - PAGE 422 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP S16**

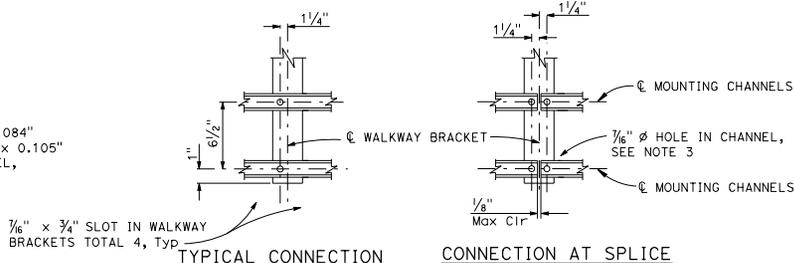
2018 REVISED STANDARD PLAN RSP S16

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

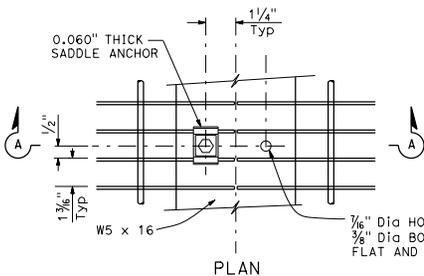

  
 REGISTERED CIVIL ENGINEER  
 October 19, 2018  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



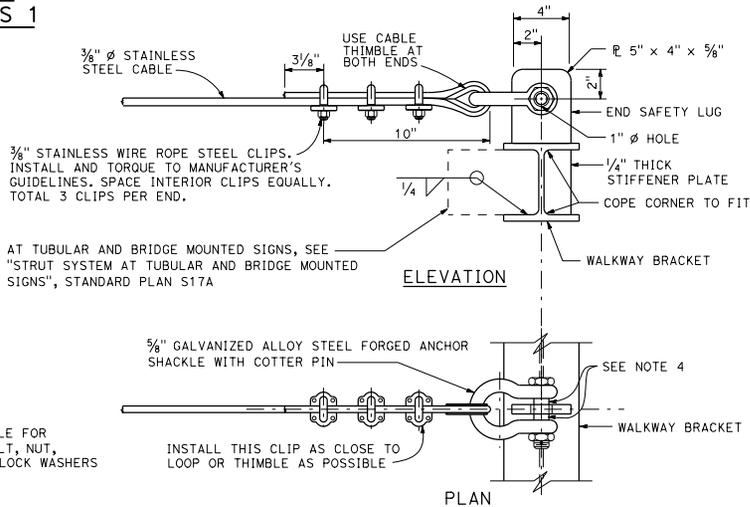
**OVERHEAD SIGN LUMINAIRE MOUNTING CHANNEL DETAILS 1**



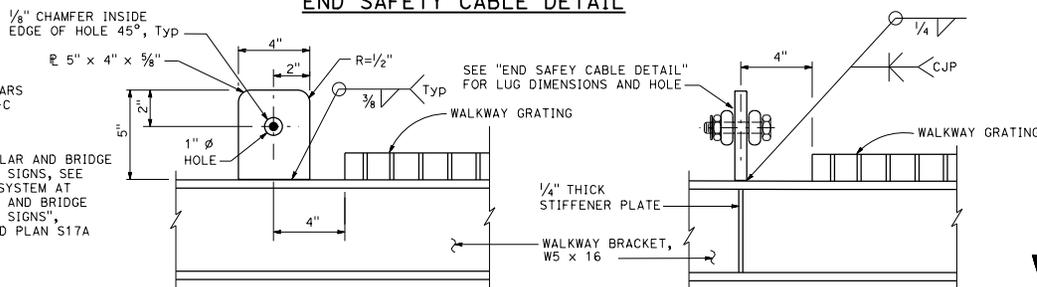
**OVERHEAD SIGN LUMINAIRE MOUNTING CHANNEL DETAILS 2**



**WALKWAY GRATING DETAILS**  
Shown at splice



**END SAFETY CABLE DETAIL**



**INTERIOR SAFETY LUG DETAIL**  
(At every walkway bracket between exterior walkway brackets)

**END SAFETY LUG DETAIL**  
(At exterior walkway brackets)

**NOTES:**

1. Welded type grating shall have 1/4" x 1/8" bearing bars at 1 3/8" centers with 1/4" diameter (or equal) cross bars at 4" centers. If mechanical lock grating is used, it shall be equal in strength to the welded type. Alternate hold-down clips may be submitted for approval.
2. Walkway grating and overhead sign luminaire mounting channels to be continuous (no splices) over as many walkway brackets as practical and consistent with fabrication, ease of handling and assembly.
3. Contractor may substitute 1 5/8" x 1 5/8" x .1084" cont-slot steel channel with pre-punched slots not larger than 1/2" x 3". Slots shall be at bottom of channel and shall be parallel to channel. Slots shall be spaced not closer than 4" center to center.
4. Place an equal amount of washers on each side to align cable with end lug without restricting shackle bolt rotation or contacting cable.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**OVERHEAD SIGNS  
WALKWAY DETAILS No. 2**

NO SCALE

RSP S17 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN S17  
DATED MAY 31, 2018 - PAGE 423 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP S17**

2018 REVISED STANDARD PLAN RSP S17

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

October 18, 2019  
PLANS APPROVAL DATE

TO ACCOMPANY PLANS DATED \_\_\_\_\_

REGISTERED CIVIL ENGINEER  
Atifa Ferouzi  
No. C80402  
Exp. 3-31-21  
CIVIL  
STATE OF CALIFORNIA

**LEGEND**

- TRAFFIC CONE
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ⬢ FLASHING ARROW SIGN (FAS)
- ☀ FAS SUPPORT OR TRAILER
- ☀ PORTABLE FLASHING BEACON

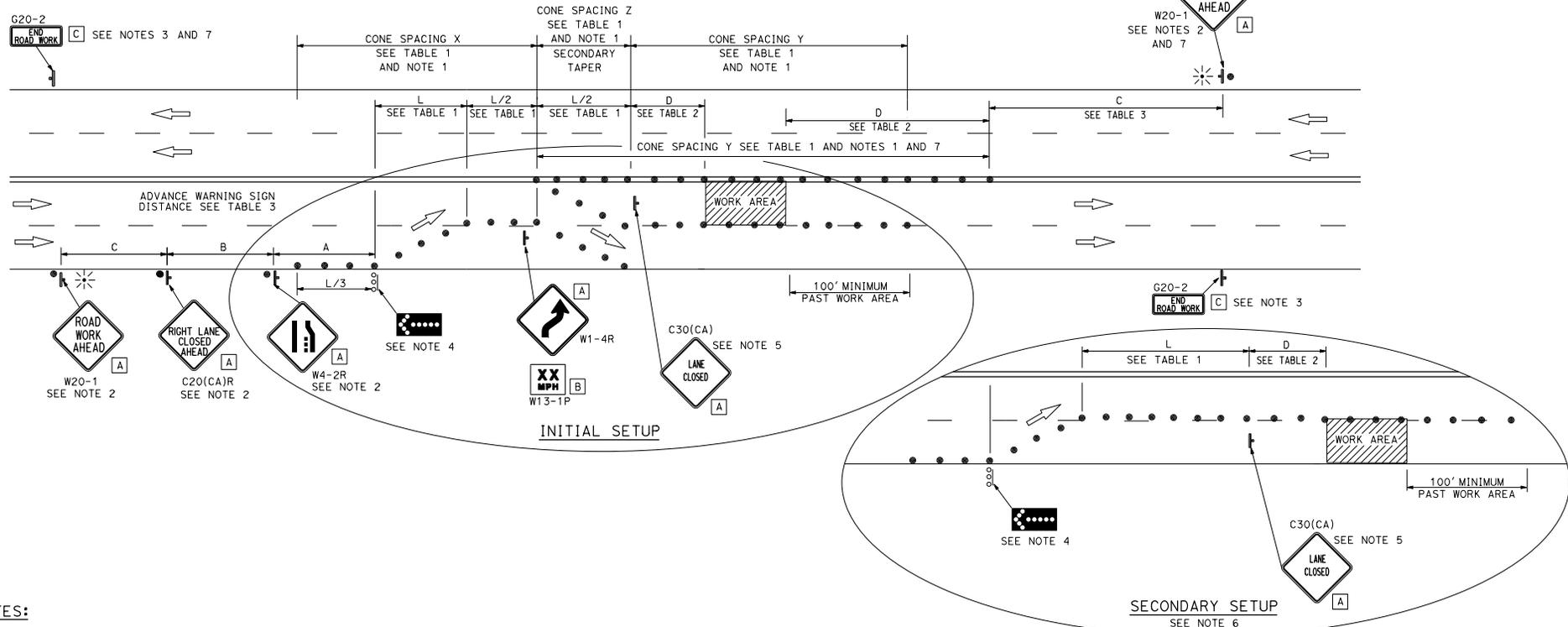
**SIGN PANEL SIZE (Min)**

- A 48" x 48"
- B 24" x 24"
- C 36" x 18"

**NOTES:**

- See Standard Plan T9 for tables.
- Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.
- Provide at least one person to continuously maintain traffic control devices for lane closures.

**TYPICAL CHANGEABLE LANE CLOSURE**



**NOTES:**

1. Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
2. Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacon shall be placed at the locations indicated for lane closure during hours of darkness.
3. A G20-2 "END ROAD WORK" sign shall be placed at the end of the lane closure unless the end of work area is obvious or ends within the larger project's limits.
4. A minimum 1500' of sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at the top of crest vertical curve or on a horizontal curve.
5. Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work area.
6. Relocate secondary taper to tangent location and relocate C30(CA) sign. Remove W1-4R/W13-1P sign package.
7. Sign installations and cones are not required when a median barrier is in place.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TRAFFIC CONTROL SYSTEM  
FOR CHANGEABLE LANE CLOSURE ON  
MULTILANE CONVENTIONAL  
HIGHWAYS AND EXPRESSWAYS**

NO SCALE

RSP T11A DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN T11A  
DATED MAY 31, 2018 - PAGE 289 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP T11A**

2018 REVISED STANDARD PLAN RSP T11A

**NOTES:**

See Standard Plan T9 for tables.

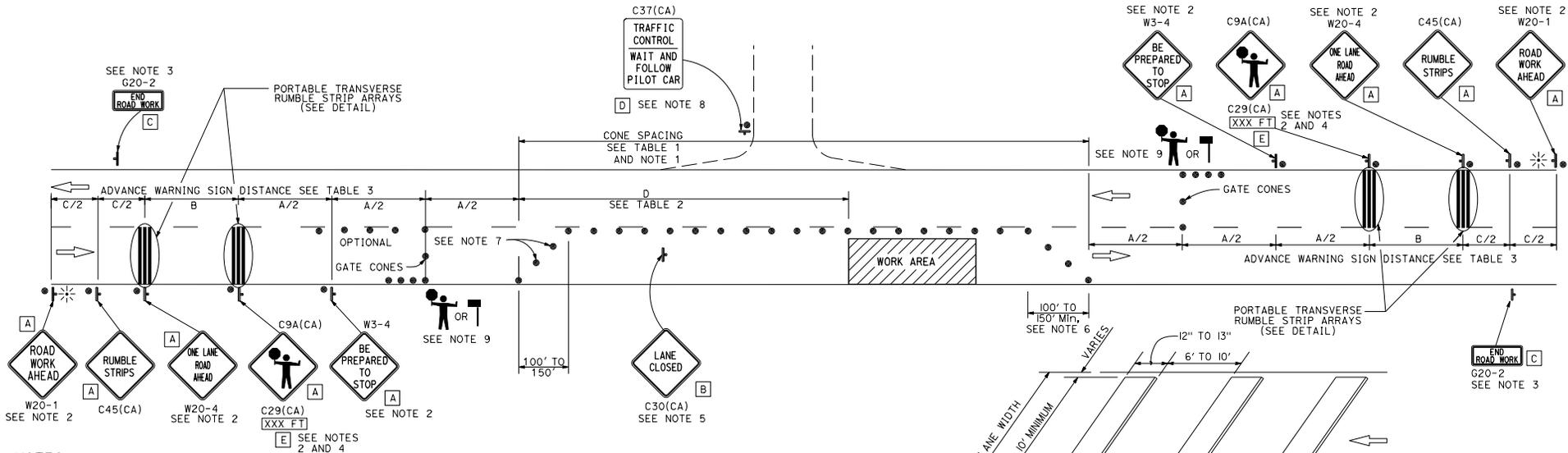
Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

Provide at least one person to continuously maintain traffic control devices for lane closures.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

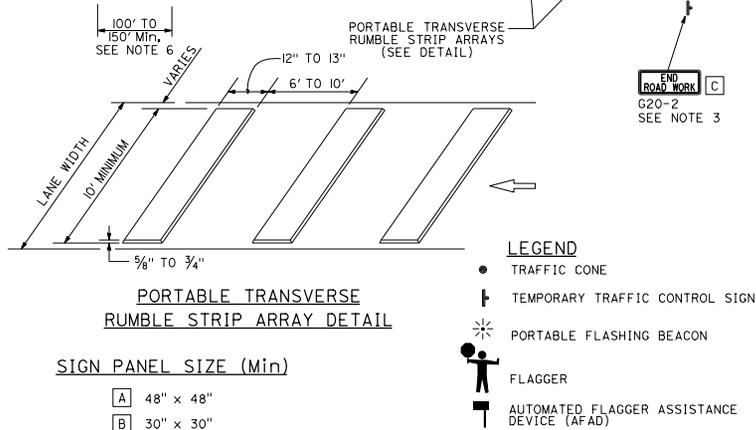
*Atifa Ferouz*  
 REGISTERED CIVIL ENGINEER  
 No. C80402  
 EXP. 3-31-21  
 CIVIL  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

**TYPICAL LANE CLOSURE WITH REVERSIBLE CONTROL**



**NOTES:**

1. Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
2. Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
3. A G20-2 "END ROAD WORK" sign, shall be placed at the end of the lane closure unless the end of work area is obvious or ends within the larger project's limits.
4. An optional C29(CA) sign may be placed below the C9A(CA) sign.
5. Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work area. They are optional if the work area is visible from the flagger station.
6. Length may be reduced by the Engineer to address site conditions.
7. Either traffic cones or barricades shall be placed on the taper. Barricades shall be Type I, II, or III.
8. When a pilot car is used, place a C37(CA) "TRAFFIC CONTROL-WAIT AND FOLLOW PILOT CAR" sign with black legend on white background at all intersections, driveways and alleys without a flagger within the traffic control area.
9. Automated Flagger Assistance Devices (AFAD) may be used if allowed by the special provisions or approved by the Engineer.



**SIGN PANEL SIZE (Min)**

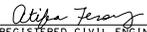
- A 48" x 48"
- B 30" x 30"
- C 36" x 18"
- D 36" x 42"
- E 20" x 7"

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
 FOR LANE CLOSURE ON  
 TWO LANE CONVENTIONAL  
 HIGHWAYS**  
 NO SCALE

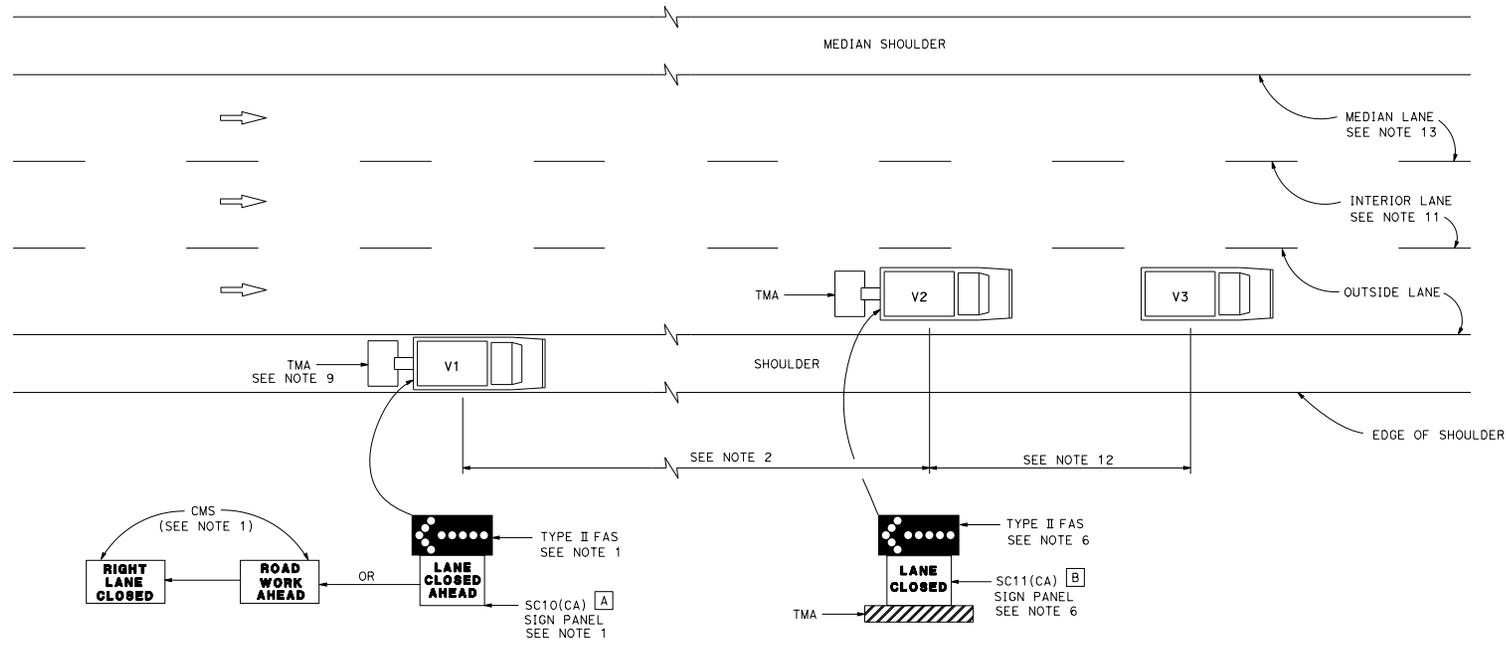
RSP T13 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN T13  
DATED MAY 31, 2018 - PAGE 291 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP T13**

2018 REVISED STANDARD PLAN RSP T13

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
 REGISTERED CIVIL ENGINEER					
April 19, 2019 PLANS APPROVAL DATE					
					
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					

TO ACCOMPANY PLANS DATED \_\_\_\_\_



**MOVING LANE CLOSURE ON MEDIAN LANE OR  
OUTSIDE LANE OF MULTILANE HIGHWAYS**

**NOTES:**

1. Either a changeable message sign or a SC10(CA) sign panel and a Type II flashing arrow sign shall be mounted on the rear of sign vehicle V1. The changeable message sign shall be sequenced to show the "ROAD WORK AHEAD" message first, followed by the "RIGHT LANE CLOSED" message. For median lane closure, the flashing arrow symbol shall be reversed with the arrowhead on the right and the changeable message sign shall show "LEFT LANE CLOSED".
2. If traffic queues develop, sign vehicle V1 should be positioned upstream from the end of queue. Sign vehicle V1 shall be positioned where highly visible when shoulders are not available.
3. A minimum sight distance of 1500' should be provided in advance of sign vehicle V1.
4. Sign vehicle V1 should remain at the beginning of horizontal or vertical curves until the other vehicles (V2 and V3) are far enough beyond the curve to resume the minimum sight distance of 1500'.
5. Vehicle-mounted sign panels shall have Type III or above retroreflective sheeting, black on white, or black on fluorescent orange, with 6" minimum series D letters per Caltrans sign specifications.
6. Shadow vehicle V2 shall be equipped with a truck-mounted attenuator. The sign panel shown and a Type II flashing arrow sign shall be mounted on the rear of shadow vehicle V2. For median lane closure the flashing arrow sign symbol shall be displayed with the arrowhead on the right.
7. All vehicles used for lane closures shall be equipped with two-way radios, and the vehicle operators shall maintain communication during the work or application operation.
8. All vehicles shall be equipped with flashing or rotating amber lights.
9. If sign vehicle V1 encroaches into the traffic lane due to insufficient shoulder width, sign vehicle V1 shall be equipped with a truck-mounted attenuator. Sign vehicle V1 shall stay as close to the edge of shoulder as practicable.
10. Where workers would be on foot in the work area, a stationary type lane closure (Standard Plan T10, T11, etc., as applicable) shall be used instead of this plan.

11. For moving lane closure on interior lane of multilane highways, use Standard Plan T16.
12. The spacing between work vehicle(s) and the shadow vehicles, and between each shadow vehicle should be minimized to deter road users from driving in between.
13. When the work/application vehicle V3 occupies the median lane, sign vehicle V1 should drive in the median shoulder and indicate left lane closed ahead.

**SIGN PANEL SIZE (Min)**

- A 66" x 36"
- B 54" x 42"

**LEGEND**

- V1 SIGN VEHICLE
- V2 SHADOW VEHICLE
- V3 WORK/APPLICATION VEHICLE
-  FLASHING ARROW SIGN (FAS)
- CMS CHANGEABLE MESSAGE SIGN
- TMA TRUCK-MOUNTED ATTENUATOR

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TRAFFIC CONTROL SYSTEM  
FOR MOVING LANE CLOSURE  
ON MULTILANE HIGHWAYS**

NO SCALE

RSP T15 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN T15  
DATED MAY 31, 2018 - PAGE 293 OF THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP T15**

**2018 REVISED STANDARD PLAN RSP T15**

**NOTES:**

- Duplicate sign installations are not required:
  - On opposite shoulder if at least one-half of the available lanes remain open to traffic.
  - In the median if the width of the median shoulder is less than 8' and the outside lanes are to be closed.
- Where speed limit reduction zones are longer than 3 miles, place intermediate R2-1 sign and G20-5aP plaque at approximate 3-mile spacing throughout the speed limit reduction zone.
- Place an R2-1 sign and G20-5aP plaque at each entrance ramp within the speed limit reduction zone.
- The distances shown for sign spacing are approximate, are intended as guidance purposes only, and should be applied with engineering judgement. The distances should be adjusted by the Engineer for field conditions, if necessary, by increasing or decreasing the recommended distances.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

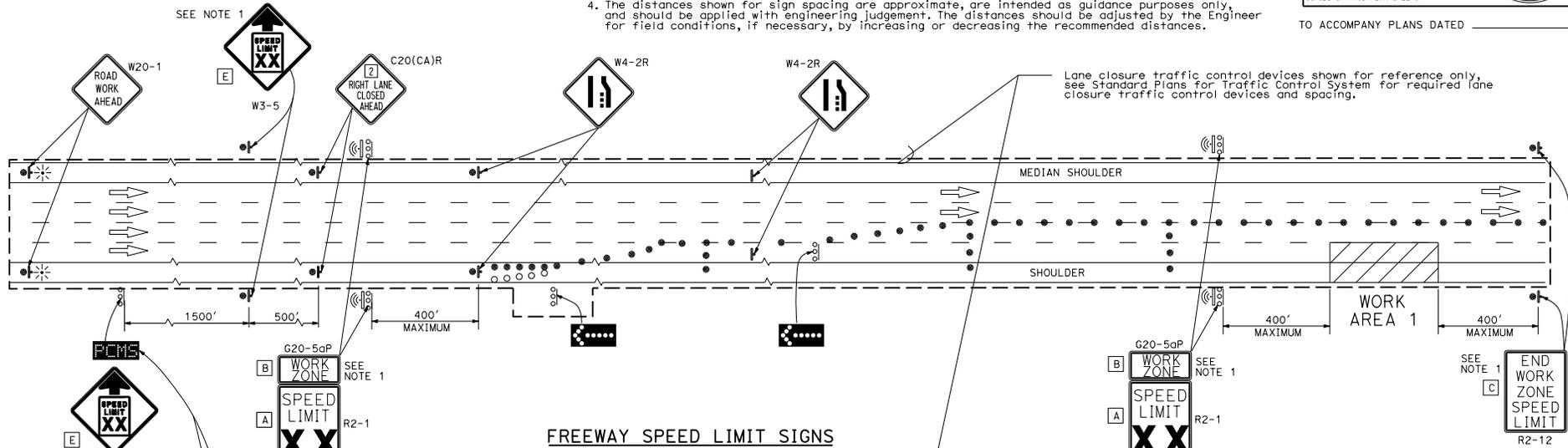
Atifa Ferouz  
REGISTERED CIVIL ENGINEER

April 17, 2020  
PLANS APPROVAL DATE

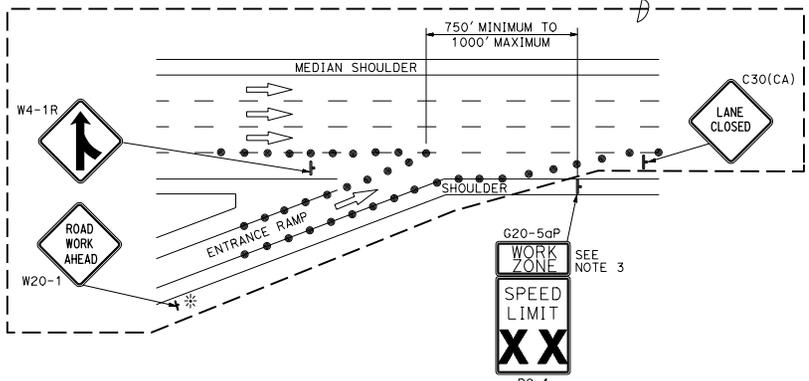
Atifa Ferouz  
No. C80402  
Exp. 3-31-21  
CIVIL

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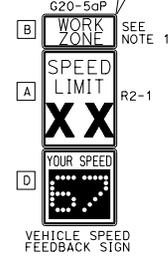
TO ACCOMPANY PLANS DATED \_\_\_\_\_



**FREEWAY SPEED LIMIT SIGNS**



**ENTRANCE RAMP SPEED LIMIT SIGN**



Sign Size	Freeway and Expressway (Min)
A	36 x 48
B	36 x 24
C	36 x 54
D	36 x 36
E	48 x 48

- LEGEND:**
- TRAFFIC CONE
  - TRAFFIC CONE (OPTIONAL TAPER)
  - ⊥ TEMPORARY TRAFFIC CONTROL SIGN
  - ⬇ FLASHING ARROW SIGN (FAS)
  - ⊞ FAS SUPPORT OR TRAILER
  - ⊛ PORTABLE FLASHING BEACON
  - PCMS PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
  - Ⓜ PORTABLE RADAR SPEED FEEDBACK SIGN SYSTEM

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
CONSTRUCTION WORK ZONE  
SPEED LIMIT REDUCTION ON  
FREEWAYS AND EXPRESSWAYS**  
NO SCALE

RSP T18 DATED APRIL 17, 2020 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP T18**

2018 REVISED STANDARD PLAN RSP T18

**LEGEND:**

- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ⬛ FLASHING ARROW SIGN (FAS)
- ☉ FAS SUPPORT OR TRAILER
- ⚡ PORTABLE FLASHING BEACON
- PCMS PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- 📡 PORTABLE RADAR SPEED FEEDBACK SIGN SYSTEM

**SIGN PANEL SIZE (Min)**

- A 48" x 48"
- B 36" x 18"
- C 24" x 30"
- D 24" x 18"
- E 24" x 36"
- F 24" x 24"

**NOTES:**

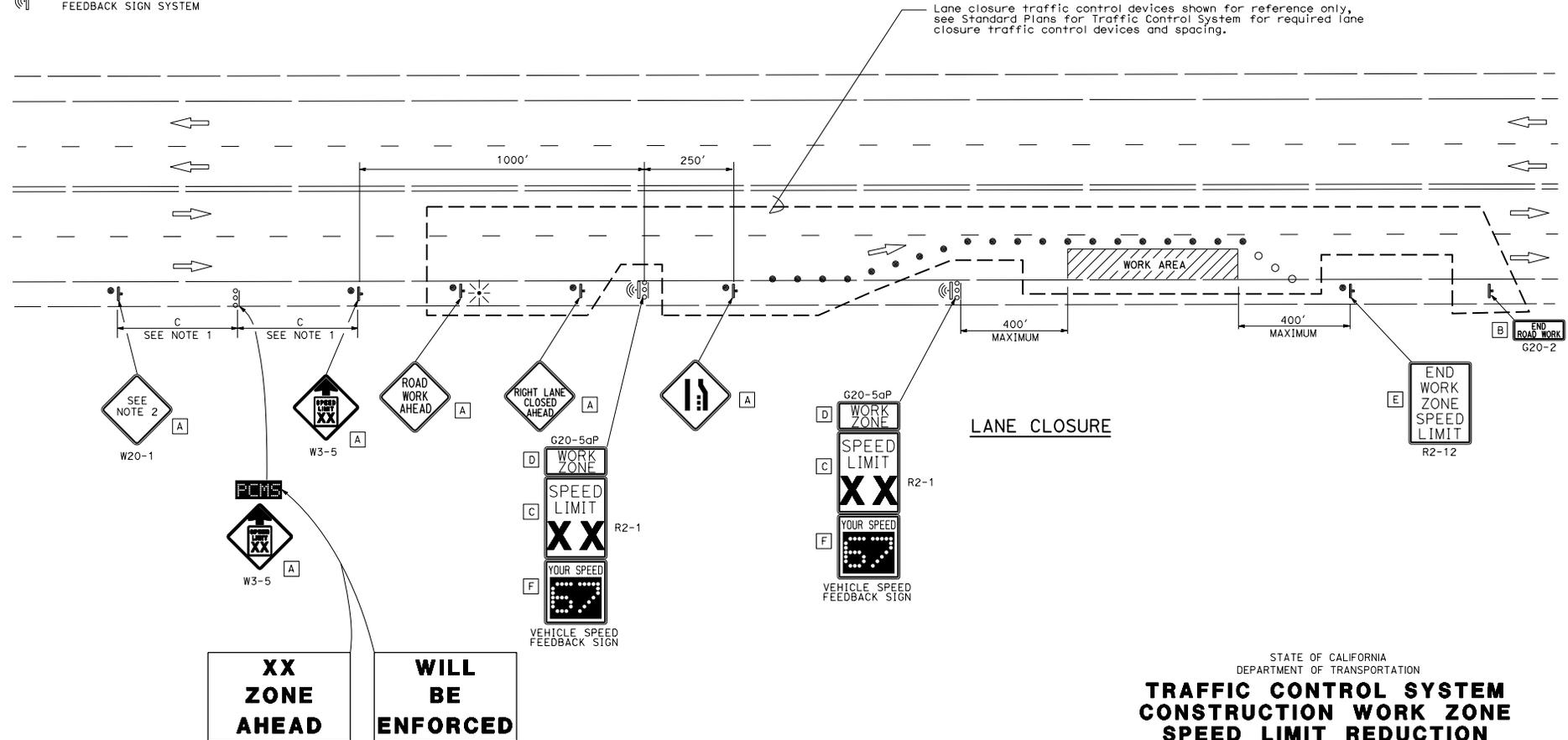
1. See Standard Plan T9 for Table 3 showing advanced warning sign spacing.
2. If the PCMS is outside the W20-1 construction area sign, place a W20-1 sign in advance of the PCMS.
3. Place additional R2-1 sign and G20-5aP plaque:
  - a. Where speed limit reduction zones are longer than 3 miles. Place intermediate signs at approximately 3-mile spacing throughout the speed limit reduction zone.
  - b. Approximately 500 feet downstream from major intersections within the speed limit reduction zone.

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Atifa Ferouz*  
 REGISTERED CIVIL ENGINEER  
 No. C80402  
 Exp. 3-31-21  
 CIVIL  
 STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
CONSTRUCTION WORK ZONE  
SPEED LIMIT REDUCTION  
ON CONVENTIONAL HIGHWAYS**  
NO SCALE

RSP T19 DATED APRIL 17, 2020 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP T19**

2018 REVISED STANDARD PLAN RSP T19

**LEGEND:**

- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- FLASHING ARROW SIGN (FAS)
- FAS SUPPORT OR TRAILER
- PORTABLE FLASHING BEACON
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- PORTABLE RADAR SPEED FEEDBACK SIGN SYSTEM

SIGN SIZE (Min)		
	FREEWAY AND EXPRESSWAY	CONVENTIONAL SINGLE LANE AND MULTILANE
A	36 x 48	24 x 30
B	36 x 24	24 x 18
C	36 x 54	24 x 36
D	36 x 36	24 x 24
E	48 x 48	48 x 48

**NOTES:**

1. See Standard Plan T9 for Table 3 showing advanced warning sign spacing.
2. Duplicate sign installations are not required:
  - a) On opposite shoulder if at least one-half of the available lanes remain open to traffic.
  - b) In the median if the width of the median shoulder is less than 8' and the outside lanes are to be closed.
3. If the PCMS is outside the W20-1 construction area sign, place a W20-1 sign in advance of the PCMS.
4. Place the R3(CA) sign 400 feet downstream from the end of the last work area and place an additional vehicle speed feedback sign system 400 feet upstream from the beginning of each work area with a separation of more than 2 miles.
5. The distances for sign spacing are approximate, are intended as guidance purposes only, and should be applied with engineering judgement. The distances should be adjusted by the Engineer for field conditions, if necessary, by increasing or decreasing the recommended distances.

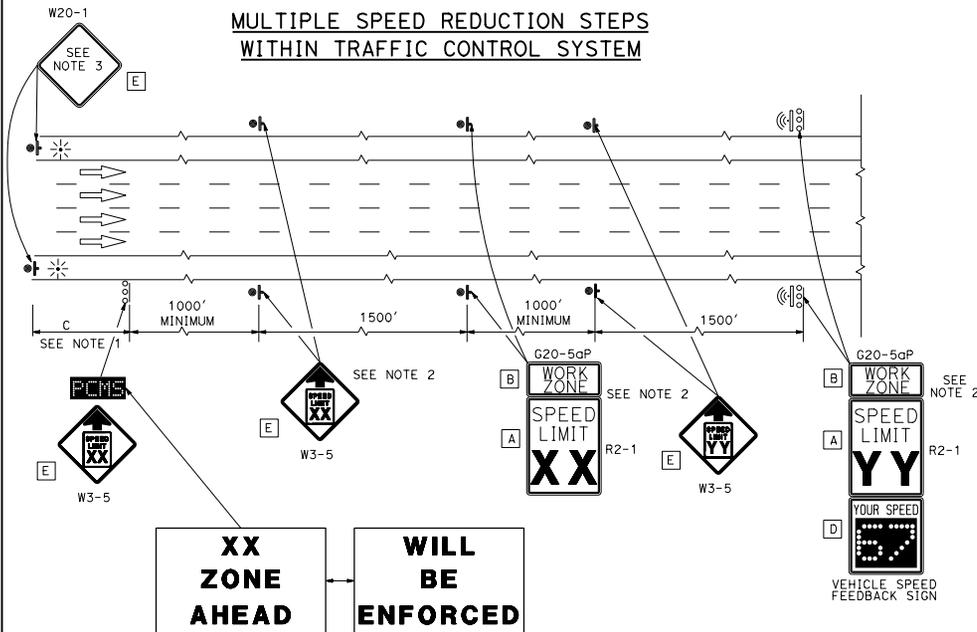
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Atifa Ferouz*  
 REGISTERED CIVIL ENGINEER  
 No. C80402  
 Exp. 3-31-21  
 CIVIL  
 STATE OF CALIFORNIA

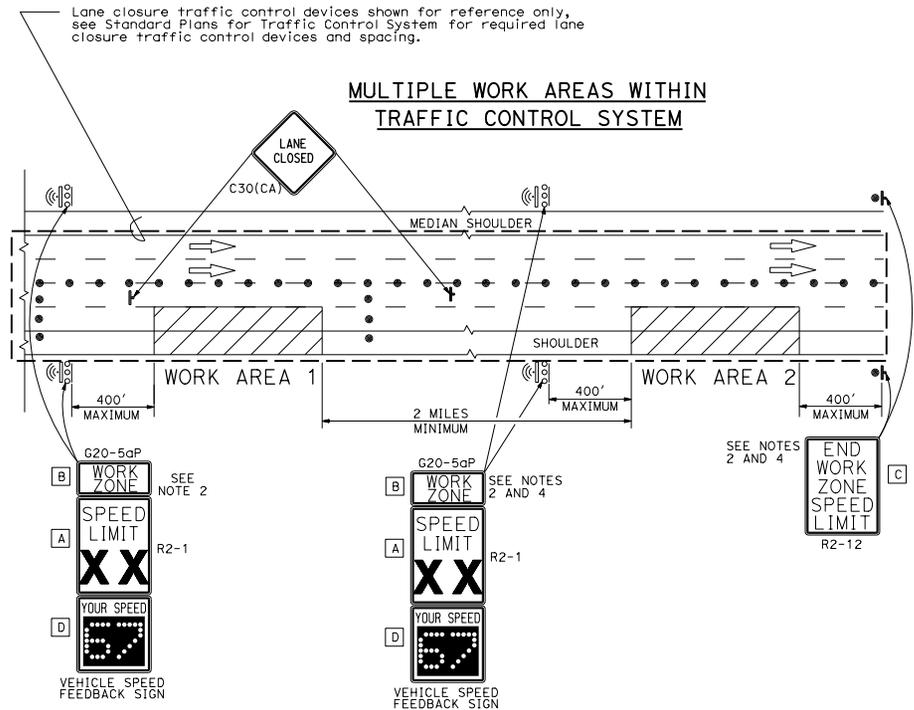
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TO ACCOMPANY PLANS DATED \_\_\_\_\_

**MULTIPLE SPEED REDUCTION STEPS WITHIN TRAFFIC CONTROL SYSTEM**



**MULTIPLE WORK AREAS WITHIN TRAFFIC CONTROL SYSTEM**



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TRAFFIC CONTROL SYSTEM  
CONSTRUCTION WORK ZONE SPEED LIMIT  
REDUCTION DETAILS**

NO SCALE  
RSP T20 DATED OCTOBER 16, 2020 SUPERSEDES RSP T20 DATED APRIL 17, 2020  
THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP T20**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

Atifa Ferouz  
REGISTERED CIVIL ENGINEER

October 16, 2020  
PLANS APPROVAL DATE

Atifa Ferouz  
No. C80402  
Exp. 3-31-21  
CIVIL  
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED \_\_\_\_\_

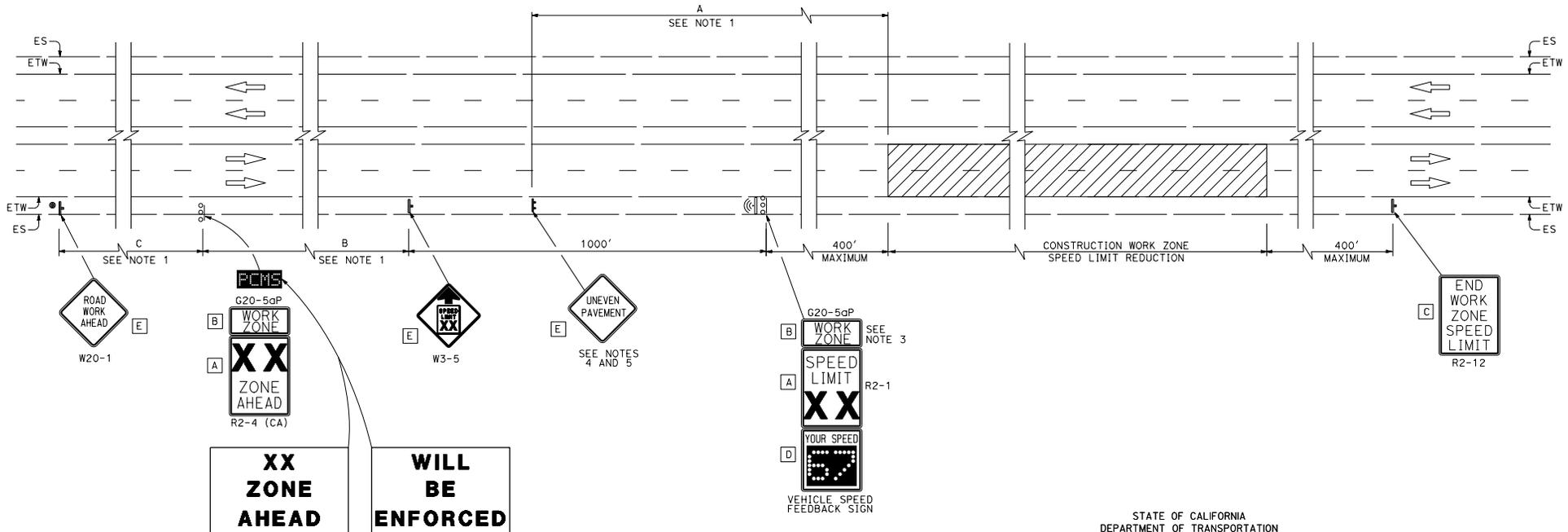
**LEGEND:**

- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ⚡ FLASHING ARROW SIGN (FAS)
- ☉ FAS SUPPORT OR TRAILER
- ⊛ PORTABLE FLASHING BEACON
- PCMS PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- Ⓜ TEMPORARY RADAR SPEED FEEDBACK SIGN SYSTEM

SIGN SIZE (Min)		
	FREEWAY AND EXPRESSWAY	CONVENTIONAL SINGLE LANE AND MULTILANE
A	36 x 48	24 x 30
B	36 x 24	24 x 18
C	36 x 54	24 x 36
D	36 x 36	24 x 24
E	48 x 48	48 x 48

**NOTES:**

1. See Standard Plan T9 for Table 3 showing advanced warning sign spacing.
2. Duplicate sign installations are not required:
  - a. On opposite shoulder if at least one-half of the available lanes remain open to traffic.
  - b. In the median if the width of the median shoulder is less than 8' and the outside lanes are to be closed.
3. Place additional R2-1 sign and G20-5aP plaque:
  - a. Where speed limit reduction zones are longer than 3 miles. Place intermediate sign at approximately 3-mile spacing throughout the speed limit reduction zone.
  - b. At each entrance ramp within the speed limit reduction zone.
  - c. Approximately 500 feet downstream from major intersections within the speed limit reduction zone.
4. Place appropriate advanced warning sign for the roadway condition that requires the construction work zone speed limit reduction.
5. Where speed limit reduction zones are longer than 3 miles, place additional appropriate advanced warning signs intermediate at approximately 3-mile spacing throughout the speed reduction zone.



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TRAFFIC CONTROL SYSTEM  
CONSTRUCTION WORK ZONE SPEED LIMIT REDUCTION  
TWENTY-FOUR HOURS A DAY 7 DAYS A WEEK (24/7)**

NO SCALE  
RSP T21 DATED OCTOBER 16, 2020 SUPERSEDES RSP T21 DATED APRIL 17, 2020  
THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP T21**

2018 REVISED STANDARD PLAN RSP T21

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

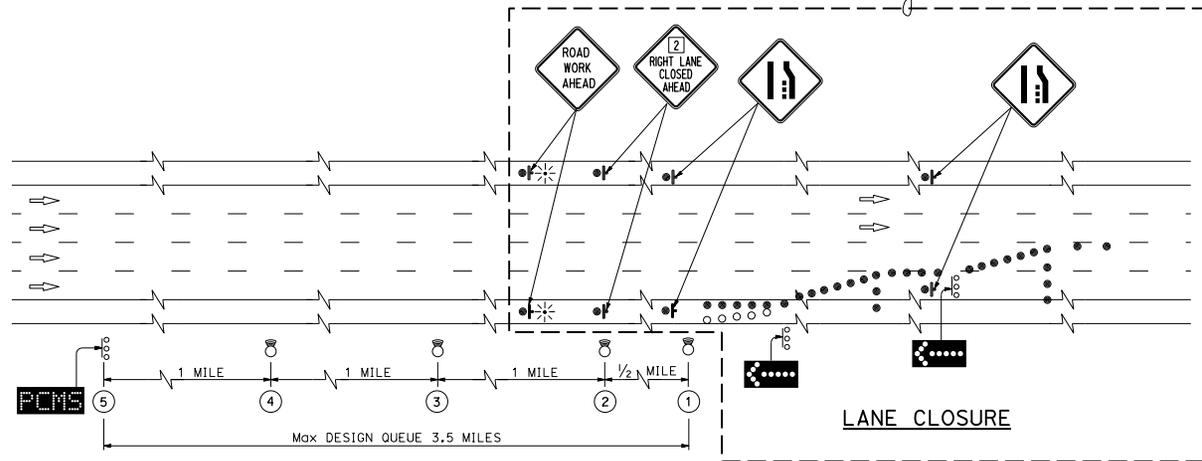
*Charles D. Suenzo*  
 REGISTERED CIVIL ENGINEER  
 No. C43029  
 EXP. 3-31-22  
 CIVIL  
 STATE OF CALIFORNIA

April 17, 2020  
 PLANS APPROVAL DATE  
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**LEGEND:**

- PORTABLE VEHICLE SPEED SENSOR
- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- PORTABLE FLASHING BEACON
- SIGN
- SUPPORT OR TRAILER
- LOCATION
- FLASHING ARROW SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

This is not part of the temporary automated end of queue warning system. See Standard Plans for Traffic Control System for lane closure components.



MESSAGE AT ⑤	LAST 5 Min SPEED AVERAGES, V(MPH)			
	SENSOR AT ④	SENSOR AT ③	SENSOR AT ②	SENSOR AT ①
ROAD WORK AHEAD	> 45	> 45	> 45	=> 45
SLOW TRAFFIC 3 MILES	> 45	> 45	=> 45	25 < V < 45
SLOW TRAFFIC 2 MILES	> 45	=> 45	25 < V < 45	---
SLOW TRAFFIC 1 MILE	=> 45	25 < V < 45	---	---
SLOW TRAFFIC AHEAD	25 < V < 45	---	---	---
STOPPED TRAFFIC 3 MILES	> 25	> 25	> 25	<= 25
STOPPED TRAFFIC 2 MILES	> 25	> 25	<= 25	---
STOPPED TRAFFIC 1 MILE	> 25	<= 25	---	---
STOPPED TRAFFIC AHEAD	<= 25	---	---	---

For other posted speed limits adjust speeds shown on the table by adding or subtracting the calculated speed adjustment using the following formula:  
 Speed Adjustment = X posted speed limit - 55 mph  
 Add speed adjustments to speed averages.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**TEMPORARY AUTOMATED END OF  
QUEUE WARNING SYSTEM  
TYPE 1  
(QUEUE <= 3.5 MILES)**

NO SCALE

RSP T26 DATED APRIL 17, 2020 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP T26**

2018 REVISED STANDARD PLAN RSP T26

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

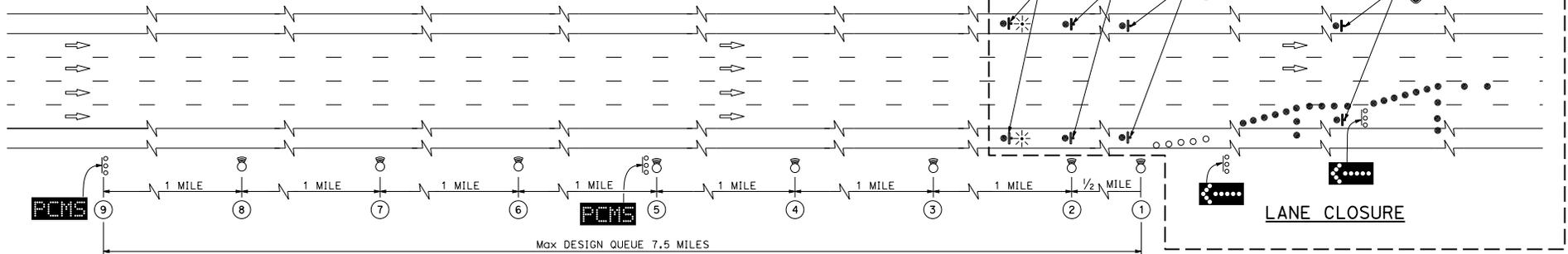
  
 REGISTERED CIVIL ENGINEER  
 April 17, 2020  
 PLANS APPROVAL DATE  
 No. C43029  
 Exp. 3-31-22  
 CIVIL  
 STATE OF CALIFORNIA

**LEGEND:**

-  PORTABLE VEHICLE SPEED SENSOR
-  TRAFFIC CONE
-  TRAFFIC CONE (OPTIONAL TAPER)
-  PORTABLE FLASHING BEACON
-  SIGN
-  SUPPORT OR TRAILER
-  LOCATION
-  FLASHING ARROW SIGN
-  PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

This is not part of the temporary automated end of queue warning system. See Standard Plans for Traffic Control System for lane closure components.

TO ACCOMPANY PLANS DATED \_\_\_\_\_



OPERATIONAL GUIDELINE FOR PCMS MESSAGES FOR POSTED SPEED LIMIT 55 MPH

MESSAGE AT ⑨	LAST 5 Min SPEED AVERAGES, V(MPH)				MESSAGE AT ⑤	LAST 5 Min SPEED AVERAGES, V(MPH)			
	SENSOR AT ⑧	SENSOR AT ⑦	SENSOR AT ⑥	SENSOR AT ⑤		SENSOR AT ④	SENSOR AT ③	SENSOR AT ②	SENSOR AT ①
ROAD WORK AHEAD	> 45	> 45	> 45	=> 45	ROAD WORK AHEAD	> 45	> 45	> 45	=> 45
SLOW TRAFFIC 3 MILES	> 45	> 45	=> 45	25 < V < 45	SLOW TRAFFIC 3 MILES	> 45	> 45	=> 45	25 < V < 45
SLOW TRAFFIC 2 MILES	> 45	=> 45	25 < V < 45	---	SLOW TRAFFIC 2 MILES	> 45	=> 45	25 < V < 45	---
SLOW TRAFFIC 1 MILE	=> 45	25 < V < 45	---	---	SLOW TRAFFIC 1 MILE	=> 45	25 < V < 45	---	---
SLOW TRAFFIC AHEAD	25 < V < 45	---	---	---	SLOW TRAFFIC AHEAD	25 < V < 45	---	---	---
STOPPED TRAFFIC 3 MILES	> 25	> 25	> 25	<= 25	STOPPED TRAFFIC 3 MILES	> 25	> 25	> 25	<= 25
STOPPED TRAFFIC 2 MILES	> 25	> 25	<= 25	---	STOPPED TRAFFIC 2 MILES	> 25	> 25	<= 25	---
STOPPED TRAFFIC 1 MILE	> 25	<= 25	---	---	STOPPED TRAFFIC 1 MILE	> 25	<= 25	---	---
STOPPED TRAFFIC AHEAD	<= 25	---	---	---	STOPPED TRAFFIC AHEAD	<= 25	---	---	---

For other posted speed limits adjust speeds shown on the table by adding or subtracting the calculated speed adjustment using the following formula:

$$\text{Speed Adjustment} = X \text{ posted speed limit} - 55 \text{ mph}$$

Add speed adjustments to speed averages.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**TEMPORARY AUTOMATED END OF  
QUEUE WARNING SYSTEM  
TYPE 2  
(QUEUE <= 7.5 MILES)**

NO SCALE

RSP T27 DATED APRIL 17, 2020 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

**REVISED STANDARD PLAN RSP T27**

2018 REVISED STANDARD PLAN RSP T27