

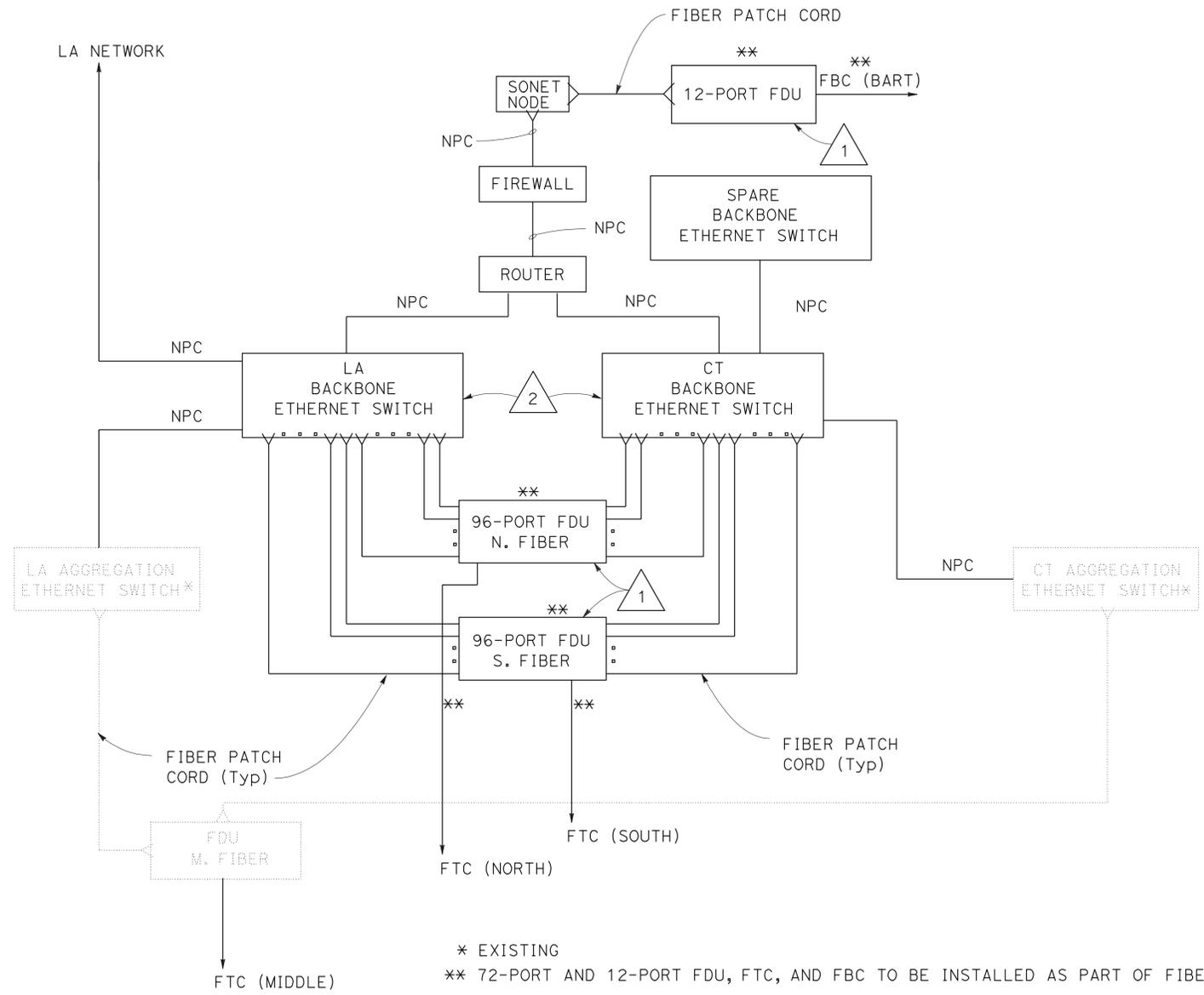
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	201	252

*Larry Porter* 12-08-11  
 REGISTERED ELECTRICAL ENGINEER DATE  
 1-23-12  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 Larry W. Porter  
 No. 15766  
 Exp. 11-30-12  
 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.

DESIGNED BY	LARRY PORTER
CHECKED BY	MICHAEL P. LEE
FUNCTIONAL SUPERVISOR	CHARLES PRICE
DEPARTMENT OF TRANSPORTATION	ELECTRICAL



\* EXISTING  
 \*\* 72-PORT AND 12-PORT FDU, FTC, AND FBC TO BE INSTALLED AS PART OF FIBER OPTIC SYSTEM.

**SHEET NOTES:**

- 1 TERMINATE FTC (ALL FIBERS 1-72) IN FDU. SEE PLAN SHEETS E-148 TO E-150 FOR FIBER ASSIGNMENTS. FOR 12-PORT BART FIBER TERMINATE FBC IN FDU (ALL FIBER 1-12).
- 2 INSTALL AND CONNECT SFP GIGABIT FIBER TRANSCEIVERS IN SWITCH PER MANUFACTURER GUIDELINES AND AS DIRECTED BY THE ENGINEER.

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.



USERNAME => s109858  
 DGN FILE => 44a923ua139.dgn

CU 04226

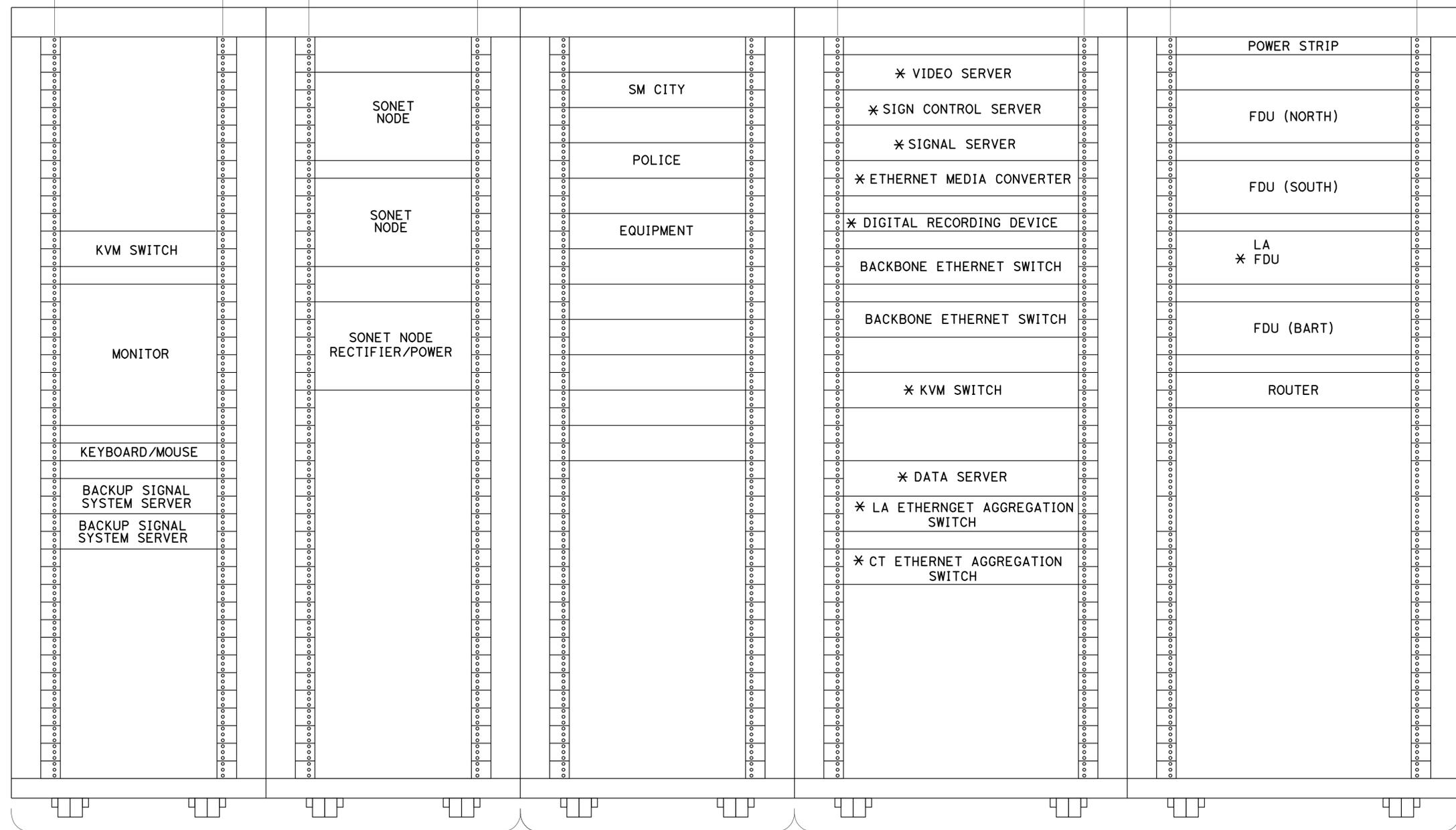
EA 4A9231

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	202	252

*Larry Porter* 12-05-11  
 REGISTERED ELECTRICAL ENGINEER DATE  
 1-23-12  
 PLANS APPROVAL DATE

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 OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
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REGISTERED PROFESSIONAL ENGINEER  
 Larry W. Porter  
 No. 15766  
 Exp. 11-30-12  
 ELECTRICAL  
 STATE OF CALIFORNIA



FURNISH AND INSTALL  
19" RACK-MOUNT  
COMMUNICATION CABINETS

\* EXISTING  
CITY OF SAN MATEO "1T" RACK

EXISTING 22" RACK-MOUNT  
COMMUNICATION CABINETS  
WITH 19" ADAPTER \*

**FRONT VIEW**

**NOTE:**  
\* EXISTING

FOR NOTES, ABBREVIATIONS AND  
LEGEND, SEE SHEET E-1 TO E-3.

**ELECTRICAL DETAILS**  
**SAN MATEO HUB COMMUNICATION SYSTEM**  
**EQUIPMENT CABINET LAYOUT**

NO SCALE

**E-140**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
**ELECTRICAL**  
FUNCTIONAL SUPERVISOR: CHARLES PRICE  
CALCULATED/DESIGNED BY: LARRY PORTER  
CHECKED BY: MICHAEL P. LEE  
REVISED BY: LARRY PORTER  
DATE REVISED: MICHAEL P. LEE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	203	252
 REGISTERED ELECTRICAL ENGINEER			12-2-11	DATE	
1-23-12 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>					



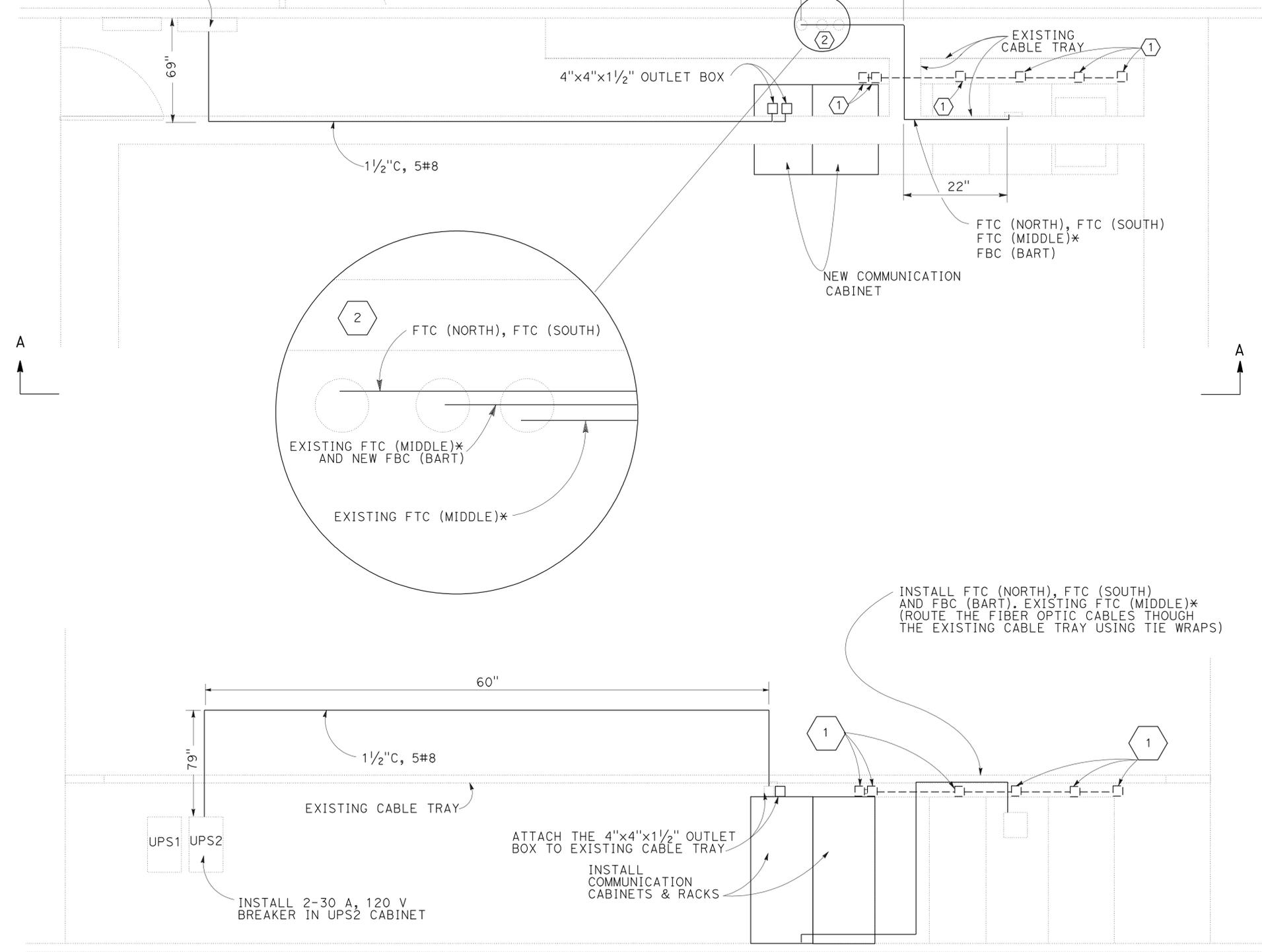
**GENERAL NOTES: (THIS SHEET ONLY)**

- SEE SHEET E-142 FOR WIRING DIAGRAM.
- SEE SHEET E-162 FOR RACK DETAILS.

**SHEET NOTES: (THIS SHEET ONLY)**

- ① EXISTING OUTLET BOX.
- ② FOR CONTINUATION SEE SHEET E-111.

INSTALL 2-30 A, 120 V BREAKER IN UPS2 CABINET



INSTALL FTC (NORTH), FTC (SOUTH) AND FBC (BART). EXISTING FTC (MIDDLE)\* (ROUTE THE FIBER OPTIC CABLES THROUGH THE EXISTING CABLE TRAY USING TIE WRAPS)

ATTACH THE 4"x4"x1 1/2" OUTLET BOX TO EXISTING CABLE TRAY

INSTALL COMMUNICATION CABINETS & RACKS

INSTALL 2-30 A, 120 V BREAKER IN UPS2 CABINET

\*EXISTING

**SECTION A-A**

ALL UNITS ARE IN INCHES UNLESS OTHERWISE NOTED

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.

**ELECTRICAL DETAILS  
SAN MATEO HUB**

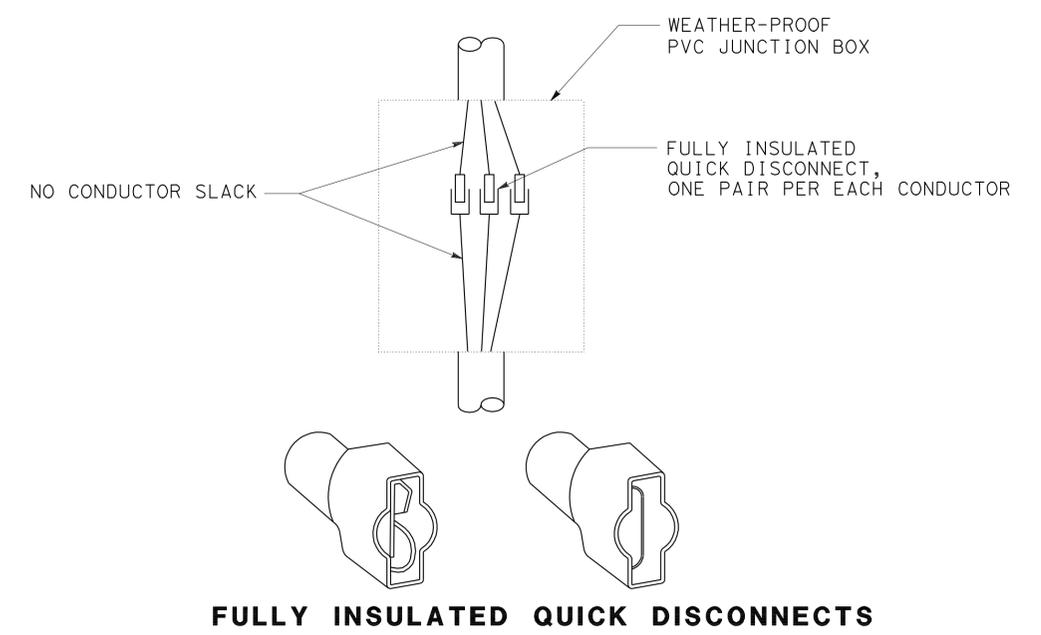
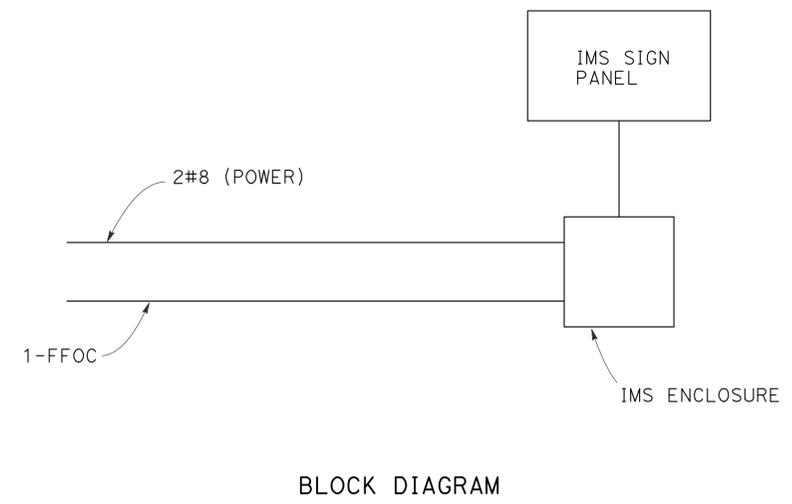
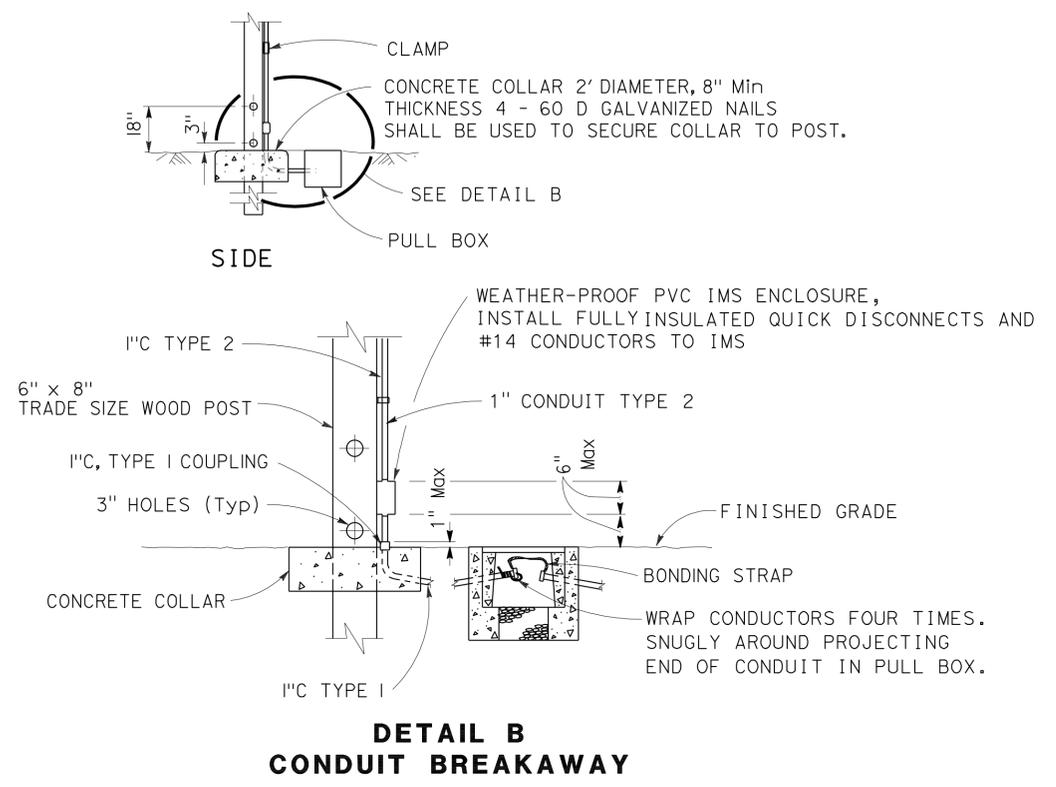
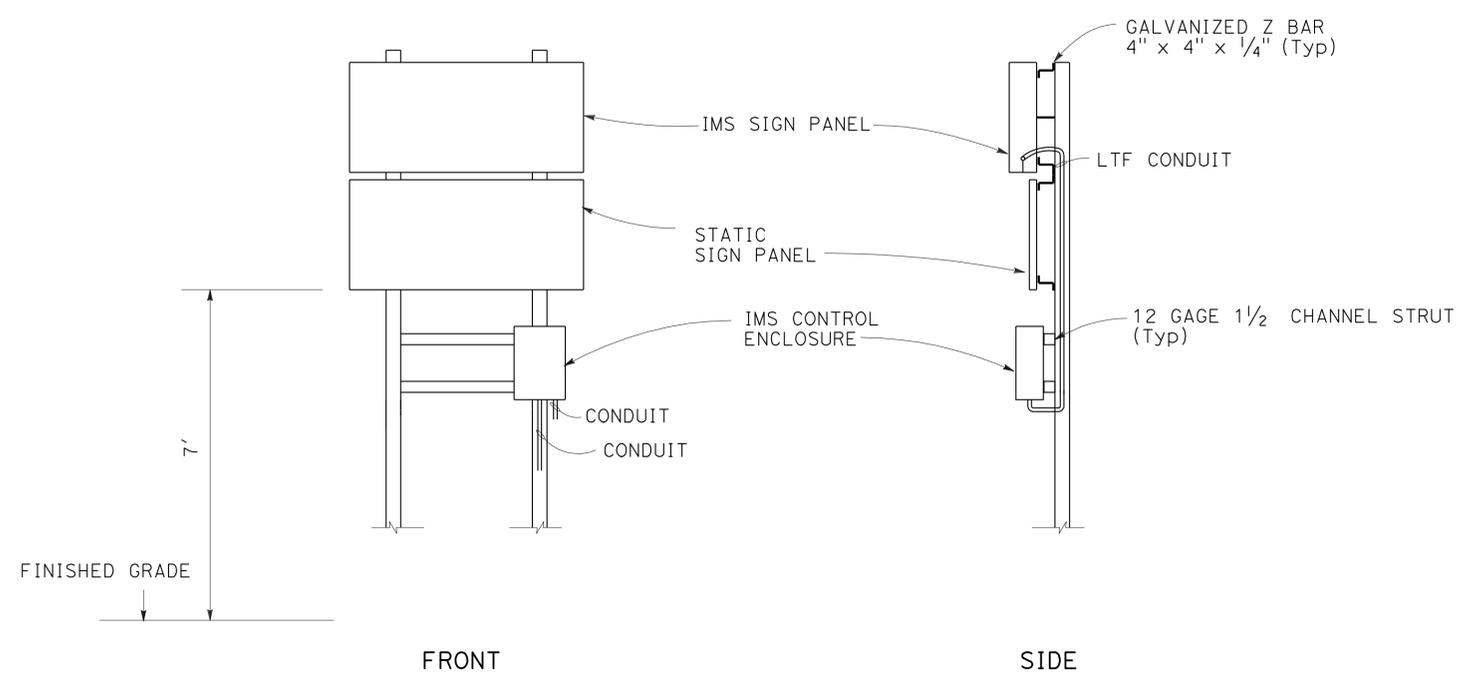
NO SCALE

**E-141**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CALCULATED, DESIGNED BY	REVISOR
<b>Caltrans</b>	BEHZAD GOLEMOHAMMADI	CHECKED BY	DATE
<b>ELECTRICAL</b>		GIZACHEW MERID	DATE
		JOHN PRESENTATION	DATE



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	205	252
<i>Sean Coughlin</i> REGISTERED ELECTRICAL ENGINEER			12-08-11 DATE		
1-23-12 PLANS APPROVAL DATE			Sean F. Coughlin No. 12227 Exp. 9-30-12 ELECTRICAL STATE OF CALIFORNIA		
<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>					



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 ELECTRICAL  
 FUNCTIONAL SUPERVISOR: CHARLES PRICE  
 SEAN COUGHLIN  
 MICHAEL P. LEE  
 REVISIONS: REVISOR, DATE, REVISION  
 CALCULATED/DESIGNED BY: CHECKED BY:

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.



USERNAME => s109858  
DGN FILE => 44a923ua143.dgn

CU 04226 EA 4A9231

**ELECTRICAL DETAILS**  
**TRAFFIC OPERATIONS SYSTEM**  
**IMS ASSEMBLY ON WOOD POST**  
 NO SCALE  
**E-143**

LAST REVISION: 09-30-12  
 DATE PLOTTED => 19-DEC-2011  
 TIME PLOTTED => 13:55

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	206	252

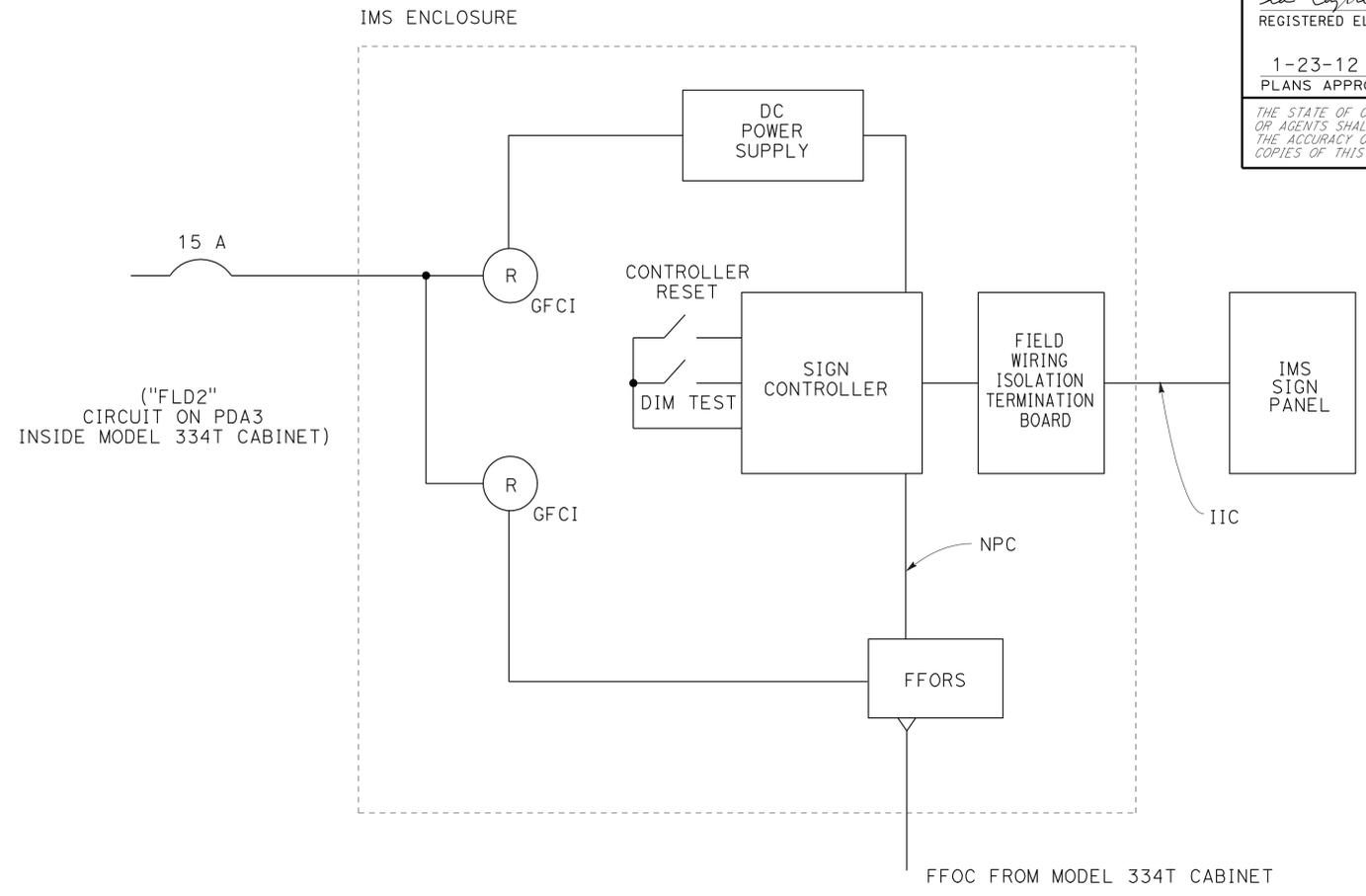
  

<i>Sean Coughlin</i>	12-08-11
REGISTERED ELECTRICAL ENGINEER	DATE
1-23-12	
PLANS APPROVAL DATE	

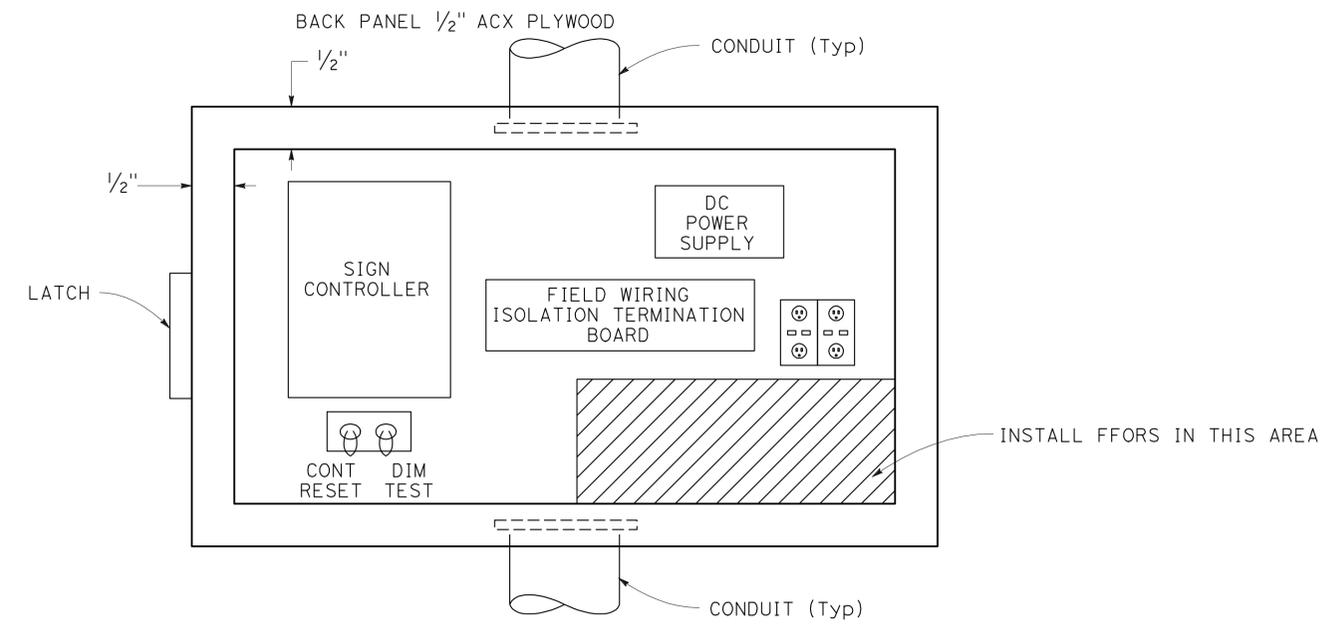
  

REGISTERED PROFESSIONAL ENGINEER
Sean F. Coughlin
No. 12227
Exp. 9-30-12
ELECTRICAL
STATE OF CALIFORNIA

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.



**WIRING DIAGRAM**



**IMS ENCLOSURE LAYOUT**

FRONT VIEW  
(DOOR REMOVED FOR CLARITY)

**ELECTRICAL DETAILS  
TRAFFIC OPERATION SYSTEM  
IMS ASSEMBLY DETAIL**

NO SCALE

**E-144**

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.



USERNAME => s109858  
DGN FILE => 44a923ua144.dgn

CU 04226

EA 4A9231

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	DESIGNED BY	REVISOR
<b>Caltrans</b>	CHARLES PRICE	SEAN COUGHLIN	SEAN COUGHLIN
<b>ELECTRICAL</b>		MICHAEL P. LEE	MICHAEL P. LEE
		CHECKED BY	DATE REVISED

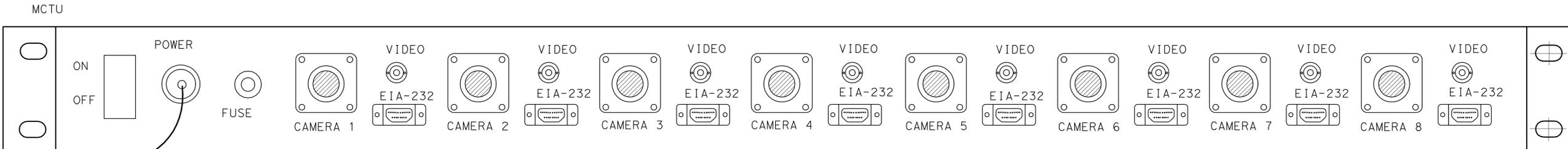
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	207	252

12-08-11  
 REGISTERED ELECTRICAL ENGINEER DATE  
 1-23-12  
 PLANS APPROVAL DATE

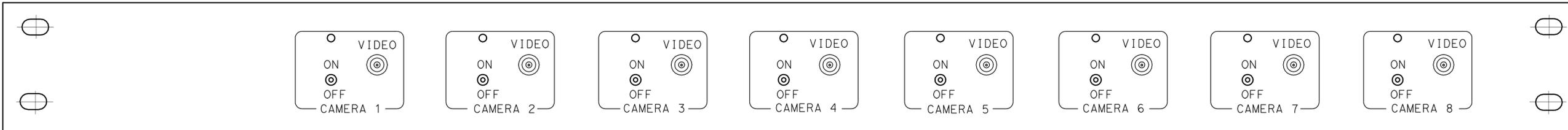
Michael P. Lee  
 No. 13435  
 Exp. 9-30-12  
 ELECTRICAL  
 STATE OF CALIFORNIA

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
**ELECTRICAL**  
 FUNCTIONAL SUPERVISOR: CHARLES PRICE  
 CALCULATED/DESIGNED BY: MICHAEL P. LEE  
 CHECKED BY: SEAN COUGHLIN  
 REVISED BY: DATE REVISIONS



**MCTU REAR PANEL LAYOUT**



**MCTU FRONT PANEL LAYOUT**

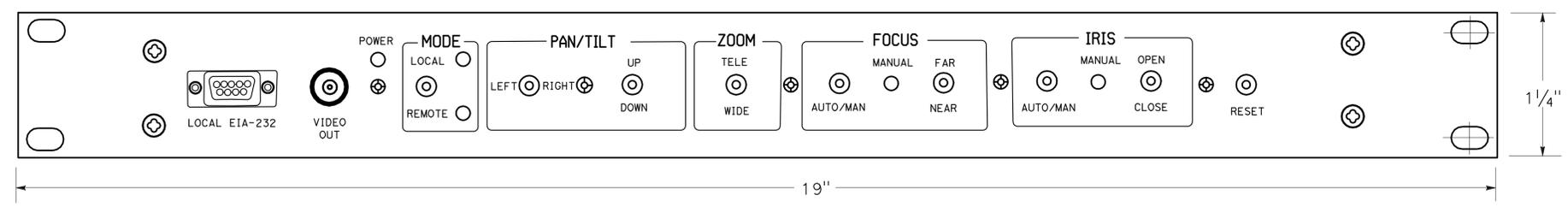
19"

**ELECTRICAL DETAILS  
MCTU PANEL LAYOUT (TYPICAL)**

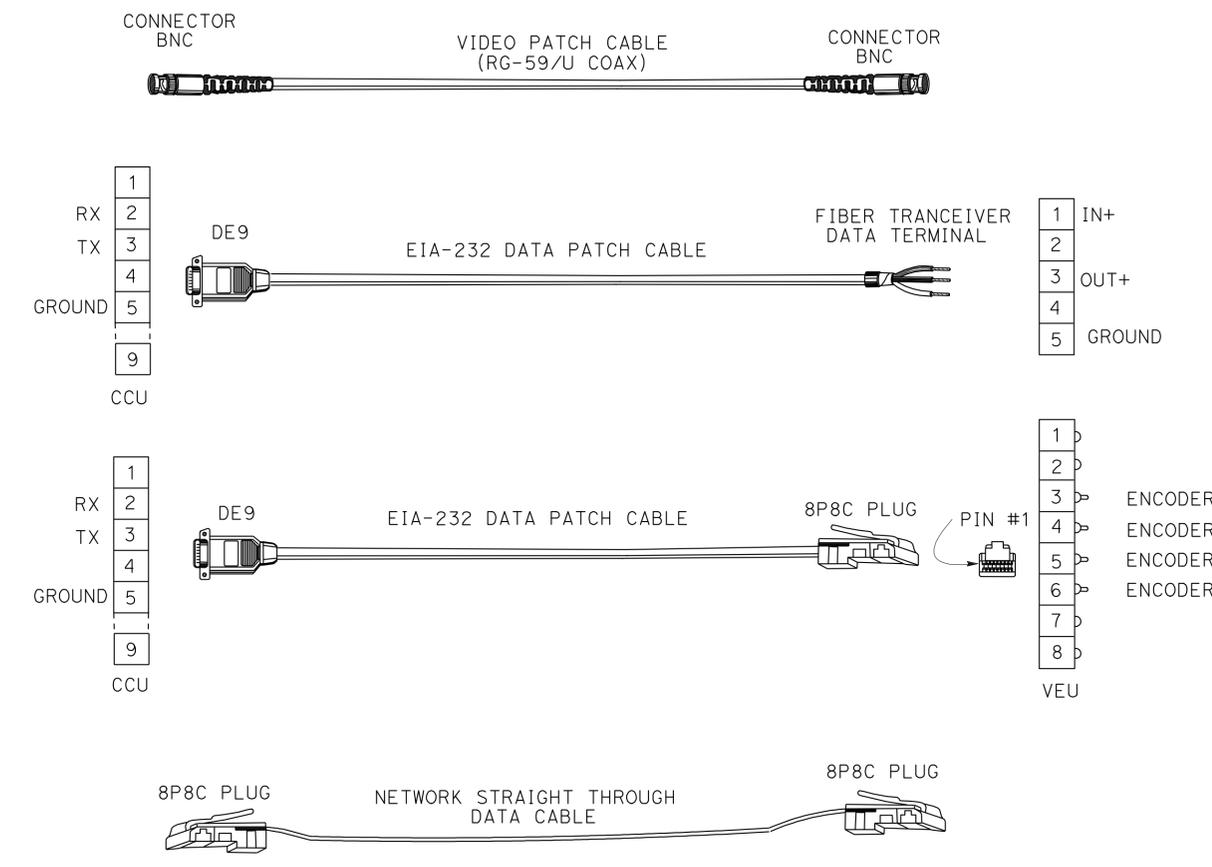
NO SCALE

**E-145**

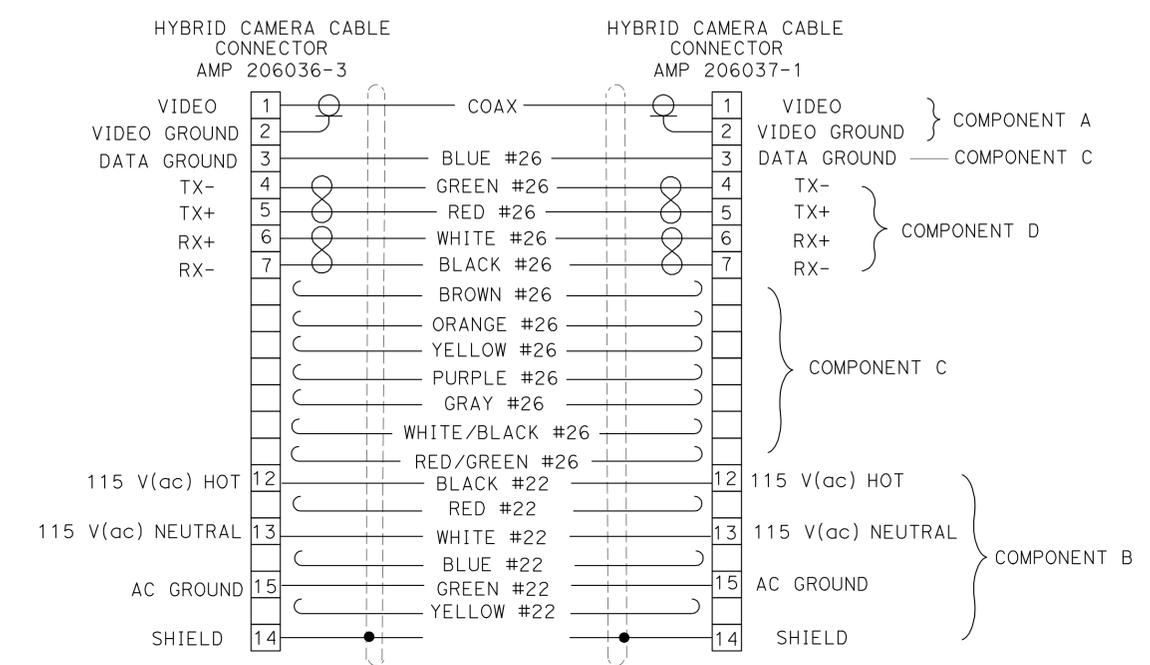
FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.



**CCU FRONT PANEL LAYOUT**

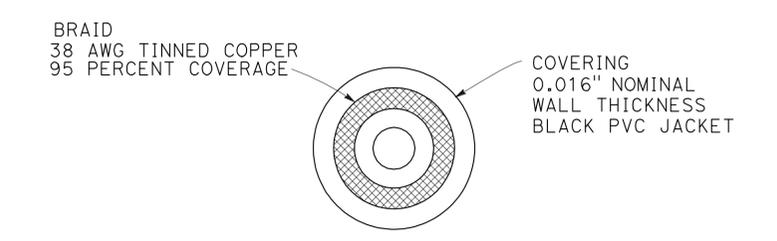


**INTERFACE CABLE DETAILS**

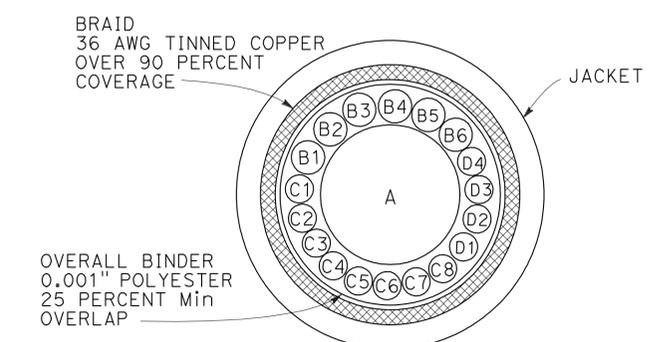


COMPONENT	CONDUCTOR	DESCRIPTION
A	COAX	75 OHM, RG-59/U TYPE, STANDARD ANALOG VIDEO CABLE, 0.242" NOMINAL DIAMETER
B	6 CONDUCTOR	22 AWG, COPPER INSULATED CONDUCTOR, 0.048" NOMINAL DIAMETER, COLOR CODED: B1-BLACK, B2-RED, B3-GREEN, B4-WHITE, B5-BLUE, B6-YELLOW
C	8 CONDUCTOR	26 AWG, COPPER INSULATED CONDUCTOR, 0.037" NOMINAL DIAMETER, COLOR CODED: C1-BROWN, C2-BLUE, C3-ORANGE, C4-YELLOW, C5-PURPLE, C6-GRAY, C7-WHITE/BLACK, C8-RED/GREEN
D	4 CONDUCTOR	26 AWG, COPPER INSULATED CONDUCTOR, 0.037" NOMINAL DIAMETER, COLOR CODED: D1-BLACK & WHITE, D2-RED & GREEN

**HYBRID CAMERA CABLE AND CONNECTORS DETAIL**



**COMPONENT A**



**HYBRID CAMERA CABLE CROSS SECTION**

**ELECTRICAL DETAILS  
(CCTV MOUNTING DETAILS)**

NO SCALE

THIS PLAN IS ACCURATE FOR ELECTRICAL WORK ONLY.

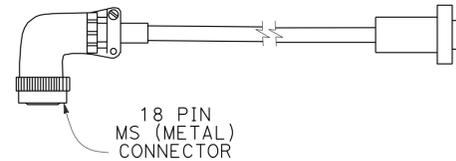
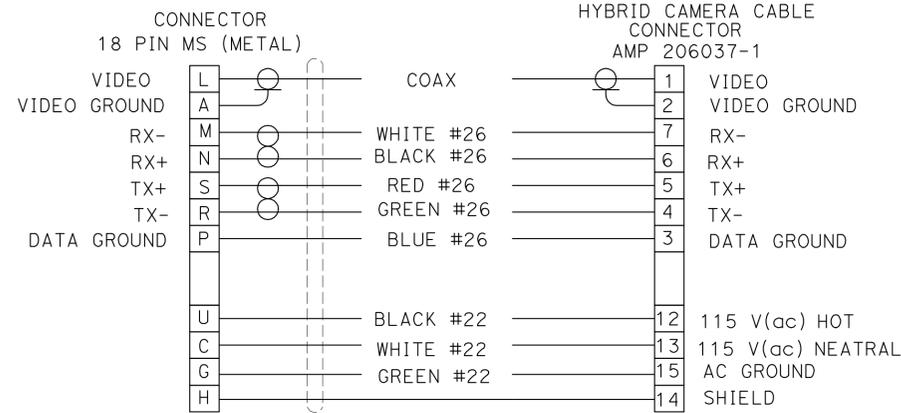
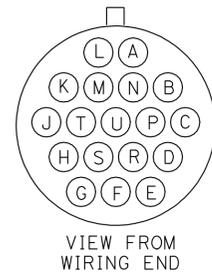
FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Electrical**  
 FUNCTIONAL SUPERVISOR: KENNETH XU  
 CALCULATED/DESIGNED BY: HENRY HOANG  
 CHECKED BY: DORIS YANG  
 REVISED BY: HENRY HOANG  
 DATE REVISED:

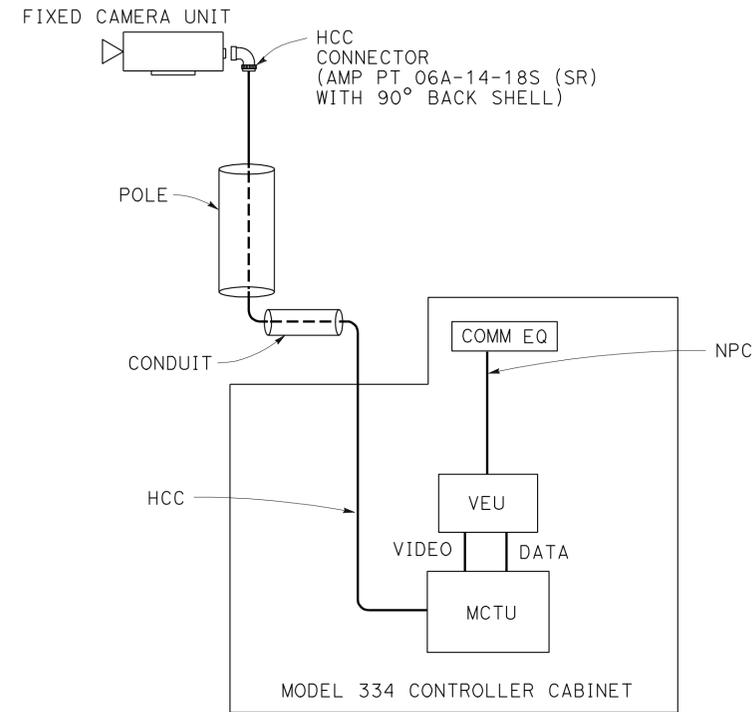
LAST REVISION: 11-03-10  
 DATE PLOTTED => 19-DEC-2011  
 TIME PLOTTED => 13:55

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	209	252
			12-08-11	REGISTERED ELECTRICAL ENGINEER DATE	
			1-23-12	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>					

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** **ELECTRICAL**  
 FUNCTIONAL SUPERVISOR: CHARLES PRICE  
 CALCULATED/DESIGNED BY: MICHAEL P. LEE  
 CHECKED BY: SEAN COUGHLIN  
 REVISOR: REVISOR  
 DATE: DATE  
 REVISION: REVISION  
 DATE: DATE



**HYBRID CAMERA CABLE**



**FIXED CCTV SYSTEM BLOCK DIAGRAM**

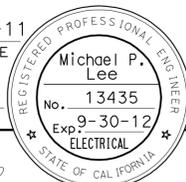
FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.

**ELECTRICAL DETAILS  
 FIXED CCTV CAMERA**  
 NO SCALE **E-147**

**NORTH FIBER OPTIC TERMINATIONS**

SHEET No.	E-73	E-74	E-77	E-84	E-90	E-93	E-96	E-98	E-101	E-102	SAN MATEO HUB	CIRCUIT ID	
CABINET ID	TSC033	TSC032	TSC031	TSC030	TSC029	TSC028	TSC027	TSC026	TSC025	TSC024			
TUBE No.	FIBER No.	ROUTE 380 EB RAMP/ROUTE 82	SAN BRUNO Ave /ROUTE 82	SAN RELIPE Ave /ROUTE 82	MILLBRAE Ave /ROUTE 82	BROADWAY Ave /ROUTE 82	FLORIBUNDA Ave/ROUTE 82	PENINSULA Ave/ROUTE 82	POPLAR Ave /ROUTE 82	4TH Ave /ROUTE 82	9TH Ave /ROUTE 82		
1	1	x										x	CIRCUIT 1
	2	x										x	CIRCUIT 1
	3	x										x	CIRCUIT 2
	4	x										x	CIRCUIT 2
	5	x										x	CIRCUIT 3
	6	x										x	CIRCUIT 3
	7	x		x x								x	CIRCUIT 4
	8	x		x x								x	CIRCUIT 4
	9	x		x x								x	CIRCUIT 5
	10	x		x x								x	CIRCUIT 5
	11	x		x x								x	CIRCUIT 6
	12	x		x x								x	CIRCUIT 6
2	13	x		x x								x	CIRCUIT 7
	14	x		x x								x	CIRCUIT 7
	15	x		x x								x	CIRCUIT 8
	16	x		x x								x	CIRCUIT 8
	17	x		x x								x	CIRCUIT 9
	18	x		x x								x	CIRCUIT 9
	19	x			x x							x	CIRCUIT 10
	20	x			x x							x	CIRCUIT 10
	21	x			x x							x	CIRCUIT 11
	22	x			x x							x	CIRCUIT 11
	23	x			x x							x	CIRCUIT 12
	24	x			x x							x	CIRCUIT 12
3	25	x			x x							x	CIRCUIT 13
	26	x			x x							x	CIRCUIT 13
	27	x			x x							x	CIRCUIT 14
	28	x			x x							x	CIRCUIT 14
	29	x			x x							x	CIRCUIT 15
	30	x			x x							x	CIRCUIT 15
	31	x					x x					x	CIRCUIT 16
	32	x					x x					x	CIRCUIT 16
	33	x					x x					x	CIRCUIT 17
	34	x					x x					x	CIRCUIT 17
	35	x					x x					x	CIRCUIT 18
	36	x					x x					x	CIRCUIT 18
4	37	x						x x				x	CIRCUIT 19
	38	x						x x				x	CIRCUIT 19
	39	x						x x				x	CIRCUIT 20
	40	x						x x				x	CIRCUIT 20
	41	x						x x				x	CIRCUIT 21
	42	x						x x				x	CIRCUIT 21
	43	x							x x			x	CIRCUIT 22
	44	x							x x			x	CIRCUIT 22
	45	x							x x			x	CIRCUIT 23
	46	x							x x			x	CIRCUIT 23
	47	x							x x			x	CIRCUIT 24
	48	x							x x			x	CIRCUIT 24
5	49	x							x x			x	CIRCUIT 25
	50	x							x x			x	CIRCUIT 25
	51	x							x x			x	CIRCUIT 26
	52	x							x x			x	CIRCUIT 26
	53	x							x x			x	CIRCUIT 27
	54	x							x x			x	CIRCUIT 27
	55	x								x x		x	CIRCUIT 28
	56	x								x x		x	CIRCUIT 28
	57	x								x x		x	CIRCUIT 29
	58	x								x x		x	CIRCUIT 29
	59	x								x x		x	CIRCUIT 30
	60	x								x x		x	CIRCUIT 30
6, 7, 8	61-96	x										x	SPARE (ALL 36)

"x" TERMINATE FIBER.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	210	252
			12-08-11		
REGISTERED ELECTRICAL ENGINEER			DATE		
1-23-12					
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>					

**ELECTRICAL DETAILS  
FIBER OPTIC SYSTEM  
(NORTH FIBER OPTIC TERMINATIONS)**

**E-148**



**BART FIBER OPTIC TERMINATIONS**

FIBER No.	MILLBRAE BART STATION TRAIN CONTROL ROOM	MILLBRAE Ave/ROLLINS Rd CABINET ID TSC004	SAN MATEO HUB
1	X	X	X
2	X	X	X
3	X	X	X
4	X	X	X
5	X	X	X
6	X	X	X
7	X	X	X
8	X	X	X
9	X	X	X
10	X	X	X
11	X	X	X
12	X	X	X

"X" TERMINATE FIBER.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	211	252

*Michael P. Lee* 12-08-11  
 REGISTERED ELECTRICAL ENGINEER DATE  
 1-23-12  
 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.

**ELECTRICAL DETAILS  
 FIBER OPTIC SYSTEM  
 (BART FIBER OPTIC TERMINATION)**

FUNCTIONAL SUPERVISOR  
 CHARLES PRICE

CALCULATED / DESIGNED BY  
 CHECKED BY

MICHAEL P. LEE  
 SEAN COUGHLIN

REVISED BY  
 DATE REVISED

**SOUTH FIBER OPTIC TERMINATIONS**

SHEET No.	CABINET ID	E-115	E-118	E-119	E-122	E-124	E-128		
TUBE No.	FIBER No.	SAN MATEO HUB	DAVEY GLEN Rd /ROUTE 82	RALSTON Ave /ROUTE 82	W HARBOR /ROUTE 82	HOLLY St /ROUTE 82	BRITTAN Ave /ROUTE 82	WHIPPLE Ave /ROUTE 82	CIRCUIT ID
1	1	x	x x					x	CIRCUIT 1
1	2	x	x x					x	CIRCUIT 1
1	3	x	x x					x	CIRCUIT 2
1	4	x	x x					x	CIRCUIT 2
1	5	x	x x					x	CIRCUIT 3
1	6	x	x x					x	CIRCUIT 3
1	7	x		x x				x	CIRCUIT 4
1	8	x		x x				x	CIRCUIT 4
1	9	x		x x				x	CIRCUIT 5
1	10	x		x x				x	CIRCUIT 5
1	11	x		x x				x	CIRCUIT 6
1	12	x		x x				x	CIRCUIT 6
2	13	x			x x			x	CIRCUIT 7
2	14	x			x x			x	CIRCUIT 7
2	15	x			x x			x	CIRCUIT 8
2	16	x			x x			x	CIRCUIT 8
2	17	x			x x			x	CIRCUIT 9
2	18	x			x x			x	CIRCUIT 9
2	19	x				x x		x	CIRCUIT 10
2	20	x				x x		x	CIRCUIT 10
2	21	x				x x		x	CIRCUIT 11
2	22	x				x x		x	CIRCUIT 11
2	23	x				x x		x	CIRCUIT 12
2	24	x				x x		x	CIRCUIT 12
3	25	x					x x	x	CIRCUIT 13
3	26	x					x x	x	CIRCUIT 13
3	27	x					x x	x	CIRCUIT 14
3	28	x					x x	x	CIRCUIT 14
3	29	x					x x	x	CIRCUIT 15
3	30	x					x x	x	CIRCUIT 15
3	31	x						x	CIRCUIT 16
3	32	x						x	CIRCUIT 16
3	33	x						x	CIRCUIT 17
3	34	x						x	CIRCUIT 17
3	35	x						x	CIRCUIT 18
3	36	x						x	CIRCUIT 18
4	37	x						x	CIRCUIT 19
4	38	x						x	CIRCUIT 19
4	39	x						x	CIRCUIT 20
4	40	x						x	CIRCUIT 20
4	41	x						x	CIRCUIT 21
4	42	x						x	CIRCUIT 21
4	43	x							SPARE
4	44	x						x	SPARE
4	45	x						x	SPARE
4	46	x						x	SPARE
4	47	x						x	SPARE
4	48	x						x	SPARE
5, 6, 7 & 8	49-96							x	SPARE (ALL 48)

"X" TERMINATE FIBER.

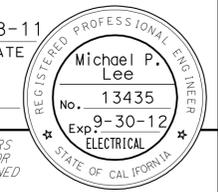
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	212	252
			12-08-11		
			REGISTERED ELECTRICAL ENGINEER DATE		
			1-23-12		
			PLANS APPROVAL DATE		

Michael P. Lee  
 No. 13435  
 Exp. 9-30-12  
 ELECTRICAL

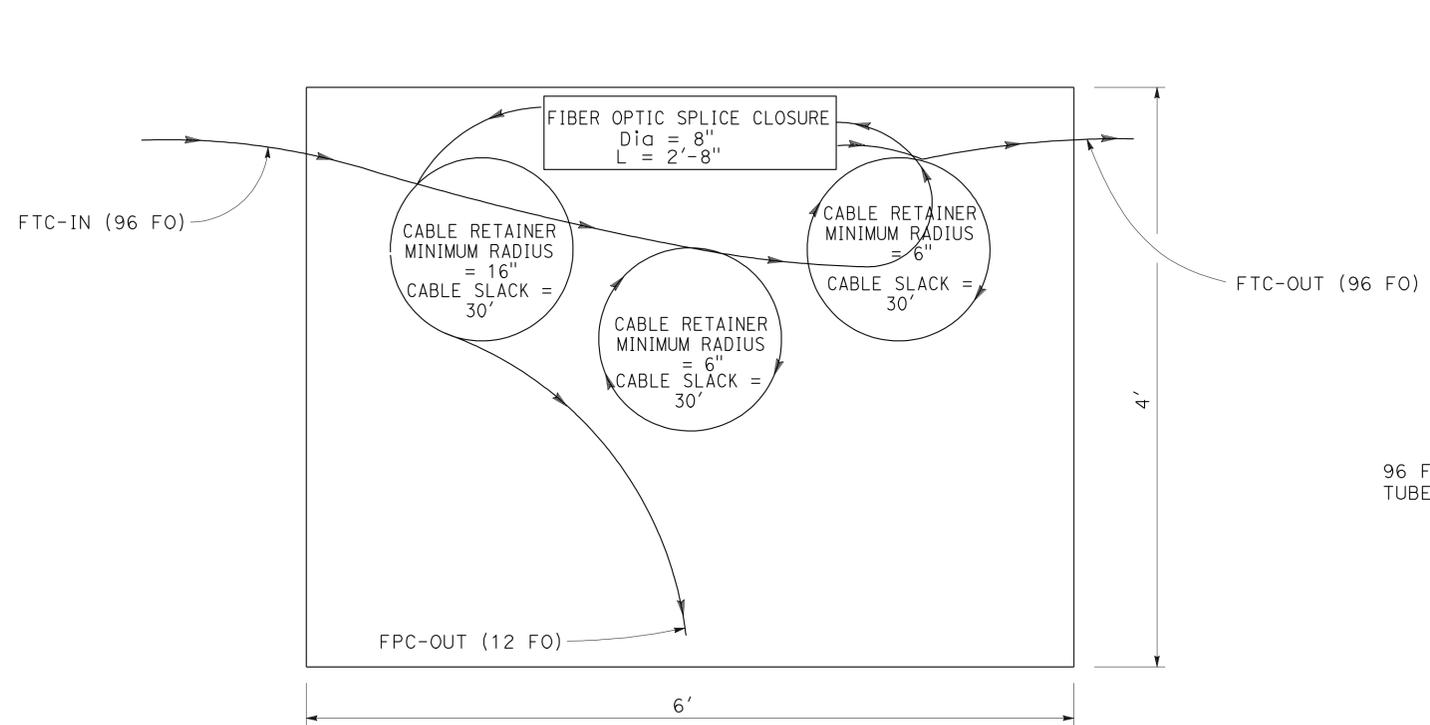
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

**ELECTRICAL DETAILS  
 FIBER OPTIC SYSTEM  
 (SOUTH FIBER OPTIC TERMINATIONS)  
 E-150**

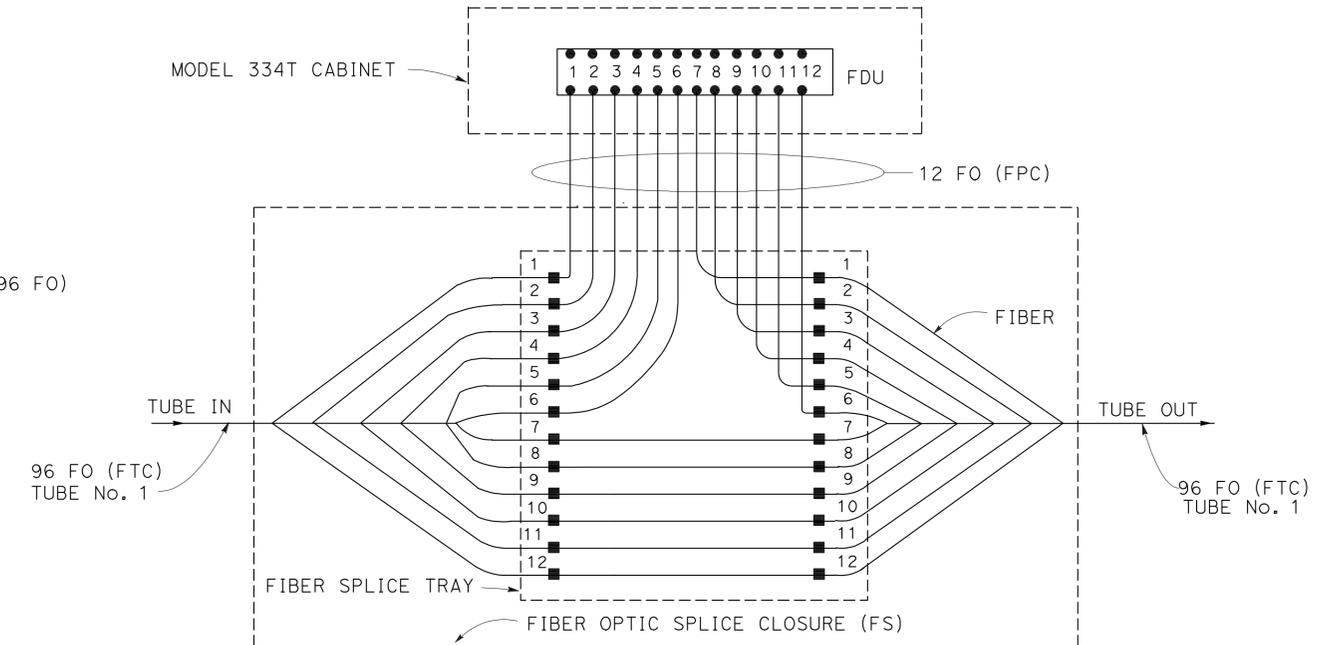
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	213	252
			12-08-11		
REGISTERED ELECTRICAL ENGINEER			DATE		
1-23-12					
PLANS APPROVAL DATE					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** **ELECTRICAL**  
 FUNCTIONAL SUPERVISOR: CHARLES PRICE  
 CALCULATED/DESIGNED BY: MICHAEL P. LEE  
 CHECKED BY: SEAN COUGHLIN  
 REVISOR: MICHAEL P. LEE  
 DATE: 12-08-11  
 REVISOR: SEAN COUGHLIN  
 DATE: 1-23-12



**FIBER SPLICE MANHOLE DETAIL 2**



**FIBER OPTIC SPLICE CLOSURE DETAIL (TYPICAL)**

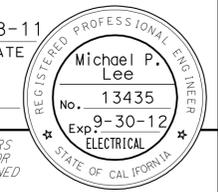
FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.

**ELECTRICAL DETAILS  
FIBER OPTIC SYSTEM  
(FIBER OPTIC SPLICE)**

NO SCALE

**E-151**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	214	252
			12-08-11	REGISTERED ELECTRICAL ENGINEER DATE	
			1-23-12	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>					

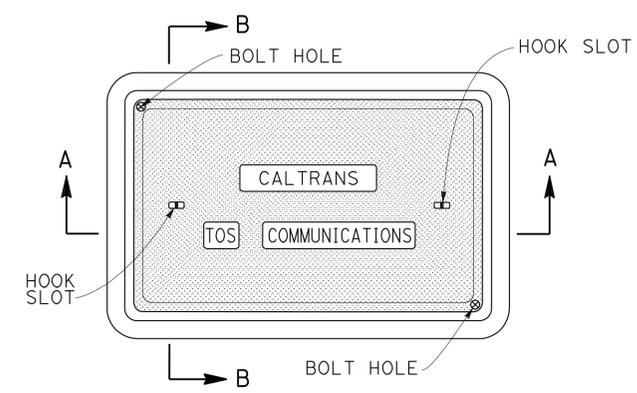


**NOTES: (THIS SHEET ONLY)**

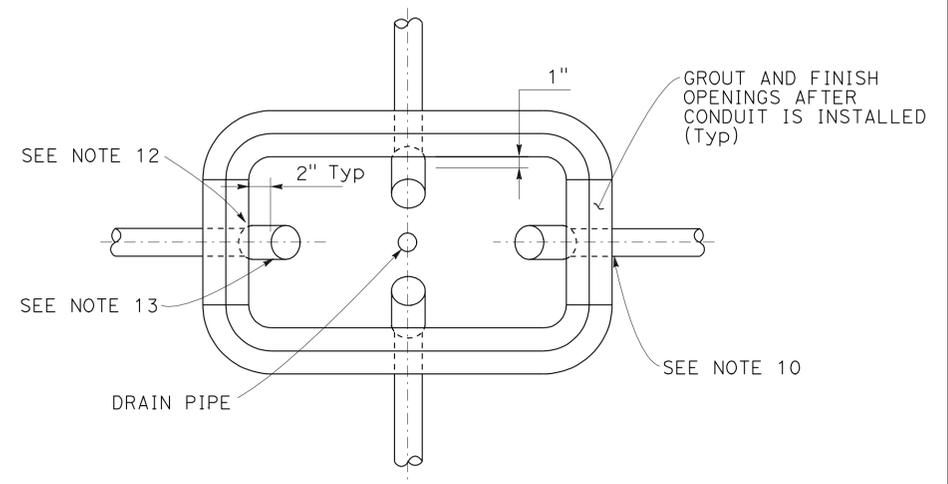
- CONCRETE SHOULD BE PLACED AROUND AND UNDER PULL BOXES (6" MINIMUM) AND SHOULD CONTAIN A MINIMUM OF 550 lbs OF PORTLAND CEMENT PER CUBIC YARD.
- PORTLAND CEMENT CONCRETE FLOOR OVER CLEAN CRUSHED ROCK SUMP. BOTTOM OF PULL BOX SHALL BE SLOPED TOWARD DRAIN PIPE FOR DRAINAGE AND SHALL HAVE SMOOTH FINISH.
- PULL BOX SHALL BE PRECAST OF STEEL REINFORCED PORTLAND CEMENT CONCRETE. PULL BOX COVER SHALL BE POLYMER CONCRETE. PULL BOX AND COVER SHALL SUPPORT MINIMUM TEST LOAD OF 25,000 lbs IF BOX IS LOCATED IN TRAVEL WAY, PULL BOX AND COVER SHALL CONFORM VERTICAL PROOF-LOAD STRENGTH REQUIREMENT.
- IF APPLICABLE, PULL BOX HEIGHT ABOVE EXISTING DIRT GRADE SHALL PERMIT 1" OF FUTURE SURFACE LANDSCAPING. WHEN PULL BOX IS INSTALLED IN EXISTING SIDEWALK, PULL BOX COVER SHALL SIT FLUSH WITH THE PAVEMENT.
- LOCKING MECHANISM SHALL BE PROVIDED FOR COVER. TWO 3/8" Ø BRASS OR STAINLESS STEEL STUB BOLTS NUTS, AND WASHERS. 2 PER BOX, RECESS IN COVER FOR NUT.
- "CALTRANS TOS COMMUNICATIONS" SHALL BE CASTED ON THE TOP FACE OF ALL COVERS.
- MINIMUM PULL BOX DEPTH WITH EXTENSION SHALL BE 20".
- SEE PLAN SHEETS FOR NUMBER AND SIZE OF CONDUIT.
- ALL CONDUITS SHALL ENTER THROUGH KNOCKOUTS. IF MORE THAN 3 CONDUITS ARE REQUIRED IN SAME KNOCKOUT, KNOCKOUT SHALL BE WIDENED TO 3/8" MORE THAN THE COMBINED CONDUIT WIDTH.
- CONDUIT FROM THE TYPICAL BORE OR TRENCH SECTION SHOULD NOT DEFLECT BY MORE THAN 1' PER 10' FROM THE ALIGNMENT PRECEDING OR THE FOLLOWING THE PULL BOX.
- BOTTOM OF CONDUIT CENTERLINE SHALL BE ALIGNED TO EXIT TOP OF PULL BOX TO FACILITATE CABLE PULLING. IF EXISTING CONDUIT USED, THE CONTRACTOR SHALL MODIFY CONDUIT SWEEP (IF NEEDED) AS SHOWN. IF NEW CONDUIT USED, THE CONTRACTOR SHALL INSTALL CONDUIT ELBOW AS SHOWN.
- EXCESS CONDUIT FOR ALL CONDUIT ENDS SHALL BE CUT BACK TO PROVIDE STUB ENDS OF 1" MINIMUM TO 2" MAXIMUM.
- ALL METALLIC CONDUIT SHALL HAVE THREADED METALLIC BUSHINGS. ALL PVC AND HDPE CONDUITS SHALL HAVE BELL ENDS.
- INSTALL CAPS OR DUCT PLUGS FOR ALL CONDUITS.
- ALL CONDUITS AND PULL BOXES CONTAINING FIBER OPTIC CABLE SHALL HAVE PERMANENT MARKERS AS SHOWN ON DRAWING SHEET E-154.

**LEGEND: (THIS SHEET ONLY)**

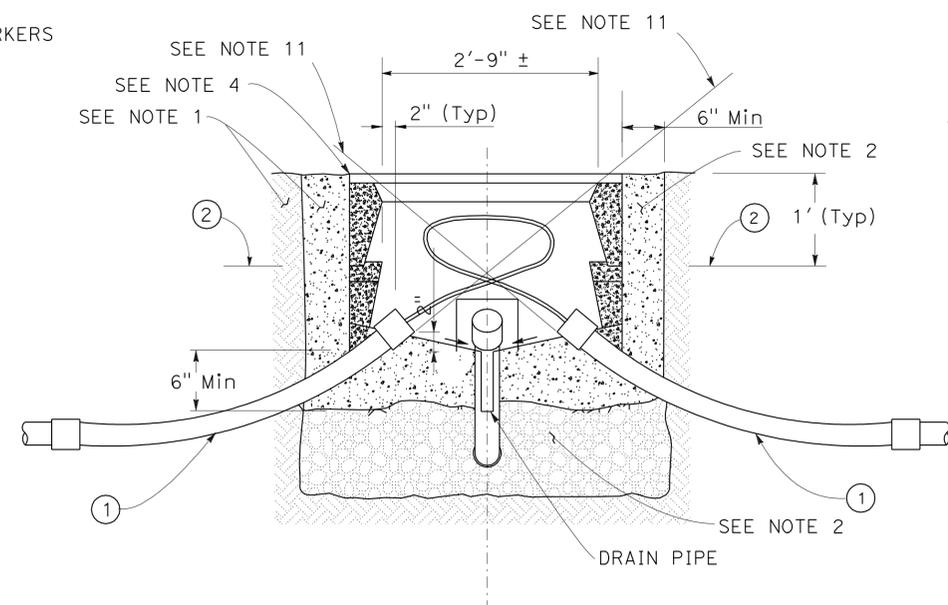
- 45 DEGREE ELBOW, 3' RADIUS Min. ELBOW AND COUPLING MAY NOT BE NECESSARY FOR NEW CONDUIT INSTALLED BY DIRECTIONAL BORING. NEW CONDUIT INSTALLED BY DIRECTIONAL BORING SHALL ENTER THE PULL BOX WITH BENDING RADIUS OF 3' Min.
- WARNING TAPE (FOR NEW CONDUIT IF INSTALLED BY TRENCHING).



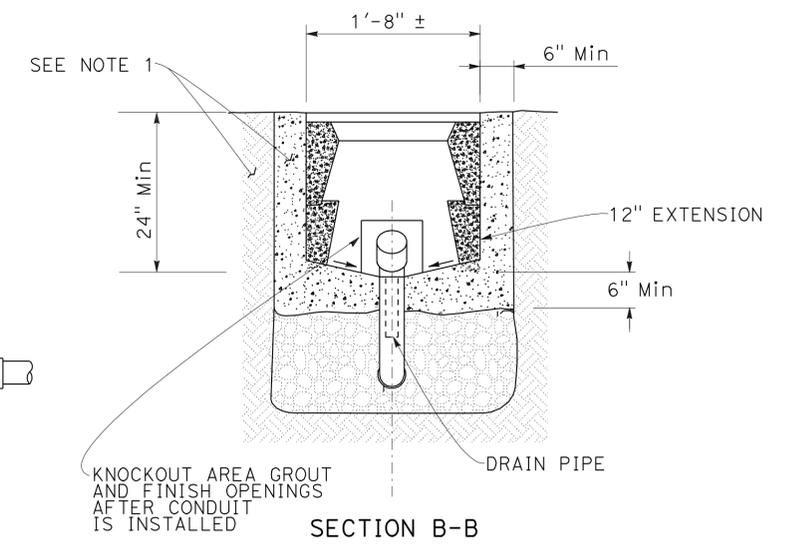
PLAN VIEW



PLAN VIEW WITHOUT COVER



SECTION A-A



SECTION B-B

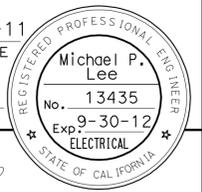
FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.

**ELECTRICAL DETAILS  
FIBER OPTIC SYSTEM  
(FIBER OPTIC PULL BOX)  
NO SCALE**

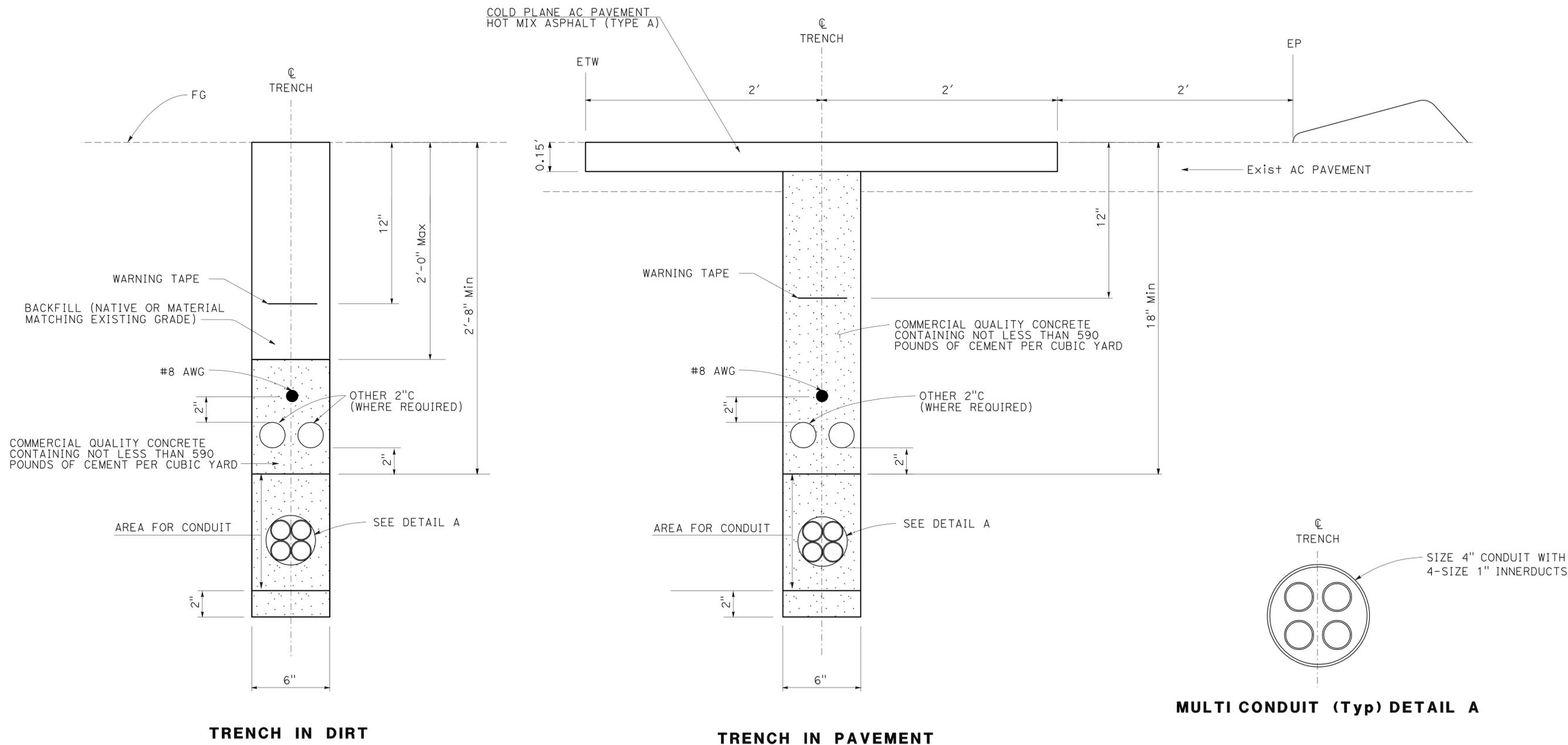
**E-152**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - ELECTRICAL  
 FUNCTIONAL SUPERVISOR: CHARLES PRICE  
 CALCULATED/DESIGNED BY: SEAN COUGHLIN  
 CHECKED BY: MICHAEL P. LEE  
 REVISOR: SEAN COUGHLIN  
 DATE: 12-08-11

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	215	252
			12-08-11	REGISTERED ELECTRICAL ENGINEER DATE	
			1-23-12	PLANS APPROVAL DATE	
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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
**ELECTRICAL**  
 FUNCTIONAL SUPERVISOR CHARLES PRICE  
 CALCULATED/DESIGNED BY MICHAEL P. LEE  
 CHECKED BY SEAN COUGHLIN  
 REVISIONS BY DATE REVISIONS BY DATE REVISIONS BY DATE REVISIONS BY DATE  
 REVISIONS BY DATE REVISIONS BY DATE REVISIONS BY DATE REVISIONS BY DATE



**ELECTRICAL DETAILS**  
**FIBER OPTIC SYSTEM**  
**(FIBER OPTIC CONDUIT AND TRENCH DETAILS)**  
 NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.



LAST REVISION DATE PLOTTED => 19-DEC-2011  
 11-03-10 TIME PLOTTED => 13:56

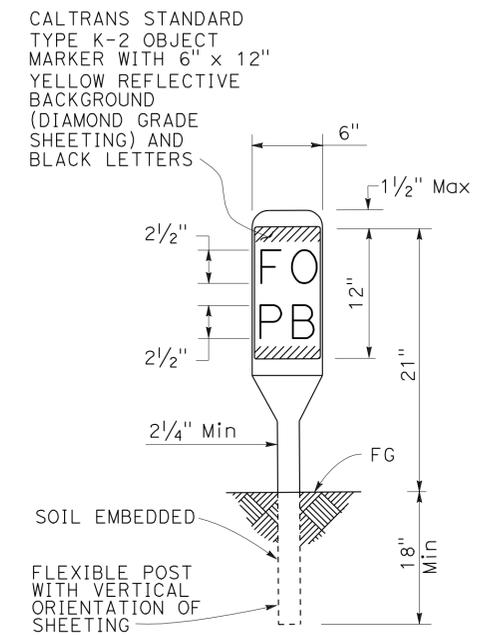
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	216	252

12-08-11  
 REGISTERED ELECTRICAL ENGINEER DATE  
 1-23-12  
 PLANS APPROVAL DATE

Michael P. Lee  
 No. 13435  
 Exp. 9-30-12  
 ELECTRICAL  
 STATE OF CALIFORNIA

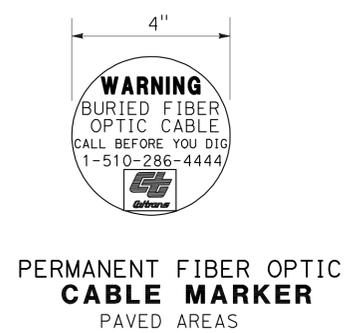
THE STATE OF CALIFORNIA OR ITS OFFICERS  
 OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
**ELECTRICAL**  
 FUNCTIONAL SUPERVISOR: CHARLES PRICE  
 CALCULATED/DESIGNED BY: MICHAEL P. LEE  
 CHECKED BY: SEAN COUGHLIN  
 REVISIONS: REVISOR: DATE: REVISION: DATE:

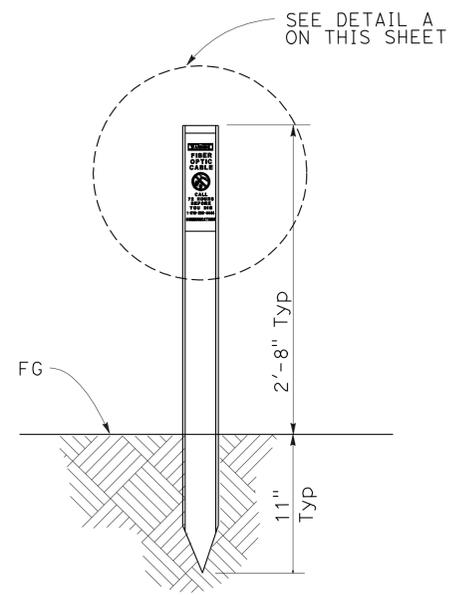


**PERMANENT FIBER OPTIC VAULT OR PULL BOX MARKER**

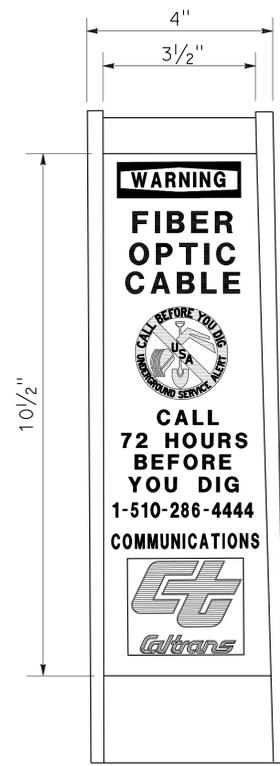
**NOTE:**  
 IN UNPAVED AREAS, INSTALL ONE MARKER 1 FOOT AWAY FROM EACH VAULT OR PULL BOX IN WHICH FIBER OPTIC CABLE IS INSTALLED.



**PERMANENT FIBER OPTIC CABLE MARKER PAVED AREAS**



**PERMANENT FIBER OPTIC CABLE MARKER UNPAVED AREAS**



**DETAIL A**

**ELECTRICAL DETAILS FIBER OPTIC SYSTEM (FIBER OPTIC MARKER DETAILS)**

NO SCALE

**E-154**

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.



USERNAME => s109858  
 DGN FILE => 44a923ua154.dgn

CU 04226

EA 4A9231

BORDER LAST REVISED 4/11/2008

LAST REVISION: DATE PLOTTED => 19-DEC-2011  
 11-05-10 TIME PLOTTED => 13:56

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	217	252

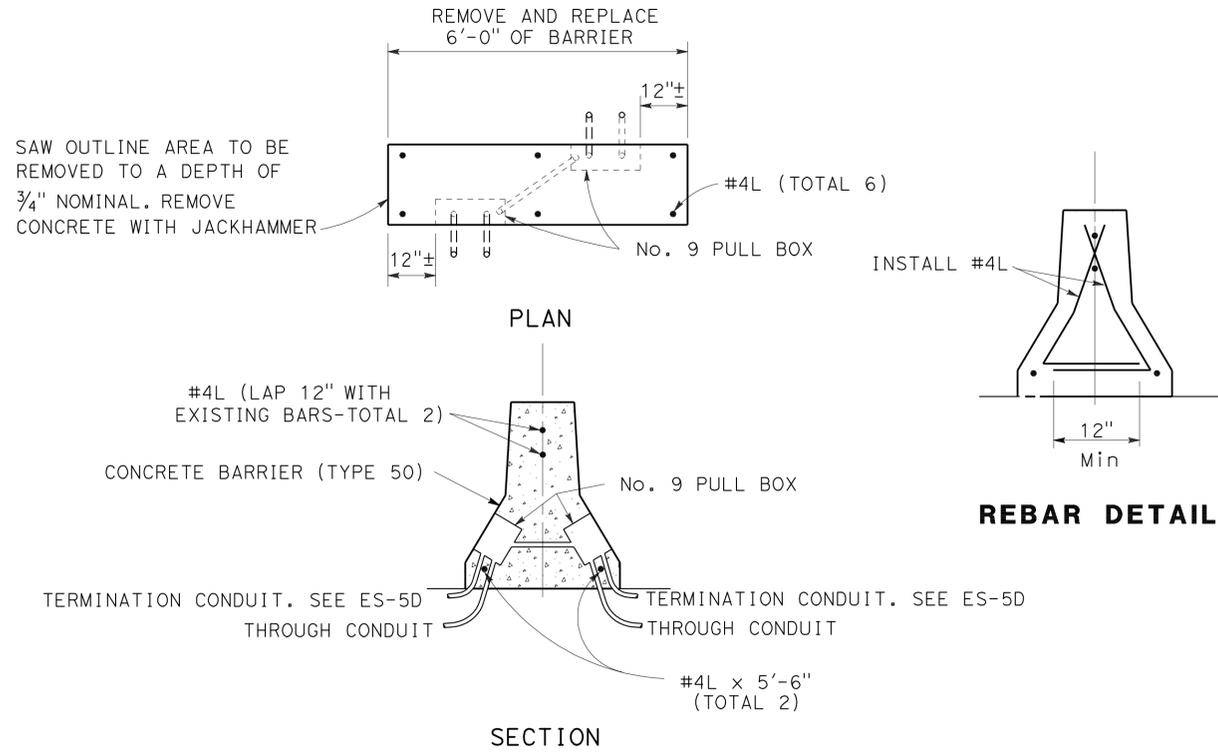
  

<i>Michael P. Lee</i>	12-08-11
REGISTERED ELECTRICAL ENGINEER	DATE
1-23-12	
PLANS APPROVAL DATE	

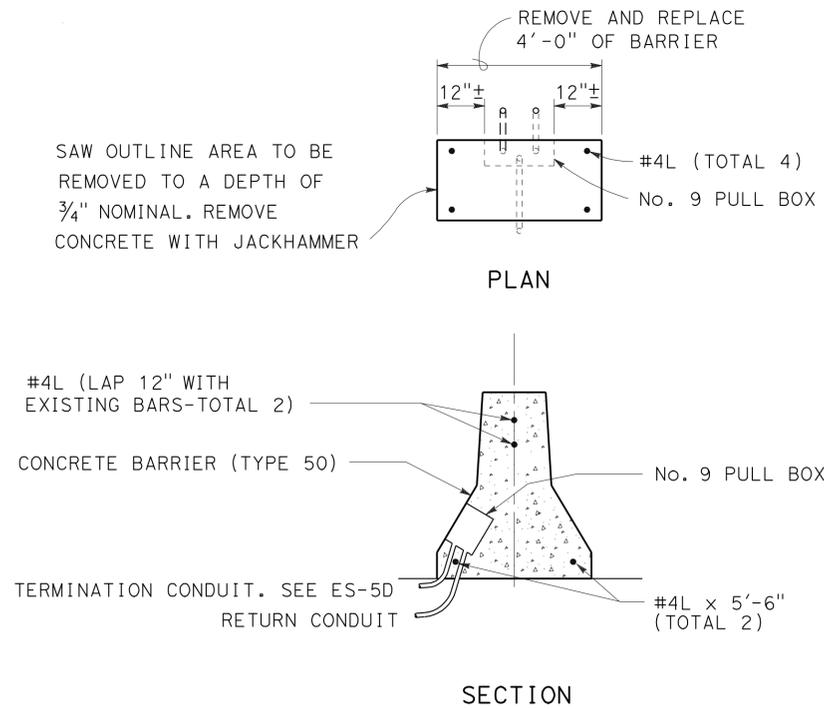
  

Michael P. Lee
No. 13435
Exp. 9-30-12
ELECTRICAL

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**DETAIL "A"**  
**CONDUIT AND No. 9 DOUBLE PULL BOX INSTALLATION**  
**IN EXISTING MEDIAN BARRIER**



**DETAIL "A-1"**  
**CONDUIT AND No. 9 SINGLE PULL BOX INSTALLATION**  
**IN EXISTING MEDIAN BARRIER**

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.

**ELECTRICAL DETAILS**  
**(No. 9 PULL BOX IN EXISTING MEDIAN BARRIER)**

NO SCALE

**E-155**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	DESIGNED BY	REVISOR	DATE
<b>Caltrans</b>	SEAN COUGHLIN	MICHAEL P. LEE		
<b>ELECTRICAL</b>	CHECKED BY			

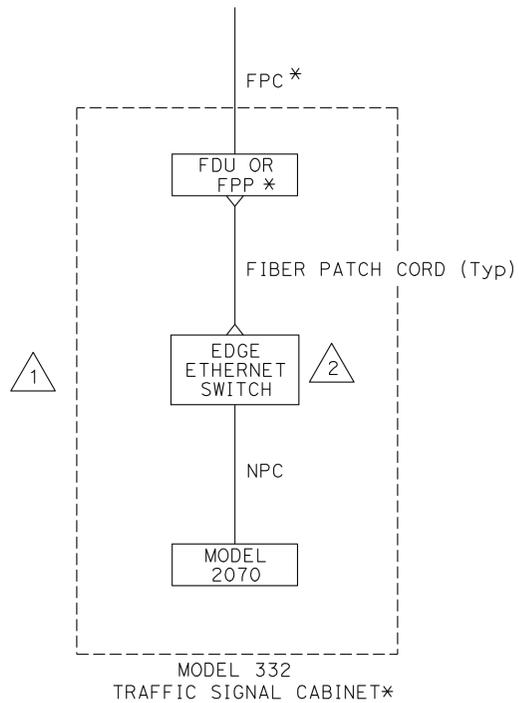
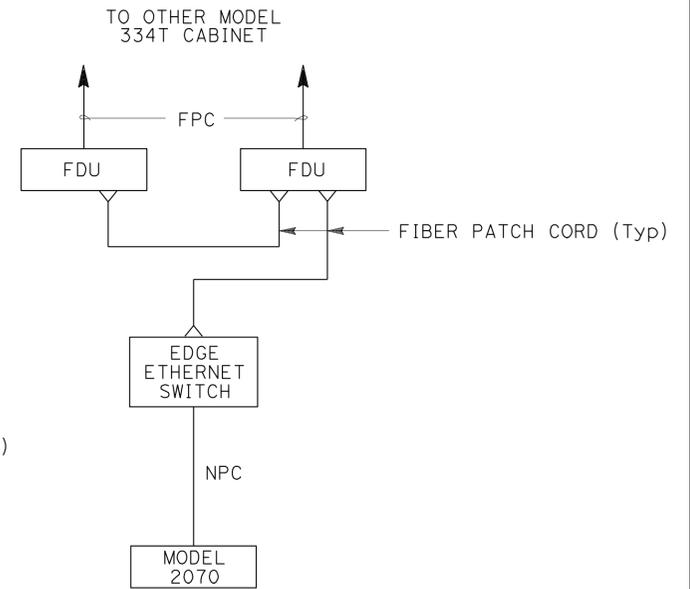
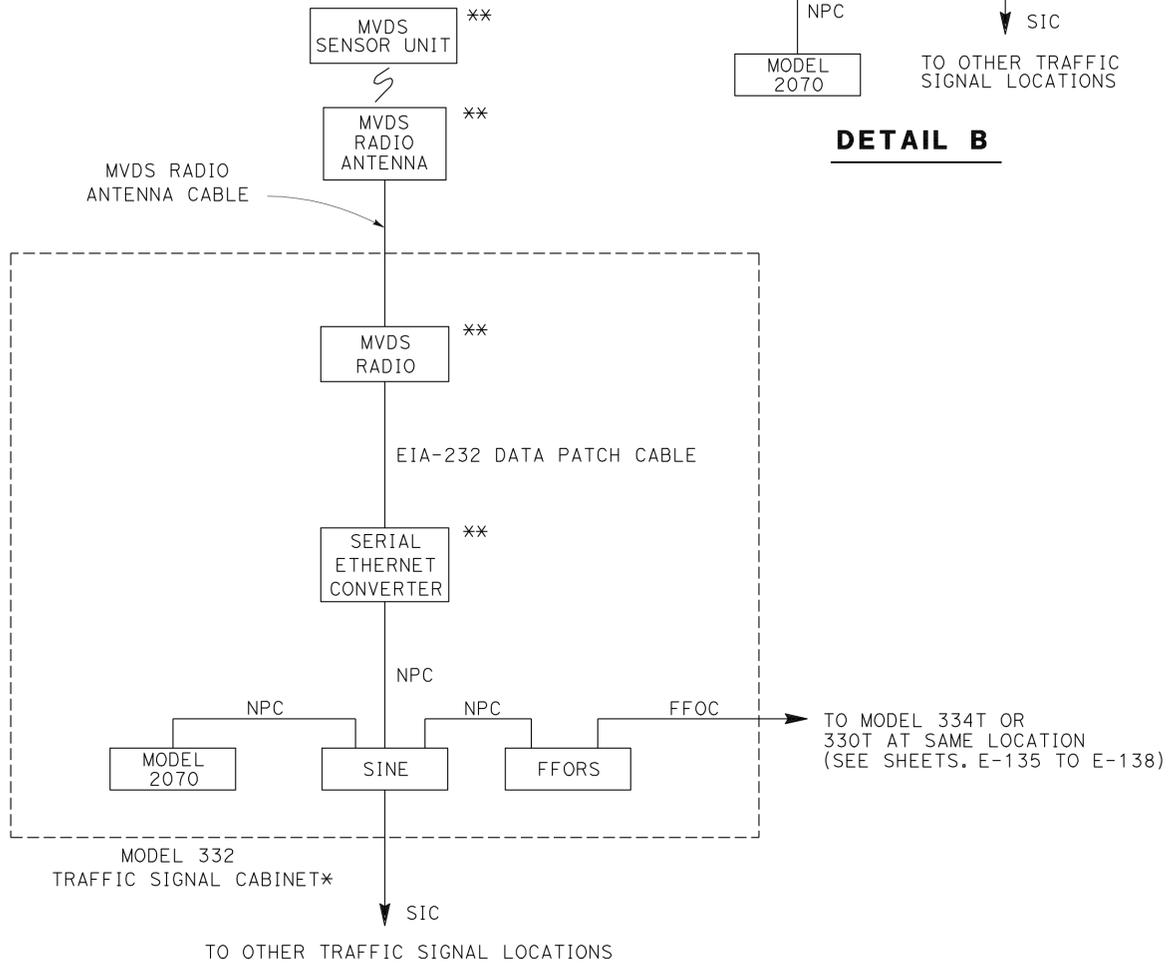
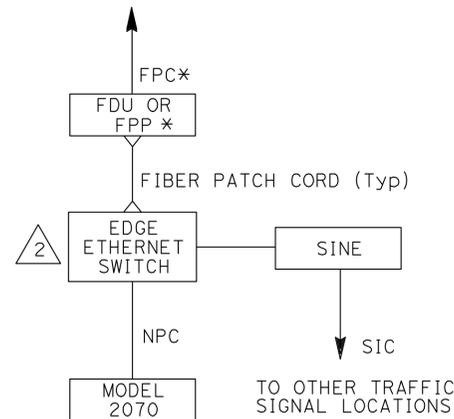


**NOTES:**

1. FOR DETAILS ON SINE, SEE E-159.
2. FOR CABINET E35X3 (CASE F), SEE DETAIL A.
3. EDGE ETHERNET SWITCH\* TO BE USED IN LIEU OF SINE AND FFORS AND FFOC NOT REQUIRED IN CABINET E35H6 (CASE I).
4. ALL MODEL 332 CABINETS EXISTING.
5. CONNECT SINE TO EDGE ETHERNET SWITCH IN CABINET ID E35H2.
6. CABINET COMMUNICATIONS EQUIPMENT QUANTITIES PER COMMUNICATIONS EQUIPMENT SCHEDULE, SEE SHEET E-160 OR E-161.
7. ALL SIC EXISTING.
8. FOR CABINET E35H2 (CASE F), SEE DETAIL B.

**SHEET NOTES:**

- 1 FURNISH 2 NPC, 2 FIBER PATCH CORDS.
- 2 INSTALL AND CONNECT SFP FAST ETHERNET FIBER TRANSCEIVER IN SWITCH PER MANUFACTURER GUIDELINES AND AS DIRECTED BY THE ENGINEER.



CABINET LOCATION (CASE F)	CABINET ID
ROUTE 82 / 25TH Ave	E35H5
ROUTE 82 / 27TH Ave	E35H4
ROUTE 82 / 28TH Ave	E358A
ROUTE 82 / 31TH Ave	E35H3
ROUTE 82 / 37TH Ave	E35H2
PENINSULA Ave / ROUTE 101 NB RAMP	E35X3
FRANKLIN Pkwy / ROUTE 101 SB RAMP	E35CE
HILLSDALE Blvd / ROUTE 101 NB RAMP	E35AX
HILLSDALE Blvd / ROUTE 101 SB RAMP	E35BK

CABINET LOCATION (CASE I)	CABINET ID
ROUTE 82 / PARK PLACE	E35K9
ROUTE 82 / TROUSDALE Dr	E35K4
ROUTE 82 / POPLAR Ave	E35I8
ROUTE 82 / 17TH Ave	E35H7
ROUTE 82 / 20TH Ave	E35H6
ROUTE 82 / MIDDLE ROAD	E35AP
ROUTE 82 / HULL Dr	E35V4
ROUTE 82 / SAN CARLOS Ave	E35G7
ROUTE 82 / HOWARD Ave	E35G5

**NOTE:**

- \* - EXISTING
- \*\* - INSTALL AS PART OF MICROWAVE VIDEO DETECTION SYSTEM.
- ⚡ - WIRELESS COMMUNICATION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.

**ELECTRICAL DETAILS  
TRAFFIC SIGNAL COMMUNICATIONS  
TYPICAL CONNECTIONS WIRING DIAGRAMS  
(CASE F AND I)**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	220	252

David S. Man 12-08-11  
 REGISTERED ELECTRICAL ENGINEER DATE  
 1-23-12  
 PLANS APPROVAL DATE

David S. Man  
 No. 18961  
 Exp. 12-31-13  
 ELECTRICAL

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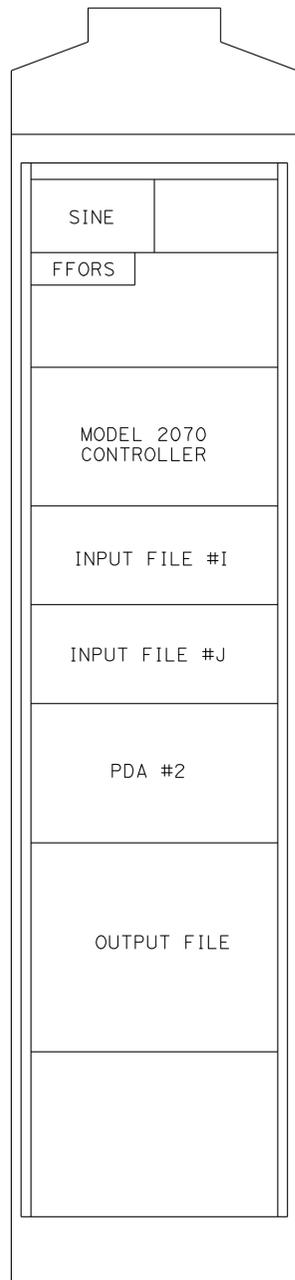
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
**ELECTRICAL**

FUNCTIONAL SUPERVISOR  
 KENNETH XU

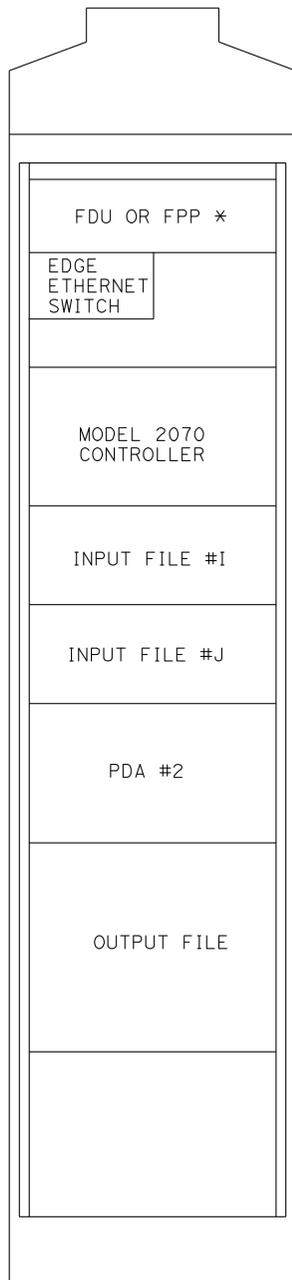
CALCULATED/DESIGNED BY  
 CHECKED BY

DAVID S. MAN  
 MIN YIN LEE

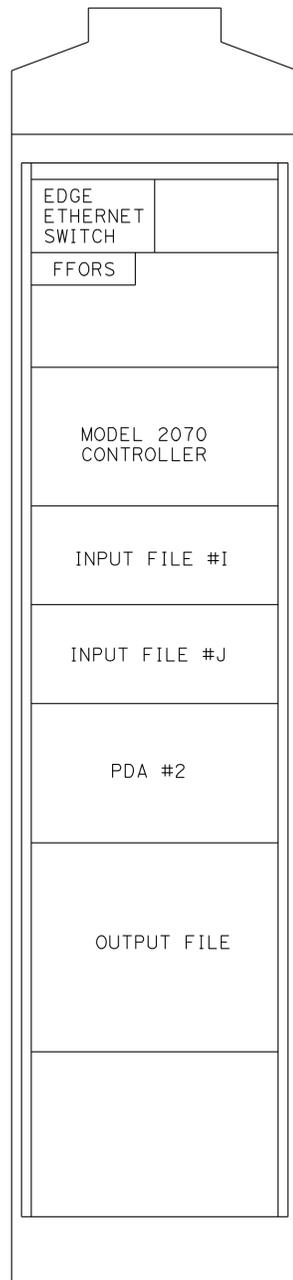
REVISED BY  
 DATE REVISED



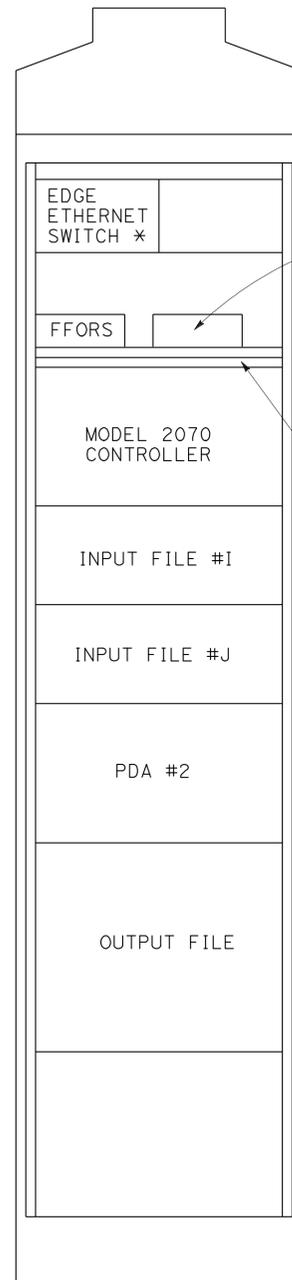
**MODEL 332 LAYOUT  
FRONT VIEW  
CASE E**



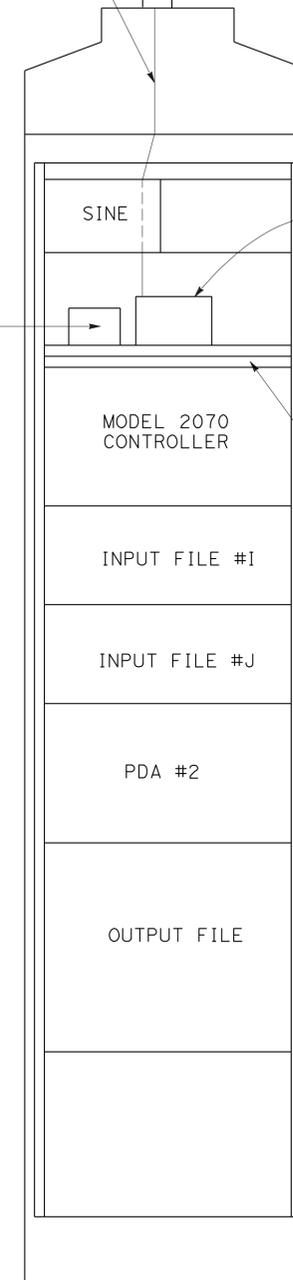
**MODEL 332 LAYOUT  
FRONT VIEW  
CASE F**



**MODEL 332 LAYOUT  
FRONT VIEW  
CASE G**



**MODEL 332 LAYOUT  
FRONT VIEW  
CASE H**



**MODEL 332 LAYOUT  
FRONT VIEW  
CASE I**

MVDS RADIO ANTENNA

MVDS RADIO ANTENNA CABLE

WIRELESS ACCESS POINT \*

FFORS

SHELF \*

MVDS RADIO

SHELF

- NOTES:**
1. ALL MODEL 332 CABINETS ARE EXISTING.
  2. COMMUNICATIONS EQUIPMENT QUANTITIES PER COMMUNICATIONS EQUIPMENT SCHEDULE SEE E-160.

\* EXISTING

**ELECTRICAL DETAILS  
TYPICAL TRAFFIC SIGNAL  
CABINET LAYOUT  
(CASE E, F, G, H, I)**

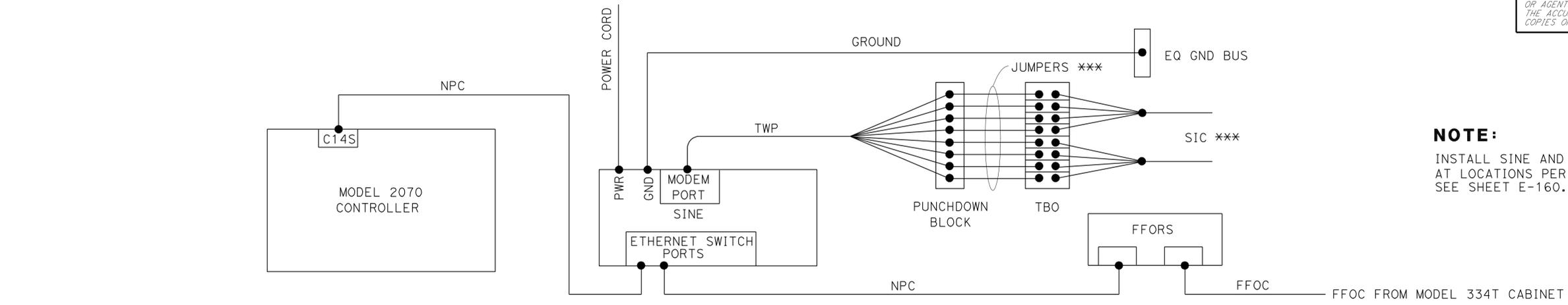
NO SCALE **E-158**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	221	252

David S. Man 12-08-11  
 REGISTERED ELECTRICAL ENGINEER DATE  
 1-23-12  
 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.

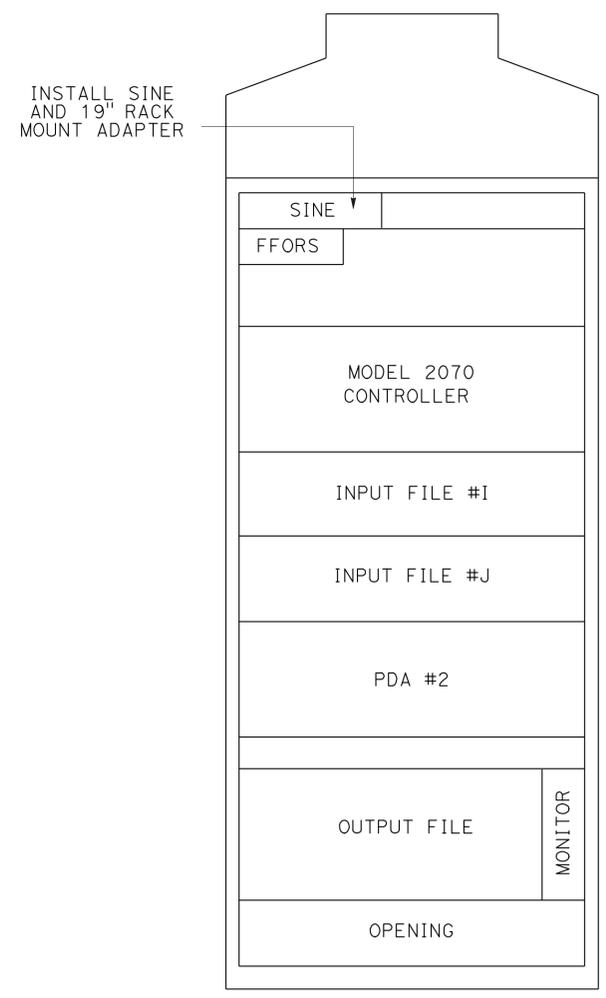
REGISTERED PROFESSIONAL ENGINEER  
 David S. Man  
 No. 18961  
 Exp. 2-31-13  
 ELECTRICAL  
 STATE OF CALIFORNIA

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DAVID S. MAN	REVISOR	DATE
<b>Caltrans</b>	MIN YIN LEE	REVISOR	DATE
ELECTRICAL	KENNETH XU	FUNCTIONAL SUPERVISOR	
		CHECKED BY	
		DESIGNED BY	

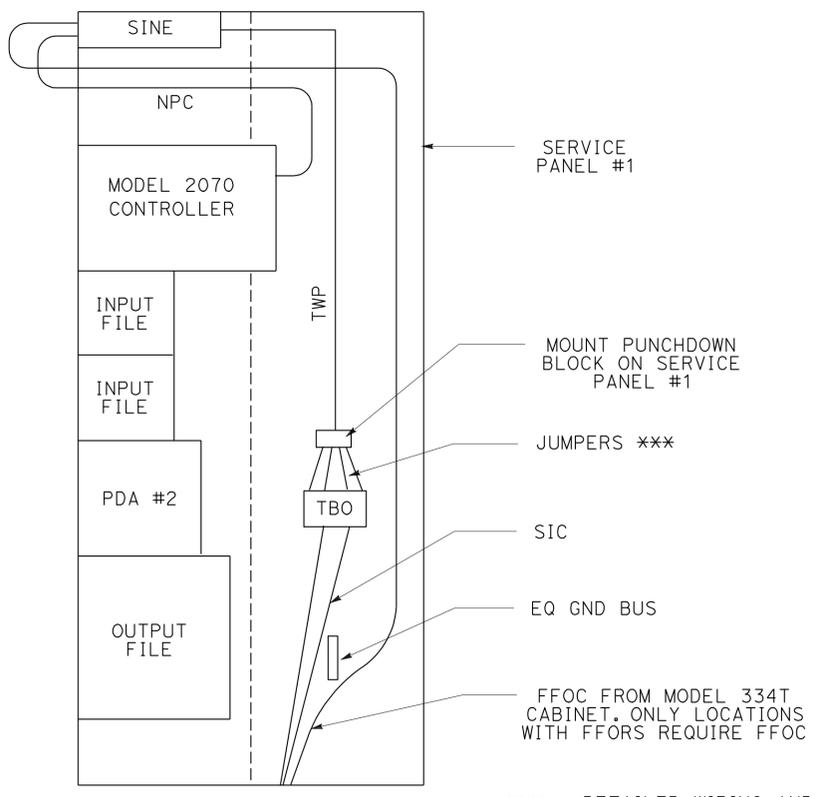


**NOTE:**  
 INSTALL SINE AND FFORS  
 AT LOCATIONS PER SCHEDULE,  
 SEE SHEET E-160.

**TYPICAL WIRING DETAIL**



TYPICAL EXISTING MODEL 332  
 LAYOUT (FRONT VIEW)



TYPICAL EXISTING MODEL 332  
 LAYOUT (SIDE VIEW)

\*\*\* - DETAILED WIRING AND PORT ASSIGNMENTS  
 TO BE PROVIDED BY ENGINEER

FOR NOTES, ABBREVIATIONS AND  
 LEGEND, SEE SHEET E-1 TO E-3.

**ELECTRICAL DETAILS  
 SIGNAL INTERCONNECT NETWORK  
 ELEMENT (SINE) INSTALLATION DETAIL**

NO SCALE

**E-159**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	222	252

David S. Man 12-08-11  
 REGISTERED ELECTRICAL ENGINEER DATE  
 1-23-12  
 PLANS APPROVAL DATE

David S. Man  
 No. 18961  
 Exp. 12-31-13  
 ELECTRICAL

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**MODEL 332 TRAFFIC SIGNAL CABINET QUANTITIES**

**MODEL 332 TRAFFIC SIGNAL CABINET QUANTITIES CONTINUED**

PLAN No.	CABINET ID NUMBER	CABINET LOCATION	SIGNAL INTERCONNECT NETWORK ELEMENT	EDGE ETHERNET SWITCH	FFORS (N)
			EA	EA	EA
E-73	E35L5	ROUTE 82 / ROUTE 380 EB RAMP	1		1
	E35L6	ROUTE 82 / ROUTE 380 WB RAMP	1		1
E-74	E35U8	ROUTE 82 / BAYHILL Dr	1		
	E35L4	ROUTE 82 / SAN BRUNO Ave	1		1
E-75	E35T0	ROUTE 82 / ANGUS Ave	1		
E-76	E35L3	ROUTE 82 / JENEVEIN Ave	1		
	E35L2	ROUTE 82 / SAN MATEO Ave	1		
E-77	E35L1	ROUTE 82 / CRYSTAL SPRINGS Ave	1		
	E35K0	ROUTE 82 / SAN FELIPE Ave	1		1
E-79	E35K9	ROUTE 82 / PARK Pl	1		
E-81	E35K8	ROUTE 82 / CENTER St	1		
	E35K7	ROUTE 82 / MEADOW GLEN Ave	1		
E-82	E35V6	ROUTE 82 / SILVA Ave	1		
E-83	E35K6	ROUTE 82 / HILLCREST Blvd	1		
E-84	E35R6	ROUTE 82 / MILLBRAE Ave	1		1
E-85	E35K5	ROUTE 82 / MURCHISON Dr	1		
E-86	E35K4	ROUTE 82 / TROUSDALE Dr	1		
E-87	E35K3	ROUTE 82 / ROSEDALE Dr	1		
E-88	E35K2	ROUTE 82 / ADELINE Dr	1		
E-89	E35K1	ROUTE 82 / HILLSIDE Dr	1		
	E35J0	ROUTE 82 / LINCOLN Ave	1		
E-90	E35J9	ROUTE 82 / BROADWAY	1		1
E-91	E35J8	ROUTE 82 / CARMELITA Ave	1		
	E35J7	ROUTE 82 / SANCHEZ Ave	1		
E-93	E35J6	ROUTE 82 / OAK GROVE Ave	1		
	E35J5	ROUTE 82 / FLORIBUNDA Ave	1		1
E-94	E35J4	ROUTE 82 / CHAPIN Ave	1		
	E35J3	ROUTE 82 / BURLINGAME Ave	1		
	E35J2	ROUTE 82 / HOWARD Ave	1		
E-95	E35J1	ROUTE 82 / PRIMROSE/BAYSWATER Ave	1		
E-96	E35I0	ROUTE 82 / PENINSULA Ave	1		1
E-97	E35I9	ROUTE 82 / BELLEVUE Ave	1		
E-98	E35I8	ROUTE 82 / POPLAR Ave	1		1
E-99	E35I7	ROUTE 82 / EL CERRITO Ave	1		
	E35I6	ROUTE 82 / BALDWIN Ave	1		
E-100	E35I5	ROUTE 82 / CRYSTAL SPRINGS Ave (SAN MATEO)	1		
	E35I4	ROUTE 82 / 2ND Ave	1		
	E35I3	ROUTE 82 / 3RD Ave	1		
E-101	E35I2	ROUTE 82 / 4TH Ave	1		1
	E35I1	ROUTE 82 / 5TH Ave	1		
E-102	E35H0	ROUTE 82 / 9TH Ave	1		1
E-103	E35H9	ROUTE 82 / 12TH Ave	1		
	E35H8	ROUTE 82 / BARNESON Ave	1		

PLAN No.	CABINET ID NUMBER	CABINET LOCATION	SIGNAL INTERCONNECT NETWORK ELEMENT	EDGE ETHERNET SWITCH	FFORS (N)
			EA	EA	EA
E-104	E35H7	ROUTE 82 / 17TH Ave	1		1
E-106	E35H6	ROUTE 82 / 20TH Ave		1	
E-107	E35H5	ROUTE 82 / 25TH Ave		1	
	E35H4	ROUTE 82 / 27TH Ave		1	
E-108	E358A	ROUTE 82 / 28TH Ave		1	
E-109	E35H3	ROUTE 82 / 31ST Ave		1	
E-112	E35H2	ROUTE 82 / 37TH Ave	1	1	
E-114	E35H1	ROUTE 82 / 41ST Ave	1		
	E35U9	ROUTE 82 / 42ND Ave	1		
E-115	E35S1	ROUTE 82 / DAVEY GLEN Rd	1		1
E-117	E35AP	ROUTE 82 / MIDDLE Rd	1		
E-118	E35G0	ROUTE 82 / RALSTON Ave	1		1
	E35AN	ROUTE 82 / O'NEILL St	1		
E-119	E35G9	ROUTE 82 / W HARBOR Blvd	1		1
	E35BF	ROUTE 82 / HARBOR Blvd	1		
E-120	E35V4	ROUTE 82 / HULL Dr	1		
E-122	E35G8	ROUTE 82 / HOLLY St	1		1
	E35G7	ROUTE 82 / SAN CARLOS Ave	1		
E-124	E35BG	ROUTE 82 / ARROYO Ave	1		
	E35G6	ROUTE 82 / BRITTAN Ave	1		1
E-125	E35G5	ROUTE 82 / HOWARD Ave	1		
E-127	E35G4	ROUTE 82 / ST. FRANCIS WAY	1		
E-128	E35G3	ROUTE 82 / WHIPPLE Hwy	1		1
E-43	E35AW	SAN BRUNO Ave / ROUTE 101 SB RAMP		1	1
E-45	E35BY	SAN BRUNO Ave / ROUTE 101 NB RAMP		1	1
E-46	E35CT	MILLBRAE Ave / ROUTE 101 NB RAMP		1	1
E-50	E35CR	MILLBRAE Ave / ROUTE 101 SB RAMP		1	1
E-52	E35CA	CADILLAC WAY / ROUTE 101 SB RAMP	1		
E-53	E35X4	BROADWAY/ROLLINS Rd	1		
E-56	E35X3	PENINSULA Ave / ROUTE 101 NB RAMP		1	
E-130	E35CE	FRANKLIN Pkwy / ROUTE 101 SB RAMP		1	
E-129	E35AX	HILLSDALE Blvd / ROUTE 101 NB RAMP		1	
	E35BK	HILLSDALE Blvd / ROUTE 101 SB RAMP		1	
E-57	E35CZ	MARINE Pkwy / ROUTE 101 NB RAMP		1	1
E-60	E35R3	MARINE Pkwy / ROUTE 101 SB RAMP		1	1
E-64	E35V2	WHIPPLE Ave / ROUTE 101 NB RAMP			1
E-62	E35R2	HOLLY St / ROUTE 101 SB RAMP		1	1
SUBTOTAL THIS SHEET			63	17	-

(N) NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 FUNCTIONAL SUPERVISOR: KENNETH XU  
 CHECKED BY: DAVID S. MAN, MIN YIN LEE  
 CALCULATED/DESIGNED BY: DAVID S. MAN  
 REVISOR: DAVID S. MAN  
 DATE: 4/11/2008

**ELECTRICAL DETAILS**  
**COMMUNICATIONS EQUIPMENT SCHEDULE**  
**E-160**

LAST REVISION: DATE PLOTTED => 28-DEC-2011  
 TIME PLOTTED => 14:56

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3 6.6/20.7	223	252

David S. Man 12-08-11  
 REGISTERED ELECTRICAL ENGINEER DATE

1-23-12  
 PLANS APPROVAL DATE

David S. Man  
 No. 18961  
 Exp. 12-31-13  
 ELECTRICAL

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.

**MODEL 334T OR 330T CABINET QUANTITIES**

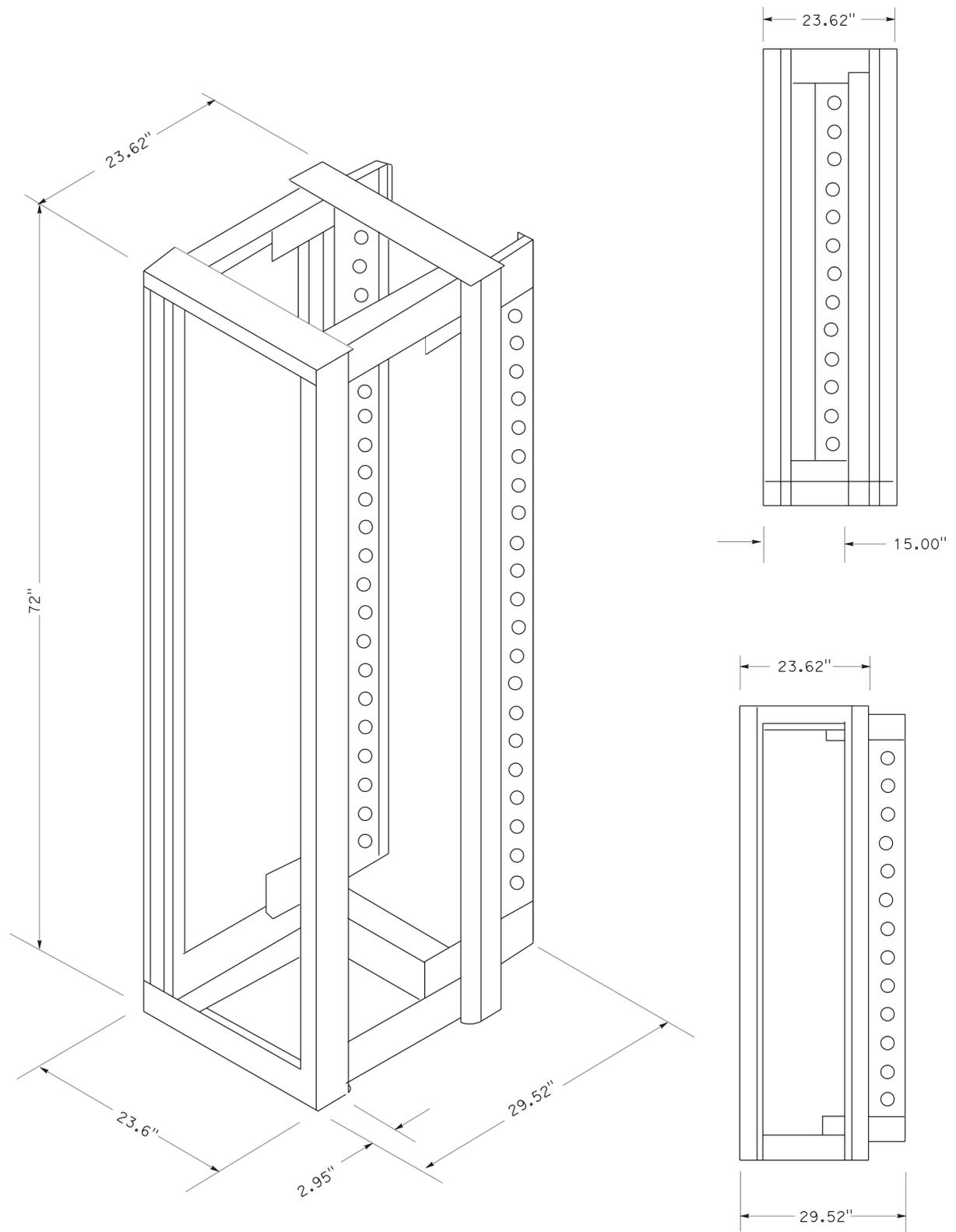
PLAN No.	ID	CABINET LOCATION	SIGNAL INTERCONNECT NETWORK ELEMENT	EDGE ETHERNET SWITCH	FFOTS (N)	AGGREGATION ETHERNET SWITCH
			EA	EA	EA	EA
E-73	TSC034	ROUTE 82 / ROUTE 380 WB RAMP		1	3	
	TSC033	ROUTE 82 / ROUTE 380 EB RAMP			3	1
E-74	TSC032	ROUTE 82 / SAN BRUNO Ave			4	2
E-77	TSC031	ROUTE 82 / SAN FELIPE		1	3	
E-84	TSC030	ROUTE 82 / MILLBRAE Ave			4	2
E-90	TSC029	ROUTE 82 / BROADWAY		1	1	
E-93	TSC028	ROUTE 82 / FLORIBUNDA Ave		1	3	
E-96	TSC027	ROUTE 82 / PENINSULA Ave			2	2
E-98	TSC026	ROUTE 82 / POPLAR Ave			3	2
E-101	TSC025	ROUTE 82 / 4TH Ave			3	2
E-102	TSC024	ROUTE 82 / 9TH Ave		1	1	
E-104	TSC023	ROUTE 82 / 17TH Ave		1	2	
E-112	TSC022	ROUTE 82 / 37TH Ave		1		
E-115	TSC021	ROUTE 82 / DAVEY GLEN Rd		1	1	
E-118	TSC020	ROUTE 82 / RALSTON Ave			4	2
E-119	TSC019	ROUTE 82 / W HARBOR Blvd			4	2
E-122	TSC018	ROUTE 82 / HOLLY St		1	4	1
E-124	TSC017	ROUTE 82 / BRITTAN Ave			4	2
E-128	TSC016	ROUTE 82 / WHIPPLE Ave			3	1
E-43	TSC015	SAN BRUNO Ave / ROUTE 101 SB RAMP			2	
E-45	TSC014	SAN BRUNO Ave / ROUTE 101 NB RAMP			2	
E-46	TSC013	MILLBRAE Ave / ROUTE 101 NB RAMP			2	
E-50	TSC012	MILLBRAE Ave / ROUTE 101 SB RAMP			2	
E-56	TSC009	PENINSULA Ave / ROUTE 101 NB RAMP		1	2	
E-57	TSC008	MARINE PKWY / ROUTE 101 NB RAMP			2	
E-60	TSC007	MARINE PKWY / ROUTE 101 SB RAMP			2	
E-64	TSC006	WHIPPLE Ave / ROUTE 101 NB RAMP		1	2	
E-62	TSC005	HOLLY St / ROUTE 101 SB RAMP		1	2	
E-100	TSC035	ROUTE 82 / 3RD Ave		1	1	
E-105	TSC001	ROUTE 82 / ROUTE 92 EB RAMPS			1	
SUBTOTAL THIS SHEET				13		19
SUBTOTAL FROM SHEET E-160			63	17		0
TOTAL			63	30		19

(N) - NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.

**ELECTRICAL DETAILS  
 COMMUNICATIONS EQUIPMENT SCHEDULE**

**E-161**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	224	252
			REGISTERED ELECTRICAL ENGINEER	DATE	
			<i>Gizachew Merid</i>	12-08-11	
			PLANS APPROVAL DATE		
			1-23-12		
			REGISTERED PROFESSIONAL ENGINEER		
			Gizachew Merid		
			No. 18216		
			Exp. 12-31-13		
			ELECTRICAL		
<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>					



**DETAIL A**

**ELECTRICAL DETAILS**  
**19" RACK**  
 NO SCALE

**E-162**

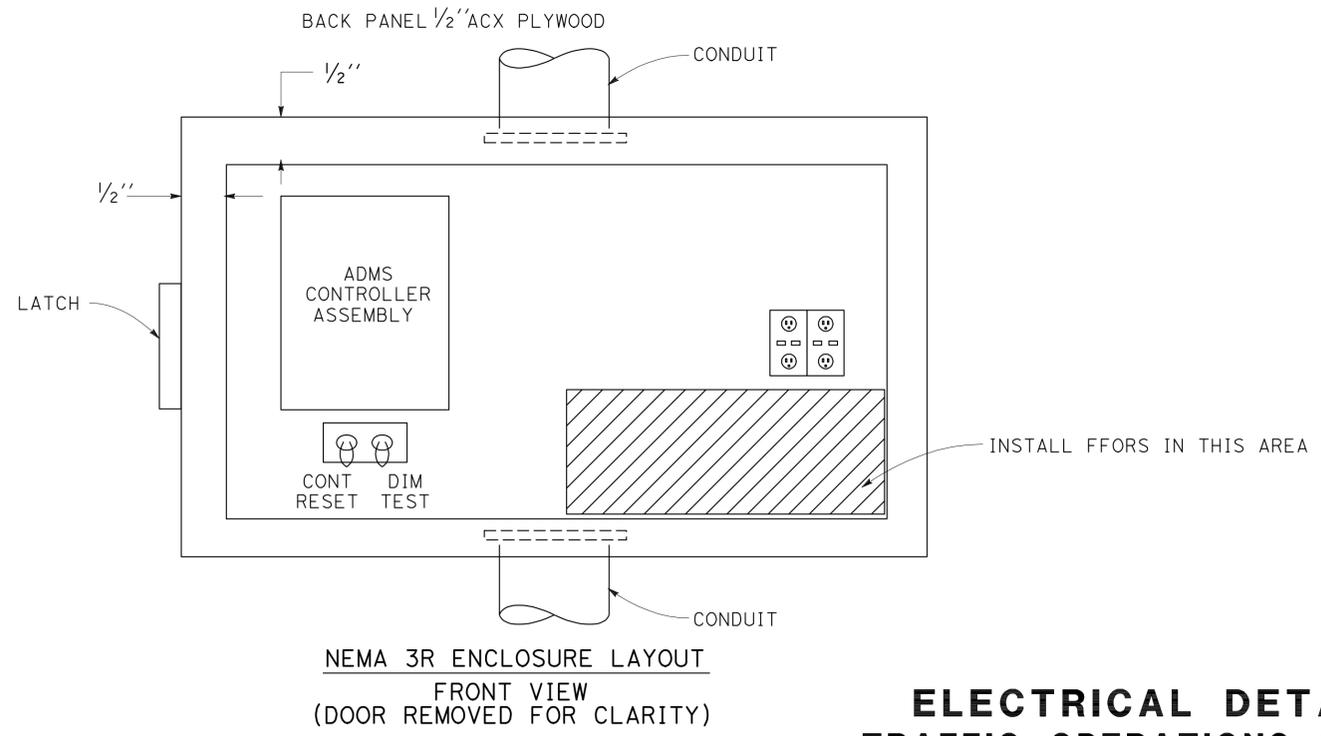
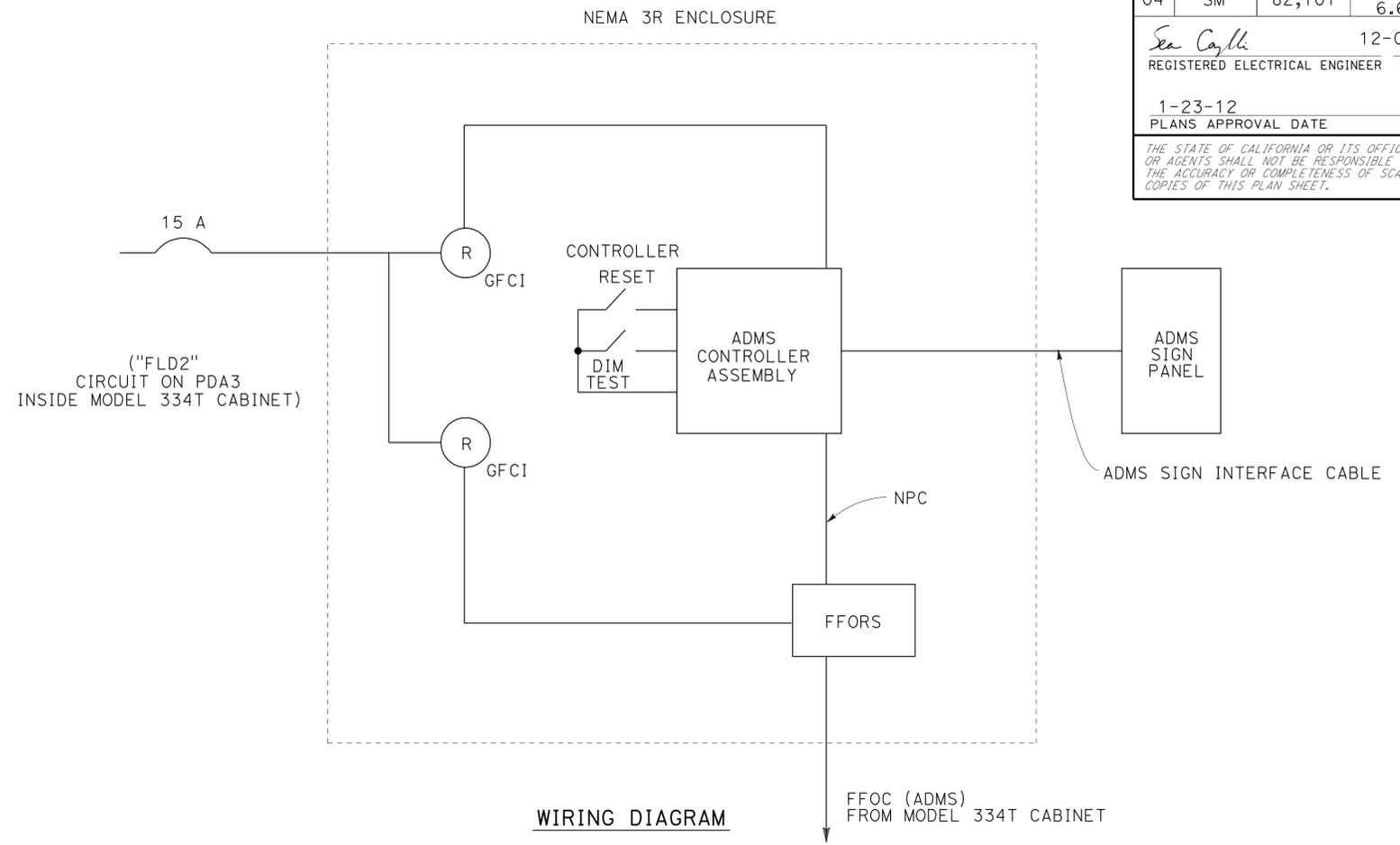
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CALCULATED, DESIGNED BY	GIZACHEW MERID	REVISED BY
<b>Caltrans</b>	BEHZAD GOLEMOHAMMADI	CHECKED BY	JOHN PRESENTATION	DATE REVISED
<b>ELECTRICAL</b>				

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** **ELECTRICAL**  
 FUNCTIONAL SUPERVISOR: SEAN COUGHLIN  
 DESIGNED BY: SEAN COUGHLIN  
 CHECKED BY: MICHAEL P. LEE  
 REVISIONS: (Table with columns for REVISED BY, DATE, REVISIONS)

**NOTE:**  
 1. SEE REVISED STANDARD PLAN ES-14C FOR MOUNTING DETAILS.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	225	252

12-08-11  
 REGISTERED ELECTRICAL ENGINEER DATE  
 Sean F. Coughlin  
 No. 12227  
 Exp. 9-30-12  
 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.



**ELECTRICAL DETAILS  
 TRAFFIC OPERATIONS SYSTEM  
 ADMS PANEL AND ASSEMBLY  
 CONNECTION DETAILS**  
 NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.



USERNAME => s128843  
 DGN FILE => 44a923uat163.dgn

CU 04226

EA 4A9231

LAST REVISION: 11-05-10  
 DATE PLOTTED => 25-JAN-2012  
 TIME PLOTTED => 10:13

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	226	252

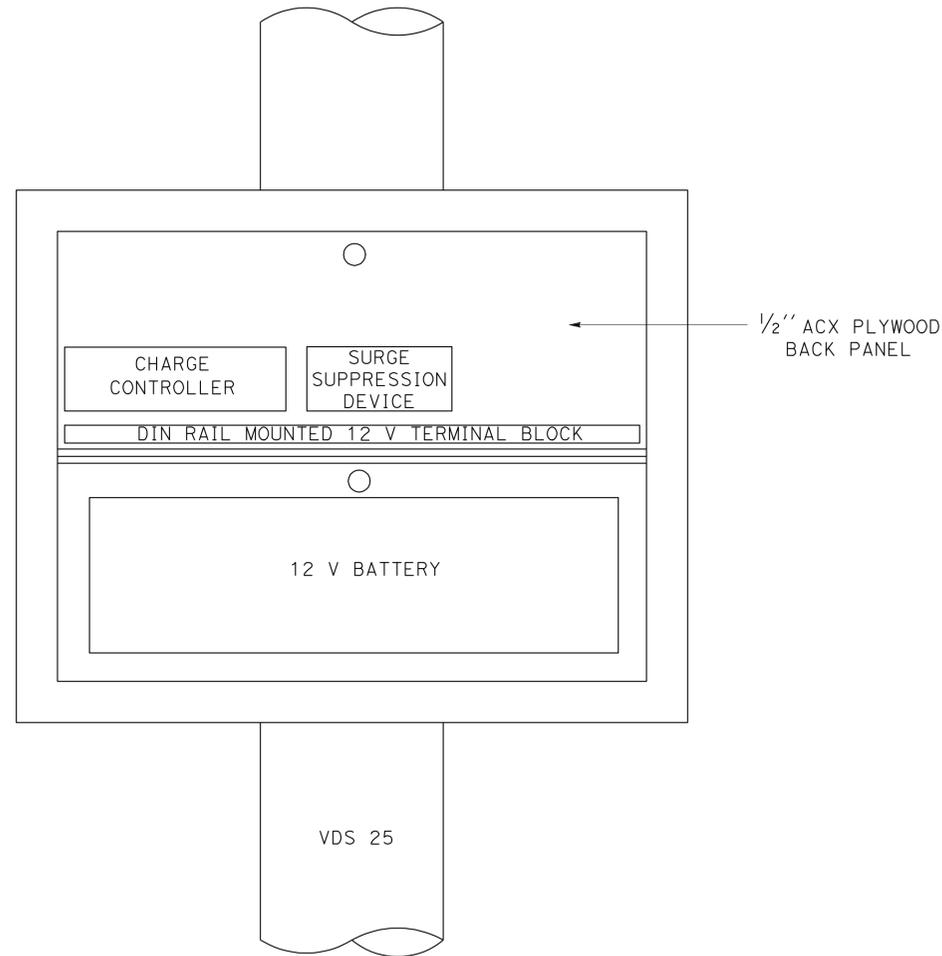
David S. Man 12-08-11  
 REGISTERED ELECTRICAL ENGINEER DATE  
 1-23-12  
 PLANS APPROVAL DATE

David S. Man  
 No. 18961  
 Exp. 12-31-13  
 ELECTRICAL  
 STATE OF CALIFORNIA

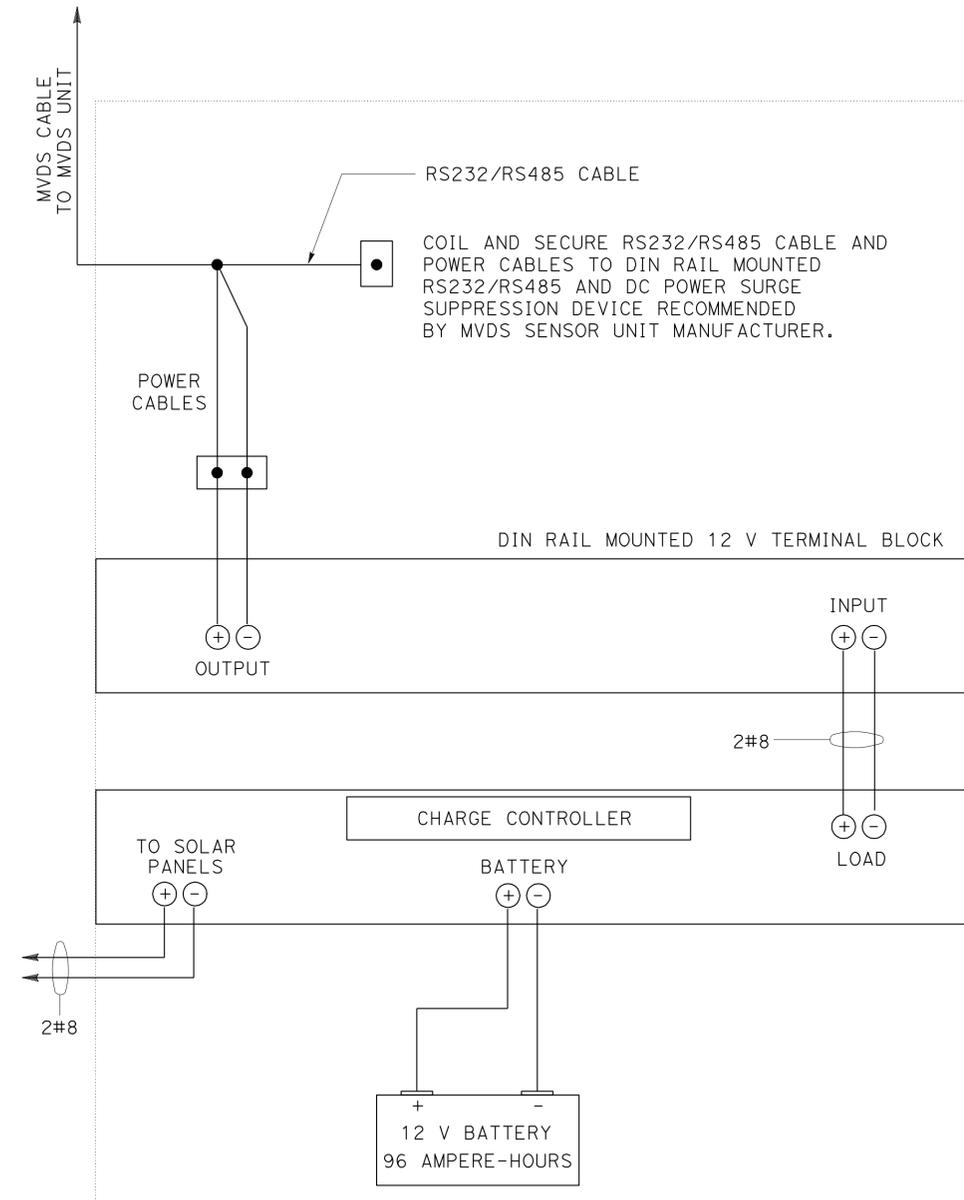
THE STATE OF CALIFORNIA OR ITS OFFICERS  
 OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
 THE ACCURACY OR COMPLETENESS OF SCANNED  
 COPIES OF THIS PLAN SHEET.

**NOTES:**

1. THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING MATERIALS.
2. NEMA 3R ENCLOSURE MOUNTING DETAILS SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE ENGINEER'S APPROVAL.
3. SEE SHEETS SES-1 AND SES-2 FOR POLE DETAILS.



FRONT VIEW  
NEMA 3R ENCLOSURE LAYOUT



TYPICAL EQUIPMENT WIRING

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 ELECTRICAL  
 FUNCTIONAL SUPERVISOR: KENNETH XU  
 CALCULATED/DESIGNED BY: CHECKED BY:  
 DAVID S. MAN  
 MIN YIN LEE  
 REVISED BY: DATE REVISED:

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.



USERNAME => s109858  
 DGN FILE => 44a923ua164.dgn

CU 04226

EA 4A9231

**ELECTRICAL DETAILS**  
**MICROWAVE VEHICLE**  
**DETECTION SYSTEM (ENCLOSURE)**

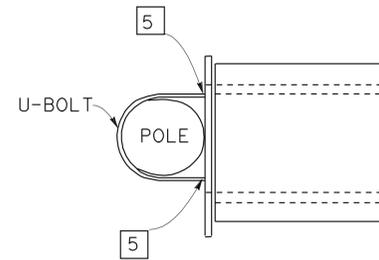
NO SCALE

**E-164**

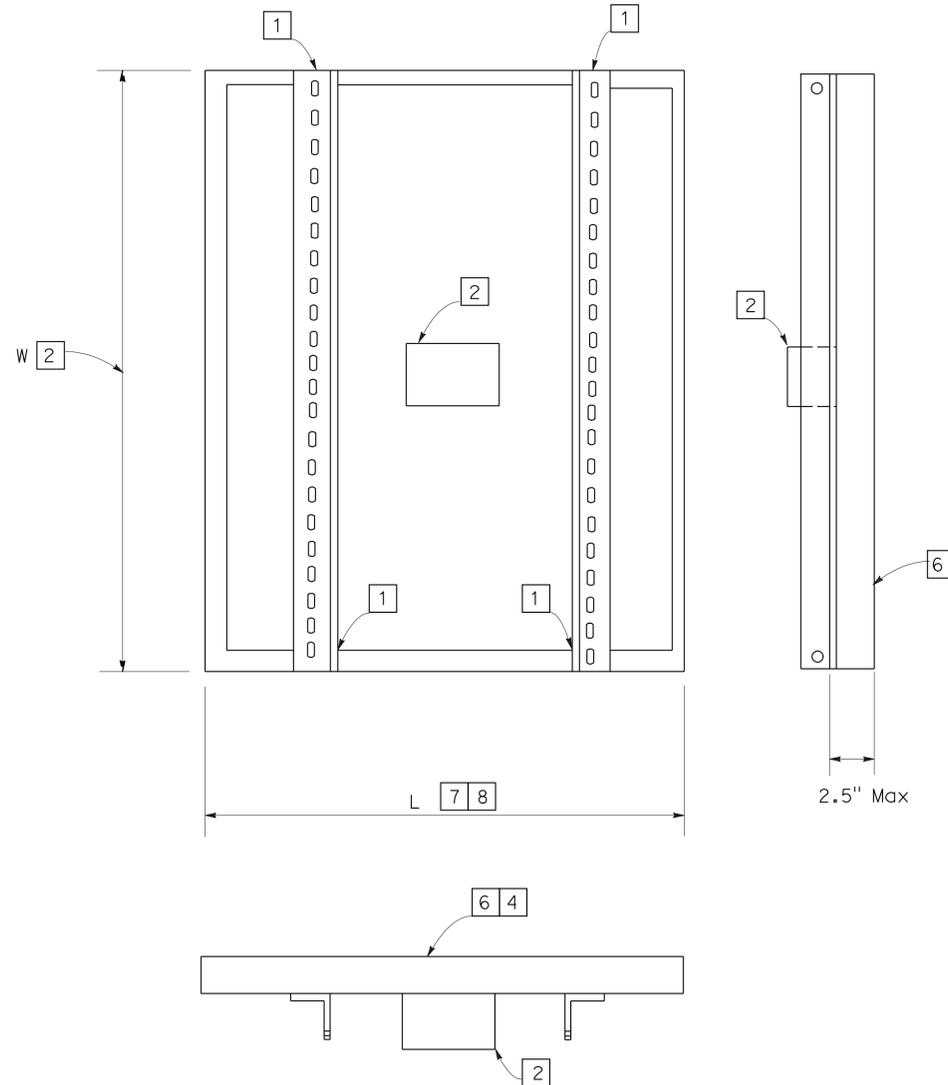
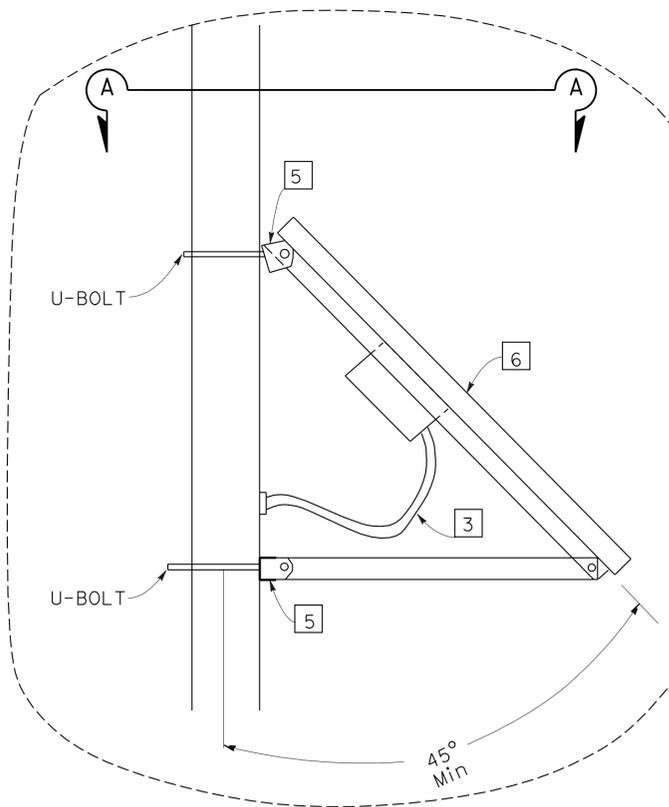
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	227	252
			12-08-11	DATE	
REGISTERED CIVIL ENGINEER			George Gin		
1-23-12			No. 61987		
PLANS APPROVAL DATE			Exp. 9-30-13		
CIVIL					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

**NOTES:** (THIS SHEET ONLY)

- 1 ATTACH "L" BRACE TO PHOTOVOLTAIC PANEL FRAME PER MANUFACTURER'S RECOMMENDATION.
- 2 JUNCTION BOX.
- 3 1/2" C, FLEXIBLE.
- 4 100 WATT PHOTOVOLTAIC PANEL, WEIGHT SHALL NOT EXCEED 31 lbs.
- 5 "U" CHANNEL WITH ANGLE BRACKET.
- 6 PHOTOVOLTAIC PANEL FACE.
- 7 THE AREA, LxW, SHALL NOT EXCEED 10 SQFT, THE W DIMENSION SHALL BE GREATER THAN 2.5 FT.
- 8 PLACE THE LONGEST PANEL EDGE ALONG THIS AXIS.
- 9. SEE SHEETS SES-1 AND SES-2 FOR POLE DETAILS.



SECTION A-A



**100 WATT PHOTOVOLTAIC MOUNTING DETAILS**

**ELECTRICAL DETAILS  
MICROWAVE VEHICLE  
DETECTION SYSTEM  
(PHOTOVOLTAIC PANEL)**

NO SCALE

**E-165**

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.

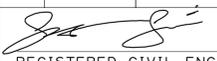
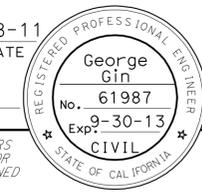


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DGN FILE => 44a923uat165.dgn

CU 04226

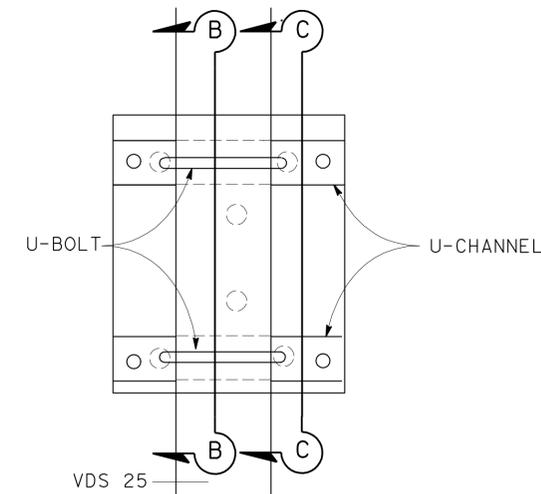
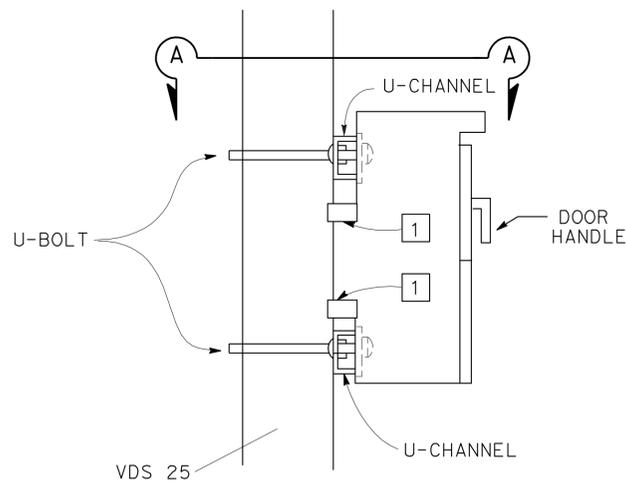
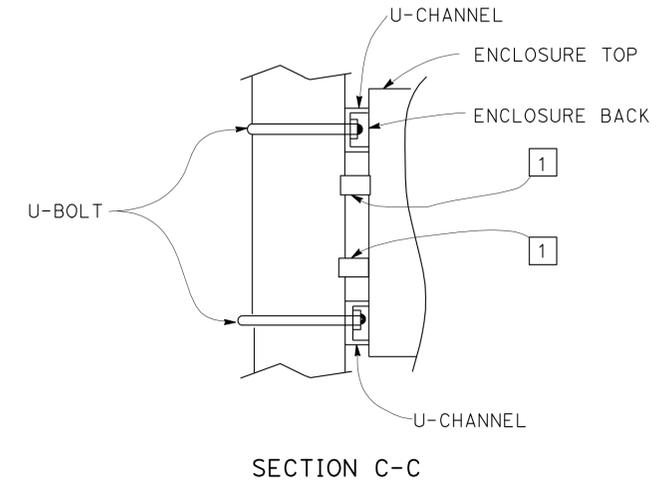
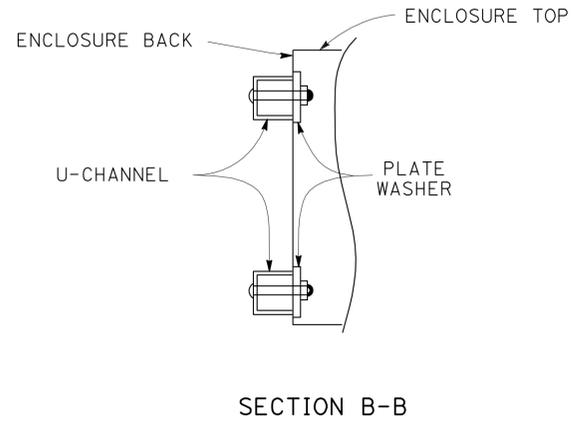
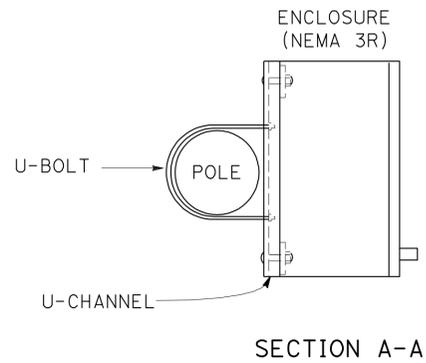
EA 4A9231

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
ELECTRICAL  
FUNCTIONAL SUPERVISOR KENNETH XU  
DAVID S. MAN  
MIN YIN LEE  
REVISOR  
DATE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	228	252
 REGISTERED CIVIL ENGINEER DATE 12-08-11					
1-23-12 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>					

**NOTES:**

- 1 2" RECESSED COUPLING.
2. SEE SHEETS SES-1 AND SES-2 FOR POLE DETAILS.
3. NEMA 3R ENCLOSURE MOUNTING DETAILS SHALL BE SUBMITTED BY THE CONTRACTOR FOR ENGINEERS APPROVAL.



**ELECTRICAL DETAILS  
MICROWAVE VEHICLE DETECTION SYSTEM  
(NEMA 3R ENCLOSURE MOUNTING DETAILS)**

NO SCALE

**E-166**

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET E-1 TO E-3.



USERNAME => s109858  
DGN FILE => 44a923ua166.dgn

CU 04226

EA 4A9231

BORDER LAST REVISED 4/11/2008

LAST REVISION DATE PLOTTED => 19-DEC-2011  
10-19-10 TIME PLOTTED => 13:58

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** ELECTRICAL  
FUNCTIONAL SUPERVISOR  
CALCULATED, DESIGNED BY  
CHECKED BY  
REVISED BY  
DATE REVISED

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	229	252

*Eliseo Lopez*  
 REGISTERED CIVIL ENGINEER DATE 11/30/11  
 No. C72910  
 Exp. 12/31/12  
 CIVIL  
 STATE OF CALIFORNIA

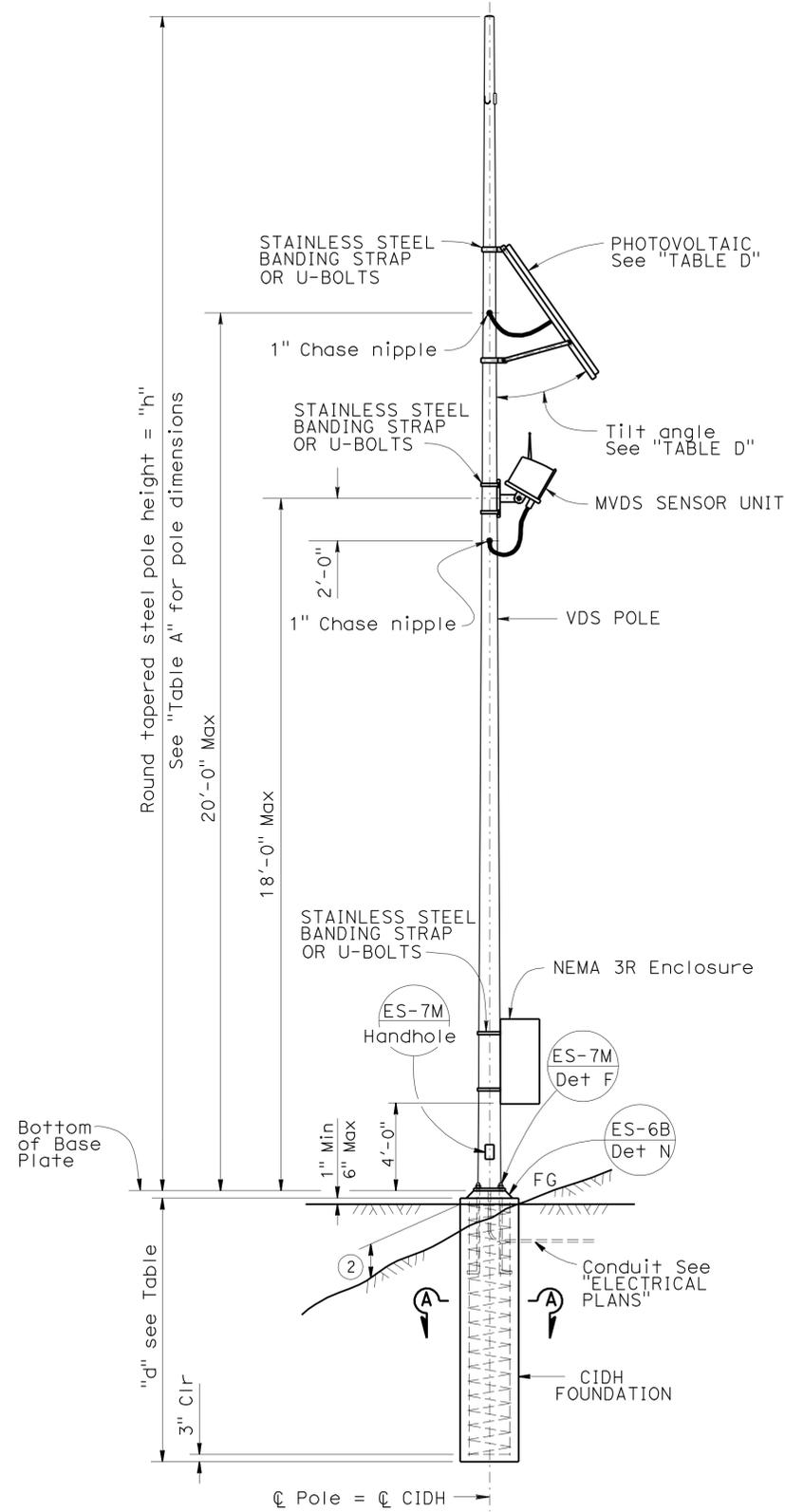
1-23-12  
 PLANS APPROVAL DATE  
 The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

Pole Type	Pole Data			Base Plate Data				"d" 2'-0" Ø CIDH Pile		Structural Steel LBS plus 3.5% Galvanizing	
	Height "h"	Min OD		Thickness	"c"	Thickness	Anchor Bolts				
		BASE	TOP				SIZE	BC = BOLT CIRCLE	LEVEL GROUND		SLOPING GROUND
VDS 25	25'	7 <sup>3</sup> / <sub>8</sub> "	3 <sup>7</sup> / <sub>8</sub> "	0.1793"	1'-0"	1"	1" x 3'-0 x 4"	10 <sup>1</sup> / <sub>2</sub> "	8'-0"	10'-0"	395

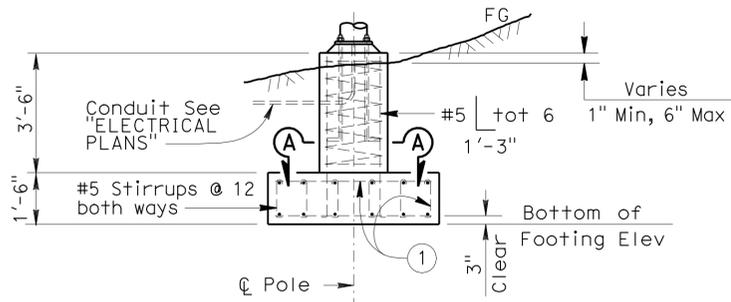
Attachment	Dimensions	Mounting Height	Weight Limits (lbs)
Enclosure	24"H X 24"W X 8"D	4'-0" Max. bottom Clr.	134 Max
Photovoltaic	48"W X 30"H	20' Max	31 Max
MVDS SENSOR UNIT	9.8" X 9.8" X 14"	18' Max	11 Max

Spread Footing		
Ground	Footing Size Length x Width x Depth	Reinforcement Top & Bottom
Level	6'-0" x 6'-0" x 1'-6"	7 - #4
Sloping	7'-0" x 7'-0" x 1'-6"	8 - #4

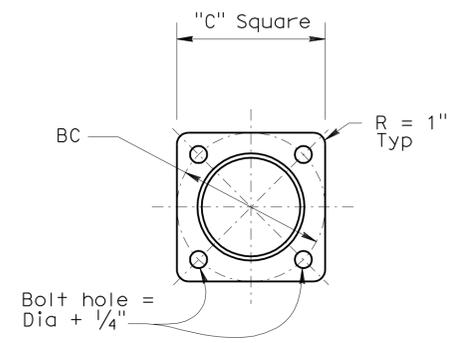
Photovoltaic Panel Limits	
Panel Size	Tilt Angle
10 ft <sup>2</sup> Max	45° Min



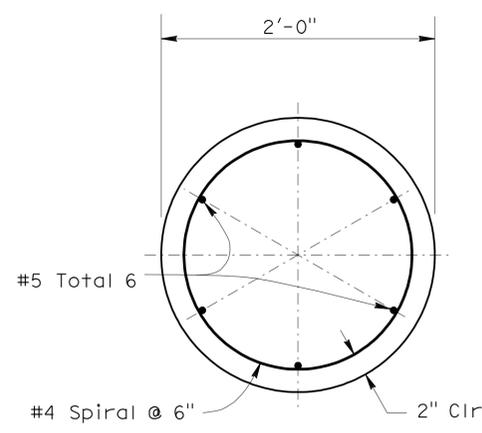
**ELEVATION**  
NO SCALE



**ALTERNATIVE FOOTING ELEVATION**  
NO SCALE



**BASE PLATE**  
SCALE 1/2" = 1'



**SECTION A-A**  
SCALE 1/2" = 1'

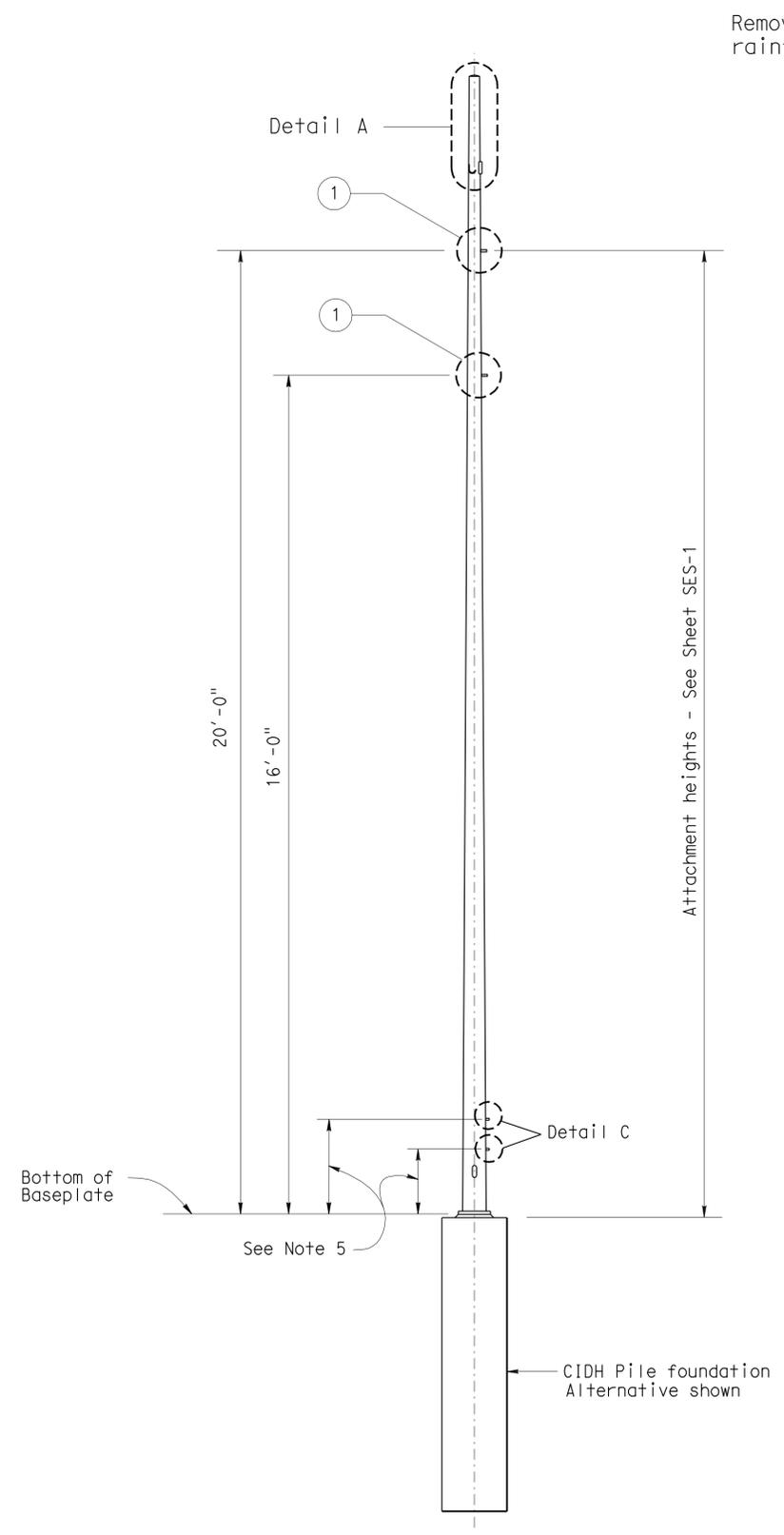
- ABBREVIATIONS:**  
 VDS = Vehicle Detection System  
 MVDS = Microwave Vehicle Detection System
- GENERAL NOTES:**
- SPECIFICATIONS**  
 Design: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals dated 2001.
- LOADING**  
 Wind Loadings: 100 mph
- UNIT STRESSES**  
 Structural Steel: fy = 48,000 psi tapered steel tube  
 fy = 36,000 psi unless otherwise noted.  
 Anchor bolts = A307  
 Reinforced Concrete: f'c = 3,600 psi  
 fy = 60,000 psi
- NOTES:**
- All steel shall be galvanized after fabrication.
  - During pole erection the pole shall be raked as necessary with the use of leveling nuts to provide a plumb pole axis.
  - The foundation shall be treated as level ground condition if the slope inclination is flatter than 4H:1V.
  - Foundation design is based on AASHTO 2001 article 13.6 Broms' approximate procedure assuming a cohesionless material. The angle of internal friction used is 30 degrees and unit weight of soil used is 120 lbs/ft<sup>3</sup>.
  - For details not shown, see "2006 STANDARD PLANS" and "2006 REVISED STANDARD PLANS".

- #5 bars and #5 stirrups (top & bottom) to run both longitudinal and transverse direction.
- 1'-3" Max for sloped finished grade.

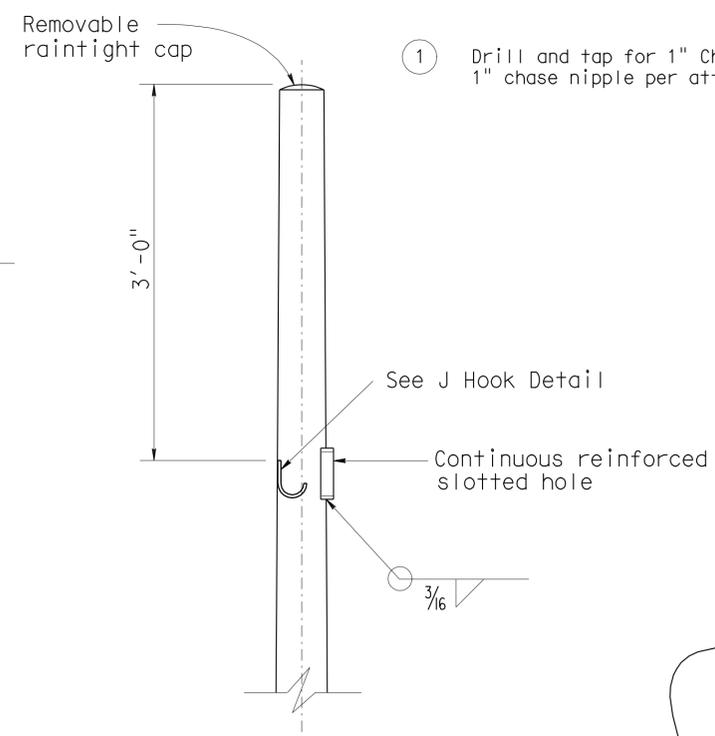
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

BRANCH CHIEF <b>JEFFREY B WOODY</b>	DESIGN	BY <i>ELISEO LOPEZ</i>	CHECKED <i>DEVANG VORA</i>	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES DESIGN AND TECHNICAL SERVICES <b>SPECIAL DESIGNS BRANCH</b>	BRIDGE NO.	N/A	<b>ELECTRICAL SYSTEMS</b> <b>MICROWAVE VEHICLE DETECTION SYSTEM</b> <b>POLE DETAILS</b>	<b>SES-1</b>
	DETAILS	BY <i>A R DUDSAK</i>	CHECKED <i>ELISEO LOPEZ</i>			POST MILE	4.8/19.3, 6.6/20.7		
	QUANTITIES	BY	CHECKED			CONTRACT NO.:	04-4A9231		

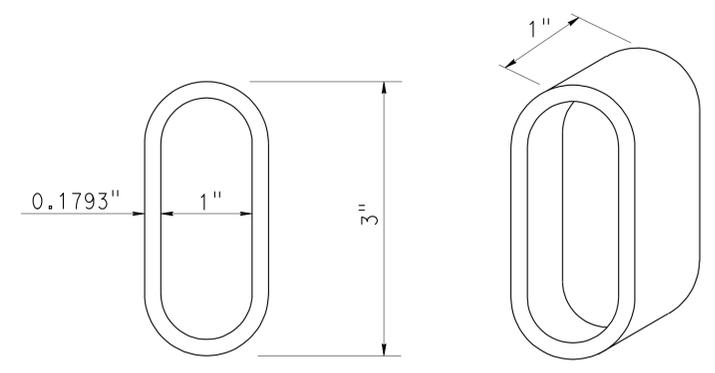
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	230	252
<i>Eliseo Lopez</i> REGISTERED CIVIL ENGINEER			11/30/11 DATE		
1-23-12			PLANS APPROVAL DATE		
<small>The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.</small>					



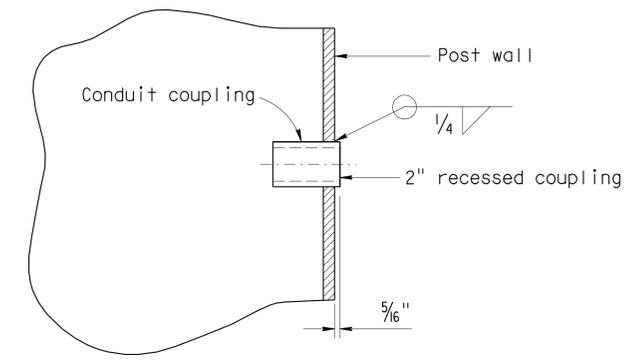
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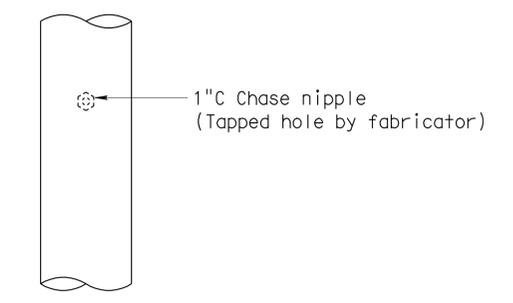
**DETAIL A**



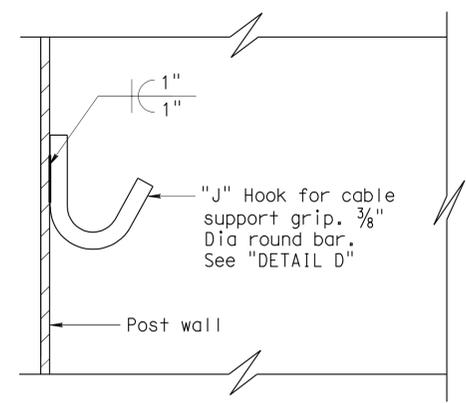
**SLOTTED HOLE**



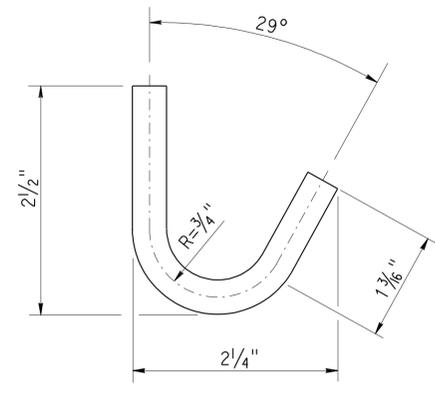
**2\"/>**



**DETAIL B  
TYPICAL ELECTRICAL  
ACCESS DETAIL**



**J HOOK DETAIL**



**DETAIL D**

**NOTES:**

1. Place all couplings on the same side of pole.
2. Chase nipples and slotted hole shall have a raintight plug. Plug should only be removed if chase nipple or slotted hole is used.
3. The chase nipples shall be 1'-0" min vertical clearance from the slotted hole and not on the same side as the slotted hole.
4. For attachment details, see sheet SES-1.
5. Coupling location above ground and spacing shall be verified to match choice of enclosure, prior to fabrication.
6. All attachments, unless otherwise noted, shall be mounted to pole with stainless steel straps or other method without drilling holes in pole. Enclosure may require drilling through post for mounting. Method of mounting enclosure will require Engineer approval.

THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

BRANCH CHIEF <b>JEFFREY B WOODY</b>	DESIGN	BY <i>ELISEO LOPEZ</i>	CHECKED <i>DEVANG VORA</i>	<b>STATE OF CALIFORNIA</b> DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES DESIGN AND TECHNICAL SERVICES <b>SPECIAL DESIGNS BRANCH</b>	BRIDGE NO.	N/A	<b>ELECTRICAL SYSTEMS</b> <b>MICROWAVE VEHICLE DETECTION SYSTEM</b> <b>POLE DETAILS</b>	<b>SES-2</b>
	DETAILS	BY <i>A R DUDSAK</i>	CHECKED <i>ELISEO LOPEZ</i>			POST MILE	4.8/19.3, 6.6/20.7		
	QUANTITIES	BY	CHECKED						

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
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*Eliseo Lopez* 11/30/11  
 REGISTERED CIVIL ENGINEER DATE

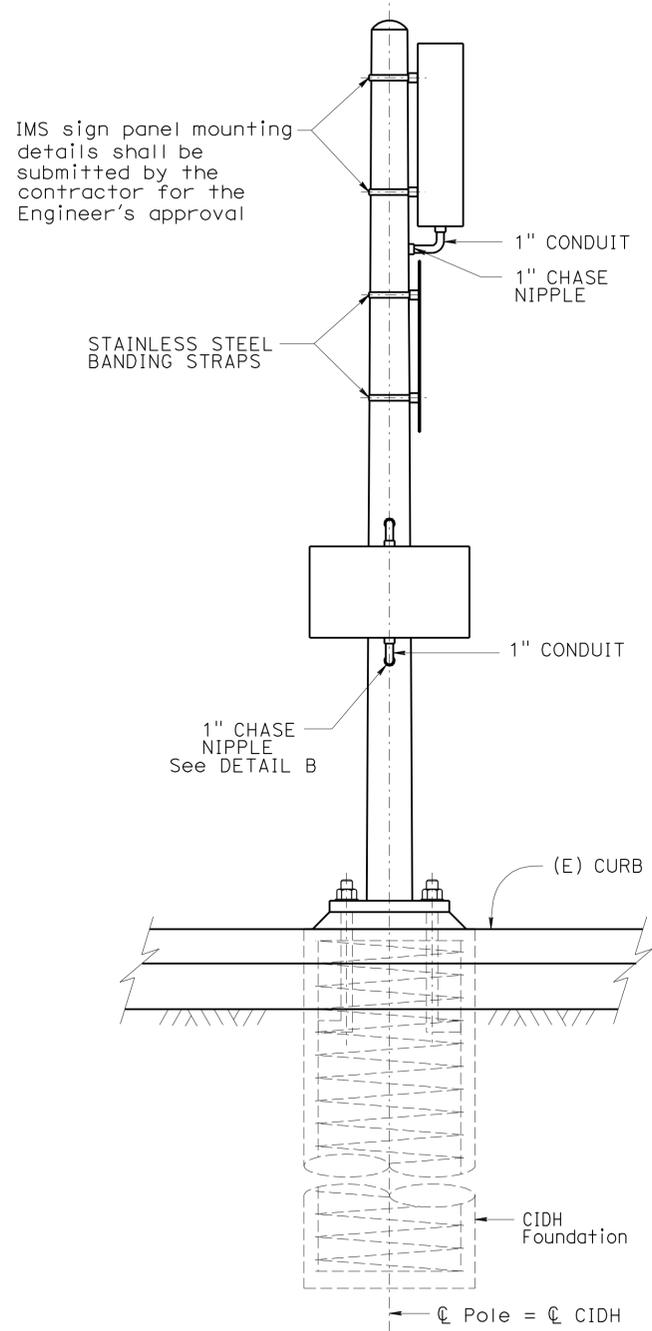
1-23-12  
 PLANS APPROVAL DATE

*Eliseo Lopez*  
 No. C72910  
 Exp. 12/31/12  
 CIVIL  
 STATE OF CALIFORNIA

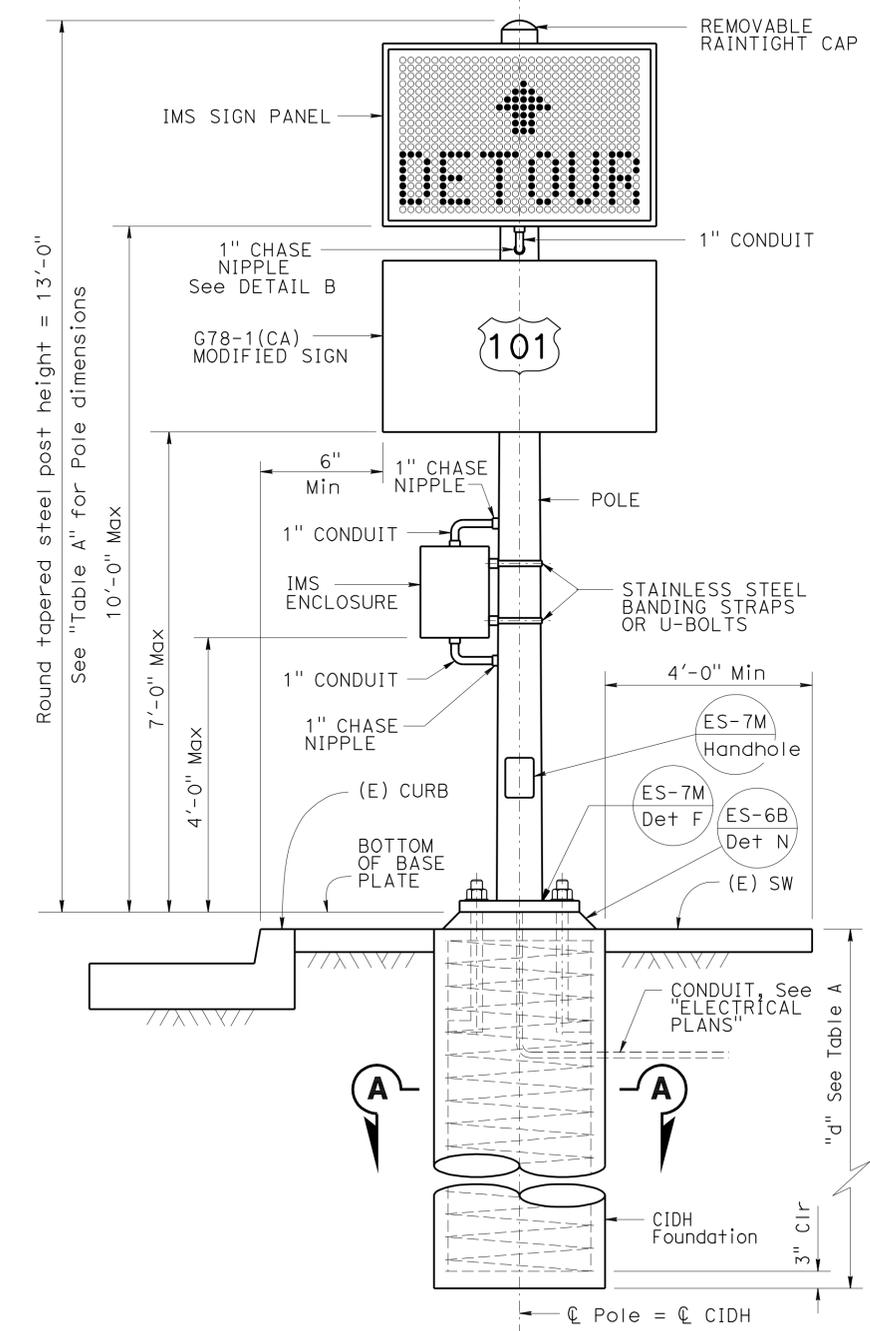
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

Pole Type	Pole Data			Base Plate Data				"d" 2'-0" Ø CIDH Pile		Structural Steel Lbs Plus 3,4% Galvanizing	
	Height "h"	Min OD		"C"	Thickness	Anchor Bolts		Level Ground	Sloping Ground		
		Base	Top			Size	BC = Bolt Circle				
VDS Pole Modified	13'	8"	6 1/4"	0.1793"	1'-0"	1"	1" x 3'-0" x 4"	11"	7'-0"	9'-0"	265

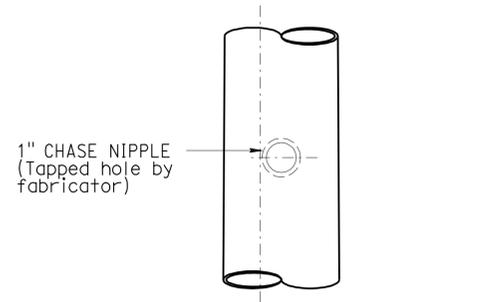
Attachment	Mounting Height	Weight Limits (lbs)
2'-4"H x 1'-4"W x 12"D IMS Enclosure	4'-0" Max. bottom Clr.	25 Max
G78-1 (CA) Modified Sign 4'-0" W x 2'-6"H	7'-0" Max. bottom Clr.	20 Max
IMS Sign Panel 4'-0" W x 2'-8"H x 8"D	10'-0" Max. bottom Clr.	120 Max



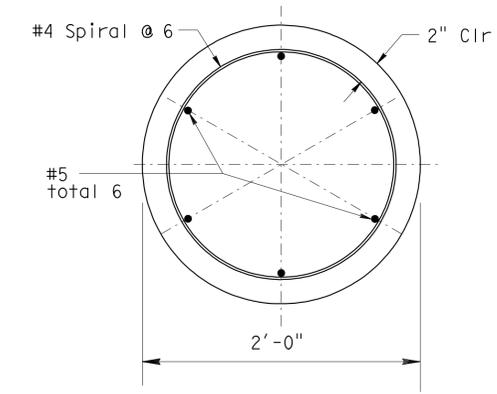
**ELEVATION**  
 SIDE VIEW  
 NO SCALE



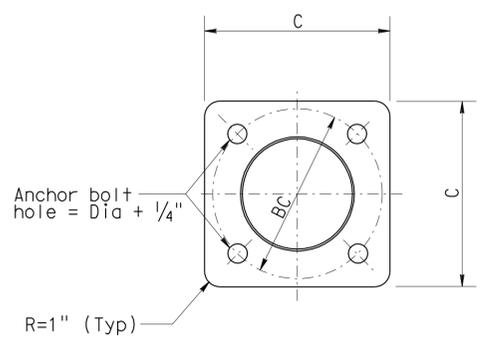
**ELEVATION**  
 FRONT VIEW  
 NO SCALE



**DETAIL B**  
 TYPICAL ELECTRICAL ACCESS DETAIL



**SECTION A-A**



**BASE PLATE**

**ABBREVIATIONS**

IMS = Informational Message Sign

**GENERAL NOTES:**

**SPECIFICATIONS**

Design: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals dated 2001.

**LOADING**

Wind Loadings: 100 mph

**UNIT STRESSES**

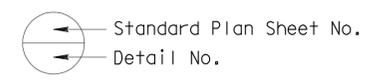
Structural Steel:  $f_y = 48,000$  psi tapered steel tube.  
 $f_y = 36,000$  psi unless otherwise noted.

Anchor bolts = A307

Reinforced Concrete:  $f'_c = 3,600$  psi  
 $f_y = 60,000$  psi

**NOTES:**

- All steel shall be galvanized after fabrication.
- During pole erection the pole shall be raked as necessary with the use of leveling nuts to provide a plumb pole axis.
- The foundation shall be treated as level ground condition if the slope inclination is flatter than 4H:1V.
- Foundation design is based on AASHTO 2001 article 13.6 Broms' approximate procedure assuming a cohesionless material. The angle of internal friction used is 30 degrees and unit weight of soil used is 120 lb/ft<sup>3</sup>.
- For details not shown, see "2006 STANDARD PLANS" and 2006 "REVISED STANDARD PLANS".
- No additional loads shall be added to the VDS Pole without DES Structures approval and review.
- Chase nipples have a raintight plug. Plug should be removed if chase nipple is used.
- All attachments, unless otherwise noted, shall be mounted to pole with stainless steel straps or other method without drilling holes in pole. Enclosure may require drilling through pole for mounting. Method of mounting enclosure will require Engineer's approval.



THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

BRANCH CHIEF	JEFFREY B WOODY
DESIGN	BY ELISEO LOPEZ CHECKED K C LIU/DEVANG VORA
DETAILS	BY A R DUDSAK CHECKED K C LIU/DEVANG VORA
QUANTITIES	BY ELISEO LOPEZ CHECKED DEVANG VORA

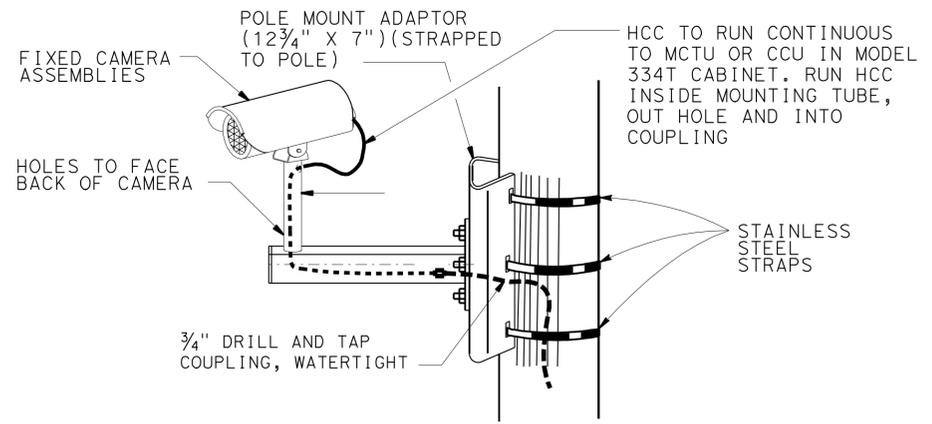
STATE OF CALIFORNIA	DIVISION OF ENGINEERING SERVICES
DEPARTMENT OF TRANSPORTATION	DESIGN AND TECHNICAL SERVICES
	SPECIAL DESIGNS BRANCH

BRIDGE NO.	N/A
POST MILE	4.8/19.3, 6.6/20.7

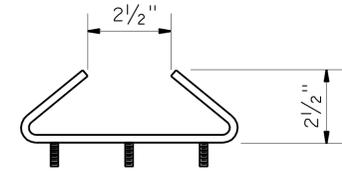
THE SMART CORRIDOR PROJECT	SES-3
INFORMATIONAL MESSAGE SIGN	

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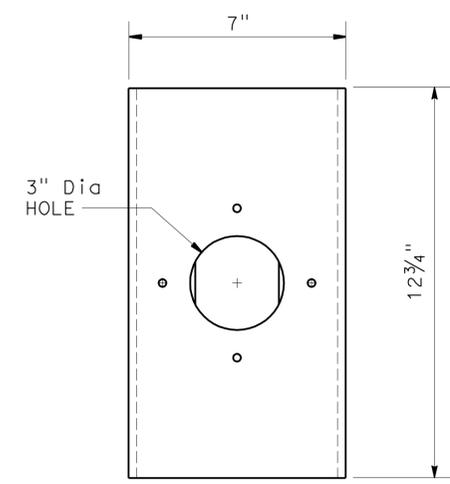
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	232	252
<i>Lisa M. McCutcheon</i> REGISTERED CIVIL ENGINEER			12/19/11	DATE	
1-23-12			PLANS APPROVAL DATE		
No. C70121			Exp. 9/30/12		
CIVIL			STATE OF CALIFORNIA		
<small>The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.</small>					



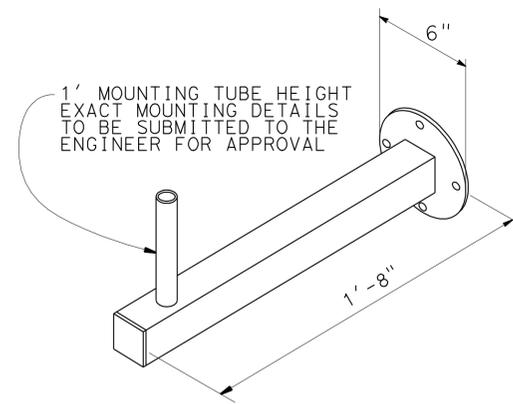
**DETAIL A**  
**CAMERA POLE MOUNTING DETAIL**  
 NO SCALE



**PLAN VIEW**

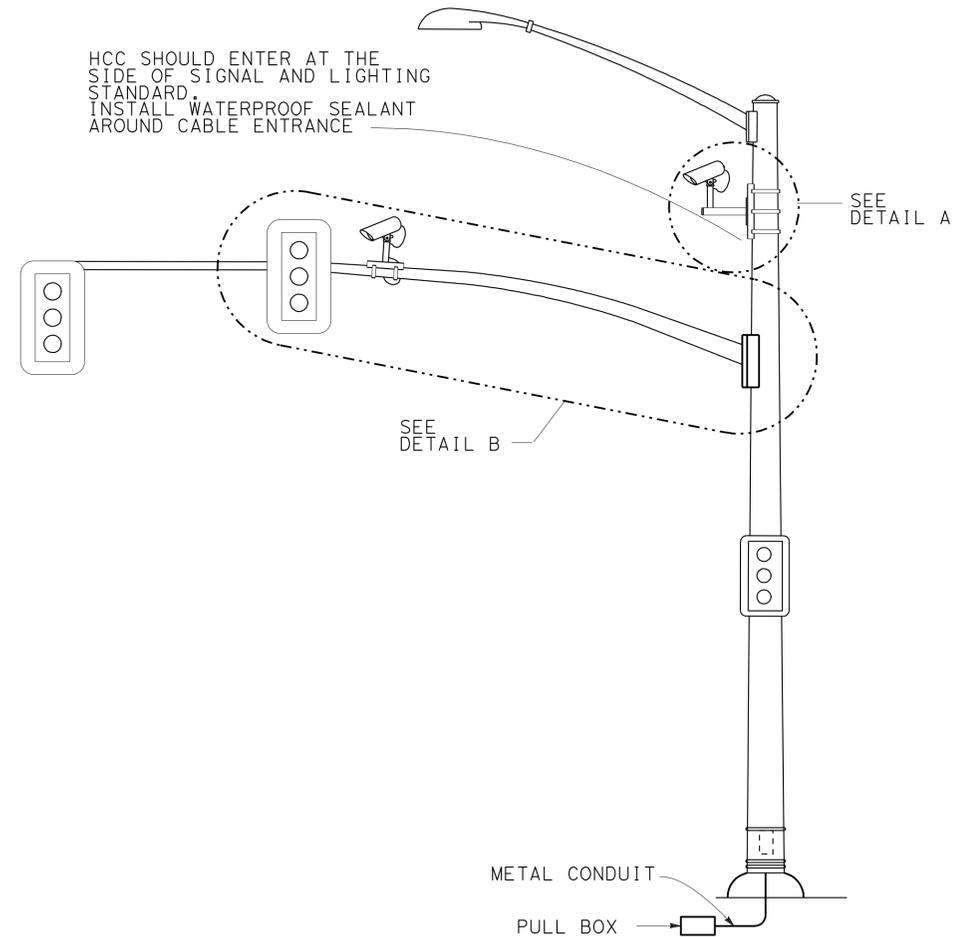


**POLE MOUNT ADAPTER**  
**FRONT VIEW**  
 NO SCALE

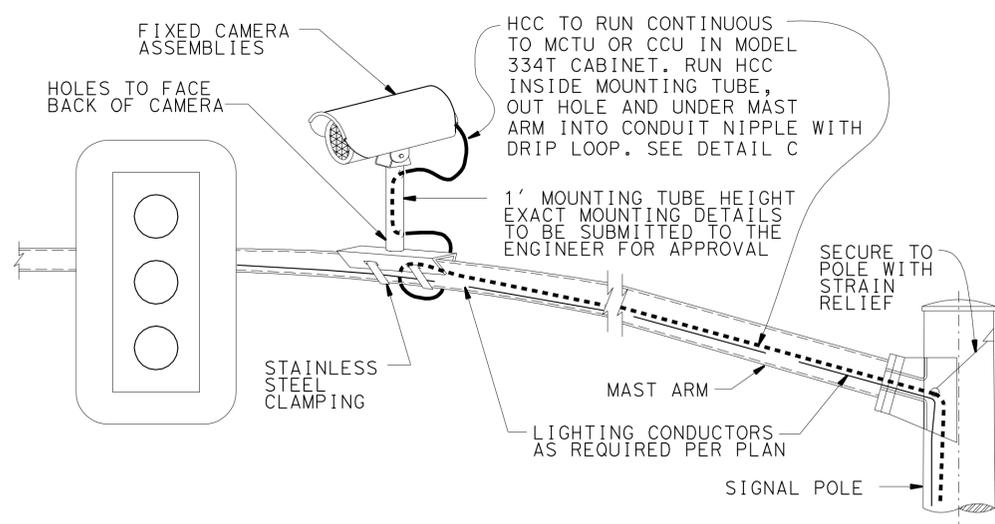


**WALL MOUNT ARM**  
 NO SCALE

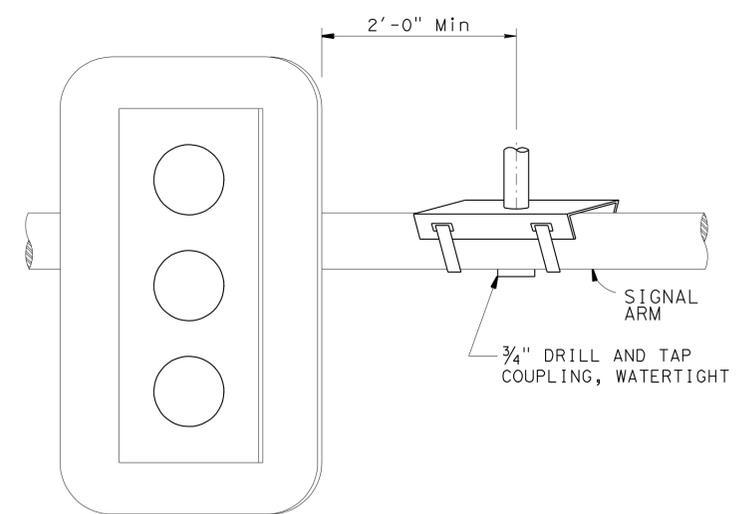
- NOTES:**
1. Attach the wall mount arm to the pole mount adaptor with flat washer, lock washer and nut.
  2. All metallic conduits, bolts and miscellaneous hardware shall be galvanized.
  3. Elements (Total fixed camera assembly) shall have a maximum weight of 10 lbs and a maximum effective pressure area of 1 square foot.
  4. Maximum of 2 Camera elements added per traffic signal structure. Maximum of 1 element per arm (lighting arm or traffic signal arm).



**FIXED CAMERA MOUNTING ON EXISTING/  
 NEW SIGNAL AND LIGHTING STANDARD**  
 NO SCALE



**DETAIL B**  
**CAMERA ARM MOUNTING DETAIL**  
 NO SCALE



**DETAIL C**  
 NO SCALE

THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

BRANCH CHIEF *Jeffrey B. Woody*

DESIGN	BY J WOODY	CHECKED L McCUTCHEON
DETAILS	BY A R DUDSAK	CHECKED L McCUTCHEON
QUANTITIES	BY J WOODY	CHECKED L McCUTCHEON

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES  
 DESIGN AND TECHNICAL SERVICES  
 SPECIAL DESIGNS BRANCH **A**

BRIDGE NO.	X
POST MILE	X

**CCTV CAMERA MODIFIED TYPE 19A-3-100**  
**MOUNTING DETAILS NO. 1**

SES-4

(ENGLISH) SPECIAL DESIGNS BRANCH BORDER SHEET (REV. 7-1-09)

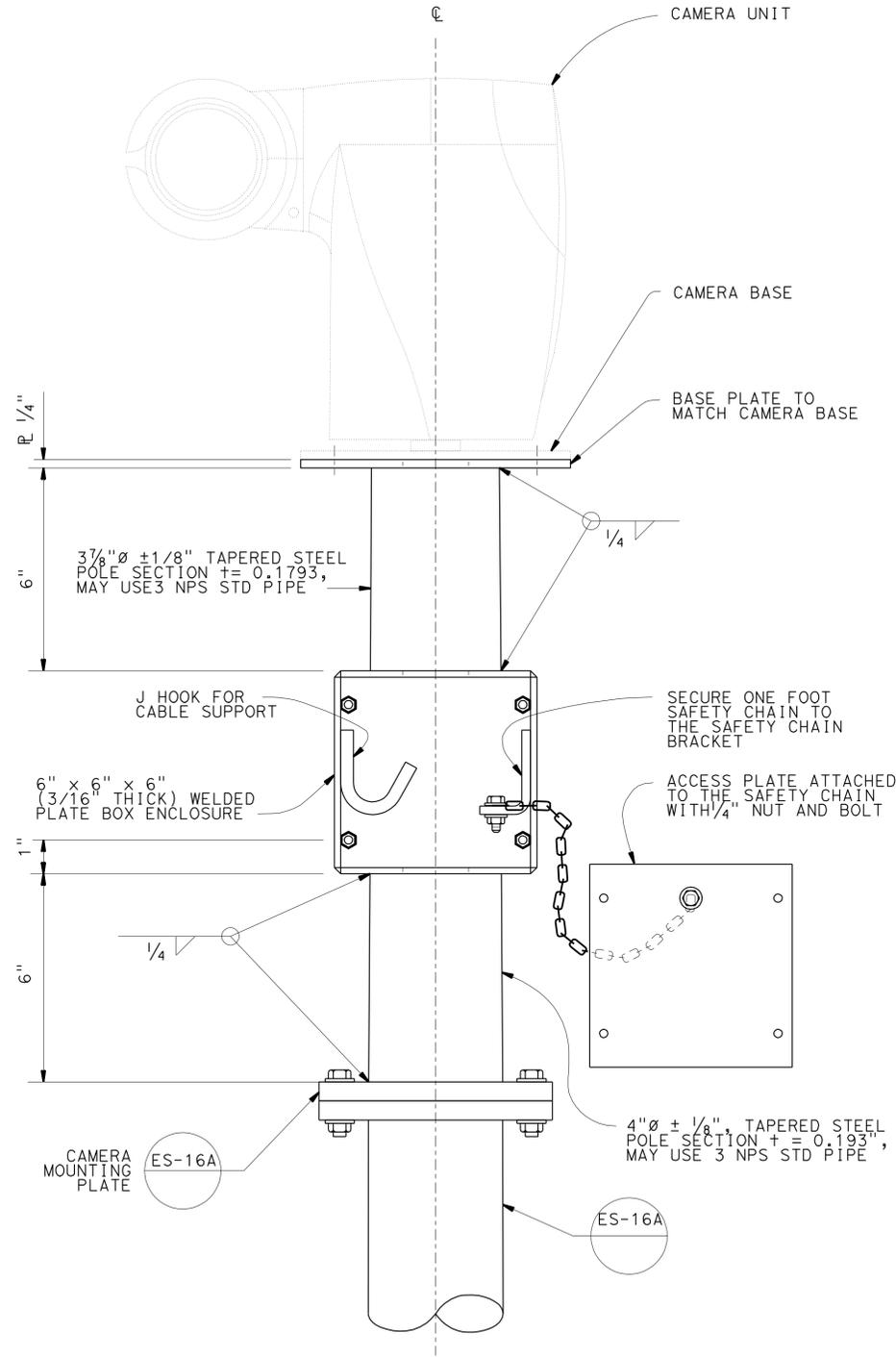


UNIT: 3620  
 PROJECT NUMBER & PHASE: 0412000313-1  
 CONTRACT NO.: 04-4A9231

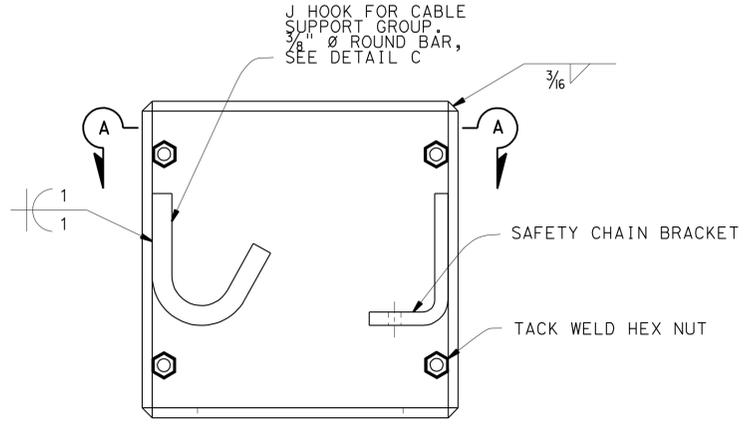
DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES	SHEET	OF
	1/24/11 1/19/11	X	X

USERNAME => s128843 DATE PLOTTED => 25-JAN-2012 TIME PLOTTED => 09:18

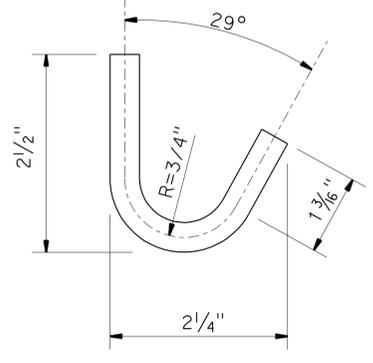
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	233	252
<i>Lisa M. McCutcheon</i> REGISTERED CIVIL ENGINEER DATE 12/19/11					
1-23-12				PLANS APPROVAL DATE	
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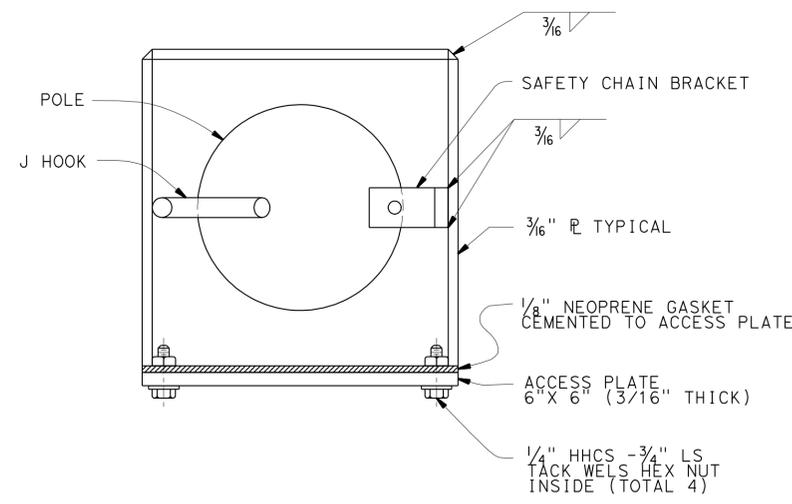
**DETAIL A**  
**CCTV POLE MOUNTING WITH ADAPTER**



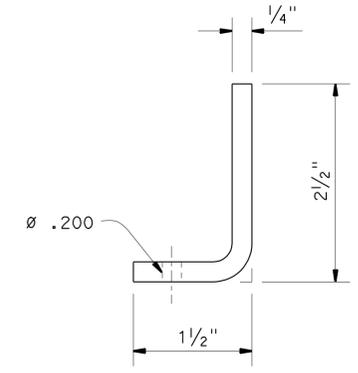
**DETAIL B**  
**BOX ENCLOSURE**



**DETAIL C**  
**J HOOK**



**SECTION A-A**



**DETAIL D**  
**SAFETY CHAIN BRACKET**

THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

BRANCH CHIEF *Jeffrey B. Woody*

DESIGN	BY J WOODY	CHECKED L McCUTCHEON
DETAILS	BY A R DUDSAK	CHECKED L McCUTCHEON
QUANTITIES	BY J WOODY	CHECKED L McCUTCHEON

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES  
DESIGN AND TECHNICAL SERVICES  
SPECIAL DESIGNS BRANCH **A**

BRIDGE NO.	X
POST MILE	X

CCTV CAMERA MODIFIED TYPE 19A-3-100  
MOUNTING DETAILS

SES-5

(ENGLISH) SPECIAL DESIGNS BRANCH BORDER SHEET (REV. 7-1-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3620 PROJECT NUMBER & PHASE: 0412000313-1 CONTRACT NO.: 04-4A9231

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES	1/24/11	1/19/11
----------------	---------	---------

SHEET	OF
X	X

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	234	252

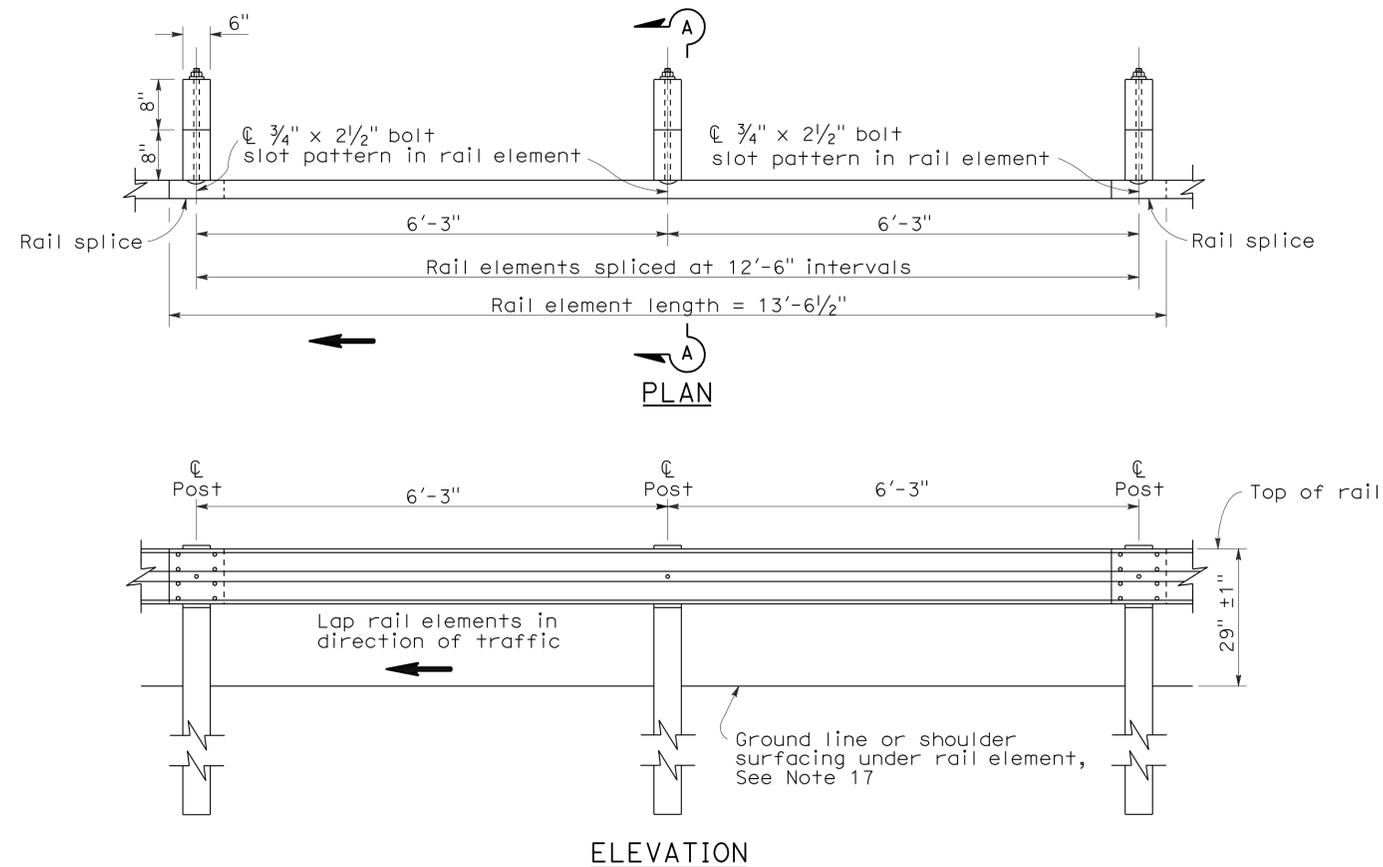
**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

May 20, 2011  
PLANS APPROVAL DATE

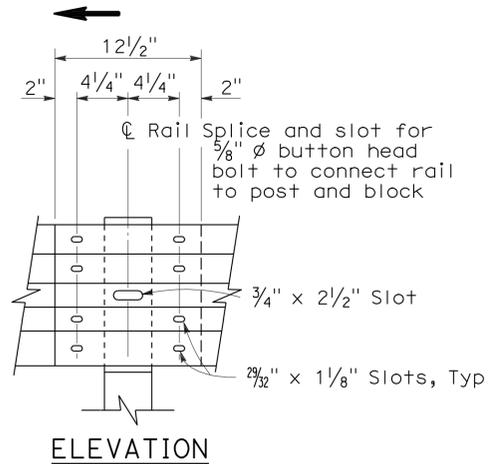
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To accompany plans dated 1-23-12

2006 REVISED STANDARD PLAN RSP A77A1

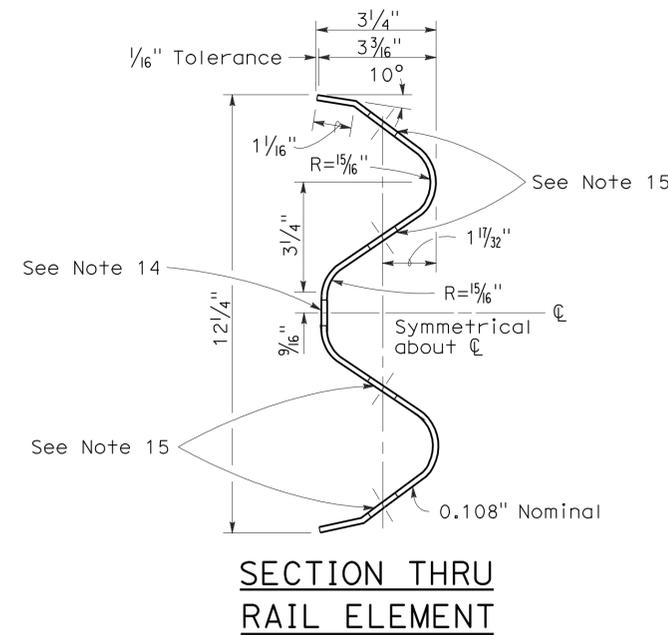


**METAL BEAM GUARD RAILING WITH WOOD POST AND BLOCKS**

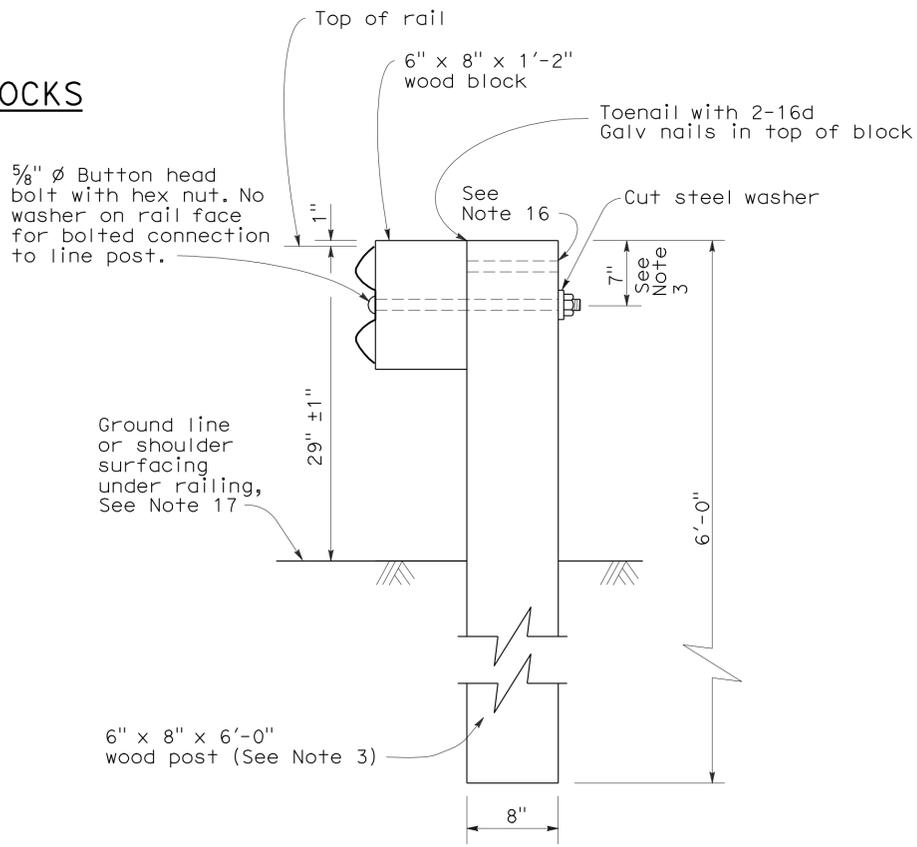


**RAIL ELEMENT SPLICE DETAIL**

- Connect the over lapped end of the rail elements with  $\frac{5}{8}$ "  $\phi$  x  $1\frac{3}{8}$ " button head oval shoulder splice bolts inserted into the  $2\frac{3}{32}$ " 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.



**SECTION THRU RAIL ELEMENT**



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

See Note 4

**NOTES:**

- For details of steel post installations, see Standard Plan A77A2.
- For details of standard hardware used to construct guard railing, see Standard Plan A77B1.
- For details of wood posts and wood blocks used to construct guard railing, see Standard Plan A77C1.
- For additional installation details, see Standard Plan A77C3.
- Guard railing post spacing to be 6'-3" center to center, except as otherwise noted.
- For guard railing typical layouts, see the A77E, A77F and A77G Series of Standard Plans.
- For terminal system end treatment details, see the A77L Series of Standard Plans. To connect railing to terminal system end treatment, transition the top of railing height at a ratio of 120:1 to terminal system end treatment height plus one 12'-6" standard railing section at the transitioned height for a horizontal connection to the end treatment.
- For guard railing end anchor details, see Standard Plans A77H1 and A77I2.
- For details of guard railing transition to bridge railing, see Standard Plan A77J4.
- For additional details of guard railing connection to bridge railings, see Standard Plans A77J1, A77J2 and A77K1.
- For guard railing connection details to abutments and walls, see Standard Plan A77J3.
- Direction of adjacent traffic indicated by  $\rightarrow$ .
- For typical guard railing delineation and dike positioning details, see Standard Plan A77C4.
- Slotted hole for bolted connection of rail element to block and post. See "Section Thru Rail Element".
- Slotted holes for splice bolts to overlap ends of rail element. See "Section Thru Rail Element".
- Additional hole in uppermost portion of line post is for potential future adjustments of railing height. See Standard Plan A77C1.
- Install posts in soil.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL BEAM GUARD RAILING  
STANDARD RAILING SECTION  
(WOOD POST WITH  
WOOD BLOCK)**

NO SCALE

RSP A77A1 DATED MAY 20, 2011 SUPERSEDES STANDARD PLAN A77A1  
DATED MAY 1, 2006 - PAGE 41 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77A1**

To accompany plans dated 1-23-12

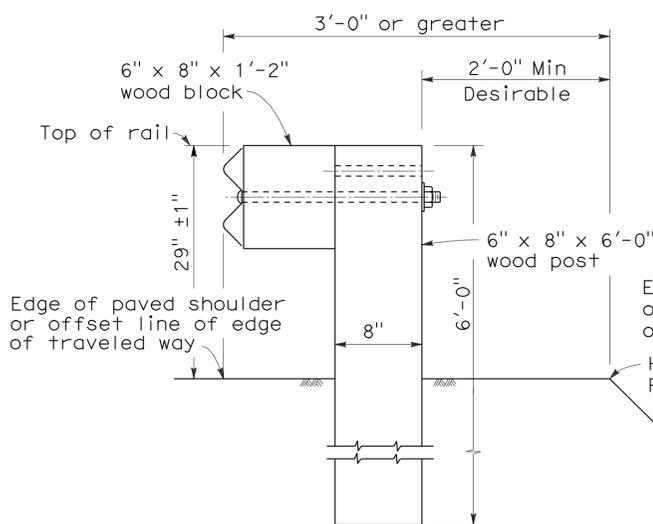
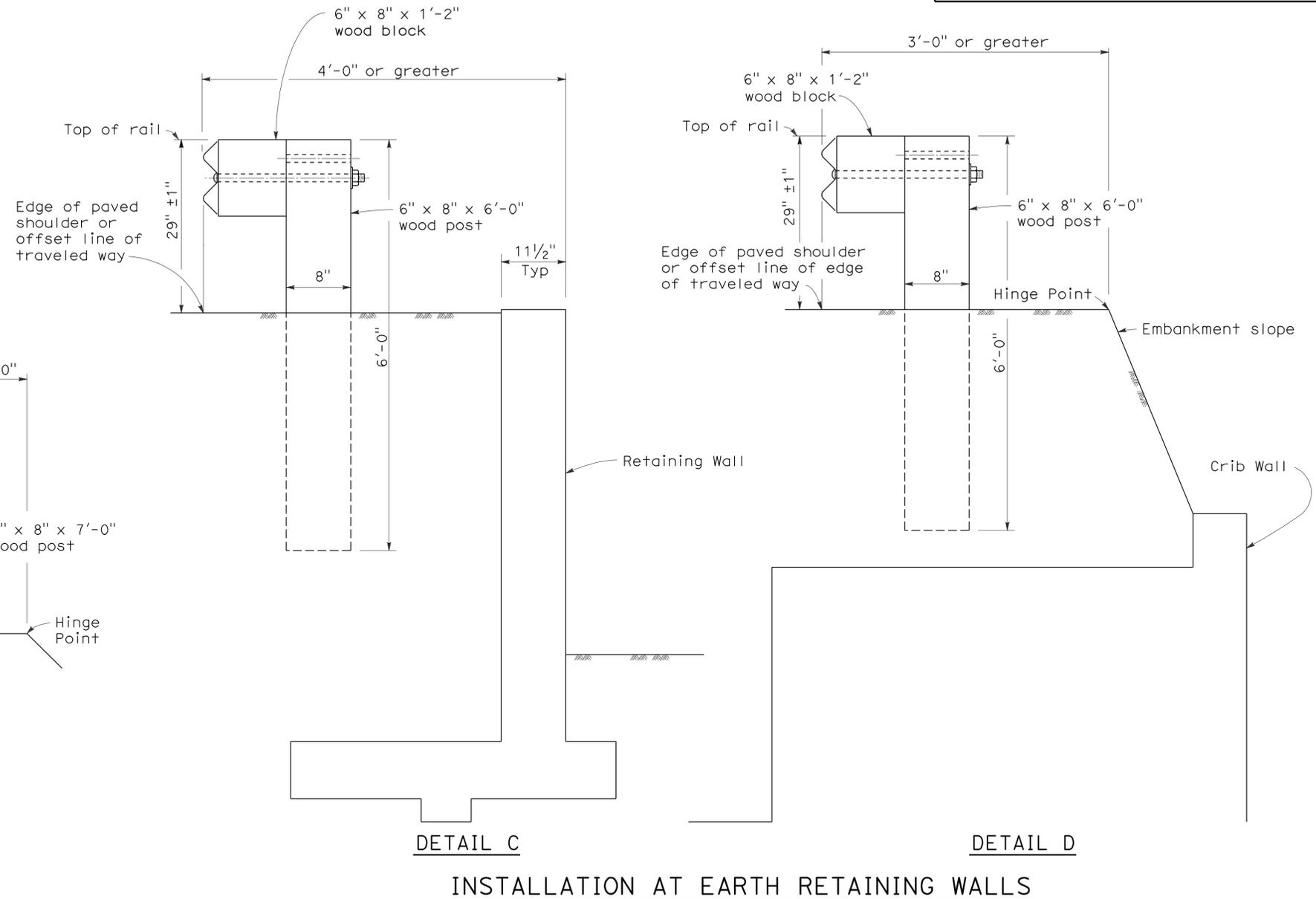
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	235	252

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

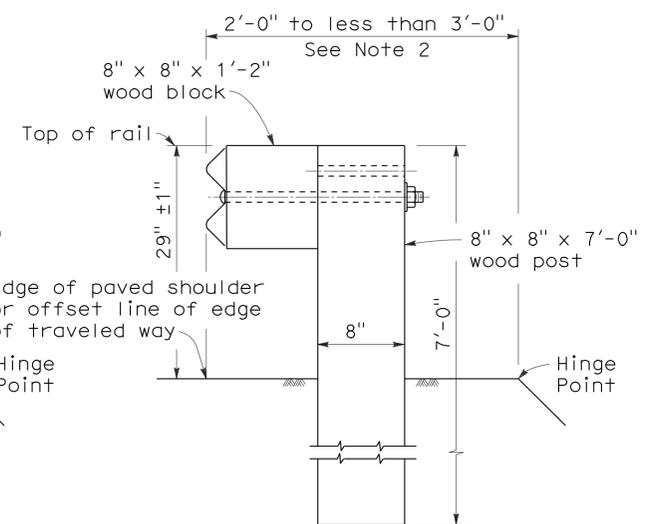
May 20, 2011  
PLANS APPROVAL DATE

*Randell D. Hiatt*  
No. C50200  
Exp. 6-30-11  
CIVIL  
STATE OF CALIFORNIA

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



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

**DETAIL C**  
**INSTALLATION AT EARTH RETAINING WALLS**

**DETAIL D**  
**INSTALLATION AT EARTH RETAINING WALLS**

**POST EMBEDMENT**

**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 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 9 steel post, 7'-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 additional installation details, see Standard Plans A77A1 and A77A2.
2. Where the distance between the face of the rail and the hinge point is less than 2'-0", see the Project Plans for special details.
3. For dike positioning with guard railing installations, see Standard Plan A77C4.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL BEAM GUARD RAILING**  
**TYPICAL LINE POST**  
**EMBEDMENT AND**  
**HINGE POINT OFFSET DETAILS**

NO SCALE

RSP A77C3 DATED MAY 20, 2011 SUPERSEDES STANDARD PLAN A77C3  
DATED MAY 1, 2006 - PAGE 46 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77C3**

2006 REVISED STANDARD PLAN RSP A77C3

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	236	252

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

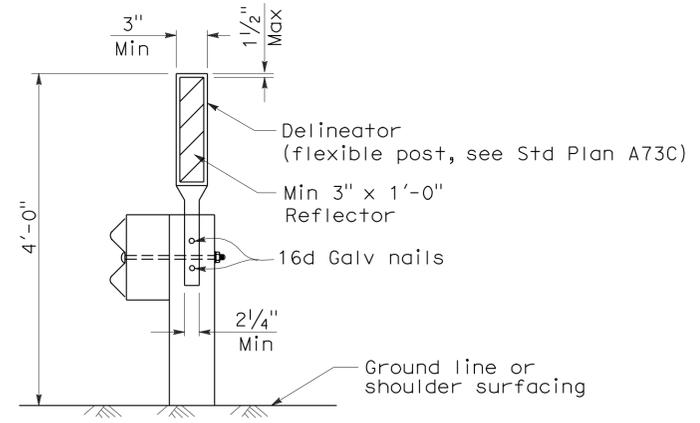
June 6, 2008  
PLANS APPROVAL DATE

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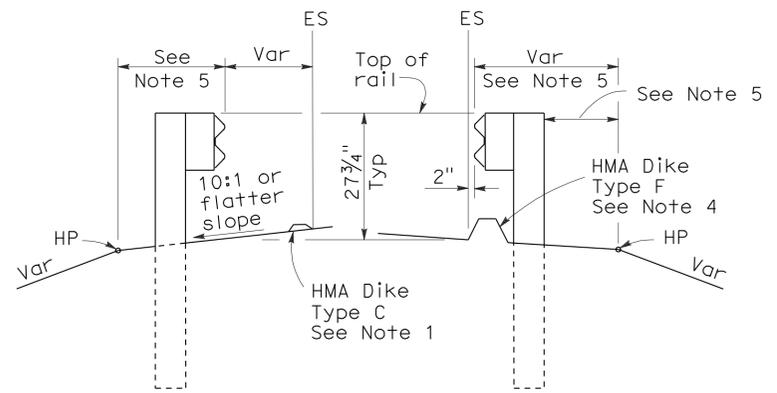
To accompany plans dated 1-23-12

**NOTES:**

1. When necessary to place dike in front of face of guard railing, only Type C dike may be used. For dike details, see Standard Plan A87B.
2. For standard railing post embedment, see Standard Plans A77C3.
3. Guard railing delineation to be used where shown on the Project Plans.
4. When dike or curb is placed under guard railing, the maximum height of the dike or curb shall be 4". Mountable dike should not be used. For dike and curb details, see Revised Standard Plans RSP A87A and Standard Plan A87B.
5. For details of typical distance between the face of rail and hinge point, see Standard Plan A77C3.



**GUARD RAILING DELINEATION**  
See Note 3



**DIKE POSITIONING**  
See Note 1

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL BEAM GUARD RAILING  
TYPICAL RAILING DELINEATION  
AND DIKE POSITIONING DETAILS**

NO SCALE

RSP A77C4 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77C4  
DATED MAY 1, 2006 - PAGE 47 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77C4**

2006 REVISED STANDARD PLAN RSP A77C4

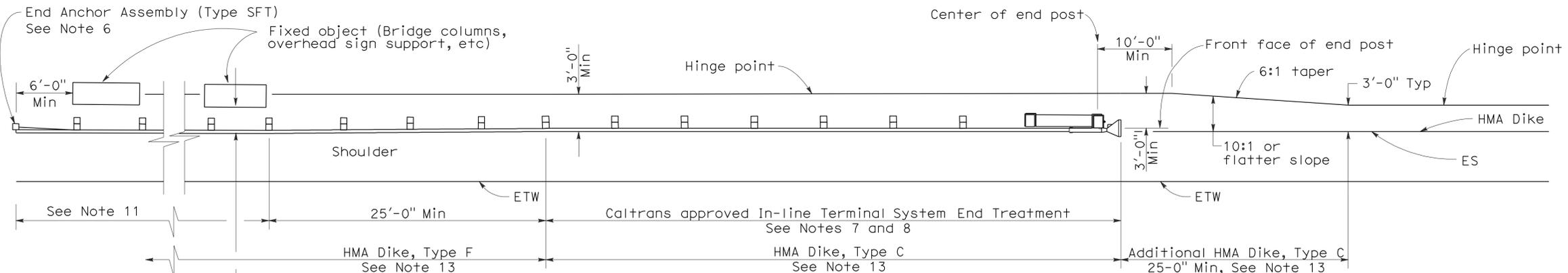
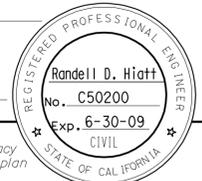
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	237	252

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

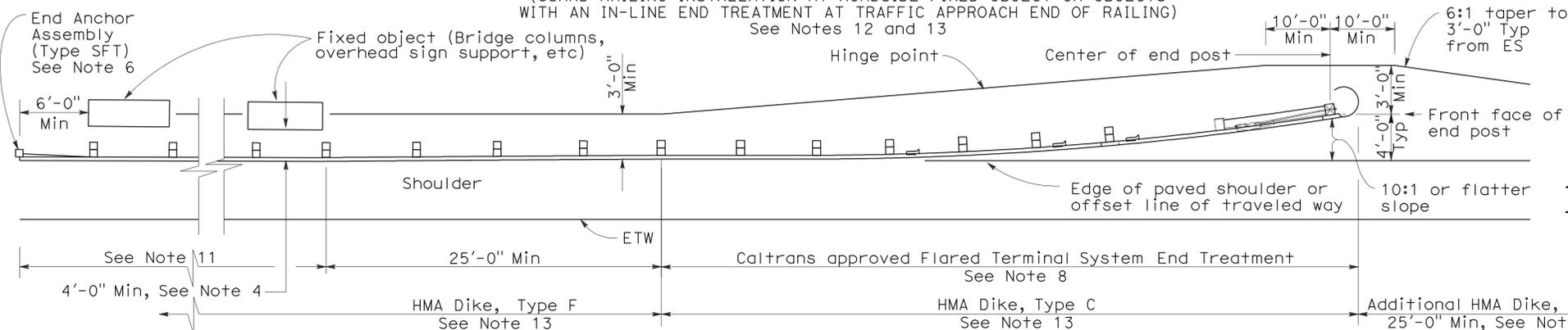
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To accompany plans dated 1-23-12



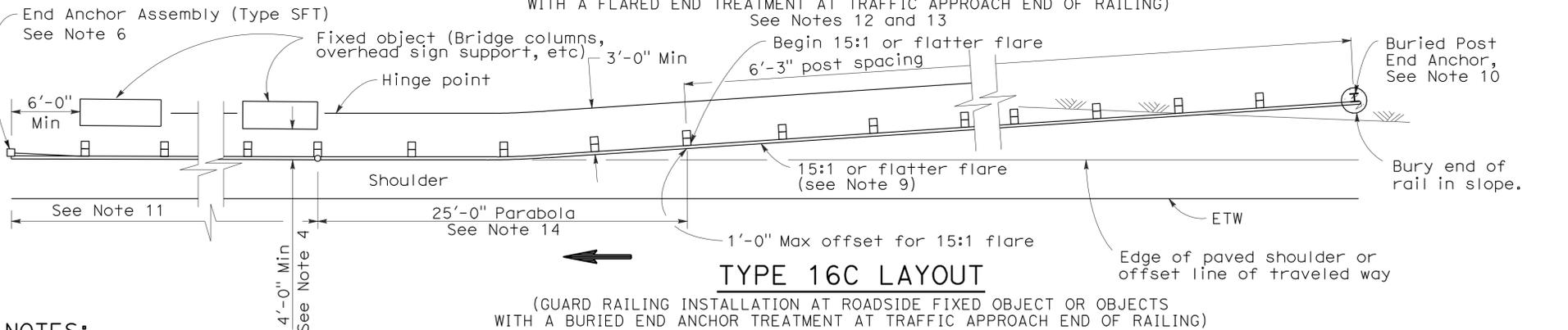
**TYPE 16A LAYOUT**

(GUARD RAILING INSTALLATION AT ROADSIDE FIXED OBJECT OR OBJECTS WITH AN IN-LINE END TREATMENT AT TRAFFIC APPROACH END OF RAILING)  
See Notes 7 and 8



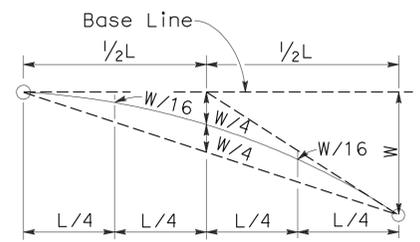
**TYPE 16B LAYOUT**

(GUARD RAILING INSTALLATION AT ROADSIDE FIXED OBJECT OR OBJECTS WITH A FLARED END TREATMENT AT TRAFFIC APPROACH END OF RAILING)  
See Notes 12 and 13

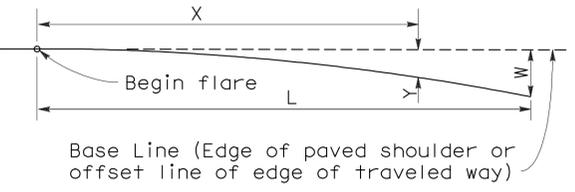


**TYPE 16C LAYOUT**

(GUARD RAILING INSTALLATION AT ROADSIDE FIXED OBJECT OR OBJECTS WITH A BURIED END ANCHOR TREATMENT AT TRAFFIC APPROACH END OF RAILING)  
See Notes 12 and 13



**TYPICAL PARABOLIC LAYOUT**

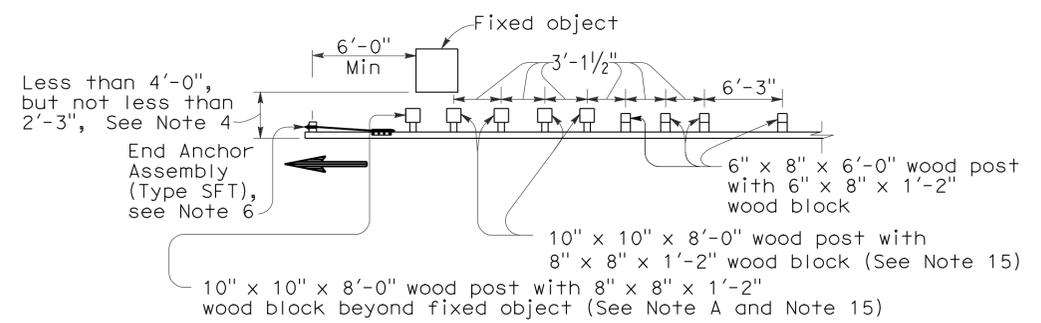


Base Line (Edge of paved shoulder or offset line of edge of traveled way)  
Y = Offset from base line  
W = Maximum offset  
X = Distance along base line  
L = Length of flare

**PARABOLIC FLARE OFFSETS**

**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans A77A1, A77A2, A77B1, A77C1 and A77C2.
- Guard railing 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 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 standard guard railing sections with post spacing of 6'-3". Construct guard railing as shown in the detail "Strengthened Railing Sections for Fixed Objects" on this plan, where the clearance between the face of the railing and the face of a fixed object is less than 4'-0", but not less than 2'-3". Where the clearance is less than 2'-3", a concrete wall or barrier should be constructed to shield the fixed object(s).
- Direction of adjacent traffic indicated by →.
- For End Anchor Assembly (Type SFT) details, see Standard Plan A77H1.
- In-line Terminal System End Treatments are used where site conditions will not accommodate a flared end treatment.
- The type of 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 guard railing 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 A77I2.
- As site conditions dictate, construct additional guard railing to shield fixed object(s). Additional guard railing 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 guard railing is recommended to shield roadside fixed object(s) and a crashworthy end treatment is required for only one direction of traffic.
- Where placement of dike is required with guard railing, see Revised Standard Plan RSP A77C4 for dike positioning details.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77E1.
- W6 x 15 steel post, 8'-0" in length, with 8" x 8" x 1'-2" notched wood block or notched recycled plastic blocks 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 "Strengthened Railing Sections Detail".



**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 RAILING SECTIONS FOR FIXED OBJECT**

Use strengthened railing sections with Types 16A, 16B or 16C Layouts where minimum clearance between the face of the guard railing and fixed object(s) is less than 4'-0", but not less than 2'-3". See Note 4

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**METAL BEAM GUARD RAILING TYPICAL LAYOUTS FOR ROADSIDE FIXED OBJECTS**

NO SCALE

RSP A77G3 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77G3 DATED MAY 1, 2006 - PAGE 61 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77G3**

2006 REVISED STANDARD PLAN RSP A77G3

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	238	252

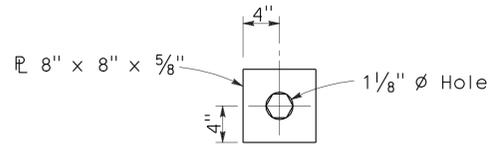
Randell D. Hiatt  
REGISTERED CIVIL ENGINEER

May 20, 2011  
PLANS APPROVAL DATE

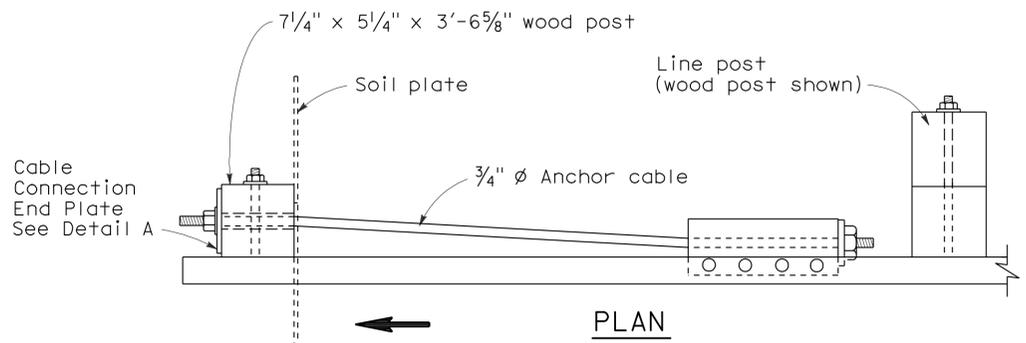
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REGISTERED PROFESSIONAL ENGINEER  
Randell D. Hiatt  
No. C50200  
Exp. 6-30-11  
CIVIL  
STATE OF CALIFORNIA

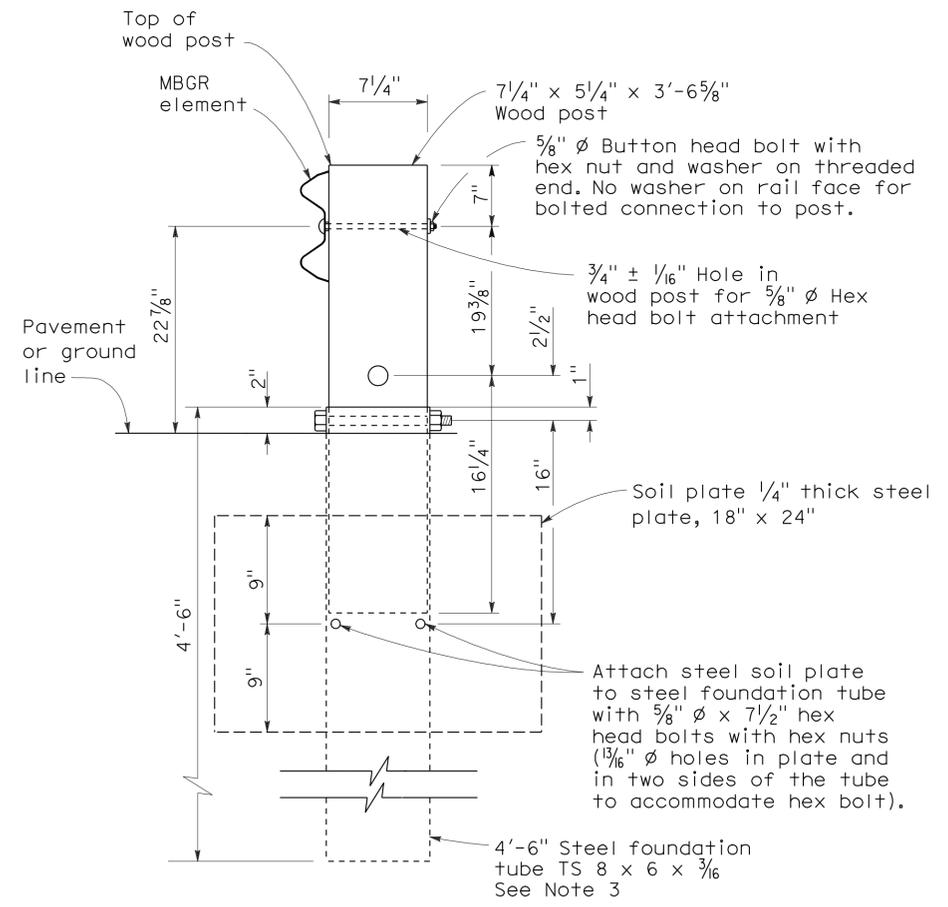
To accompany plans dated 1-23-12



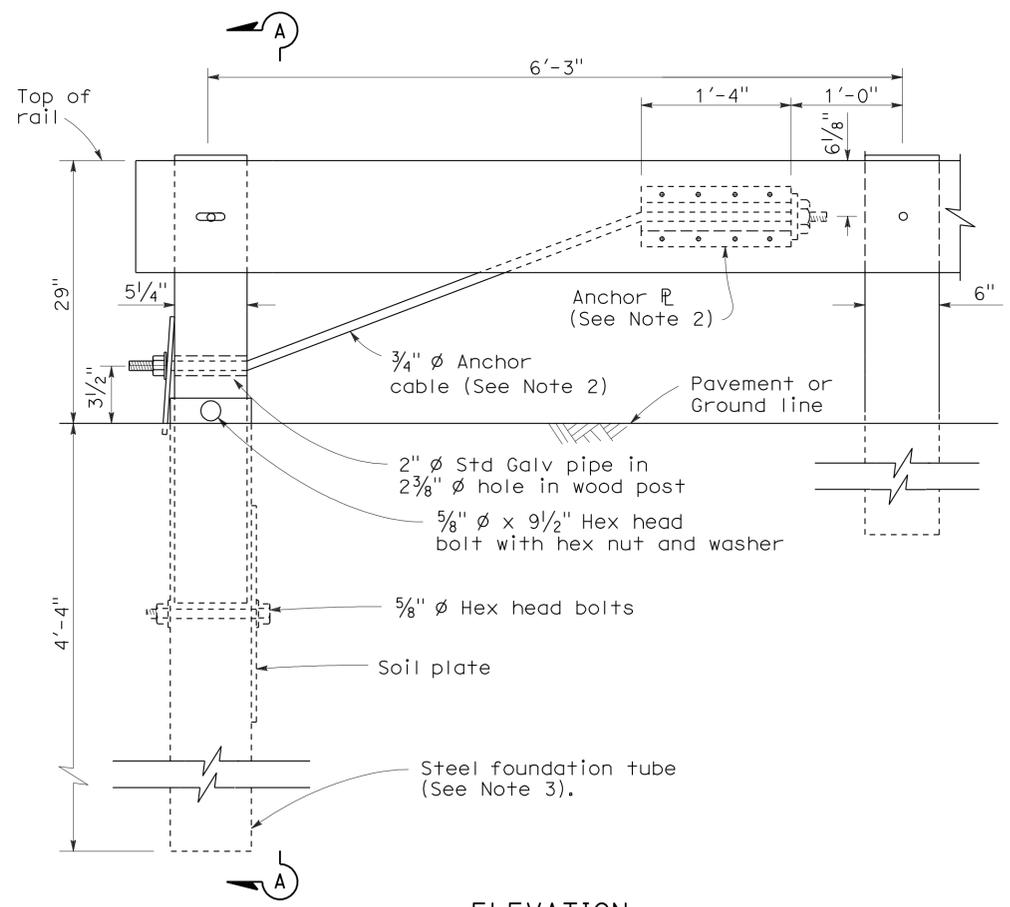
**DETAIL A**  
**CABLE CONNECTION**  
**END PLATE**



**PLAN**



**SECTION A-A**



**ELEVATION**  
**END ANCHOR**  
**ASSEMBLY (TYPE SFT)**  
See Note 1

**NOTES:**

1. See the A77E, A77F and A77G series of Standard Plans for typical use of End Anchor Assembly (Type SFT).
2. For details of the anchor plate and 3/4" cable, see Standard Plan A77H3.
3. 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 5/8" diameter 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.
4. Direction of traffic indicated by →.
5. Install line post, steel foundation tube and soil plate in soil.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL RAILING**  
**END ANCHOR ASSEMBLY**  
**(TYPE SFT)**

NO SCALE

RSP A77H1 DATED MAY 20, 2011 SUPERSEDES STANDARD PLAN A77H1  
DATED MAY 1, 2006 - PAGE 67 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77H1**

2006 REVISED STANDARD PLAN RSP A77H1

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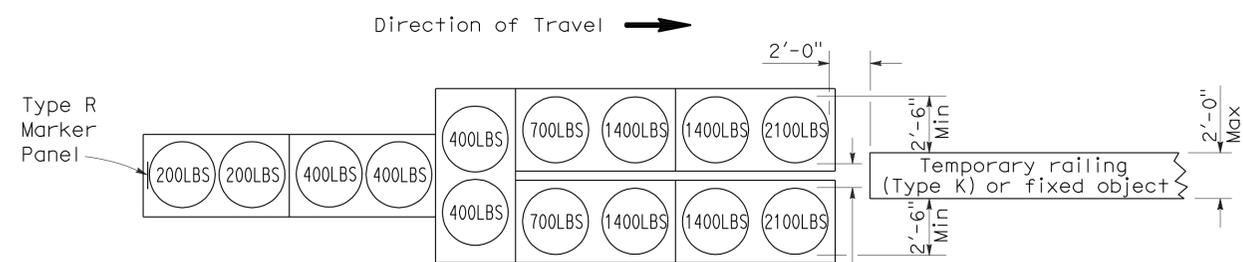
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

*Randell D. Hiatt*  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA

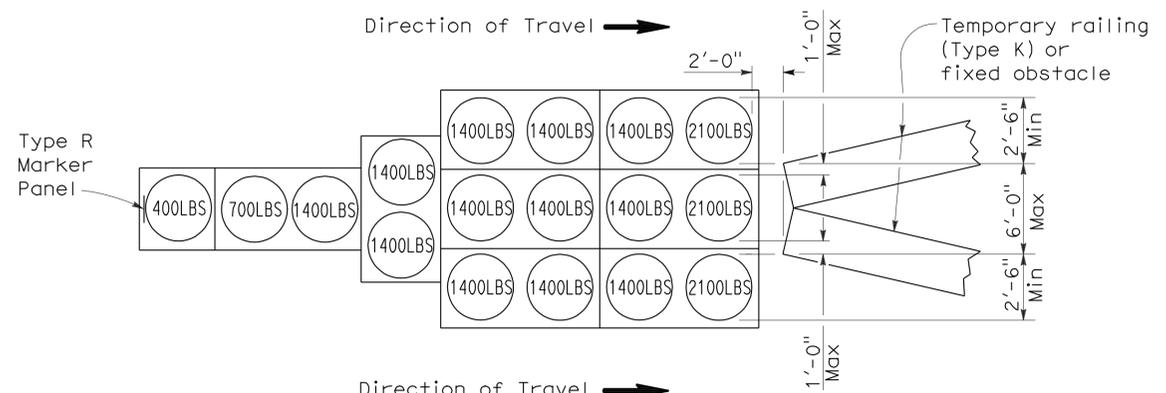
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To accompany plans dated 1-23-12



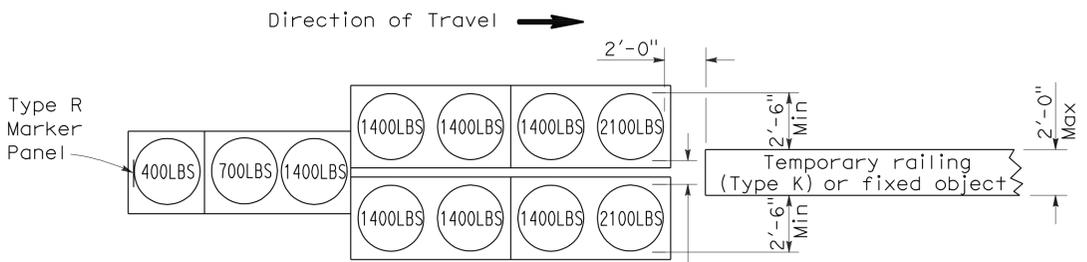
**ARRAY 'TU14'**

Approach speed 45 mph or more



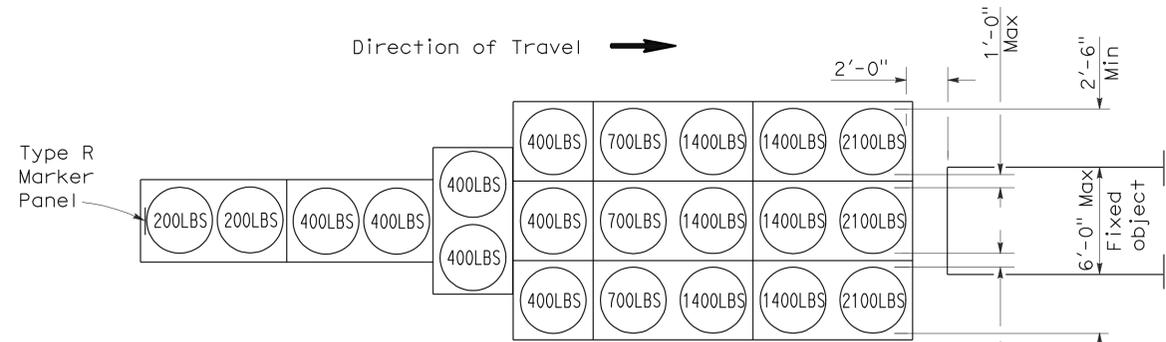
**ARRAY 'TU17'**

Approach speed less than 45 mph



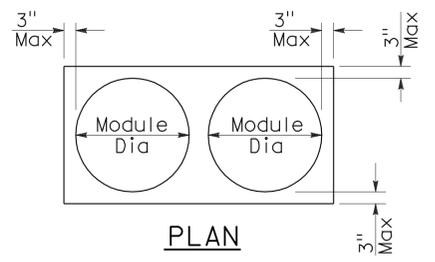
**ARRAY 'TU11'**

Approach speed less than 45 mph

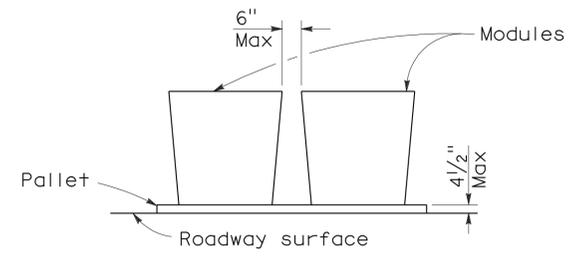


**ARRAY 'TU21'**

Approach speed 45 mph or more



**PLAN**



**ELEVATION**

**CRASH CUSHION PALLET DETAIL**

See Note 7

**NOTES:**

1. (XXX) Indicates sand filled module location and weight of sand in pounds for each module. Module spacing is based on the greater diameter of the module.
2. All sand weights are nominal.
3. Temporary crash cushion arrays shall not encroach on the traveled way.
4. Place the top of Type R marker panel 1" below the module lid.
5. Refer to Standard Plan A73B for marker details.
6. Approach speeds indicated conform to NCHRP 350 Report criteria.
7. Use of pallets is optional.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY CRASH CUSHION,  
SAND FILLED  
(UNIDIRECTIONAL)**

NO SCALE

RSP T1A DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN T1A  
DATED MAY 1, 2006 - PAGE 211 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP T1A**

2006 REVISED STANDARD PLAN RSP T1A

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	240	252

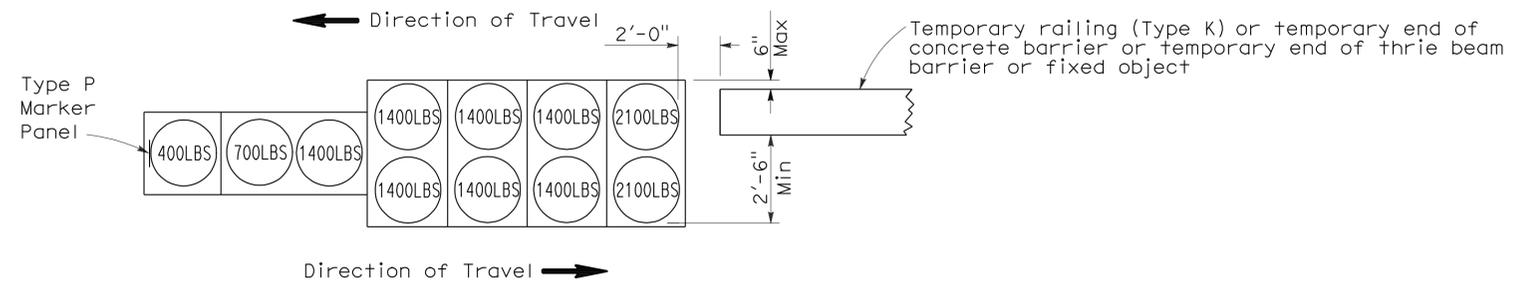
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

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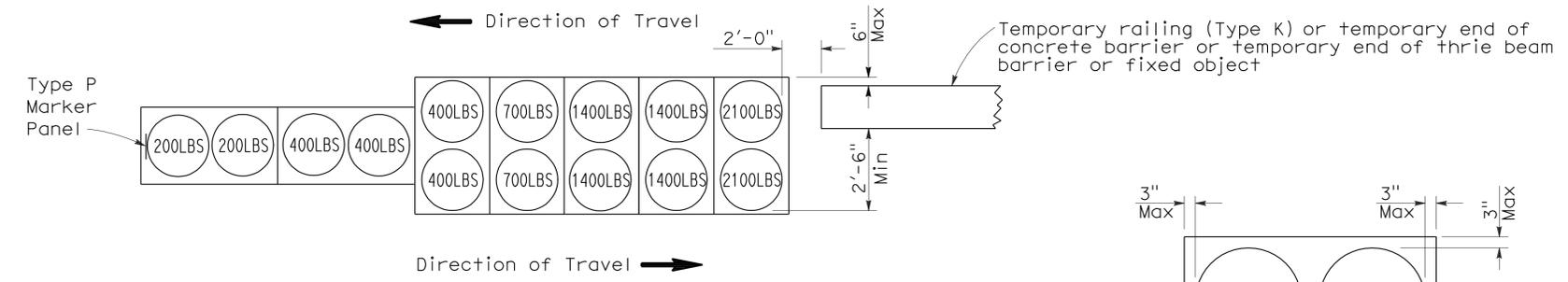


To accompany plans dated 1-23-12



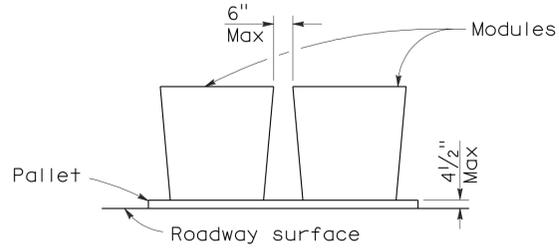
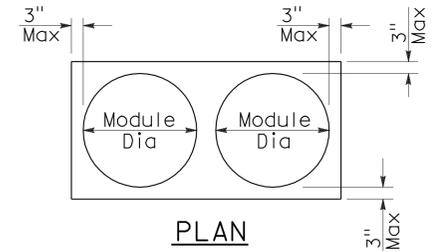
**ARRAY 'TB11'**

Approach speed less than 45 mph



**ARRAY 'TB14'**

Approach speed 45 mph or more



**CRASH CUSHION PALLET DETAIL**  
See Note 7

**NOTES:**

1. (XXX) Indicates sand filled module location and weight of sand in pounds for each module. Module spacing is based on the greater diameter of the module.
2. All sand weights are nominal.
3. Temporary crash cushion arrays shall not encroach on the traveled way.
4. Place the Type P marker panel so that the bottom of the panel rests upon the pallet.
5. Refer to Standard Plan A73B for marker details.
6. Approach speeds indicated conform to NCHRP 350 Report criteria.
7. Use of pallets is optional.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**TEMPORARY CRASH CUSHION,  
SAND FILLED  
(BIDIRECTIONAL)**  
NO SCALE

RSP T1B DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN T1B  
DATED MAY 1, 2006 - PAGE 212 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP T1B**

2006 REVISED STANDARD PLAN RSP T1B

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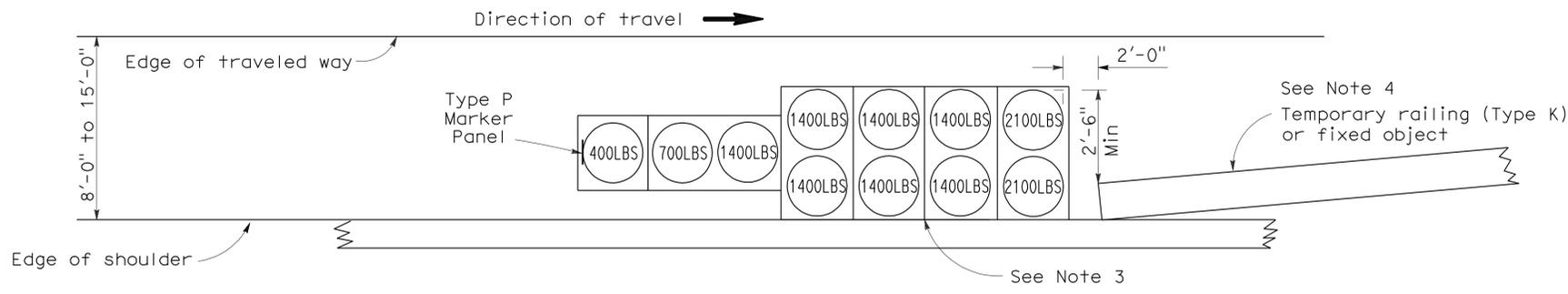
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

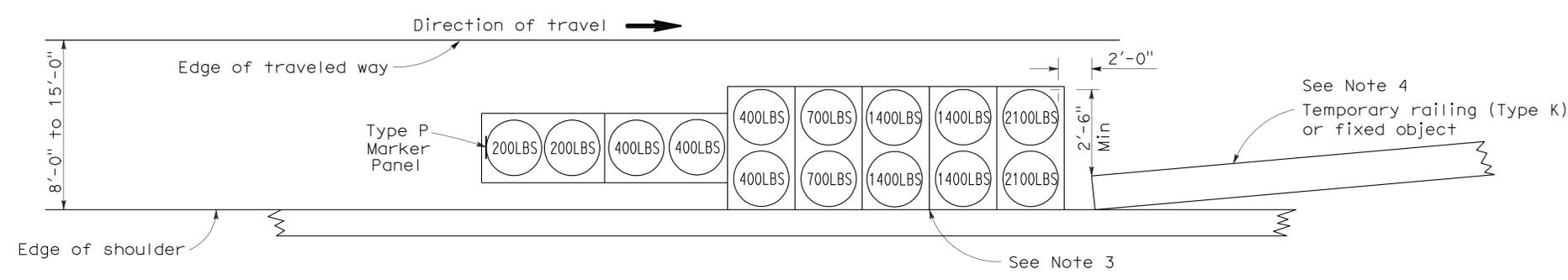
*Randell D. Hiatt*  
REGISTERED PROFESSIONAL ENGINEER  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA

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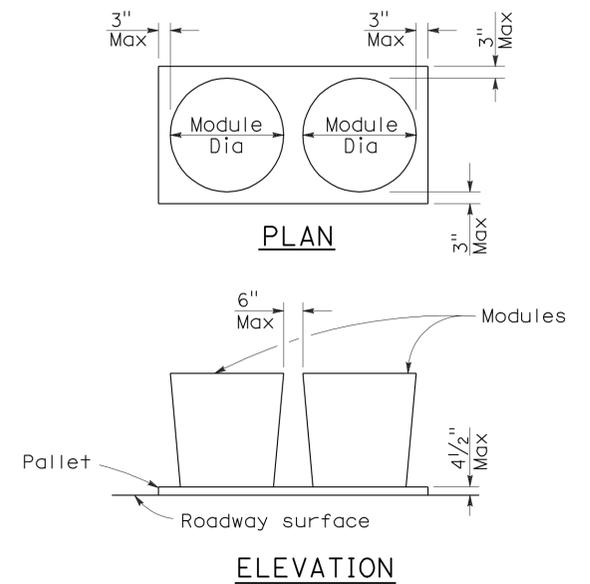
To accompany plans dated 1-23-12



**ARRAY 'TS11'**  
Approach speed less than 45 mph  
See Note 9



**ARRAY 'TS14'**  
Approach speed 45 mph or more  
See Note 9



**CRASH CUSHION PALLET DETAIL**  
See Note 11

**NOTES:**

1. (XXX) Indicates sand filled module location and weight of sand in pounds for each module. Module spacing is based on the greater diameter of the module.
2. All sand weights are nominal.
3. The temporary crash cushion arrays shown on this plan shall be used only in locations where there will be traffic on one side of the temporary crash cushion array.
4. If the fixed object or approach end of the temporary railing is less than 15'-0" from the edge of traveled way, a temporary crash cushion is required in a construction or work zone.
5. Temporary crash cushion arrays shall not encroach on the traveled way.
6. Arrays for median shoulders shall conform to details shown on this plan for outside shoulders.
7. Place the Type P marker panel so that the bottom of the panel rests upon the pallet and faces traffic.
8. Refer to Standard Plan A73B for marker details.
9. For shoulder widths less than 8'-0", appropriate approved crash cushion protection, other than sand filled modules, shall be provided at fixed objects and at approach ends of temporary railing. The specific type of crash cushion shall be as shown on the project plans or as specified in the Special Provisions, or if not shown on the project plans or specified in the Special Provisions, shall be as approved by the Engineer.
10. Approach speeds indicated conform to NCHRP 350 Report criteria.
11. Use of pallets is optional.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY CRASH CUSHION,  
SAND FILLED  
(SHOULDER INSTALLATIONS)**

NO SCALE  
RSP T2 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN T2  
DATED MAY 1, 2006 - PAGE 213 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP T2**

2006 REVISED STANDARD PLAN RSP T2

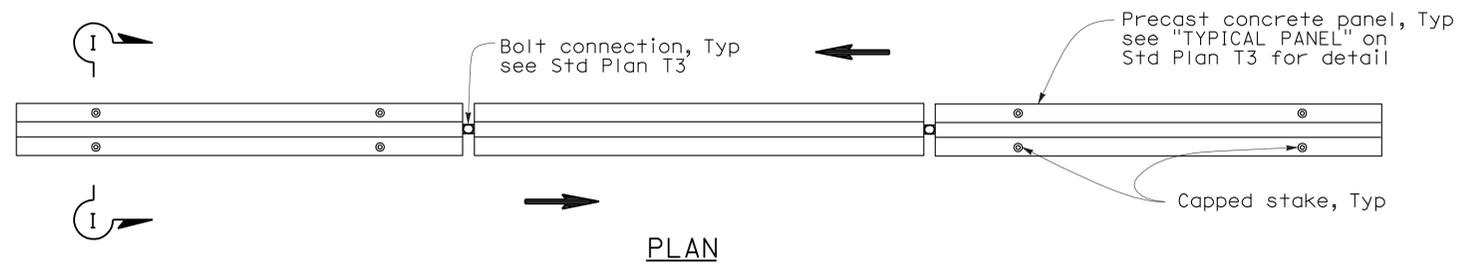
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	242	252

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

May 20, 2011  
PLANS APPROVAL DATE

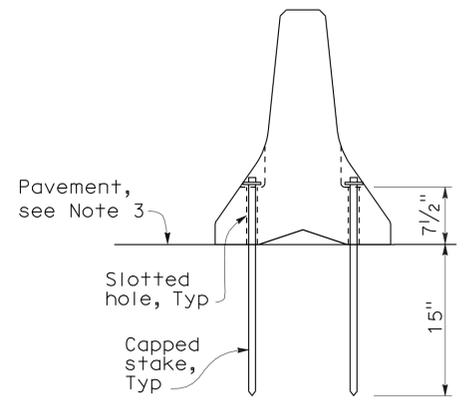
*The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.*

To accompany plans dated 1-23-12



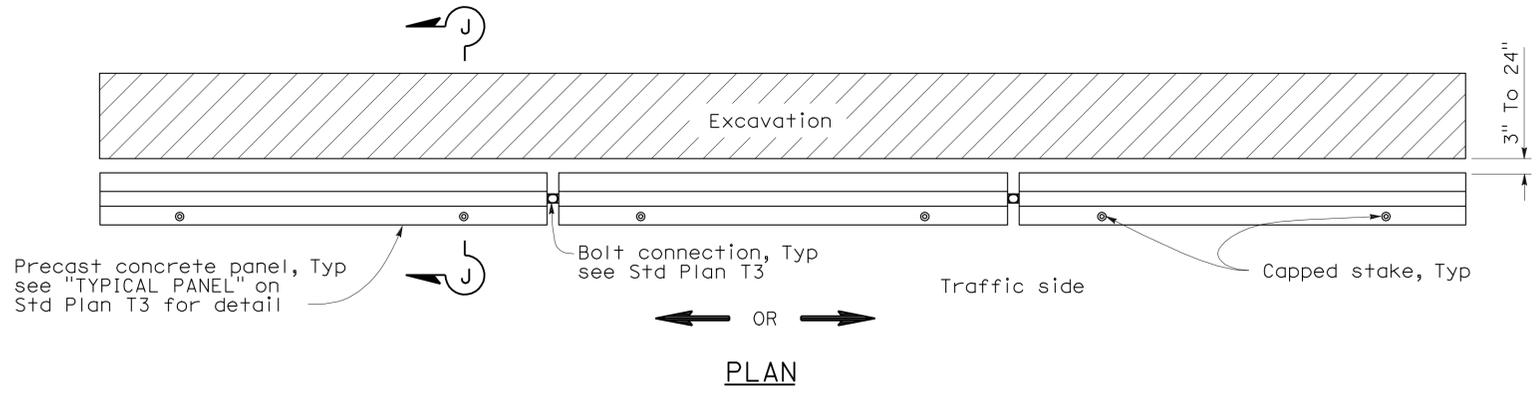
**RAILING STAKING CONFIGURATION FOR TWO-WAY TRAFFIC**

See Note 1



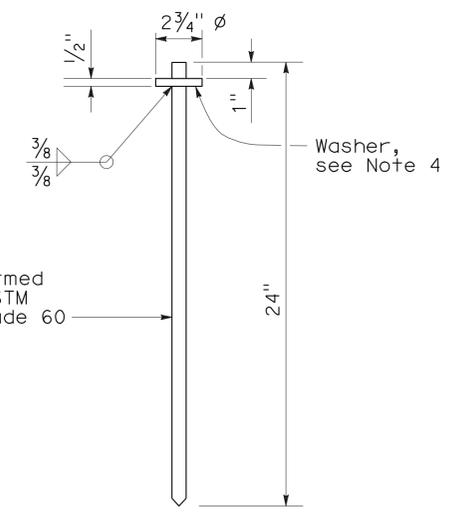
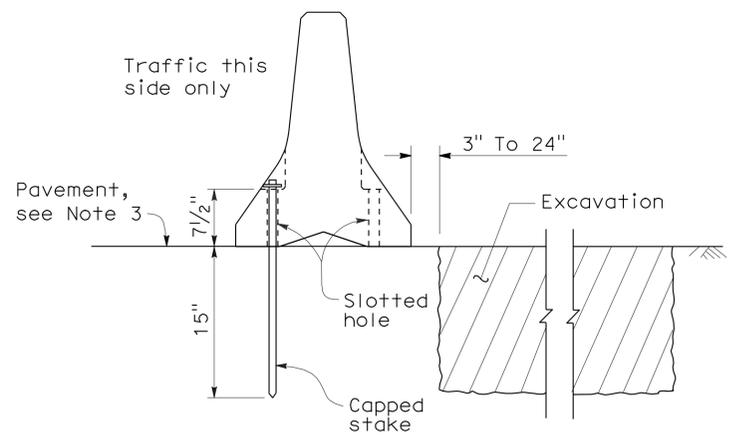
**NOTES:**

1. Where Type K Temporary Railing is placed as a temporary or long term barrier in two-way traffic on highways with less than 24" from the edge of traveled way, use four capped stakes per every other panel with end panels staked.
2. Where Type K Temporary Railing is placed 3" to 24" from the edge of an excavation on highways, use two capped stakes per panel along the traffic side.
3. Staked Type K Temporary Railing must be supported by at least 4" thick concrete, hot mix asphalt or existing asphalt concrete pavement.
4. The minimum yield strength for the washer must be 60,000 psi.
5. Direction of adjacent traffic indicated by  $\Rightarrow$ .



**RAILING STAKING CONFIGURATION ADJACENT TO AN EXCAVATION**

See Note 2



STATE OF CALIFORNIA  
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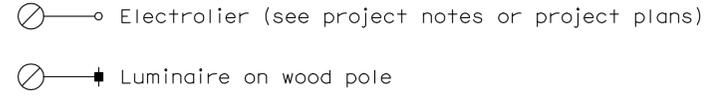
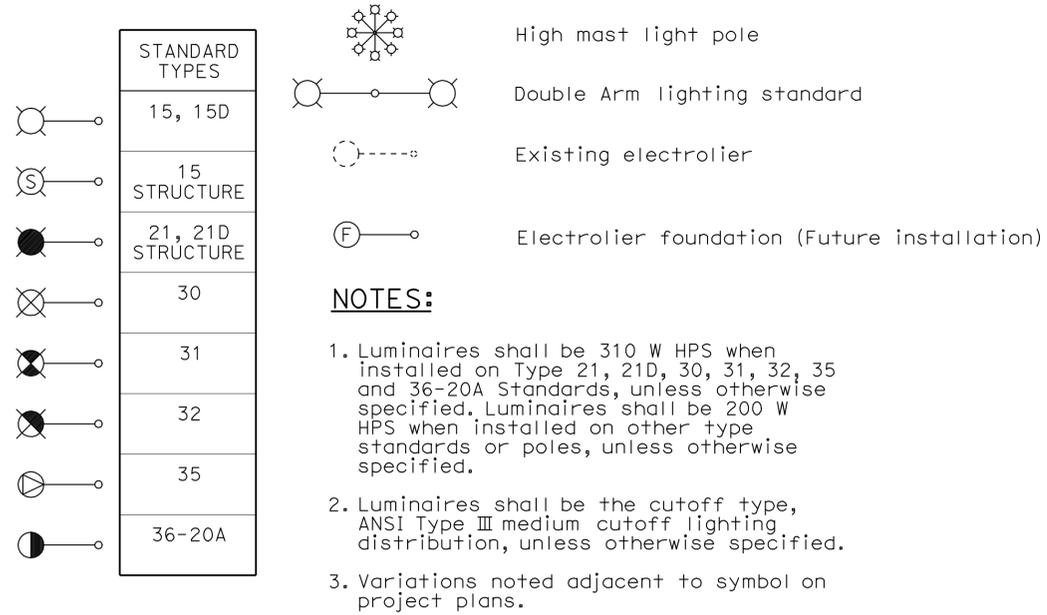
**TEMPORARY RAILING  
(TYPE K)**

NO SCALE

NSP T3A DATED MAY 20, 2011 SUPPLEMENTS  
THE STANDARD PLANS BOOK DATED MAY 2006.

2006 NEW STANDARD PLAN NSP T3A

# ELECTROLIERS



## STANDARD NOTES:

- AB** Abandon. If applied to conduit, remove conductors.
- BC** Install pull box in existing conduit run.
- BP** Pedestrian barricade, type as indicated on plan.
- CB** Install conduit into existing pull box.
- CC** Connect new and existing conduit. Remove existing conductors and install conductors as indicated.
- CF** Conduit to remain for future use. Remove conductors. Install pull wire or rope.
- DH** Detector handhole.
- FA** Foundation to be abandoned.
- IS** Install sign on signal mast arm.
- NS** No slip base on standard.
- PEC** Photoelectric control.
- PEU** Photoelectric unit.
- RC** Equipment or material to be removed and become the property of the Contractor.
- RE** Remove electrolier, fuses and ballast. Tape ends of conductors.
- RL** Relocate equipment.
- RR** Remove and reuse equipment.
- RS** Remove and salvage equipment.
- SC** Splice new to existing conductors.
- SD** Service disconnect.
- SF** Standard to remain for future use. Remove luminaire, pole conductors, fuses and ballast.
- TSP** Telephone service point.

# ABBREVIATIONS AND EQUIPMENT DESIGNATIONS

## PROPOSED EXISTING

BBS	bbs	Battery backup system
BC	bc	Bolt circle
C	C	Conduit
CCTV	cctv	Closed circuit television
CKT	ckt	Circuit
CMS	cms	Changeable message sign
DLC	dlc	Loop detector lead-in cable
EMS	ems	Extinguishable message sign
EVC	evc	Emergency vehicle cable
EVD	evd	Emergency vehicle detector
FB	fb	Flashing beacon
FBCA	fbca	Flashing beacon control assembly
FBS	fbs	Flashing beacon with slip base
FO	fo	Fiber optic
G	G	Ground (Equipment Grounding Conductor)
GFCI	GFCI	Ground fault circuit interrupt
HAR	har	Highway advisory radio
HEX	hex	Hexagonal
HPS	hps	High pressure sodium
IISNS	iisns	Internally illuminated street name sign
ISL	isl	Induction sign lighting
LED	led	Light emitting diode
LMA	lma	Luminaire mast arm
LPS	lps	Low pressure sodium
LTG	ltg	Lighting
LUM	lum	Luminaire
MAT	mat	Mast arm mounting vehicle signal faces, top attachment
MAS	mas	Mast arm mounting vehicle signal faces, side attachment
MAS-4A	mas-4A	Mast arm mounting vehicle signal faces, side attachment - 4 signal section
MAS-4B	mas-4B	
MAS-4C	mas-4C	
MAS-5A	mas-5A	Mast arm mounting vehicle signal faces, side attachment - 5 signal section
MAS-5B	mas-5B	
MC	mc	Mercury contactor
M/M	m/m	Multiple to multiple transformer
MT	mt	Conduit with pull wire or rope only
MTG	mtg	Mounting
	mv	Mercury vapor lighting fixture
N	N	Neutral (Grounded Conductor)
NC	NC	Normally closed
NO	NO	Normally open
PB	pb	Pull box
PEC	pec	Photoelectric control (Type I, II, III, IV or V as shown)
PED	ped	Pedestrian
PEU	peu	Photoelectric unit
PPB	ppb	Pedestrian push button
RL		Relocated equipment
RM	rm	Ramp metering
SB	sb	Slip base
SIC	sic	Signal interconnect cable
SIG	sig	Signal
SMA	sma	Signal mast arm
SNS	sns	Street name sign
SP	sp	Service point
TDC	tdc	Telephone demarcation cabinet
TMS	tms	Traffic monitoring station
TOS	tos	Traffic Operations System
VEH	veh	Vehicle
XFMR	xfmr	Transformer
COMM	comm	Communication
RWIS	rwis	Roadway weather information system

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	243	252

*Jeffery G. McRae*  
REGISTERED ELECTRICAL ENGINEER

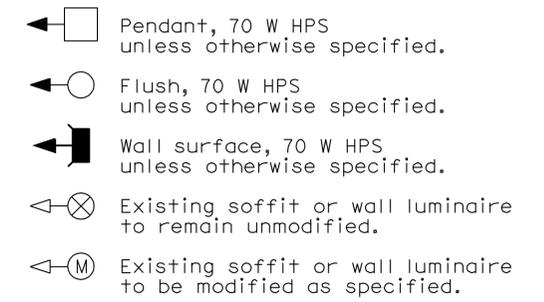
October 5, 2007  
PLANS APPROVAL DATE

Jeffery G. McRae  
No. E14512  
Exp. 6-30-08  
ELECTRICAL  
STATE OF CALIFORNIA

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To accompany plans dated 1-23-12

## SOFFIT AND WALL MOUNTED LUMINAIRES



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

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

### ELECTRICAL SYSTEMS (SYMBOLS AND ABBREVIATIONS)

NO SCALE

RSP ES-1A DATED OCTOBER 5, 2007 SUPERSEDES STANDARD PLAN ES-1A DATED MAY 1, 2006 - PAGE 400 OF THE STANDARD PLANS BOOK DATED MAY 2006.

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

2006 REVISED STANDARD PLAN RSP ES-1A

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	244	252

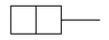
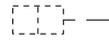
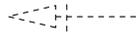
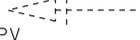
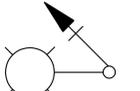
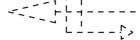
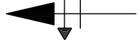
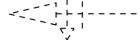
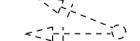
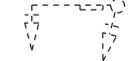
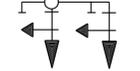
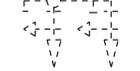
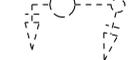
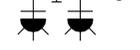
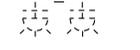
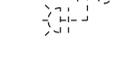
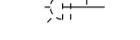
Jeffrey G. McRae  
 REGISTERED ELECTRICAL ENGINEER  
 October 5, 2007  
 PLANS APPROVAL DATE  
 Jeffrey G. McRae  
 No. E14512  
 Exp. 6-30-08  
 ELECTRICAL  
 STATE OF CALIFORNIA

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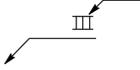
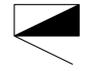
### CONDUIT

PROPOSED	EXISTING	
---	---	Lighting Conduit, unless otherwise indicated or noted
---	---	Traffic signal conduit
-C-	-c-	Communication conduit
-T-	-t-	Telephone conduit
-F-	-f-	Fire alarm conduit
-FO-	-fo-	Fiber optic conduit
---	---	Conduit termination 
		Conduit riser in/on structure or service pole

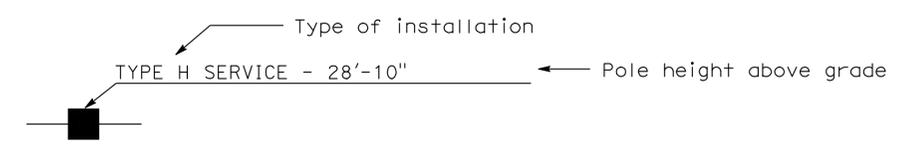
### SIGNAL EQUIPMENT

PROPOSED	EXISTING	
		Pedestrian signal face
		Pedestrian push button post
		Pedestrian barricade
		Vehicle signal face (with backplate, 3-Section: red, yellow and green)
		Vehicle signal face with angle visors
		Modifications of basic symbols: "L" indicates all non-arrow sections louvered "LG" indicates louvered green section only "PV" indicates 12" programmed visibility sections "8" indicates all 8" sections (only when specified)
		Type 15TS and Vehicle signal face
		Vehicle signal face with red, yellow and green left arrow sections
		Vehicle signal face with red and yellow sections and up green arrow
		Vehicle signal face (5 Section) with red, yellow and green sections and yellow and green right arrows
		Type 1 Standard and attached vehicle signal faces
		Standard with signal mast arm only and attached vehicle signal faces and internally illuminated street name sign
		Type 33 Standard, Left-turn vehicle signal face and sign
		Standard with luminaire and signal mast arms and attached vehicle signal faces
		Cantilever flashing beacon Type 9 Frame, with a sign unless otherwise specified or indicated
		Type 15-FBS Standard with two vehicle signal face sections with lens, backplate and visor with a sign
		Flashing beacon. One vehicle signal face section with lens, backplate and visor. "R" indicates red indication, "Y" indicates yellow indication
		Controller assembly. Door indicates front of cabinet

### SERVICE EQUIPMENT

PROPOSED	EXISTING	
---OH	---oh	Overhead lines
		Wood pole "U" indicates utility owned
		Pole guy with anchor
		Utility transformer - ground mounted
		Service equipment enclosure type
		Service equipment enclosure door indicates front of enclosure
		Telephone demarcation cabinet

### POLE-MOUNTED SERVICE DESIGNATION



### ILLUMINATED OVERHEAD SIGN

PROPOSED	EXISTING	
		Overhead sign - Single post
		Overhead sign - Two post
		Overhead sign - Mounted on structure
		Overhead sign with electrolier

### SIGNAL EQUIPMENT Cont

PROPOSED	EXISTING	
		Guard post
		Type 1 Standard with "Meter On" sign
		Emergency Vehicle detector

### NOTES:

1. All signal sections shall be 12" unless shown otherwise.
2. Signal heads shall be provided with backplates unless shown otherwise.
3. Signal indication shall be LED.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (SYMBOLS AND ABBREVIATIONS)**  
 NO SCALE

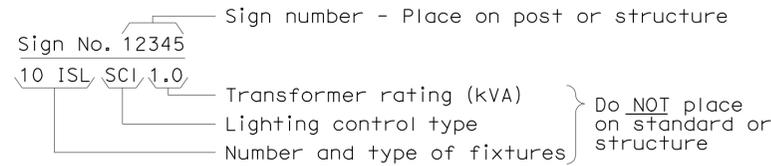
RSP ES-1B DATED OCTOBER 5, 2007 SUPERCEDES STANDARD PLAN ES-1B  
 DATED MAY 1, 2006 - PAGE 401 OF THE STANDARD PLANS BOOK DATED MAY 2006.

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

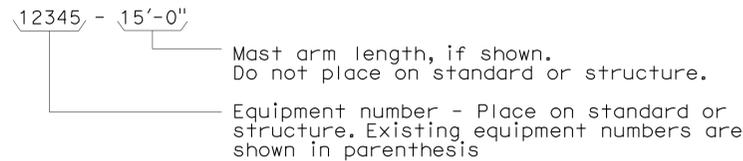
2006 REVISED STANDARD PLAN RSP ES-1B

### EQUIPMENT IDENTIFICATION

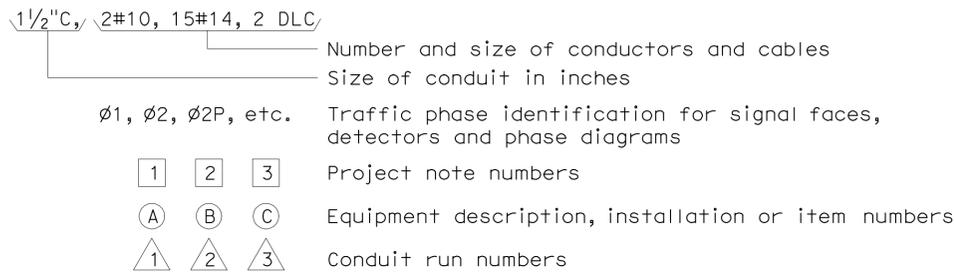
#### ILLUMINATED SIGN IDENTIFICATION NUMBER:



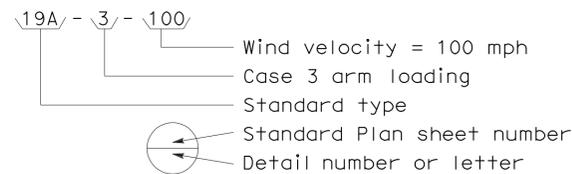
#### ELECTROLIER OR EQUIPMENT IDENTIFICATION NUMBER:



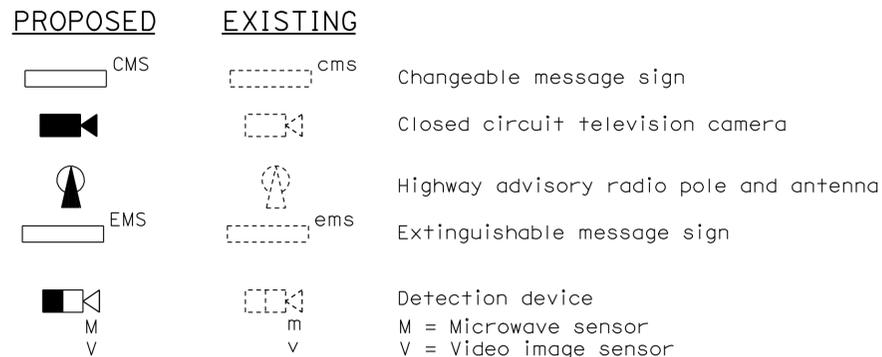
#### CONDUIT AND CONDUCTOR IDENTIFICATION:



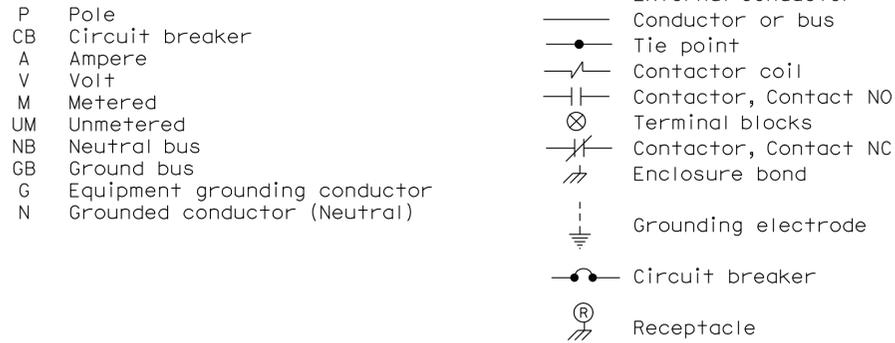
#### SIGNAL AND LIGHTING STANDARD (TYPICAL DESIGNATION):



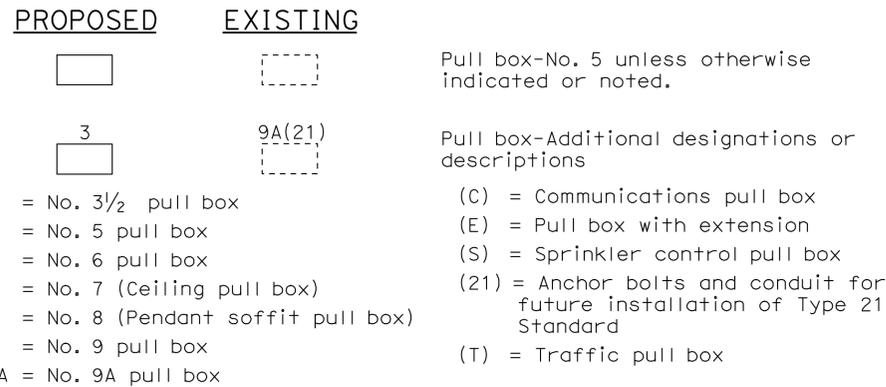
### MISCELLANEOUS EQUIPMENT



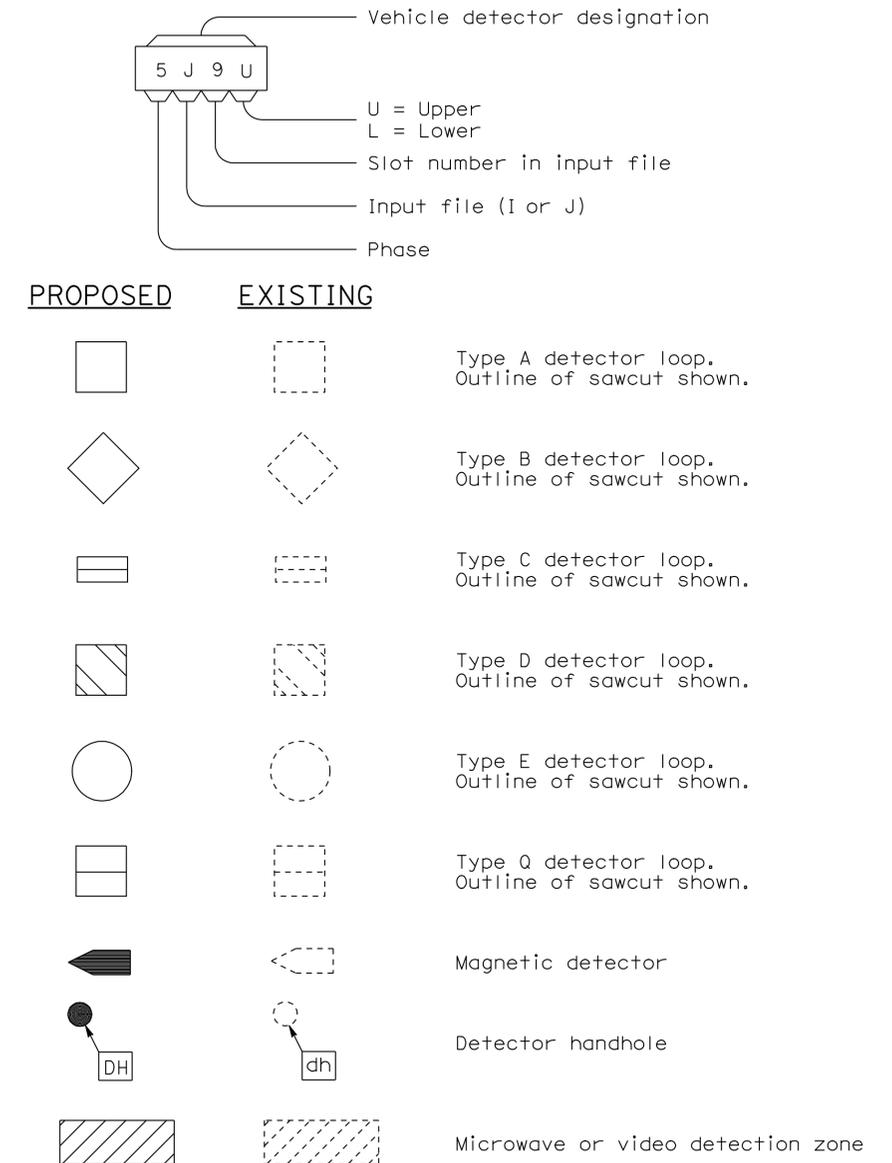
### WIRING DIAGRAM LEGEND



### PULL BOXES



### VEHICLE DETECTORS



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(SYMBOLS AND ABBREVIATIONS)**

NO SCALE

RSP ES-1C DATED OCTOBER 5, 2007 SUPERCEDES STANDARD PLAN ES-1C  
DATED MAY 1, 2006 - PAGE 402 OF THE STANDARD PLANS BOOK DATED MAY 2006.

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

2006 REVISED STANDARD PLAN RSP ES-1C

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	246	252

*Jeffery G. McRae*  
 REGISTERED ELECTRICAL ENGINEER

October 5, 2007  
 PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER  
 Jeffery G. McRae  
 No. E14512  
 Exp. 6-30-08  
 ELECTRICAL  
 STATE OF CALIFORNIA

**NOTES-TYPE III SERVICE EQUIPMENT ENCLOSURES:**

1. Service equipment enclosure and metering equipment shall meet the requirements of the service utility. The meter area shall have a sealable, lockable, weathertight cover that can be removed without the use of tools.
2. Service equipment enclosures shall be factory wired and conform to NEMA standards.
3. Dimensions of service equipment enclosures shall meet the requirements of the service utility.
4. The dead front panels on Type III service equipment enclosures shall have a continuous stainless steel or aluminum piano hinge. The panel in front of the breakers shall be secured with a latch or captive screws. No live parts shall be mounted on the dead front panel.
5. The exterior door shall have provisions for padlocking. The padlock hole shall be a minimum diameter of  $\frac{1}{16}$ ".
6. Enclosures housing transformers of more than one kVA shall have effective screened ventilation louver of not less than 50 square inches. Screen shall be stainless steel No. 304, with a No. 10 size mesh. Framed screen shall be secured with at least four bolts.
7. Fasteners on the exterior of the enclosure shall be vandal-resistant and shall not be removable from the exterior. Exterior screws, nuts, bolts and washers shall be stainless steel.
8. Landing lugs for incoming service conductors shall be compatible with either copper or aluminum conductors sized to suit the conductors shown on the plan. Landing lugs shall be copper or tin-plated aluminum. Neutral bus shall be rated for 125 A and be suitable for copper or aluminum conductors unless otherwise specified. The terminal shall include but not be limited to:
  - a) Incoming terminals (landing lugs)
  - b) Neutral lugs
  - c) Solid neutral terminal strip
9. At least 6 standard single pole circuit breaker spaces,  $\frac{3}{4}$ " nominal, shall be provided for branch circuits. Circuit breaker interiors shall be copper. Interiors of enclosure shall accept plug-in or cable-in/cable-out circuit breakers.
10. Control wiring shall be 600 V, 14 stranded machine tool wire. Where subject to flexing, 19 strand wire shall be used.
11. Main bus shall be rated for 125 A and shall be tin-plated copper.
12. A plastic laminated wiring diagram shall be provided with brass mounting eyelets and attached to the inside of the enclosure and the wiring diagram shall be affixed to the interior with a UL or ETL approved method.

13. An engraved phenolic nameplate on the dead front panel indicating the function of each circuit or device shall be installed with stainless steel rivets or stainless steel screws:
  - a) Adjacent to the breaker or device with character size a minimum of  $\frac{1}{8}$ ".
  - b) At the top of the exterior door panel indicating State system number, voltage level and number of phases with character size a minimum of  $\frac{3}{16}$ ".
14. 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.
15. 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.
16. Foundation shall extend 2" minimum beyond edge of service equipment enclosure.
17. Internal bus, where shown, is typical only. Alternative design of proposed service equipment enclosure shall be submitted to the Engineer for approval.
18. 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.
19. 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.
20. Type III-AR and Type III-BR service equipment enclosures 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.
21. Minimum clearance shall be required for front and back of service equipment enclosure per National Electrical Code, Article 110.26, "Spaces About Electric Equipment (600 Volts, Nominal, or Less)."

To accompany plans dated 1-23-12

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

RSP ES-2C DATED OCTOBER 5, 2007 SUPERCEDES STANDARD PLAN ES-2C  
DATED MAY 1, 2006 - PAGE 405 OF THE STANDARD PLANS BOOK DATED MAY 2006.

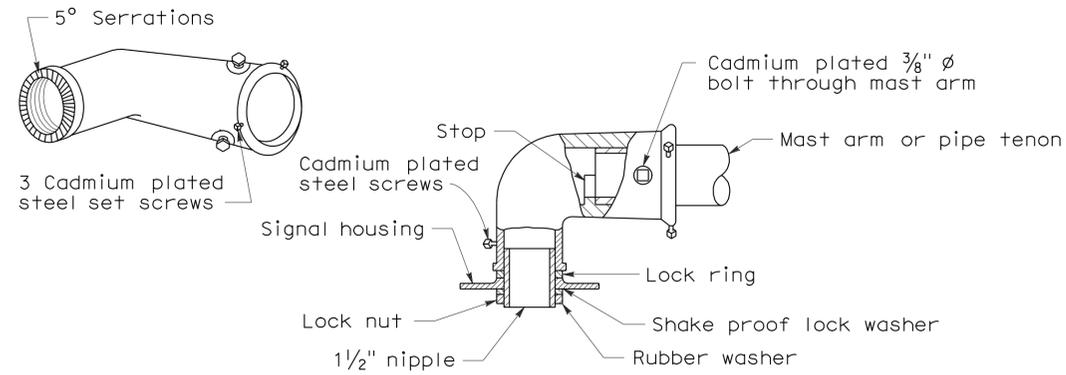
**REVISED STANDARD PLAN RSP ES-2C**

2006 REVISED STANDARD PLAN RSP ES-2C

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	247	252

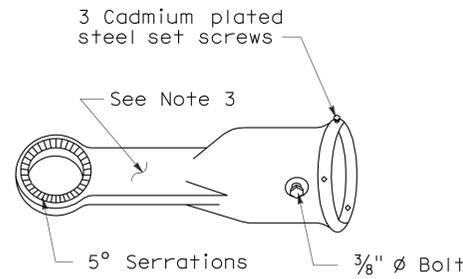
Jeffrey G. McRae  
 REGISTERED ELECTRICAL ENGINEER  
 June 6, 2008  
 PLANS APPROVAL DATE  
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 REGISTERED PROFESSIONAL ENGINEER  
 Jeffrey G. McRae  
 No. E14512  
 Exp. 6-30-10  
 ELECTRICAL  
 STATE OF CALIFORNIA

To accompany plans dated 1-23-12



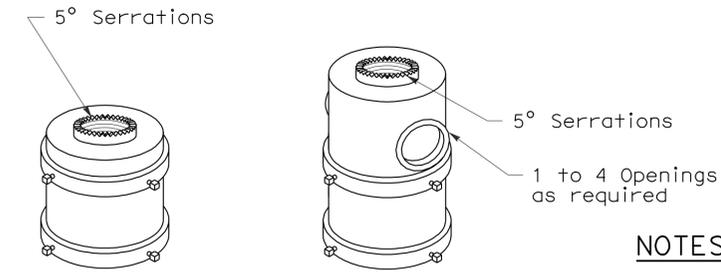
**MAST ARM MOUNTING - TYPE "MAT"**

For 2 NPS pipe, see Note 1.



**MAST ARM MOUNTING - TYPE "MAS"**

For 2 NPS pipe. See Note 1.

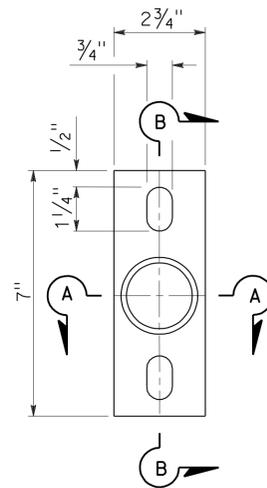


For one mounting For multiple mountings

**TOP MOUNTINGS**

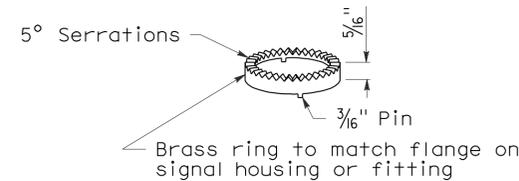
For 4 NPS pipe, see Note 2.

**SIGNAL SLIP FITTERS**



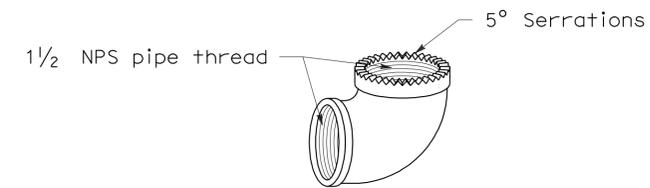
**POLE PLATE**

For side mountings



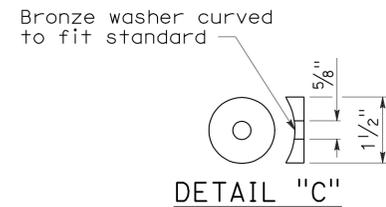
**LOCK RING**

Use where locking ring is not integral with signal housing or fitting.



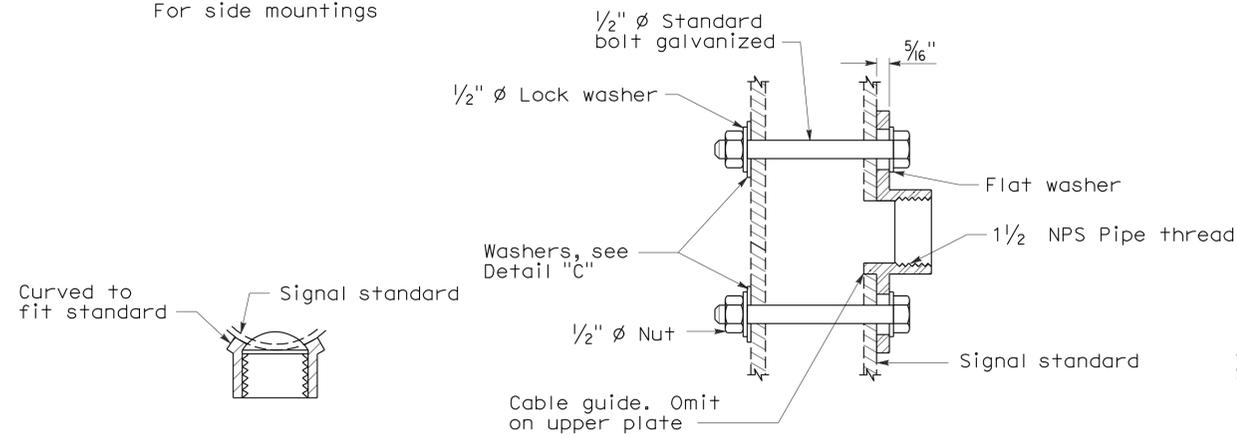
**SPECIAL 90° ELBOW**

One for each signal head, except those with special slip fitter mounting

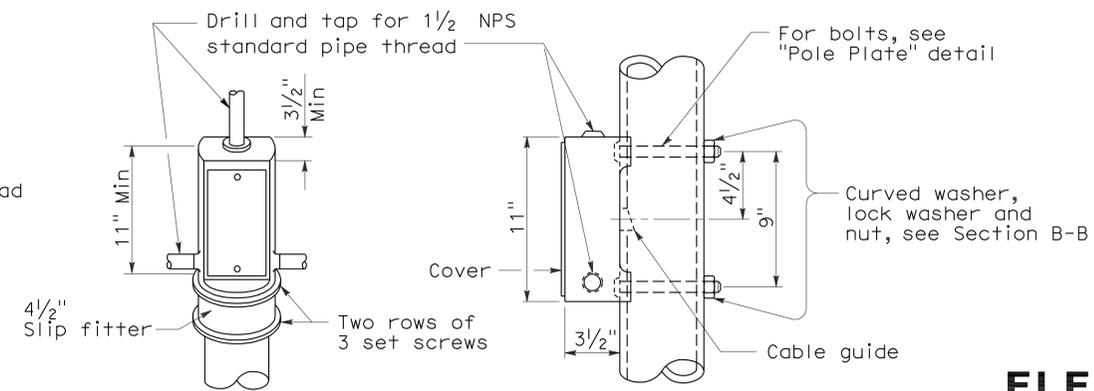


**DETAIL "C"**

**MISCELLANEOUS MOUNTING HARDWARE**



**SECTION B-B**



**TOP MOUNTING**

**SIDE MOUNTING**

**TERMINAL COMPARTMENTS**

**ELECTRICAL SYSTEMS (SIGNAL HEADS AND MOUNTINGS)**

NO SCALE

RSP ES-4D DATED June 6, 2008 SUPERSEDES STANDARD PLAN ES-4D DATED MAY 1, 2006 - PAGE 421 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP ES-4D**

2006 REVISED STANDARD PLAN RSP ES-4D

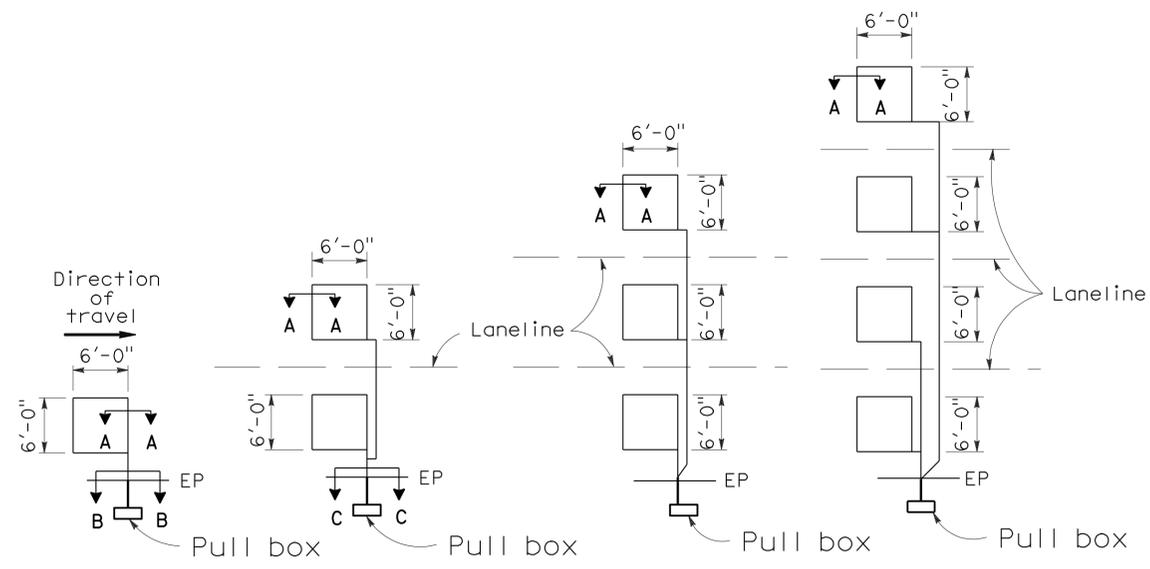
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	248	252

REGISTERED ELECTRICAL ENGINEER  
 October 5, 2007  
 PLANS APPROVAL DATE  
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 To accompany plans dated 1-23-12

REGISTERED PROFESSIONAL ENGINEER  
 Jeffrey G. McRae  
 No. E14512  
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 ELECTRICAL  
 STATE OF CALIFORNIA

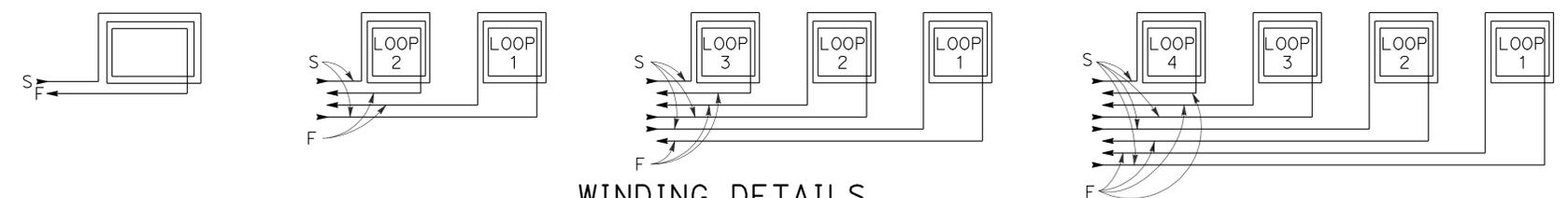
## LOOP INSTALLATION PROCEDURE

- Loops shall be centered in lanes.
- Saw slots in pavement for loop conductors as shown in details.
- Distance between side of loop and a lead-in saw cut from adjacent detectors shall be 2'-0" minimum. Distance between lead-in saw cuts shall be 6" minimum.
- Bottom of saw slot shall be smooth with no sharp edges.
- Slots shall be washed until clean, blown out and thoroughly dried before installing loop conductors.
- Adjacent loops on the same sensor unit channel shall be wound in opposite directions.
- Identify and tag loop circuit pairs in the pull box with loop number, start (S) and finish (F) of conductor. Identify and tag lead-in-cable with sensor number and phase.
- Install loop conductor in slot using a 3/16" to 1/4" thick wood paddle. Hold loop conductors with wood paddles (at the bottom of the sawed slot) during sealant placement.
- No more than 2 twisted pairs shall be installed in one sawed slot.
- Allow additional 5'-0" of slack length of conductor for the lead-in run to pull box.
- The additional length of each conductor for each loop shall be twisted together into a pair (6 turns per 3'-4" minimum) before being placed in the slot and conduit leading to pull box.
- Test each loop circuit for continuity, circuit resistance and insulation resistance at the pull box before filling slots.
- Fill slots as shown in details.
- Splice loop conductors to lead-in-cable. Splices shall be soldered.
- End of lead-in-cable and Type 2 loop conductor shall be waterproofed prior to installing in conduit to prevent moisture from entering the cable.
- Lead-in-cable shall not be spliced between the pull box and the controller cabinet terminals.
- Test each loop circuit for continuity, circuit resistance and insulation resistance at the controller cabinet location.
- Where loop conductors are not to be spliced to a lead-in-cable, the ends of the conductors shall be taped and waterproofed with electrical insulating coating.



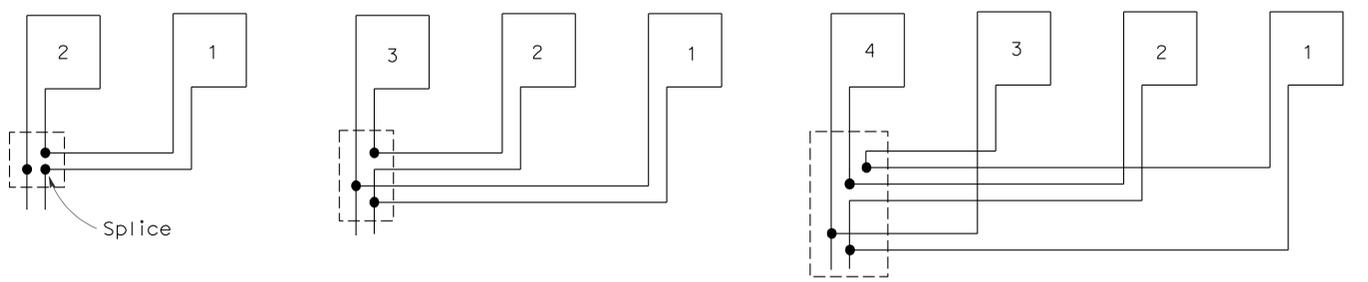
TYPE 1A INSTALLATION    TYPE 2A INSTALLATION    TYPE 3A INSTALLATION    TYPE 4A INSTALLATION  
**SAWCUT DETAILS**

- (Type A loop detector configurations illustrated)
- 1A thru 4A = 1 Type A loop configuration in each lane.
  - 1B thru 4B = 1 Type B loop configuration in each lane.
  - 1C = 1 Type C loop configuration entering lanes as required.
  - 1D thru 4D = 1 Type D loop configuration in each lane.
  - 1E thru 4E = 1 Type E loop configuration in each lane.
  - 1Q thru 4Q = 1 Type Q loop configuration in each lane.
- (Use Type A, B, C, D, E or Q loop detector configurations only when specified or shown on plans)



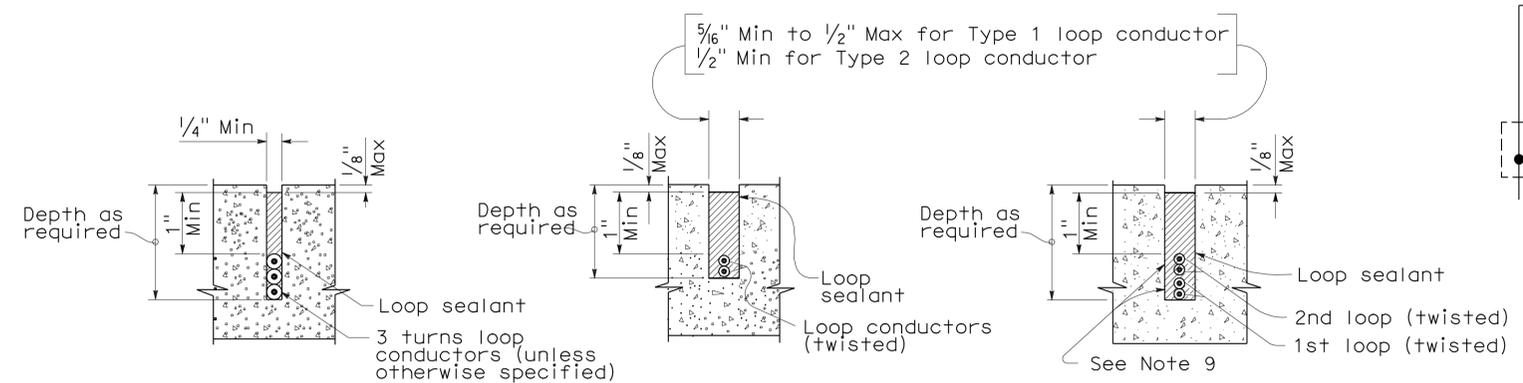
**WINDING DETAILS**

See Notes 6 and 7



**TYPICAL LOOP CONNECTIONS**

(Dashed lines represent the pull box)



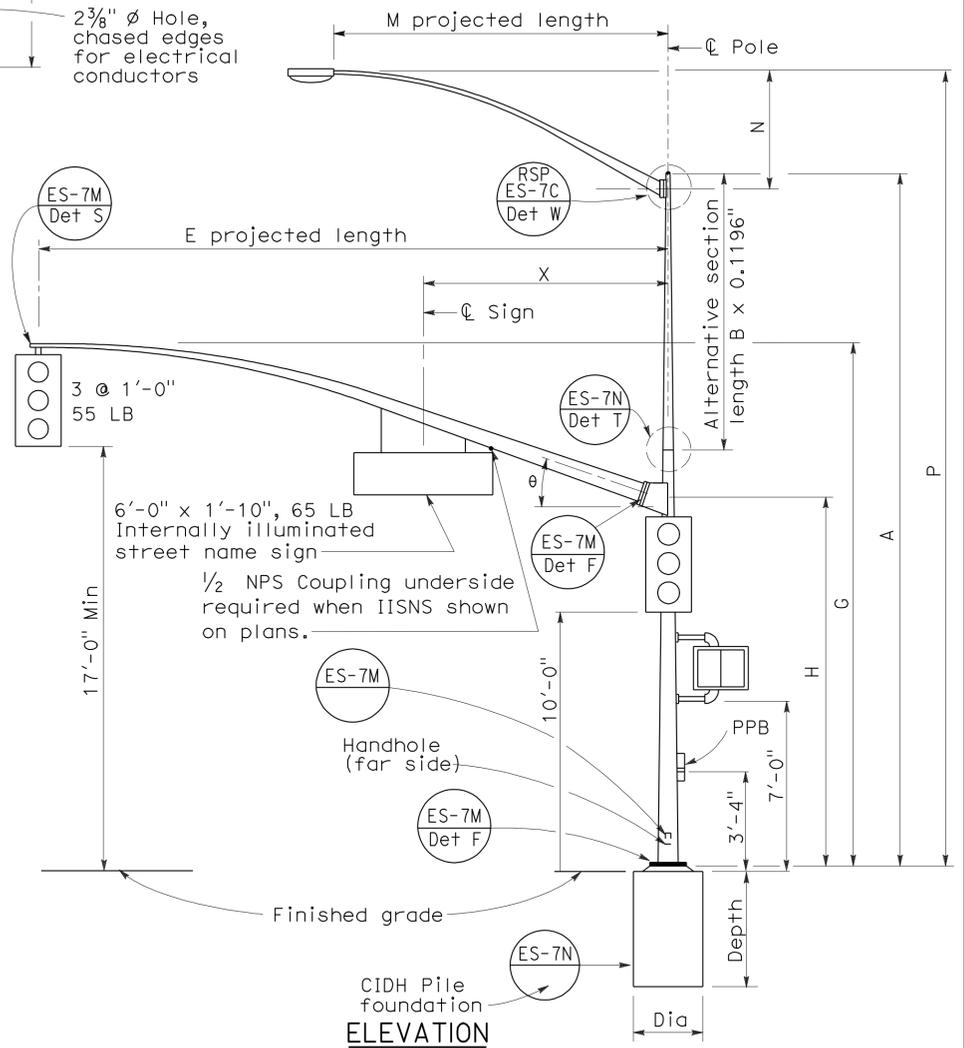
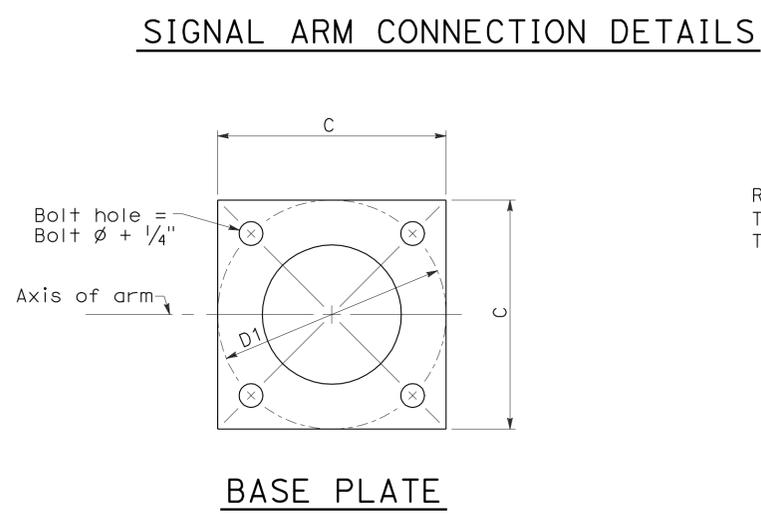
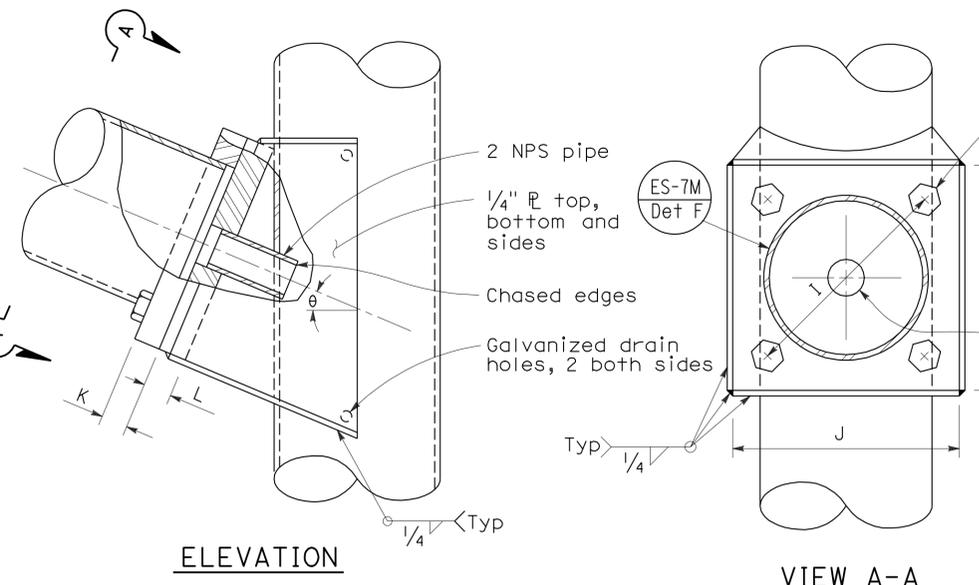
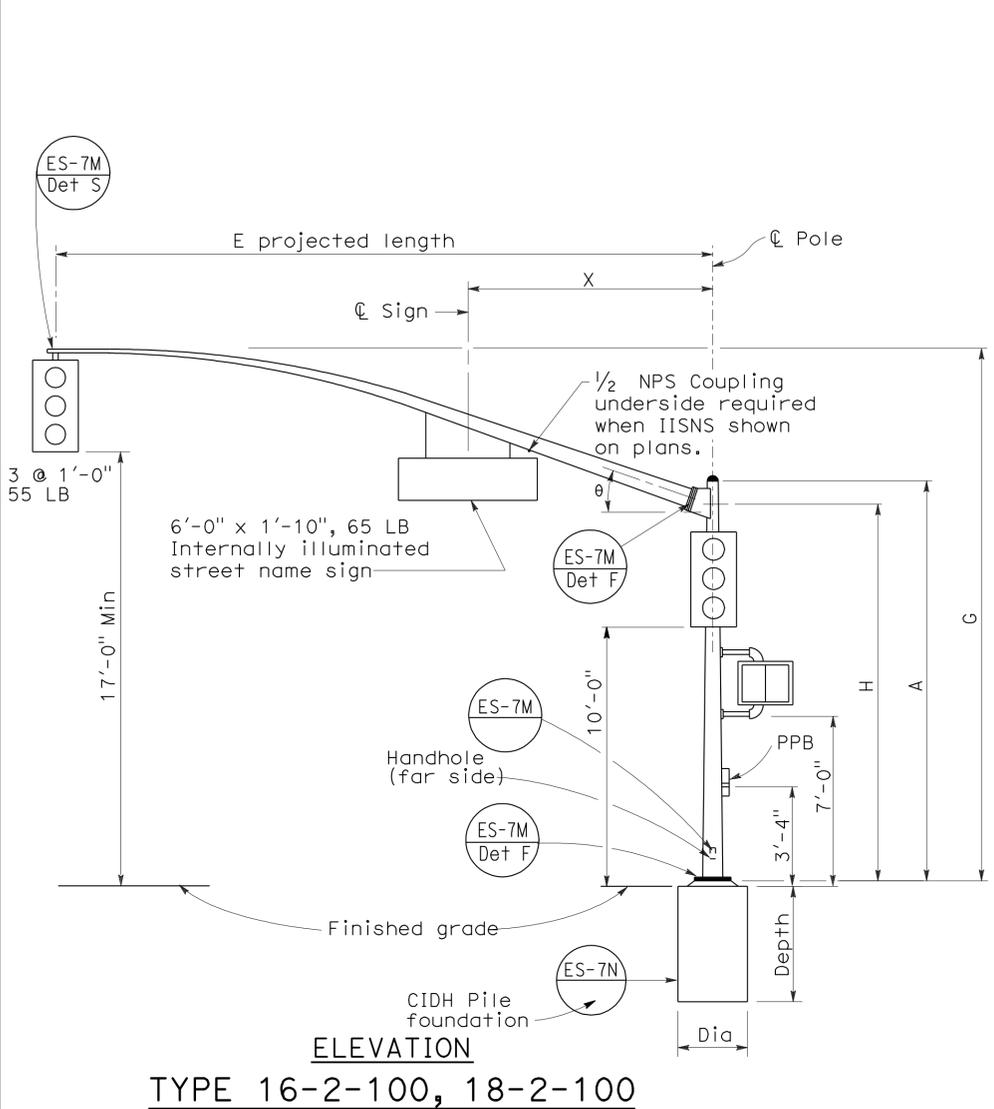
SECTION A-A    SECTION B-B    SECTION C-C  
**SLOT DETAILS - TYPE 1 AND TYPE 2 LOOP CONDUCTOR**

## ELECTRICAL SYSTEMS (DETECTORS)

NO SCALE

RSP ES-5A DATED OCTOBER 5, 2007 SUPERCEDES STANDARD PLAN ES-5A DATED MAY 1, 2006 - PAGE 423 OF THE STANDARD PLANS BOOK DATED MAY 2006.

2006 REVISED STANDARD PLAN RSP ES-5A



E Projected Length	G Mounting Height	H	Min OD At Pole	Thickness	I Bolt Circle	HS Cap Screws	J Plate Size	K Arm R Thickness	L Pole R Thickness	θ	X Max
15'-0"	21'-8"±	17'-6"	6 5/8"	0.1793"	12"	1 1/4"-7NC-3"	1'-0"	1 1/4"	1 1/2"	23°	10'-6"
20'-0"	21'-8"±	17'-6"	6 5/8"								
25'-0"	22'-8"±	16'-0"	7 5/16"	0.1793"	12"	1 1/4"-7NC-3"	1'-0"	1 1/4"	1 1/2"	23°	10'-6"
30'-0"	23'-0"±		8"								

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
8'-0"	2'-6"±	3 1/2"		35'-0" Pole
10'-0"	3'-3"±	3 7/8"	0.1196"	32'-0"±
12'-0"	4'-3"±	4 1/4"		37'-0"±
15'-0"	4'-9"±	4 1/4"	0.1196"	32'-9"±
				37'-9"±
				33'-9"±
				38'-9"±
				34'-3"±
				39'-3"±

Pole Type	Load Case	Wind Velocity mph	POLE DATA				BASE PLATE DATA				Anchor Bolts Size	Luminaire Arm	Signal Arm	CIDH PILE FOUNDATION					
			A Height	Min OD		Thickness	Alternative Section		C	D1 Bolt Circle				Thickness	Diameter	Depth	Reinforced		
				Base	Top		B Length	Bottom										Top	
16-2-100	2	100	18'-6"	10 3/4"	0.1793"	None	8"	6 5/8"	1'-6"	1'-5 1/2"	1 1/2"	2"φ x 42" x 6"	None	15'-0", 20'-0"	2'-6"	7'-2"	Yes		
17-2-100			30'-0"			None												10'-0"	6 5/8"
17A-2-100			35'-0"			None												15'-0"	5 15/16"
18-2-100			17'-0"			None												None	8"
19-2-100			30'-0"			None												10'-0"	6 5/8"
19A-2-100			35'-0"			None												15'-0"	5 15/16"

□ Indicates arm length to be used unless otherwise noted on plans.

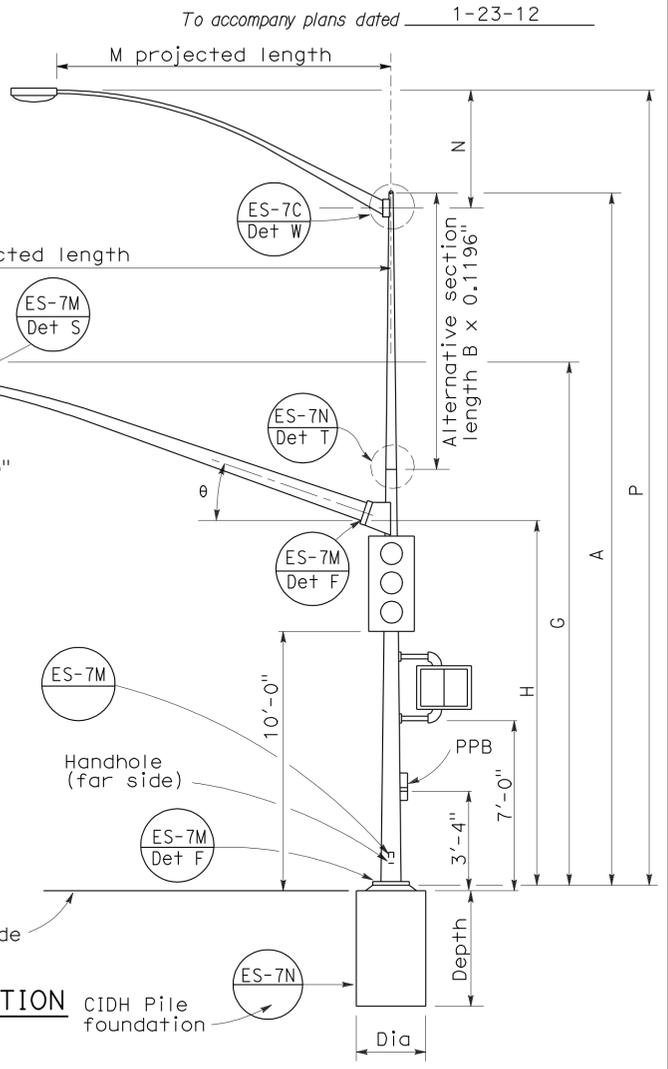
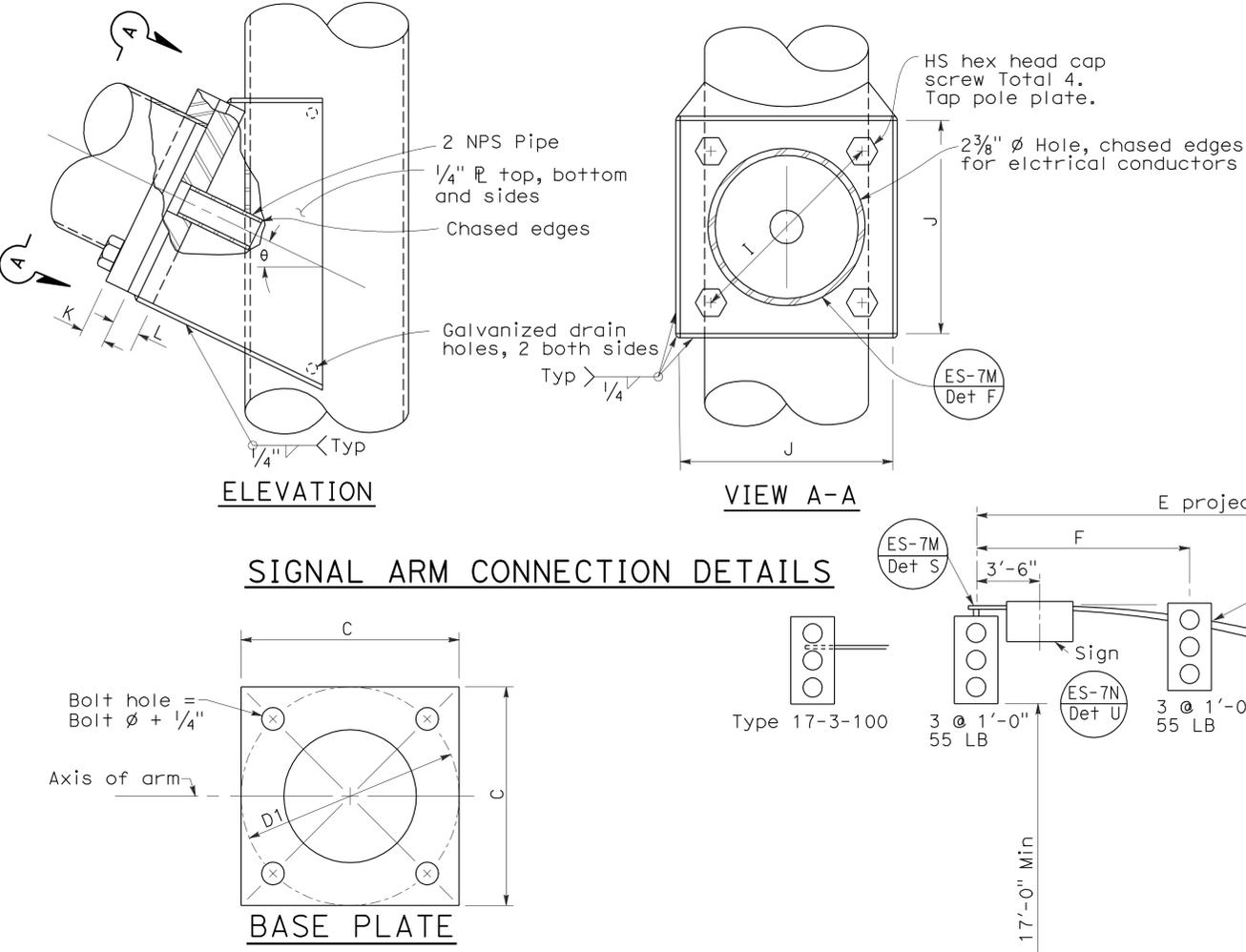
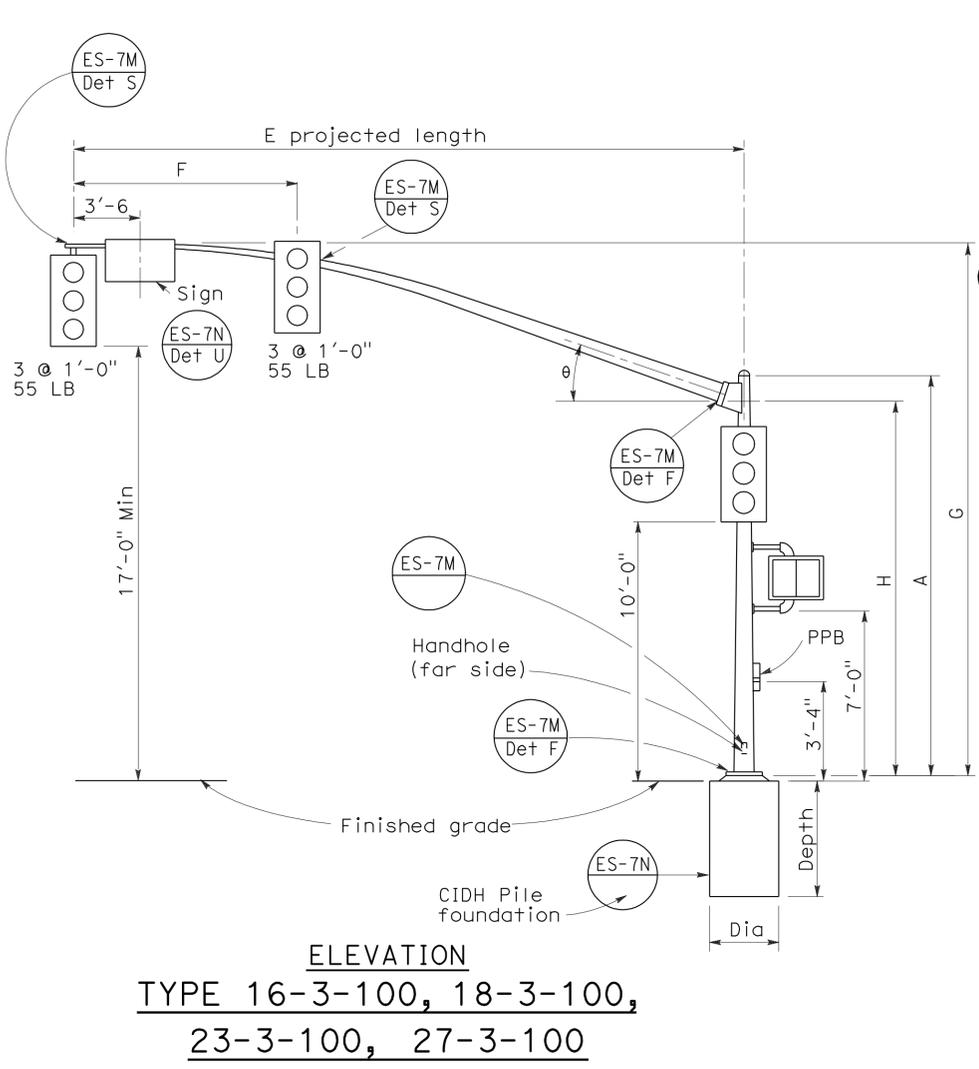
TYPE 17-2-100, 17A-2-100, 19-2-100, 19A-2-100  
 STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(SIGNAL AND LIGHTING STANDARD**  
**CASE 2 ARM LOADING**  
**WIND VELOCITY=100 MPH**  
**ARM LENGTHS 15' TO 30')**  
 NO SCALE  
 RSP ES-7D DATED OCTOBER 5, 2007 SUPERCEDES STANDARD PLAN ES-7D  
 DATED MAY 1, 2006 - PAGE 440 OF THE STANDARD PLANS BOOK DATED MAY 2006.

2006 REVISED STANDARD PLAN RSP ES-7D

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	250	252

REGISTERED CIVIL ENGINEER  
 June 30, 2006  
 PLANS APPROVAL DATE  
 The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

REGISTERED PROFESSIONAL ENGINEER  
 Jeffrey B. Woody  
 No. C41260  
 Exp. 3-31-07  
 CIVIL  
 STATE OF CALIFORNIA



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 Arm Thickness	L Pole Thickness	theta
15'-0"	8'-0"	21'-8"±	17'-6"	6 5/8"	0.1793"	12"	1 1/4"-7NC-3"	1'-0"	1 1/4"	1 1/2"	23°
20'-0"		21'-8"±		7"							
25'-0"		22'-8"±		7 5/8"							
30'-0"	12'-0"			8"							
35'-0"	14'-0"	23'-0"±	16'-0"	8 3/4"	0.2391"	13"	1'-1"	1 1/2"	1 3/4"	21°	
40'-0"				9 3/8"							
45'-0"	15'-0"	23'-8"±		10 1/16"							

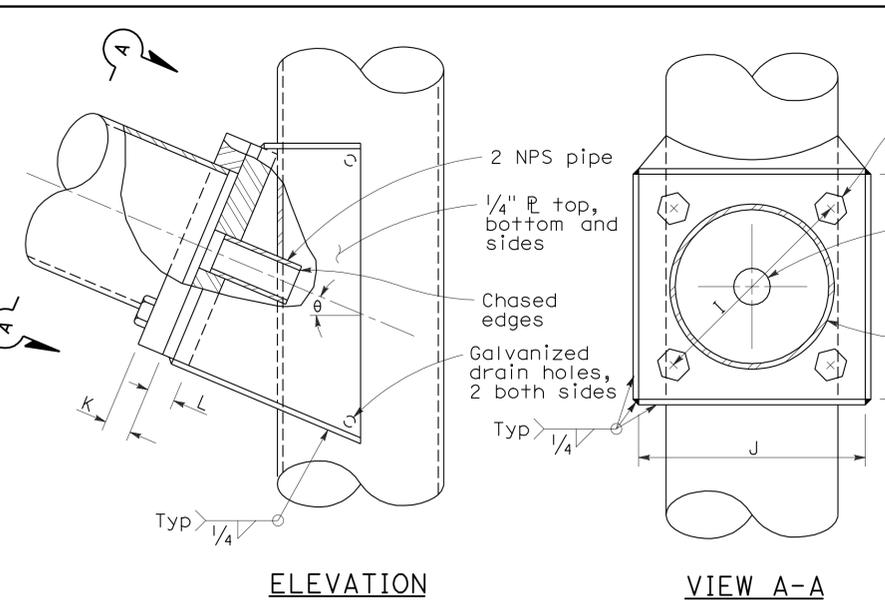
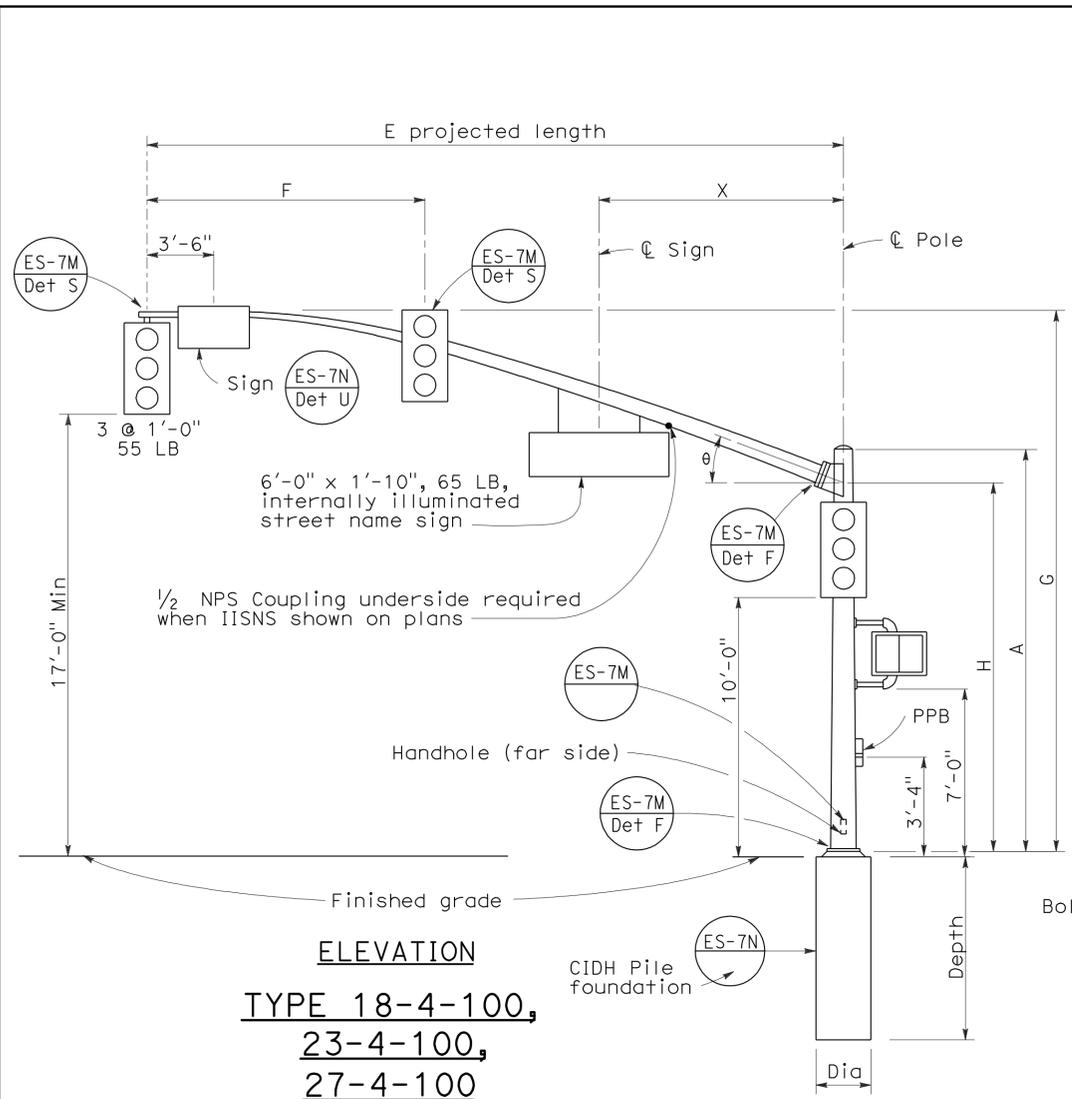
M Projected Length	N Rise	Min OD at Pole	Thickness	P Mounting Height Pole
6'-0"	2'-0"±	3 1/4"	0.1196"	31'-6"±
8'-0"	2'-6"±	3 1/2"		32'-0"±
10'-0"	3'-3"±	3 7/8"	0.1196"	32'-9"±
12'-0"	4'-3"±			33'-9"±
15'-0"	4'-9"±	4 1/4"		34'-3"±

Pole Type	Load Case	Wind Velocity mph	POLE DATA				BASE PLATE DATA				Luminaire Arm	Signal Arm	CIDH PILE FOUNDATION					
			A Height	Min OD		Thickness	Alternative Section			C			D1 Bolt Circle	Thickness	Anchor Bolts Size	Diameter	Depth	Reinforced
				Base	Top		B Length	Bottom	Top									
16-3-100	3	100	18'-6"	10 3/4"	8 1/4"	0.1793"	None	8"	7 5/8"	1'-6"	1'-5 1/2"	1 1/2"	2"ø x 42" x 6"	3'-0"	9'-0"	Yes		
17-3-100			30'-0"		6 5/8"		10'-0"										None	
18-3-100			17'-0"	8 7/16"	None													
19-3-100			30'-0"	7 7/8"	10'-0"	9 1/4"	7 7/8"											
19A-3-100			35'-0"	7 3/16"	15'-0"	7 3/16"												
23-3-100			17'-0"	9 5/8"	None													
24-3-100			30'-0"	7 7/8"	10'-0"	9 1/4"	7 7/8"											
24A-3-100			35'-0"	7 3/16"	15'-0"	7 3/16"												
26-3-100			30'-0"	8"	10'-0"		8"											
26A-3-100			35'-0"	7 5/16"	15'-0"	9 3/8"	7 5/16"											
27-3-100			17'-0"	9 3/4"	None													

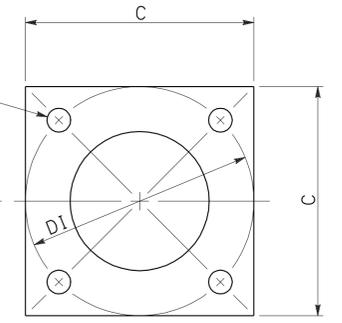
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(SIGNAL AND LIGHTING STANDARD**  
**CASE 3 ARM LOADING**  
**WIND VELOCITY=100 MPH**  
**ARM LENGTHS 15' TO 45')**  
 NO SCALE  
 RSP ES-7E DATED JUNE 30, 2006 SUPERSEDES STANDARD PLAN DATED MAY 1, 2006 -  
 PAGE 441 OF THE STANDARD PLANS BOOK DATED MAY 2006.

□ Indicates arm length to be used unless otherwise noted on plans.

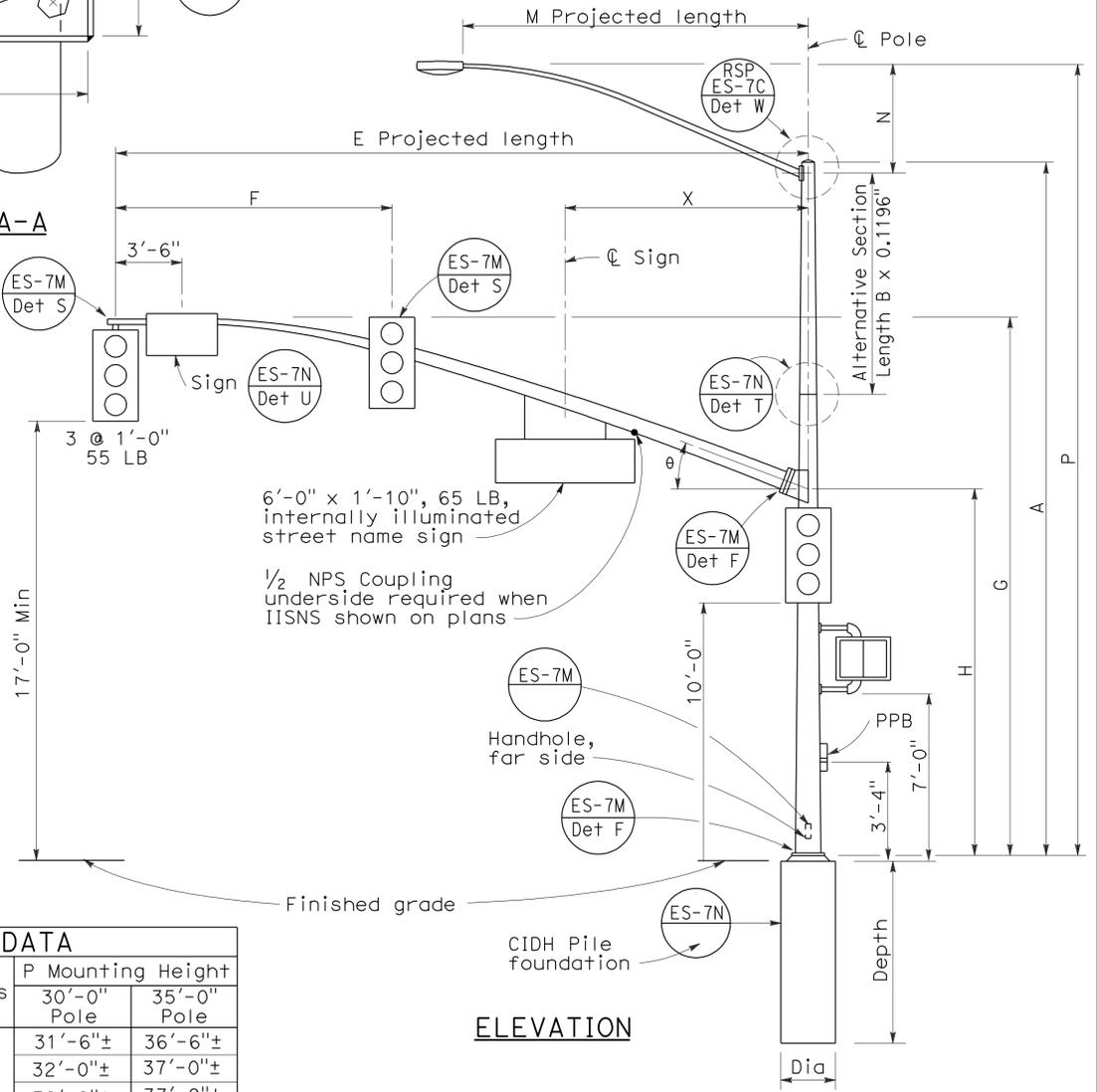
2006 REVISED STANDARD PLAN RSP ES-7E



**SIGNAL ARM CONNECTION DETAILS**



**BASE PLATE**



**ELEVATION**

TYPE 19-4-100, 19A-4-100,  
 24-4-100, 24A-4-100,  
 26-4-100, 26A-4-100

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 Arm R Thickness	L Pole R Thickness	θ	X Max
25'-0"	10'-0"	22'-8"±	16'-0"	7 5/16"	0.2391"	12"	1 1/4"-7NC-3"	1'-0"	1 1/4"	1 1/2"	23°	10'-6"
30'-0"	12'-0"	8"										
35'-0"	14'-0"	8 1/16"										
40'-0"	15'-0"	9 3/8"										
45'-0"	15'-0"	23'-8"±		10 1/4"		13 1/2"		1'-1 1/2"	1 1/2"	1 3/4"	15°	13'-0"

M Projected Length	N Rise	Min OD at Pole	Thickness	P Mounting Height	
				30'-0" Pole	35'-0" Pole
6'-0"	2'-0"±	3 1/4"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3 1/2"		32'-0"±	37'-0"±
10'-0"	3'-3"±	3 7/8"		32'-9"±	37'-9"±
12'-0"	4'-3"±			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 Arm	Signal Arm	CIDH PILE FOUNDATION				
			A Height	Min OD		Thickness	Alternative Section			C	DI Bolt Circle	Thickness			Anchor Bolts Size	Dia	Depth	Reinforced	
				Base	Top		B Length	Bottom	Top										
18-4-100	4	100	17'-0"	12"	0.2391"	None	9 3/8"	8"	1'-6"	1'-6"	1 1/2"	2" Ø x 42" x 6"	None	25'-0", 30'-0"	3'-0"	9'-0"	Yes		
19-4-100			30'-0"			8"												None	8"
19A-4-100			35'-0"			7 5/16"												15'-0"	7 5/16"
23-4-100			17'-0"			9"												None	
24-4-100			30'-0"	12 1/2"	0.3125"	10'-0"	9 3/8"	8"	1'-6"	1'-6"	1 1/2"	2" Ø x 42" x 6"	None	35'-0"	3'-0"	9'-0"	Yes		
24A-4-100			35'-0"			7 5/16"												15'-0"	7 5/16"
26-4-100			30'-0"			8"												10'-0"	8 3/8"
26A-4-100			35'-0"			7 5/16"												15'-0"	7 1/16"
27-4-100			17'-0"	9 3/4"	None														

□ Indicates arm length to be used unless otherwise noted on plans.

**REVISED STANDARD PLAN RSP ES-7F**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (SIGNAL AND LIGHTING STANDARD  
 CASE 4 ARM LOADING  
 WIND VELOCITY=100 MPH  
 ARM LENGTHS 25' TO 45')**  
 NO SCALE

RSP ES-7F DATED OCTOBER 5, 2007 SUPERCEDES RSP ES-7F DATED  
 NOVEMBER 17, 2006 AND STANDARD PLAN ES-7F DATED MAY 1, 2006 -  
 PAGE 442 OF THE STANDARD PLANS BOOK DATED MAY 2006.

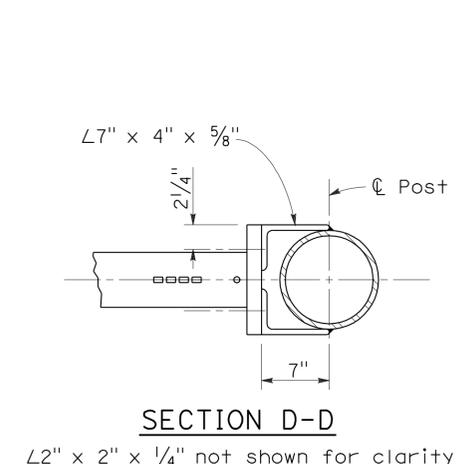
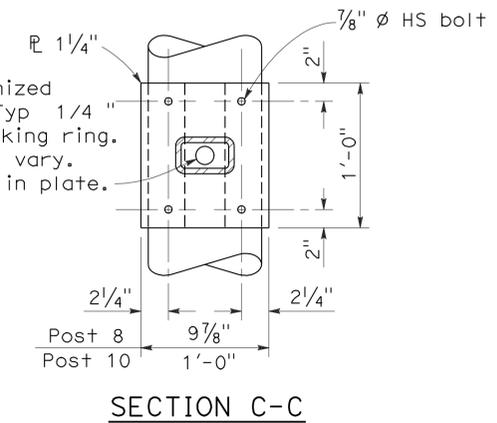
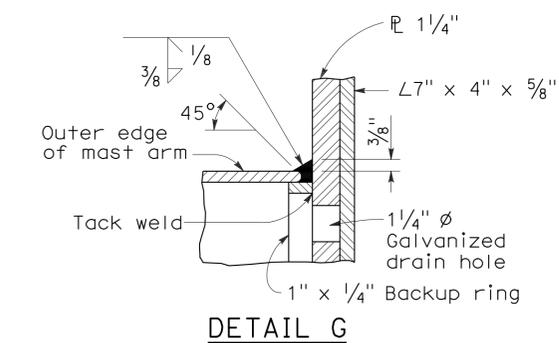
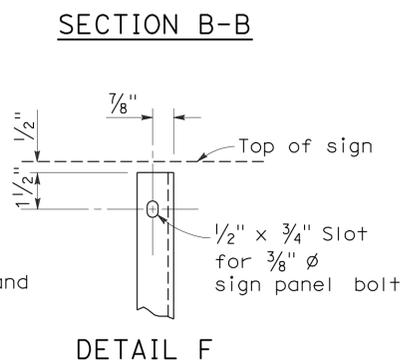
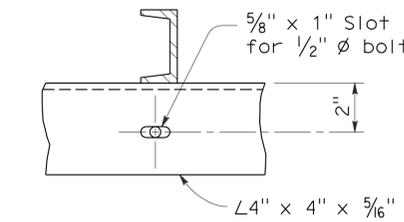
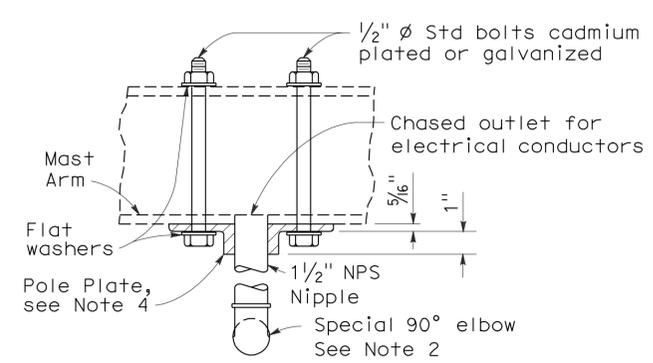
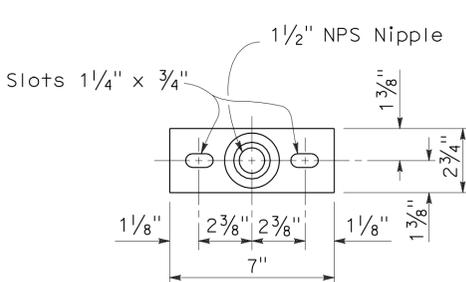
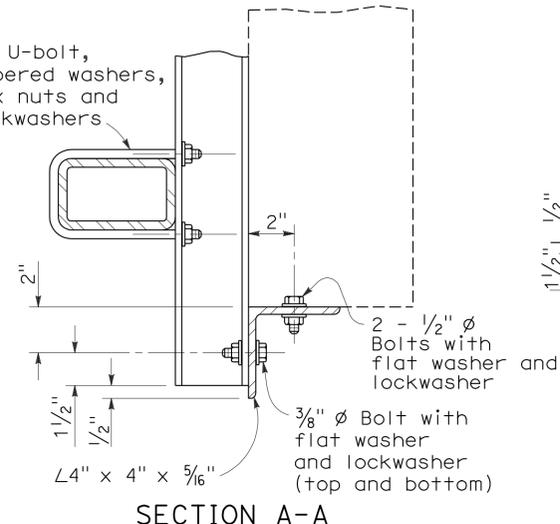
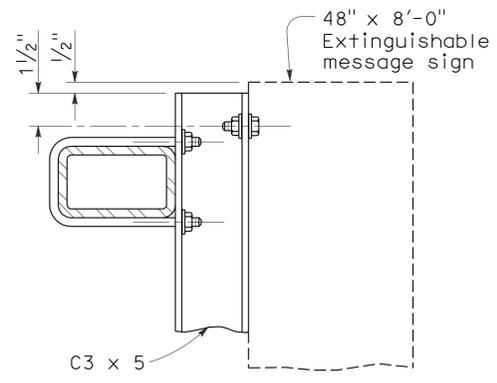
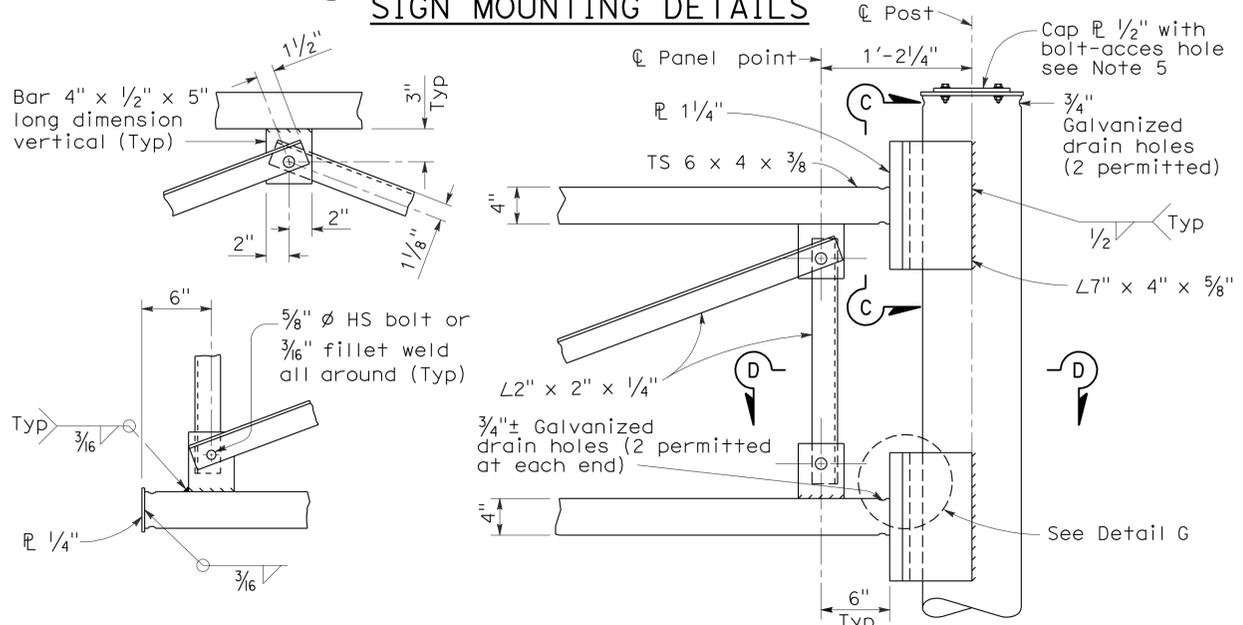
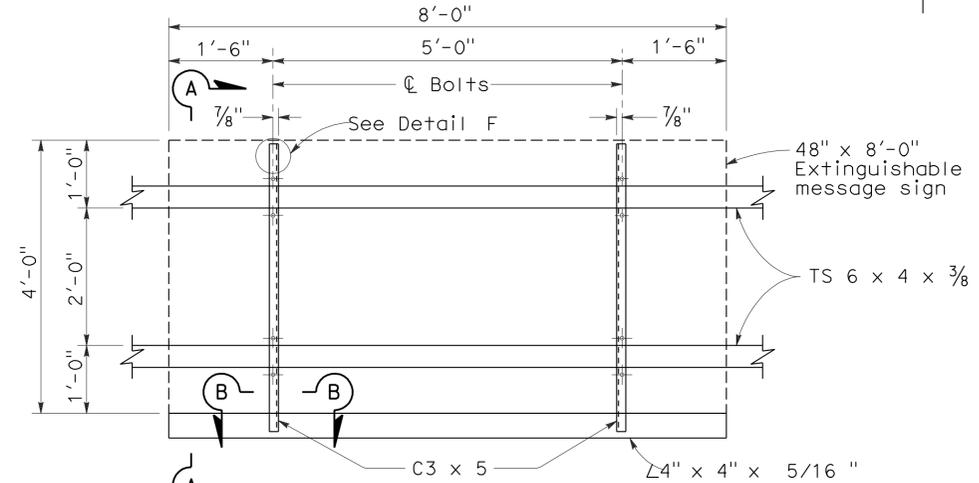
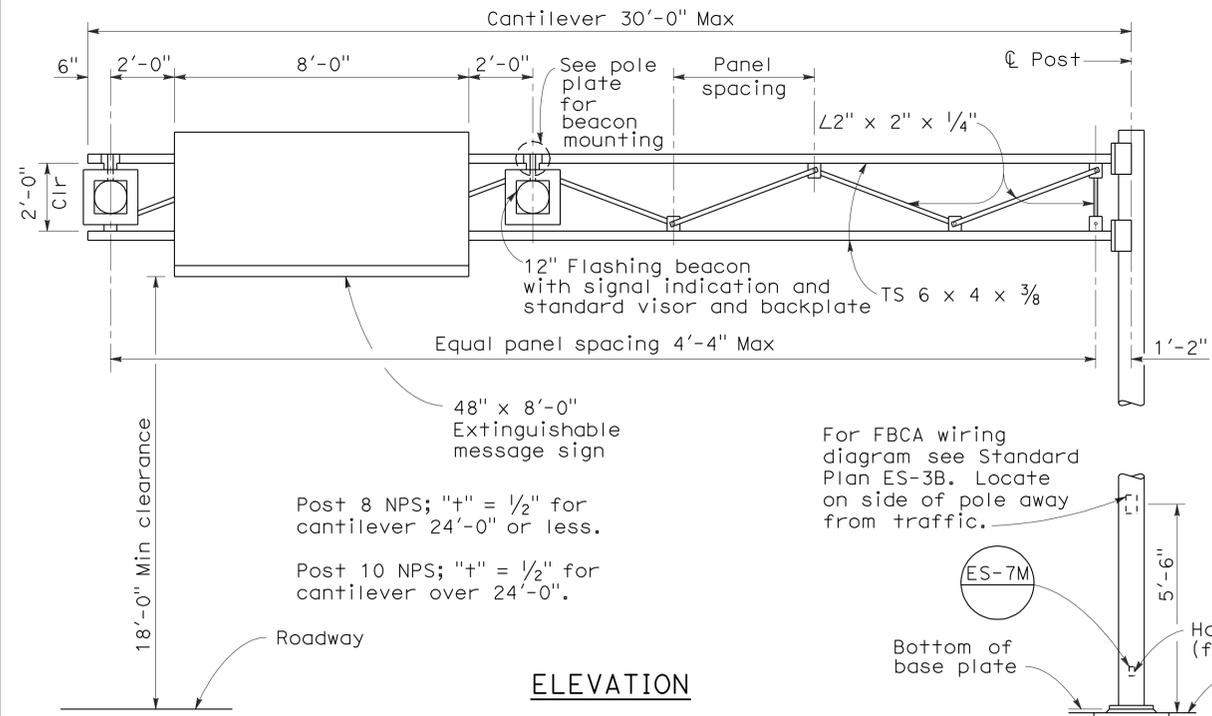
2006 REVISED STANDARD PLAN RSP ES-7F

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SM	82,101	4.8/19.3, 6.6/20.7	252	252

Stanley P. Johnson  
 REGISTERED CIVIL ENGINEER  
 October 5, 2007  
 PLANS APPROVAL DATE  
 The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

REGISTERED PROFESSIONAL ENGINEER  
 Stanley P. Johnson  
 No. C57793  
 Exp. 3-31-08  
 CIVIL  
 STATE OF CALIFORNIA

To accompany plans dated 1-23-12



**NOTES:**

- For general notes, base plates, anchor bolts and foundations refer to Lightweight Signs, Post Details and Foundation Details sheets of the Standard Plans.
- For details of special 90° elbow, see Standard Plans ES-4D.
- For sign structure dimensions, see Project Plans.
- Pole plate shall be bronze, aluminum or ductile iron as specified in the Standard Specifications.
- For Bolt-Access Hole Details, see Overhead Signs-Truss Frame Juncture Details.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(EXTINGUISHABLE MESSAGE  
SIGN AND FLASHING BEACONS)**

NO SCALE

RSP ES-14C DATED OCTOBER 5, 2007 SUPERCEDES STANDARD PLAN ES-14C DATED MAY 1, 2006 - PAGE 468 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP ES-14C**

2006 REVISED STANDARD PLAN RSP ES-14C