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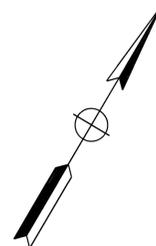
THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY

IN SANTA BARBARA AND SAN LUIS OBISPO COUNTIES
ABOUT 17 MILES EAST OF SANTA MARIA
FROM ALISOS CREEK BRIDGE TO CUYAMA RIVER BRIDGE

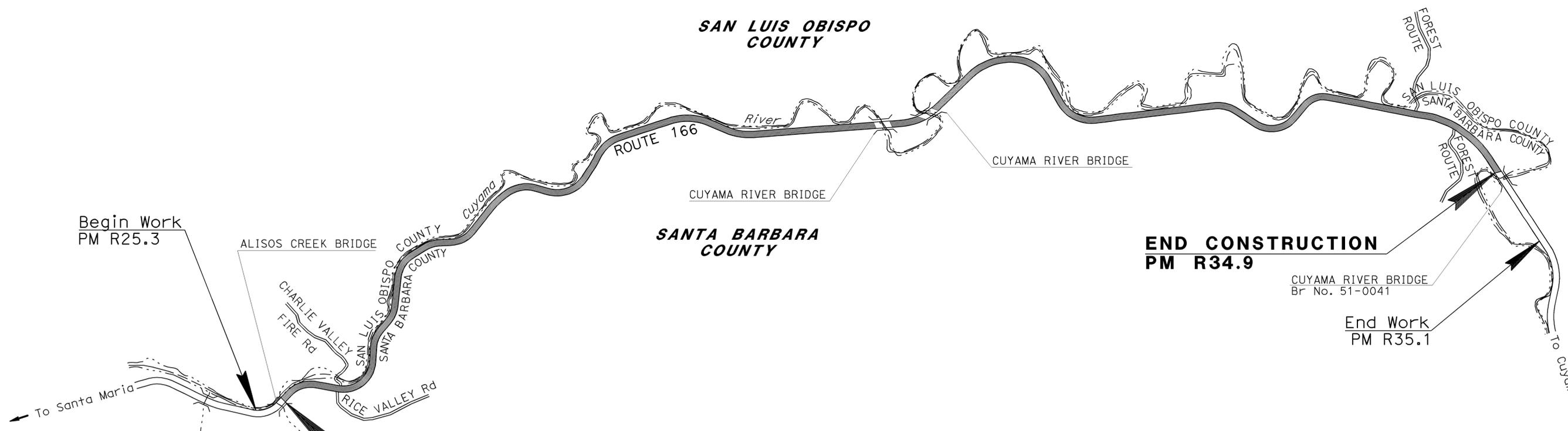
TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB,SLO	166	R25.5/R34.9	1	38

Caltrans

LOCATION MAP



BEGIN CONSTRUCTION
PM R25.5

END CONSTRUCTION
PM R34.9

CUYAMA RIVER BRIDGE
Br No. 51-0041
End Work
PM R35.1

NO SCALE

PROJECT MANAGER	KELLY McCLAIN
DESIGN ENGINEER	KELLY McCLAIN

Mark E. Cresswell 12-23-13
PROJECT ENGINEER DATE
REGISTERED CIVIL ENGINEER

December 23, 2013
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.

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB,SLO	166	R25.5/R34.9	2	38

12-23-13
 REGISTERED CIVIL ENGINEER DATE
 12-23-13
 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.

MARK CRESSWELL
 No. 63117
 Exp. 6-30-14
 CIVIL

- NOTES:**
1. DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
 2. HMA AND TACK COAT SHALL NOT BE PLACED ON PCC STRUCTURES OR SURFACES.
 3. ASPHALTIC EMULSION (FOG SEAL COAT) SHALL BE APPLIED TO EXISTING AC DIKE TO REMAIN IN PLACE, BERMS, OVERSIDE DRAINS AND DOWNDRAIN ENTRANCES.
 4. PLACE 3' WIDE SHOULDER BACKING AT LOCATIONS WITH NO DIKE.
 5. FOR EXACT LOCATIONS AND TYPES OF DIKES AND GUARDRAIL SEE SUMMARY OF QUANTITIES SHEETS.
 7. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

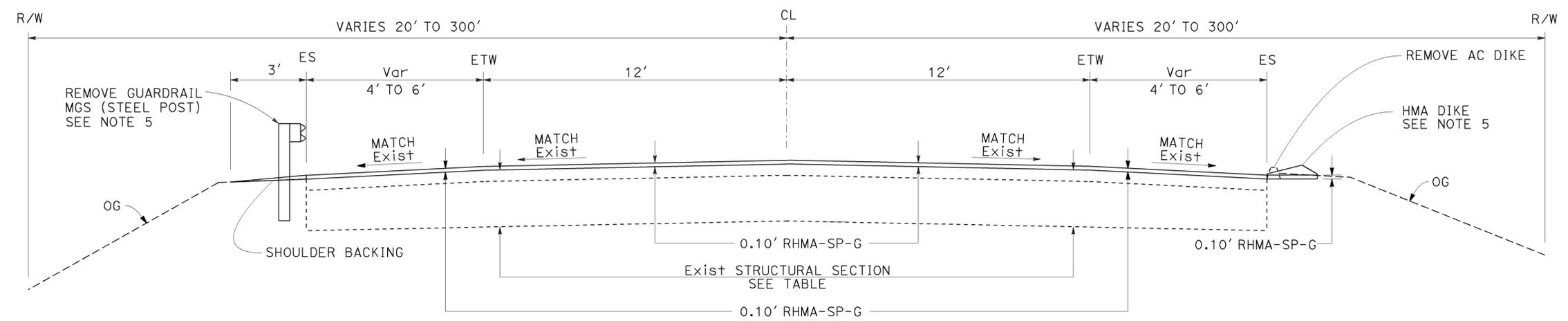
ABBREVIATIONS:

RHMA-SP-G = RUBBERIZED HOT MIX ASPHALT - SUPERPAVE (GAP GRADED)

HMA-SP (TYPE A) = HOT MIX ASPHALT - SUPERPAVE (TYPE A)

RAC = EXISTING RUBBERIZED ASPHALT CONCRETE

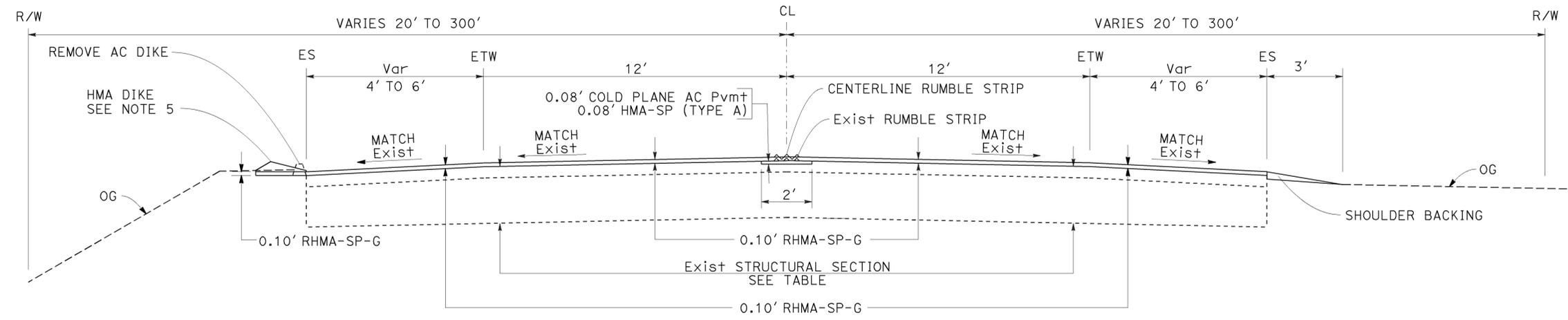
PAVEMENT CLIMATE REGION
SOUTH COAST



- EXISTING STRUCTURAL SECTIONS
- PM R25.50 TO R25.56
 - PM R25.93 TO R25.96
 - PM R28.26 TO R28.29
 - PM R29.98 TO R29.01
 - PM R29.56 TO R29.58
 - PM R29.74 TO R30.58
 - PM R30.64 TO R30.80
 - PM R31.09 TO R31.11
 - PM R31.65 TO R34.90

EXISTING STRUCTURAL SECTIONS

LOCATION PM		EXISTING THICKNESSES
FROM	TO	
25.5	28.2	0.10' RAC 0.30' AC 1.20' AB
28.2	31.0	0.30' AC 1.20' AB
31.0	32.5	0.10' RAC 0.30' AC 1.20' AB
32.5	34.9	0.10' RAC 0.50' AC 1.20' AB



- EXISTING STRUCTURAL SECTIONS
- PM R25.56 TO R25.93
 - PM R25.96 TO R28.26
 - PM R28.29 TO R29.98
 - PM R29.01 TO R29.56
 - PM R29.58 TO R29.74
 - PM R30.58 TO R30.64
 - PM R30.80 TO R31.09
 - PM R31.11 TO R31.65

ROUTE 166

TYPICAL CROSS SECTIONS

NO SCALE X-1

EXISTING UTILITY FACILITIES HAVE NOT BEEN PLOTTED ON THESE PLANS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
 Kelly J. McClain
 Functional Supervisor
 Kelly J. McClain
 Checked By
 Kelly J. McClain
 Calculated/Designed By
 Kelly J. McClain
 Mark Cresswell
 Kelly J. McClain
 Revised By
 Kelly J. McClain
 Date Revised

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB,SLO	166	R25.5/R34.9	3	38

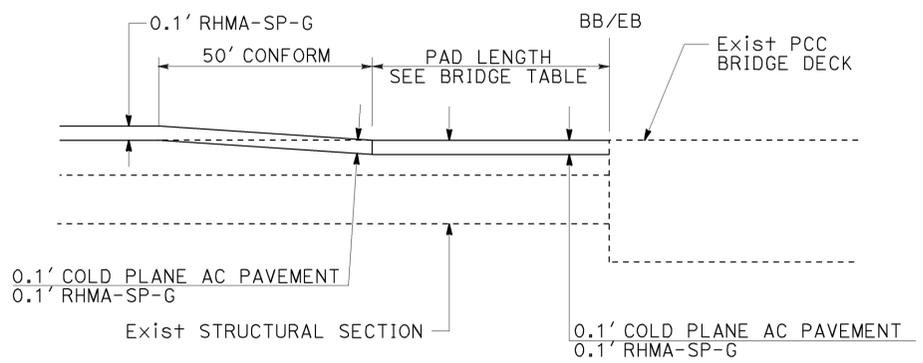
REGISTERED CIVIL ENGINEER DATE 12-23-13
 MARK CRESSWELL No. 63117 Exp. 6-30-14 CIVIL
 PLANS APPROVAL DATE 12-23-13
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ABBREVIATION:

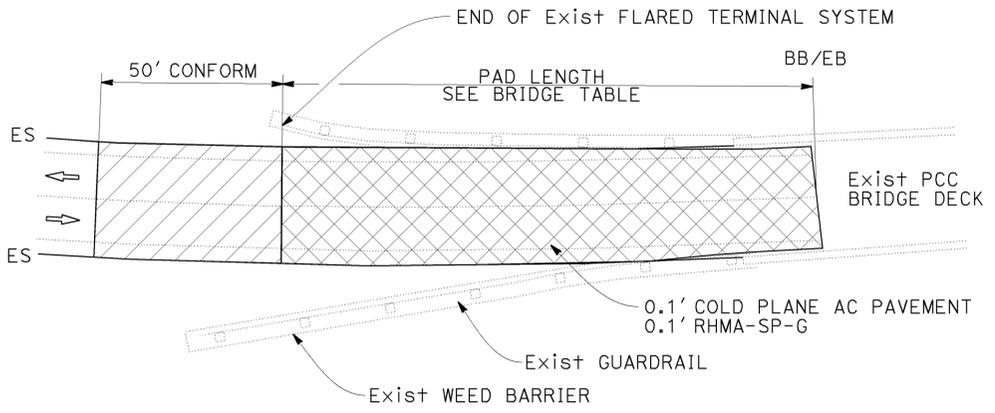
RHMA-SP-G = RUBBERIZED HOT MIX ASPHALT - SUPERPAVE (GAP GRADED)

NOTE:

1. ANTICIPATE A MINIMUM OF TWO MOVE-IN OPERATIONS FOR COLD PLANE AC PAVEMENT CONFORMS.



LONGITUDINAL CONFORM AT BRIDGE ELEVATION

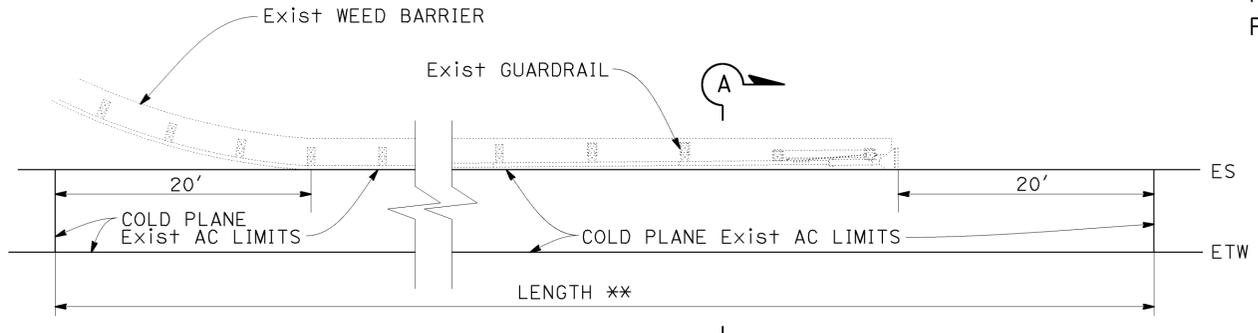


LONGITUDINAL CONFORM AT BRIDGE PLAN

BRIDGE TABLE

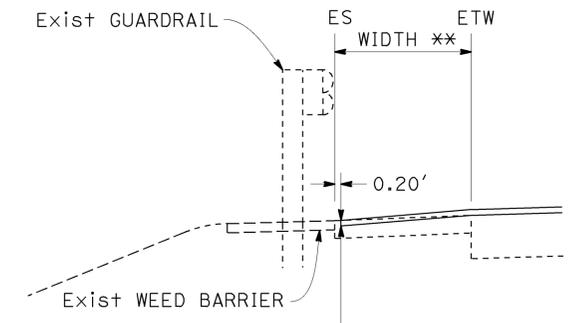
BRIDGE NAME	SIDE	LOCATION	PAD LENGTH
		PM	LF
ALISOS CREEK Br	EAST	R25.53	50
CUYAMA RIVER Br No 51-218	WEST	R30.35	110
	EAST	R30.45	110
CUYAMA RIVER Br No 51-219	WEST	R30.65	150
	EAST	R30.75	170
CUYAMA RIVER Br No 51-41	WEST	R34.92	0*

* = END OVERLAY WITH CONFORM 50' PRIOR TO BB



SHOULDER CONFORM AT GUARDRAIL

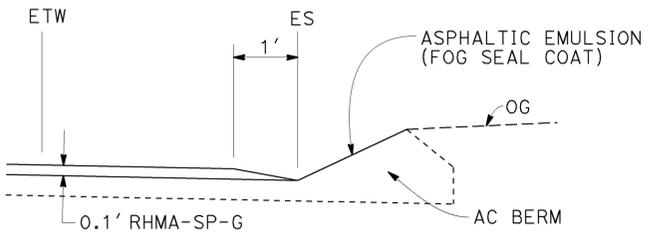
** = SEE "SHOULDER CONFORM TABLE"



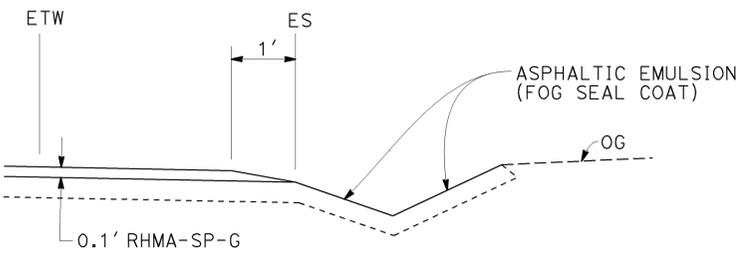
SECTION A-A

SHOULDER CONFORM TABLE

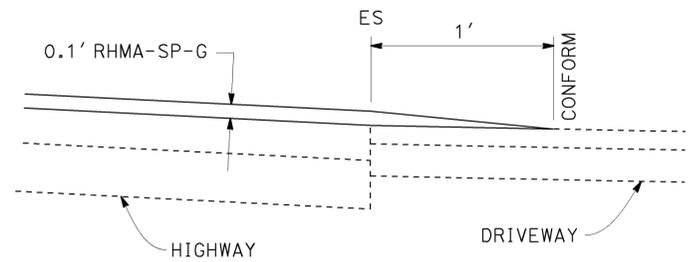
LOCATION	DIRECTION	LENGTH	WIDTH	AREA
PM	EB/WB	LF	LF	SQYD
R33.48	WB	90	6	60
R33.70	WB	110	4	50



CONFORM AT AC BERM



CONFORM AT AC DITCH



CONFORM AT DRIVEWAY

CONSTRUCTION DETAILS

NO SCALE

C-1

REVISIONS: REVISED BY: MARK CRESSWELL, DATE: KELLY J. McCLAIN, CHECKED BY: KELLY J. McCLAIN, FUNCTIONAL SUPERVISOR: KELLY J. McCLAIN, DEPARTMENT OF TRANSPORTATION - MAINTENANCE DESIGN

LAST REVISION DATE PLOTTED => 31-DEC-2013 12-23-13 TIME PLOTTED => 08:13

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB,SLO	166	R25.5/R34.9	4	38

<i>Mark E. Cresswell</i>		12-23-13
REGISTERED CIVIL ENGINEER	DATE	
12-23-13		
PLANS APPROVAL DATE		

REGISTERED PROFESSIONAL ENGINEER	MARK CRESSWELL
No.	63117
Exp	6-30-14
CIVIL	

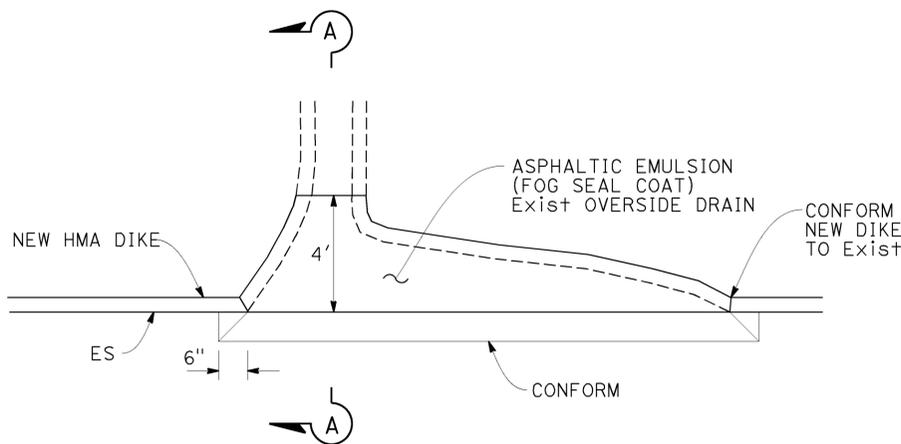
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NOTE:

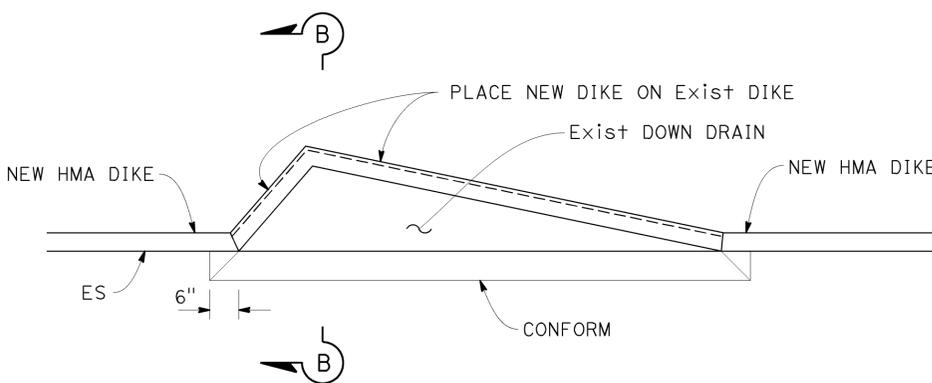
- MATCH ADJACENT NEW DIKE TYPE. USE HMA DIKE (TYPE F) WHERE SPACE LIMITATIONS Exist.

LEGEND:

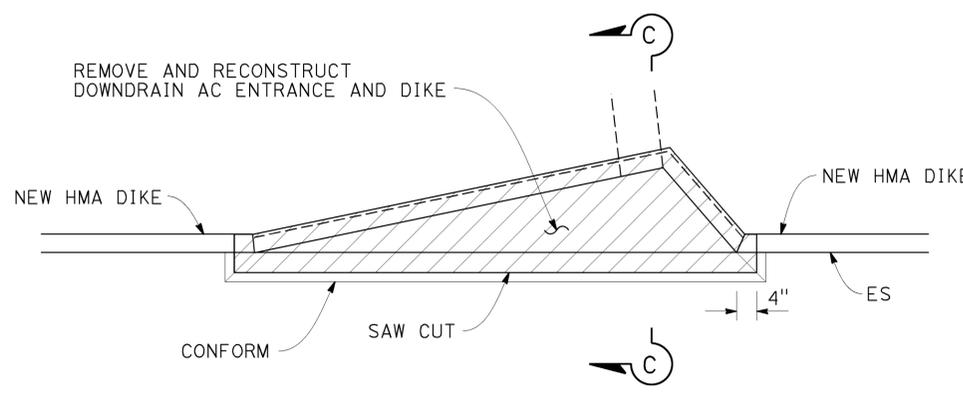
 REMOVE & RECONSTRUCT DOWNDRAIN AC ENTRANCE



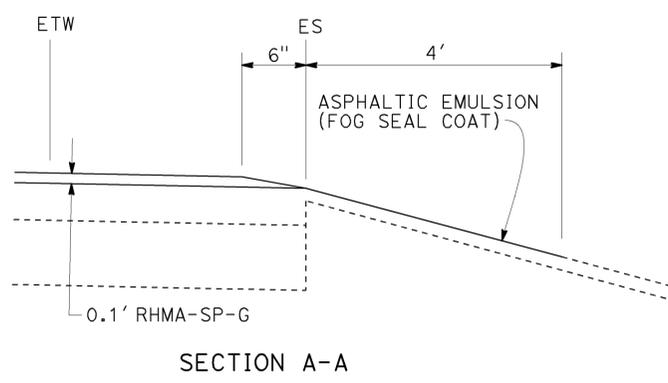
CONFORM AT OVSIDE DRAINS



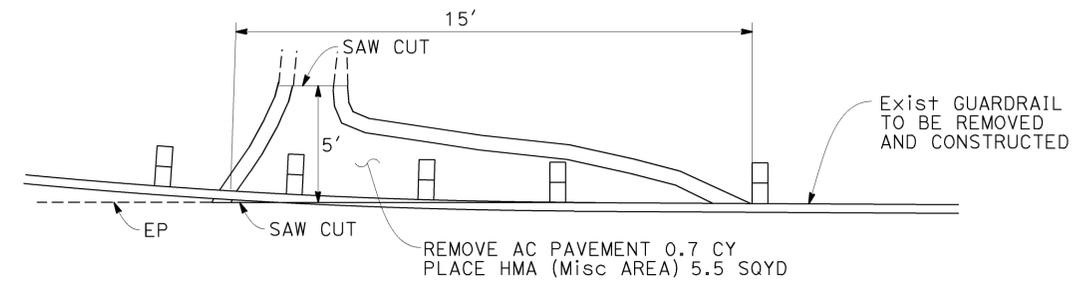
CONFORM AT DOWN DRAINS



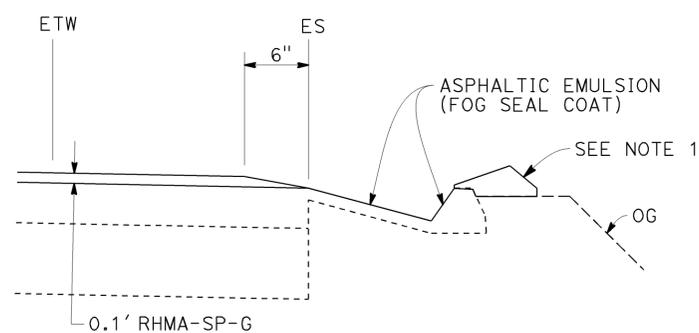
RECONSTRUCT DOWNDRAIN AC ENTRANCE
PM R34.15 R+



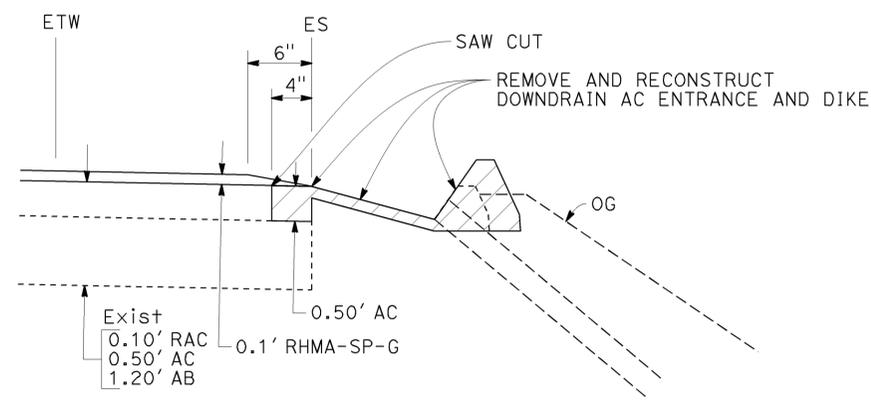
SECTION A-A



RECONSTRUCT OVSIDE DRAIN ENTRANCE
PM R26.36 R+



SECTION B-B



SECTION C-C

CONSTRUCTION DETAILS

NO SCALE

C-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans MAINTENANCE DESIGN
 FUNCTIONAL SUPERVISOR: KELLY J. McCLAIN
 CALCULATED/DESIGNED BY: [Blank]
 CHECKED BY: [Blank]
 MARK CRESSWELL
 KELLY J. McCLAIN
 REVISOR: [Blank]
 DATE: [Blank]
 REVISION: [Blank]
 DATE: [Blank]

LAST REVISION | DATE PLOTTED => 31-DEC-2013
 12-23-13 | TIME PLOTTED => 08:13

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB,SLO	166	R25.5/R34.9	5	38

12-23-13
 REGISTERED CIVIL ENGINEER DATE
 12-23-13
 PLANS APPROVAL DATE

Mark E. Cresswell
 No. 63117
 Exp. 6-30-14
 CIVIL
 STATE OF CALIFORNIA

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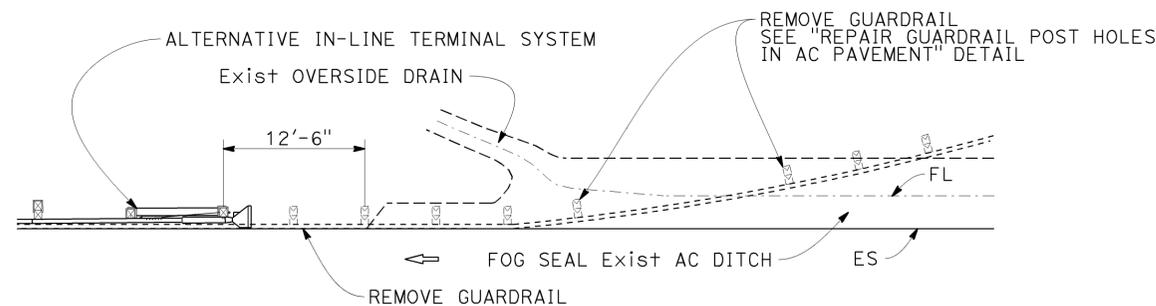
ABBREVIATION:

HMA-SP (TYPE A) = HOT MIX ASPHALT - SUPERPAVE (TYPE A)

EXISTING SURVEY MONUMENTS TO REMAIN

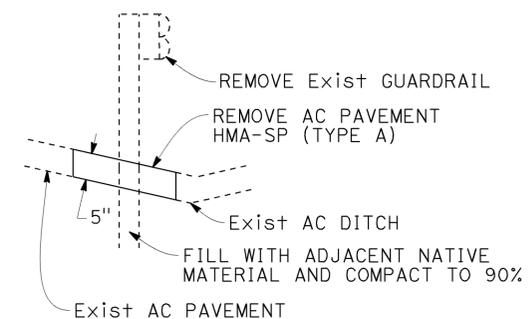
LOCATION	DIRECTION	LOCATION DESCRIPTION
PM	EB/WB	
R26.04	EB	BEHIND GUARDRAIL TO BE RECONSTRUCTED. RESET WITNESS POST.
R26.09	WB	BEHIND AC DIKE TO BE REMOVED AND RECONSTRUCTED. RESET WITNESS POST.
R29.14	WB	NEAR GUARDRAIL TO BE RECONSTRUCTED.
R31.00	WB	BEHIND AC DIKE TO BE REMOVED AND RECONSTRUCTED.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans MAINTENANCE DESIGN
 FUNCTIONAL SUPERVISOR
 KELLY J. McCLAIN
 CHECKED BY
 MARK CRESSWELL
 KELLY J. McCLAIN
 REVISIONS BY
 DATE REVISIONS

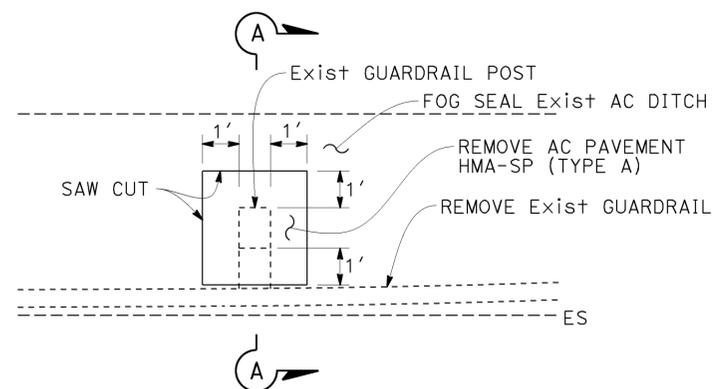


GUARDRAIL AT AC DITCH

PM R34.64 To R34.66 Lt



SECTION A-A



REPAIR GUARDRAIL POST HOLES IN AC PAVEMENT

CONSTRUCTION DETAILS

NO SCALE

C-3

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB,SLO	166	R25.5/R34.9	6	38

Mark E. Cresswell 12-23-13
 REGISTERED CIVIL ENGINEER DATE
 12-23-13
 PLANS APPROVAL DATE

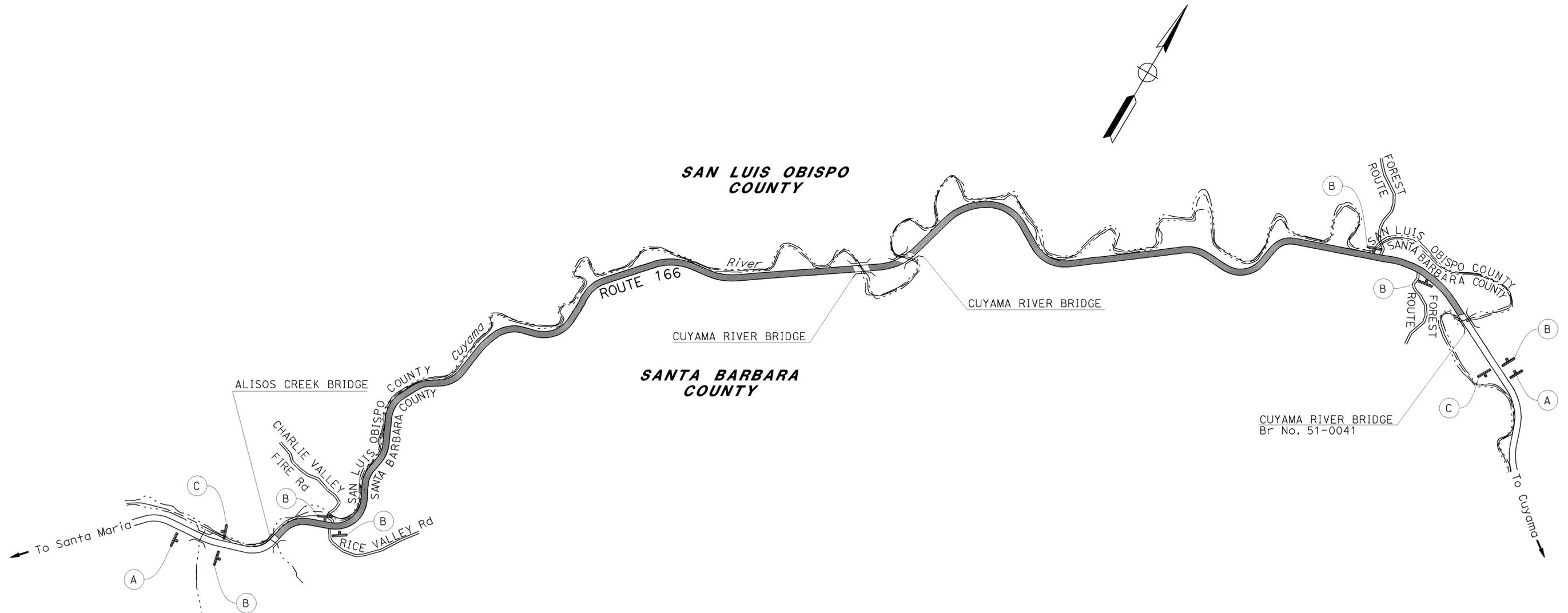
REGISTERED PROFESSIONAL ENGINEER
 MARK CRESSWELL
 No. 63117
 Exp. 6-30-14
 CIVIL
 STATE OF CALIFORNIA

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STATIONARY MOUNTED CONSTRUCTION AREA SIGNS

SIGN No. (X)	SIGN CODE		PANEL SIZE	SIGN MESSAGE	NUMBER OF POSTS AND SIZE	NUMBER OF SIGNS
	FEDERAL	CALIFORNIA				
A	G20-1		36" x 18"	ROAD WORK NEXT 10 MILES	1 - 4" x 4"	2
B	W20-1		30" x 30"	ROAD WORK AHEAD	1 - 4" x 4"	6
C	G20-2		36" x 18"	END ROAD WORK	1 - 4" x 4"	2

NOTE: LOCATION OF CONSTRUCTION AREA SIGNS ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED BY THE ENGINEER.



CONSTRUCTION AREA SIGNS

NO SCALE CS-1

APPROVED FOR CONSTRUCTION AREA SIGN WORK ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans MAINTENANCE DESIGN
 FUNCTIONAL SUPERVISOR: KELLY J. McCLAIN
 CALCULATED/DESIGNED BY: MARK CRESSWELL
 CHECKED BY: KELLY J. McCLAIN
 REVISED BY: MARK CRESSWELL
 DATE REVISED: KELLY J. McCLAIN

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB,SLO	166	R25.5/R34.9	7	38

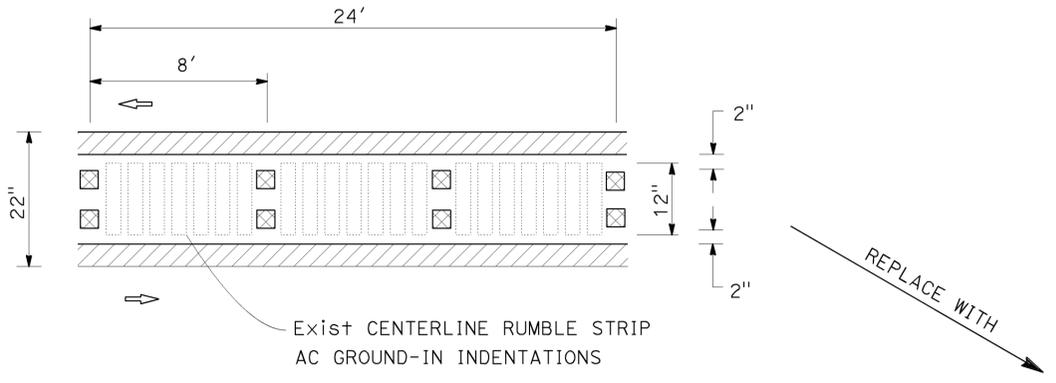
<i>Mark E. Cresswell</i>		12-23-13
REGISTERED CIVIL ENGINEER	DATE	
12-23-13		
PLANS APPROVAL DATE		

REGISTERED PROFESSIONAL ENGINEER	MARK CRESSWELL
No.	63117
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CIVIL	

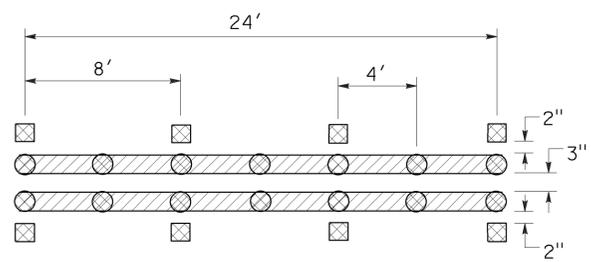
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LEGEND:

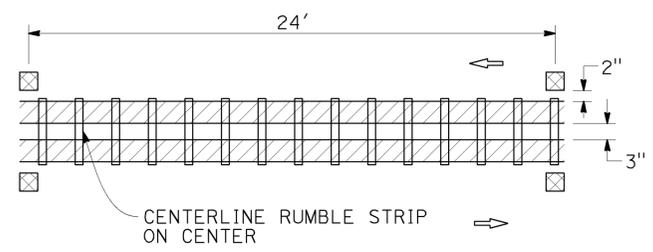
-  4" YELLOW THERMOPLASTIC TRAFFIC STRIPE (SPRAYABLE)
-  TYPE D TWO-WAY YELLOW RETROREFLECTIVE Pvmt Mkr
-  TYPE H ONE-WAY YELLOW RETROREFLECTIVE Pvmt Mkr
-  TYPE AB BLACK NON-RETROFLECTIVE Pvmt Mkr
-  TYPE AY YELLOW NON-REFLECTIVE Pvmt Mkr



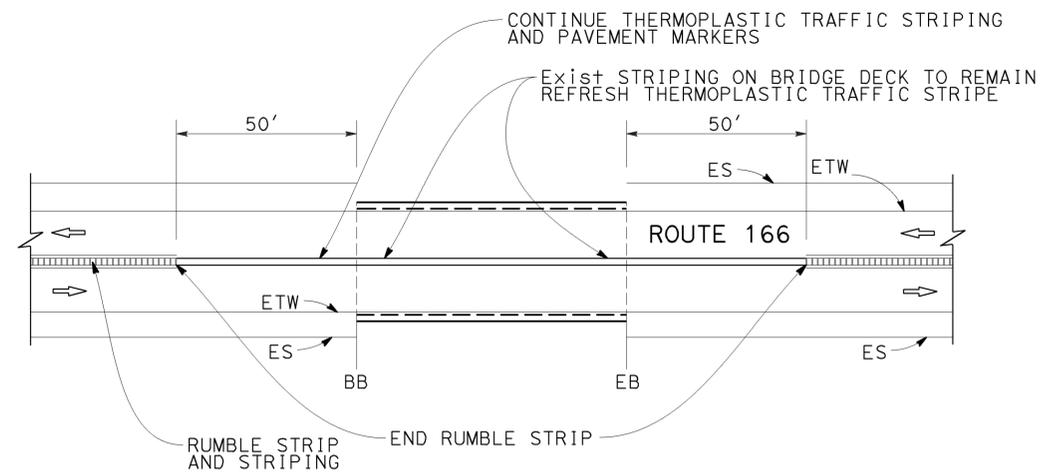
**EXISTING
DETAIL 22 MODIFIED**



**EXISTING
DETAIL 23 MODIFIED**



**DETAIL 22
WITH CENTERLINE RUMBLE STRIP**



CENTERLINE RUMBLE STRIP AT BRIDGES

**PAVEMENT DELINEATION DETAILS
NO SCALE
PDD-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans MAINTENANCE DESIGN

REVISOR
MARK CRESSWELL
KELLY J. McCLAIN

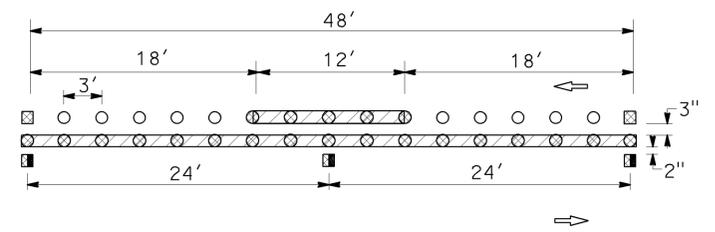
CHECKED BY
KELLY J. McCLAIN

FUNCTIONAL SUPERVISOR
KELLY J. McCLAIN

DESIGNED BY
KELLY J. McCLAIN

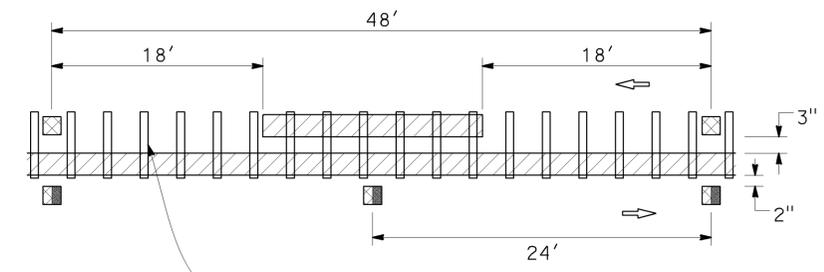
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			12-23-13	DATE	
REGISTERED CIVIL ENGINEER			DATE		
12-23-13			PLANS APPROVAL DATE		
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans MAINTENANCE DESIGN
 FUNCTIONAL SUPERVISOR: KELLY J. McCLAIN
 CALCULATED/DESIGNED BY: CHECKED BY:
 MARK CRESSWELL
 REVISOR BY: KELLY J. McCLAIN
 DATE REVISOR: DATE

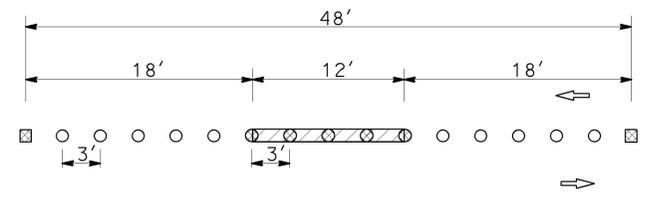


**EXISTING
DETAIL 19 MODIFIED**

REPLACE WITH →

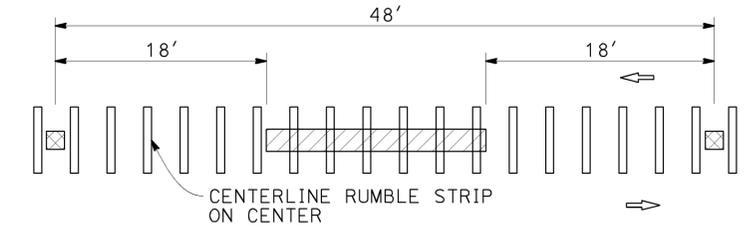


**DETAIL 19
WITH CENTERLINE RUMBLE STRIP**



**EXISTING
DETAIL 6 MODIFIED**

REPLACE WITH →



**DETAIL 6
WITH CENTERLINE RUMBLE STRIP**

**PAVEMENT DELINEATION DETAILS
NO SCALE
PDD-2**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB,SLO	166	R25.5/R34.9	9	38

Mark E. Crosswell 12-23-13
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12-23-13
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PAVEMENT DELINEATION QUANTITIES

LOCATION	(N) LENGTH	Exist DETAIL No.		NEW DETAIL No.		REMOVE THERMOPLASTIC TRAFFIC STRIPE		REMOVE PAVEMENT MARKER EA	4" THERMOPLASTIC TRAFFIC STRIPE			PAVEMENT MARKER (RETRO- REFLECTIVE)		CENTERLINE RUMBLE STRIP STA
		CL	ETW	CL	ETW	YELLOW LF	WHITE LF		BROKEN 36-12 LF	SOLID LF	WHITE SOLID LF	TYPE D EA	TYPE H EA	
PM	LF	CL	ETW	CL	ETW	LF	LF	EA	LF	LF	LF	EA	EA	STA
R25.52 TO R25.53	53	23M	27B	22	27B					106	106	8		
R25.53 TO R25.56	159	23M	27B	22+RS	27B	318	318	124		318	318	16		1.59
R25.56 TO R25.93	1,954	22M	27B	22+RS	27B		3,908	492		3,908	3,908	166		19.54
R25.93 TO R25.96	159	23M	27B	22+RS	27B	318	318	124		318	318	16		1.59
R25.96 TO R28.26	12,144	22M	27B	22+RS	27B		24,288	3,038		24,288	24,288	1,014		121.44
R28.26 TO R28.29	159	23M	27B	22+RS	27B	318	318	124		318	318	16		1.59
R28.29 TO R28.98	3,644	22M	27B	22+RS	27B		7,288	914		7,288	7,288	306		36.44
R28.98 TO R29.01	159	23M	27B	22+RS	27B	318	318	124		318	318	16		1.59
R29.01 TO R29.56	2,904	22M	27B	22+RS	27B		5,808	728		5,808	5,808	244		29.04
R29.56 TO R29.58	106	23M	27B	22+RS	27B	212	212	88		212	212	12		1.06
R29.58 TO R29.74	845	22M	27B	22+RS	27B			214		1,690	1,690	74		8.45
R29.74 TO R30.00	1,373	19M	27B	19+RS	27B	1,721	2,746	988	1,373	1,373	2,746	30	59	13.73
R30.00 TO R30.36	1,901	6M	27B	6+RS	27B	480	4,282	641	1,901		3,802	41		19.01
R30.36 TO R30.37	53	6M	27B	6	27B					53	106	3		
R30.37 TO R30.44	370	19M	27B	19	27B					370	370	9	17	
R30.44 TO R30.58	740	19M	27B	19+RS	27B	932	2,412	546	740	740	1,480	17	33	7.40
R30.58 TO R30.64	317	22M	27B	22+RS	27B		634	82		634	634	30		3.17
R30.64 TO R30.67	159	23M	27B	22+RS	27B	318	318	124		318	318	16		1.59
R30.67 TO R30.77	528	23M	27B	22	27B					1,056	1,056	46		
R30.77 TO R30.80	159	23M	27B	22+RS	27B	318	318	124		318	318	16		1.59
R30.80 TO R31.09	1,532	22M	27B	22+RS	27B		3,064	386		3,064	3,064	130		15.32
R31.09 TO R31.11	106	23M	27B	22+RS	27B	212	212	88		212	212	12		1.06
R31.11 TO R31.65	2,852	22M	27B	22+RS	27B		5,704	716		5,704	5,704	240		28.52
R31.65 TO R31.86	1,109	19	27B	19	27B	1,397	2,218	74	1,109	1,109	2,218	25	49	
R31.86 TO R32.62	4,013	6	27B	6	27B	1,008	8,026	85	4,013		8,026	85		
R32.62 TO R32.72	529	19	27B	19	27B	673	1,058	38	529	529	1,058	13	25	
R32.72 TO R33.17	2,377	22	27B	22	27B	4,754	4,754	202		4,754	4,754	202		
R33.17 TO R33.56	2,060	19	27B	19	27B	2,756	4,120	131	2,060	2,060	4,120	44	87	
R33.56 TO R33.68	634	22	27B	22	27B	1,268	1,268	56		1,268	1,268	56		
R33.68 TO R33.89	1,109	19	27B	19	27B	1,397	2,218	74	1,109	1,109	2,218	25	49	
R33.89 TO R34.27	2,007	6	27B	6	27B	504	4,014	43	2,007		4,014	43		
R34.27 TO R34.49	1,162	19	27B	19	27B	1,462	2,324	77	1,162	1,162	2,324	26	51	
R34.49 TO R34.79	1,584	22	27B	22	27B	3,168	3,168	134		3,168	3,168	134		
R34.79 TO R34.94	792	19	27B	19	27B	996	1,584	53	792	792	1,584	18	35	
SUBTOTAL						24,668	97,496	10,632	17,218	74,312	99,504	3,149	405	313.72
TOTAL						122,164		10,632	17,218	173,816		3,554		313.72

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PAVEMENT DELINEATION QUANTITIES

PDQ-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans MAINTENANCE DESIGN
 FUNCTIONAL SUPERVISOR: KELLY J. McCLAIN
 CALCULATED/DESIGNED BY: MARK CRESSWELL
 CHECKED BY: KELLY J. McCLAIN
 REVISED BY: _____ DATE REVISED: _____

LAST REVISION | DATE PLOTTED => 31-DEC-2013
 12-23-13 | TIME PLOTTED => 08:13

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB,SLO	166	R25.5/R34.9	10	38

Mark E. Cresswell 12-23-13
 REGISTERED CIVIL ENGINEER DATE

12-23-13
 PLANS APPROVAL DATE

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GUARDRAIL

	LOCATION (PM)		REMOVE GUARDRAIL	MIDWEST GUARDRAIL SYSTEM (STEEL POST)	MIDWEST GUARDRAIL SYSTEM (8' POST)	BURIED POST END ANCHOR ^(N)	END ANCHOR ASSEMBLY (TYPE SFT)	TRANSITION RAILING (TYPE WB-31)	ALTERNATIVE IN-LINE TERMINAL SYSTEM	ALTERNATIVE FLARED TERMINAL SYSTEM	GUARD RAILING DELINEATOR
	FROM	TO	LF	LF	LF	EA	EA	EA	EA	EA	EA
EASTBOUND	R25.52	R25.52	25.0					1			
	R25.52	R25.53	12.5	12.5							1
	R25.53	R25.54	37.5							1	
	R26.02	R26.33	1,620.0	1,620.0		1					
	R26.33	R26.35	125.0		125.0						
	R26.35	R26.36	86.0	86.0							22
	R26.36	R26.37	37.5							1	
	R33.01	R33.02							1		
	R33.02	R33.04			90.0						
	R33.04	R33.05	50.0		50.0						10
	R33.05	R33.14	415.0		415.0						
	R33.14	R33.17	140.0	140.0			1				
	R33.18	R33.24	360.0		360.0	1	1				8
	R33.24	R33.29	250.0	250.0							
R34.91	R34.92	37.5							1		
R34.92	R34.93	75.0	75.0							2	
R34.93	R34.93	25.0					1				
SUBTOTAL			3,296.0	2,183.5	1,040.0	2	2	2	1	3	41
WESTBOUND	R25.52	R25.52	25.0					1			11
	R25.52	R25.65	690.0	690.0		1					
	R25.70	R25.81	555.0	555.0		1					8
	R25.81	R25.82	50.0					1			
	R26.33	R26.34	50.0					1			9
	R26.34	R26.45	600.0	600.0			1				
	R26.74	R26.75	37.5							1	
	R26.75	R27.03	1,545.0	1,545.0							21
	R27.03	R27.04	37.5							1	
	R27.59	R27.60	50.0						1		12
	R27.60	R27.77	945.0		945.0		1				
	R28.41	R28.55	820.0	820.0		2					11
	R28.58	R28.65	370.0	370.0		1					5
	R28.65	R28.66	50.0						1		
	R28.96	R29.05	480.0	480.0		1	1				7
	R29.15	R29.27	660.0	660.0		1					10
	R29.27	R29.28	50.0						1		
	R31.01	R31.02	50.0						1		6
	R31.02	R31.10	440.0	440.0		1					
	R31.20	R31.49	1,530.0	1,530.0		1	1				21
	R31.58	R31.63	260.0	260.0		1	1				
	R31.63	R31.67	200.0		200.0						8
	R31.67	R31.68	120.0	120.0							
	R32.84	R32.92	400.0	400.0		2					6
R32.97	R33.04	360.0	360.0		1					5	
R33.04	R33.05	50.0						1			
R34.25	R34.26	115.0		115.0							
R34.26	R34.32	330.0	330.0								
R34.32	R34.38	300.0		300.0						21	
R34.38	R34.41	175.0	175.0								
R34.41	R34.62	1,090.0		1,090.0							
R34.62	R34.68	320.0	20.0		1			1			
R34.87	R34.88	37.5							1		
R34.88	R34.92	260.0	260.0							4	
R34.92	R34.93	25.0					1				
SUBTOTAL			13,077.5	10,560.0	1,705.0	14	6	2	8	3	165
TOTAL			16,373.5	12,743.5	2,745.0		8	4	9	6	206

SUMMARY OF QUANTITIES

Q-1

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

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans MAINTENANCE DESIGN
 FUNCTIONAL SUPERVISOR: KELLY J. McCLAIN
 CALCULATED/DESIGNED BY: CHECKED BY:
 MARK CRESSWELL
 KELLY J. McCLAIN
 REVISED BY: DATE REVISED:

LAST REVISION | DATE PLOTTED => 31-DEC-2013
 12-23-13 TIME PLOTTED => 08:13

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB,SLO	166	R25.5/R34.9	11	38

Mark E. Cresswell 12-23-13
 REGISTERED CIVIL ENGINEER DATE
 12-23-13
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
MARK CRESSWELL
 No. 63117
 Exp. 6-30-14
 CIVIL
 STATE OF CALIFORNIA

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OVERSIDE DRAINS, DOWNDRAINS AND AC DITCH

LOCATION	SIDE	ASPHALTIC EMULSION (FOG SEAL)	REMOVE ASPHALT CONCRETE PAVEMENT	PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)	HOT MIX ASPHALT-SUPERPAVE (TYPE A)	COMMENTS
R25.59	EB	0.003				OVERSIDE DRAIN
R25.75	EB	0.002				DOWNDRAIN
R25.83	WB	0.002				DOWNDRAIN
R25.89	EB	0.003				OVERSIDE DRAIN
R25.13	WB	0.002				DOWNDRAIN
R26.26	WB	0.002				DOWNDRAIN
R26.36	EB		0.7	8.4	1.4	RECONSTRUCT OVERSIDE DRAIN ENTRANCE
R26.51	WB	0.002				DOWNDRAIN
R27.28	WB	0.002				DOWNDRAIN
R27.32	WB	0.002				DOWNDRAIN
R27.40	WB	0.002				DOWNDRAIN
R27.47	WB	0.002				DOWNDRAIN
R28.17	WB	0.002				DOWNDRAIN
R28.24	WB	0.002				DOWNDRAIN
R28.78	WB	0.002				DOWNDRAIN DRAINAGE INLET
R29.40	WB	0.002				DOWNDRAIN
R29.66	WB	0.003				OVERSIDE DRAIN
R30.15	WB	0.002				DOWNDRAIN
R30.23	WB	0.002				DOWNDRAIN
R30.90	WB	0.002				DOWNDRAIN
R31.85	WB	0.002				DOWNDRAIN
R31.97	WB	0.002				DOWNDRAIN
R32.39	WB	0.002				DOWNDRAIN
R32.49	WB	0.002				DOWNDRAIN
R32.62	WB	0.002				DOWNDRAIN
R33.04	EB	0.002				DOWNDRAIN
R33.22	WB	0.002				DOWNDRAIN
R33.28	WB	0.003				OVERSIDE DRAIN
R33.29	EB	0.002				DOWNDRAIN
R33.36	WB	0.002				DOWNDRAIN DRAINAGE INLET
R34.07	EB	0.002				DOWNDRAIN
R34.07	WB	0.002				DOWNDRAIN
R34.15	EB	0.002				DOWNDRAIN
R34.15	WB	0.002				DOWNDRAIN
R34.29	EB		1.3	11.2	2.5	RECONSTRUCT DOWNDRAIN ENTRANCE
R34.59	EB	0.002				DOWNDRAIN
R34.66	EB	0.003	2.1	15.0	4.2	OVERSIDE DRAIN AND REPAIR GUARDRAIL IN AC DITCH - 15 POSTS
R34.66	WB	0.003				OVERSIDE DRAIN
R34.85	WB	0.003				OVERSIDE DRAIN
R34.88	EB	0.002				DOWNDRAIN
TOTAL		0.083*	4.1	34.6	8.1 *	

HMA DIKE AND SHOULDER BACKING

	LOCATION (PM)		(N) Exist AC DIKE	REMOVE AC DIKE	PLACE HOT MIX ASPHALT DIKE				HOT MIX ASPHALT-SUPERPAVE (TYPE A)	SHOULDER BACKING	ASPHALTIC EMULSION (FOG SEAL)
	FROM	TO			TYPE	LF	TYPE A	TYPE C			
				LF	LF	LF	LF	LF	TON	TON	TON
	R25.52	R25.57	F	265				265	1.2		
	R25.57	R25.82								39	
	R25.82	R25.92	A	529			529		4.5		
	R25.92	R26.02								16	
	R26.02	R26.30	A	1,479	1,479				13.1		
	R26.30	R26.50								31	
	R26.50	R26.68	A	951			951		8.1		
	R26.68	R27.28								92	
	R27.28	R27.60	A	1,690			1,690		14.4		
	R27.60	R27.62	F	106				106	0.5		
	R27.62	R28.18								86	
	R28.18	R28.29	A	581			581		5.0		
	R28.29	R28.69								62	
	R28.69	R28.70	F	53				53	258.9		
	R28.70	R28.83	A	687			687		5.9		
	R28.83	R29.31								74	
	R29.31	R29.47	A	845			845		7.2		
	R29.47	R29.66								30	
	R29.66	R29.80	A	740			740		6.3		
	R29.80	R30.10								46	
	R30.10	R30.25	A	792			792		6.8		
	R30.25	R30.91								102	
	R30.91	R31.03	A	634			634		5.4		
	R31.03	R31.05	F	106		106		106	0.5		
	R31.05	R31.86								125	
	R31.86	R32.03	A	898			898		7.7		
	R32.03	R32.39								56	
	R32.39	R32.72	A	1,743			1,743		14.8		
	R32.72	R33.04								49	
	R33.04	R33.06	C	106					0.3		
	R33.06	R33.46	A	2,112			2,112		18.0		
	R33.46	R33.75								45	
	R33.75	R33.79	A	212	212				1.9		
	R33.79	R33.89	A	529			529		4.5		
	R33.89	R34.00	AC BERM								0.11
	R34.00	R34.09	A								0.09
	R34.09	R34.26	A	898	898				8.0		
	R34.27	R34.33	F	317				317	1.4		
	R34.33	R34.66								51	
	R34.66	R34.85	AC DITCH								0.38
	R34.85	R34.91	AC BERM								0.06
	R34.91	R34.97	F	317				317	1.4		
SUBTOTAL THIS SHEET				16,590	2,589	106	12,731	1,164	395.8	904	0.64

SUMMARY OF QUANTITIES

Q-2

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

* QUANTITIES INCLUDED IN PAVEMENT STRUCTURE QUANTITIES SUMMARY.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB,SLO	166	R25.5/R34.9	12	38

Mark E. Cresswell 12-23-13
 REGISTERED CIVIL ENGINEER DATE
 12-23-13
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
MARK CRESSWELL
 No. 63117
 Exp. 6-30-14
 CIVIL
 STATE OF CALIFORNIA

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LEGEND:

(N) = NOT A SEPARATE PAY ITEM. FOR INFORMATION ONLY.
 * = QUANTITIES INCLUDED IN PAVEMENT STRUCTURE QUANTITIES SUMMARY.

HMA DIKE AND SHOULDER BACKING (CONTINUED)

LOCATION (PM)	(N) Exist AC DIKE	REMOVE AC DIKE	PLACE HOT MIX ASPHALT DIKE				HOT MIX ASPHALT-SUPERPAVE (TYPE A)	SHOULDER BACKING	ASPHALTIC EMULSION (FOG SEAL)	
			TYPE A	TYPE C	TYPE E	TYPE F				
FROM	TO	LF	LF	LF	LF	TON	TON	TON		
R25.52	R25.58						10			
R25.58	R25.90	A	1,690			14.4				
R25.90	R26.29				1,690		60			
R26.29	R26.35	F	317			1.4				
R26.35	R27.52				317		180			
R27.52	R27.61	A								
R27.61	R33.02						829			
R33.02	R33.03	C	25		25	0.1				
R33.03	R33.11	F	423			1.9				
R33.11	R33.72				423		94			
R33.72	R33.80	A	423			3.6				
R33.80	R33.87						11			
R33.87	R34.01	AC BERM						0.14		
R34.01	R34.04						5			
R34.04	R34.08	A						0.04		
R34.08	R34.21	A	687	687		6.1				
R34.21	R34.29	A						0.08		
R34.29	R34.42	A	687	687		6.1				
R34.42	R34.47	A	264		264	2.3				
R34.47	R34.50	A	159	159		1.5				
R34.53	R34.66	A	687		687	5.9				
R34.66	R34.85	AC BERM						0.19		
R34.85	R34.91	A	317		317	2.7				
R34.91	R34.94						5			
EB SUBTOTAL			5,679	1,533	25	3,381	740	46.0	1,194	0.45
WB SUBTOTAL			16,590	2,589	106	12,731	1,164	395.8	904	0.64
GRAND TOTAL			22,269	4,122	131	16,112	1,904	441.8*	2,098	1.09*

REMOVE CENTERLINE RUMBLE STRIPS

LOCATION (PM)		(N) LENGTH	COLD PLANE AC PAVEMENT	TACK COAT	HOT MIX ASPHALT (TYPE A)
FROM	TO	LF	SQYD	TON	TON
R25.56	R25.93	1,954	434	1.31	22.7
R25.96	R28.26	12,144	2,696	8.10	140.9
R28.29	R29.98	8,924	1,982	5.95	103.6
R29.01	R29.56	2,904	645	1.94	33.7
R29.58	R29.74	845	188	0.57	9.9
R30.58	R30.64	317	71	0.22	3.7
R30.80	R31.09	1,532	341	1.03	17.8
R31.11	R31.65	2,852	634	1.91	33.1
TOTAL			6,991*	21.03*	365.4*

PAVEMENT STRUCTURE

LOCATION	COLD PLANE AC PAVEMENT	TACK COAT	HOT MIX ASPHALT-SUPERPAVE (TYPE A)	RUBBERIZED HOT MIX ASPHALT-SUPERPAVE (GAP GRADED)	ASPHALTIC EMULSION (FOG SEAL)
	SQYD	TON	TON	TON	TON
REMOVE CENTERLINE RUMBLE STRIPS	6,991	21.03	365.4		
OVERLAY PM R25.5 TO R34.9 - LANES AND SHOULDERS	2,992	59.87		11,703	
SHOULDER CONFORM AT GUARDRAIL	110				
DIKE AND SHOULDER BACKING			441.8		1.09
OVERSIDE DRAINS, DOWNDRAINS AND AC DITCH			8.1		0.08
TOTAL	10,093	80.90	815.3	11,703	1.17

SUMMARY OF QUANTITIES
Q-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
 Kelly J. McClain
 FUNCTIONAL SUPERVISOR
 Kelly J. McClain
 CALCULATED/DESIGNED BY
 Kelly J. McClain
 CHECKED BY
 Kelly J. McClain
 MARK CRESSWELL
 KELLY J. McCLAIN
 REVISOR BY
 DATE REVISED

LAST REVISION | DATE PLOTTED => 31-DEC-2013
 12-23-13 TIME PLOTTED => 08:13

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	13	38

Grace M. Tsushima
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

Grace M. Tsushima
No. C49814
Exp. 9-30-14
CIVIL
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED 12-23-13

UNIT OF MEASUREMENT SYMBOLS:

Some of the symbols used in the project plan quantity tables and in the Bid Item List are:

TABLE A

SYMBOL USED	DEFINITIONS
ACRE	ACRE
CF	CUBIC FOOT
CY	CUBIC YARD
EA	EACH
GAL	GALLON
LB	POUND
LF	LINEAR FOOT
SQFT	SQUARE FOOT
SQYD	SQUARE YARD
STA	100 FEET
TAB	TABLET
TON	2,000 POUNDS

Some of the symbols used in the plans other than in the project plan quantity tables are:

TABLE B

SYMBOL USED	DEFINITIONS
ksi	KIPS PER SQUARE INCH
ksf	KIPS PER SQUARE FOOT
psi	POUNDS PER SQUARE INCH
psf	POUNDS PER SQUARE FOOT
lb/ft ³ , pcf	POUNDS PER CUBIC FOOT
tsf	TONS PER SQUARE FOOT
mph, MPH *	MILES PER HOUR
∅	NOMINAL DIAMETER
oz	OUNCE
lb	POUND
kíp	1,000 POUNDS
cal	CALORIE
ft	FOOT OR FEET
gal	GALLON

* For use on a sign panel only

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**ABBREVIATIONS
(SHEET 2 OF 2)**

NO SCALE

RSP A10B DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN A10B
DATED MAY 20, 2011 - PAGE 2 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A10B

	M
Maint	MAINTENANCE
Max	MAXIMUM
MB	METAL BEAM
MBB	METAL BEAM BARRIER
MBGR	METAL BEAM GUARD RAILING
Med	MEDIAN
MGS	MIDWEST GUARDRAIL SYSTEM
MH	MANHOLE
Min	MINIMUM
Misc	MISCELLANEOUS
Misc I & S	MISCELLANEOUS IRON AND STEEL
Mkr	MARKER
Mod	MODIFIED, MODIFY
Mon	MONUMENT
MP	METAL PLATE
MPGR	METAL PLATE GUARD RAILING
MR	MOVEMENT RATING
MSE	MECHANICALLY STABILIZED EMBANKMENT
Mt	MOUNTAIN, MOUNT
MtI	MATERIAL
MVP	MAINTENANCE VEHICLE PULLOUT
	N
N	NORTH
NB	NORTHBOUND
No.	NUMBER (MUST HAVE PERIOD)
Nos.	NUMBERS (MUST HAVE PERIOD)
NPS	NOMINAL PIPE SIZE
NS	NEAR SIDE
NSP	NEW STANDARD PLAN
NTS	NOT TO SCALE
	O
Obir	OBLITERATE
OC	OVERCROSSING
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OG	ORIGINAL GROUND
OGAC	OPEN GRADED ASPHALT CONCRETE
OGFC	OPEN GRADED FRICTION COURSE
OH	OVERHEAD
OHWM	ORDINARY HIGH WATER MARK
O-O	OUT TO OUT
Opp	OPPOSITE
OSD	OVERSIDE DRAIN
	P
p	PAGE
PAP	PERFORATED ALUMINUM PIPE
PB	PULL BOX
PC	POINT OF CURVATURE, PRECAST
PCC	POINT OF COMPOUND CURVE, PORTLAND CEMENT CONCRETE
PCMS	PORTABLE CHANGEABLE MESSAGE SIGN
PCP	PERFORATED CONCRETE PIPE, PRESTRESSED CONCRETE PIPE
PCVC	POINT OF COMPOUND VERTICAL CURVE
PEC	PERMIT TO ENTER AND CONSTRUCT
Ped	PEDESTRIAN
Ped OC	PEDESTRIAN OVERCROSSING
Ped UC	PEDESTRIAN UNDERCROSSING
Perm MtI	PERMEABLE MATERIAL

	P continued
PG	PROFILE GRADE
PI	POINT OF INTERSECTION
PJP	PARTIAL JOINT PENETRATION
Pkwy	PARKWAY
PL, PL	PLATE
P/L	PROPERTY LINE
PM	POST MILE, TIME FROM NOON TO MIDNIGHT
PN	PAVING NOTCH
POC	POINT OF HORIZONTAL CURVE
POT	POINT OF TANGENT
POVC	POINT OF VERTICAL CURVE
PP	PIPE PILE, PLASTIC PIPE, POWER POLE
PPL	PREFORMED PERMEABLE LINER
PPP	PERFORATED PLASTIC PIPE
PRC	POINT OF REVERSE CURVE
PRF	PAVEMENT REINFORCING FABRIC
PRVC	POINT OF REVERSE VERTICAL CURVE
PS&E	PLANS, SPECIFICATIONS AND ESTIMATES
PS, P/S	PRESTRESSED
PSP	PERFORATED STEEL PIPE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
Pvmt	PAVEMENT
	Q
Qty	QUANTITY
	R
R	RADIUS
R & D	REMOVE AND DISPOSE
R & S	REMOVE AND SALVAGE
R/C	RATE OF CHANGE
RCA	REINFORCED CONCRETE ARCH
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
RCPA	REINFORCED CONCRETE PIPE ARCH
Rd	ROAD
Reinf	REINFORCED, REINFORCEMENT, REINFORCING
Rel	RELOCATE
Repl	REPLACEMENT
Ret	RETAINING
Rev	REVISED, REVISION
Rdwy	ROADWAY
RHMA	RUBBERIZED HOT MIX ASPHALT
Riv	RIVER
RM	ROAD-MIXED
RP	RADIUS POINT, REFERENCE POINT
RR	RAILROAD
RSP	ROCK SLOPE PROTECTION, REVISED STANDARD PLAN
Rt	RIGHT
Rte	ROUTE
RW	REDWOOD, RETAINING WALL
R/W	RIGHT OF WAY
Rwy	RAILWAY

	S
S	SOUTH, SUPPLEMENT
SAE	STRUCTURE APPROACH EMBANKMENT
Salv	SALVAGE
SAPP	STRUCTURAL ALUMINUM PLATE PIPE
SB	SOUTHBOUND
SC	SAND CUSHION
SCSP	SLOTTED CORRUGATED STEEL PIPE
SD	STORM DRAIN
Sec	SECOND, SECTION
Sep	SEPARATION
SG	SUBGRADE
Shld	SHOULDER
Sht	SHEET
Sim	SIMILAR
ℒ	STATION LINE
SM	SELECTED MATERIAL
Spec	SPECIAL, SPECIFICATIONS
SPP	SLOTTED PLASTIC PIPE
SS	SLOPE STAKE
SSBM	STRAP AND SADDLE BRACKET METHOD
SSD	STRUCTURAL SECTION DRAIN
SSPA	STRUCTURAL STEEL PLATE ARCH
SSPP	STRUCTURAL STEEL PLATE PIPE
SSPPA	STRUCTURAL STEEL PLATE PIPE ARCH
SSRP	STEEL SPIRAL RIB PIPE
St	STREET
Sta	STATION
STBB	SINGLE THRIE BEAM BARRIER
Std	STANDARD
Str	STRUCTURE
Surf	SURFACING
SW	SIDEWALK, SOUND WALL
Swr	SEWER
Sym	SYMMETRICAL
S4S	SURFACE 4 SIDES
	T
T	SEMI-TANGENT
Tan	TANGENT
TBB	THRIE BEAM BARRIER
Tbr	TIMBER
TC	TOP OF CURB
TCB	TRAFFIC CONTROL BOX
TCE	TEMPORARY CONSTRUCTION EASEMENT
TeI	TELEPHONE
Temp	TEMPORARY
TG	TOP OF GRADE
Tot	TOTAL
TP	TELEPHONE POLE
TPB	TREATED PERMEABLE BASE
TPM	TREATED PERMEABLE MATERIAL
Trans	TRANSITION

	T continued
TS	TRANSVERSE, TRAFFIC SIGNAL, TUBULAR STEEL
Typ	TYPICAL
	U
UC	UNDERCROSSING
UD	UNDERDRAIN
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
UP	UNDERPASS
	V
V	VALVE, DESIGN SPEED
Var	VARIABLE, VARIES
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
Vert	VERTICAL
Via	VIADUCT
Vol	VOLUME
	W
W	WEST, WIDTH
WB	WESTBOUND
WH	WEEP HOLE
WM	WIRE MESH
WS	WATER SURFACE
WSP	WELDED STEEL PIPE
Wt	WEIGHT
WV	WATER VALVE
WW	WINGWALL
WWLOL	WINGWALL LAYOUT LINE
	X
X Sec	CROSS SECTION
Xing	CROSSING
	Y
Yr	YEAR
Yrs	YEARS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	14	38

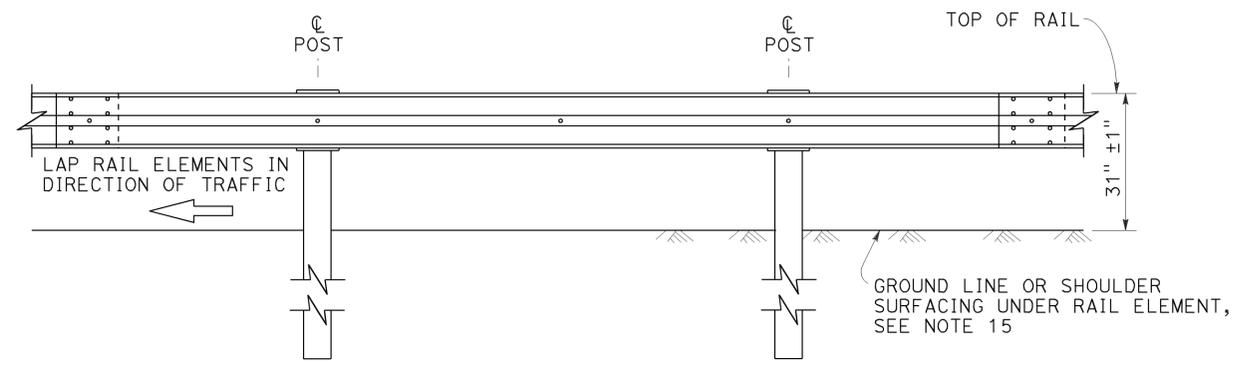
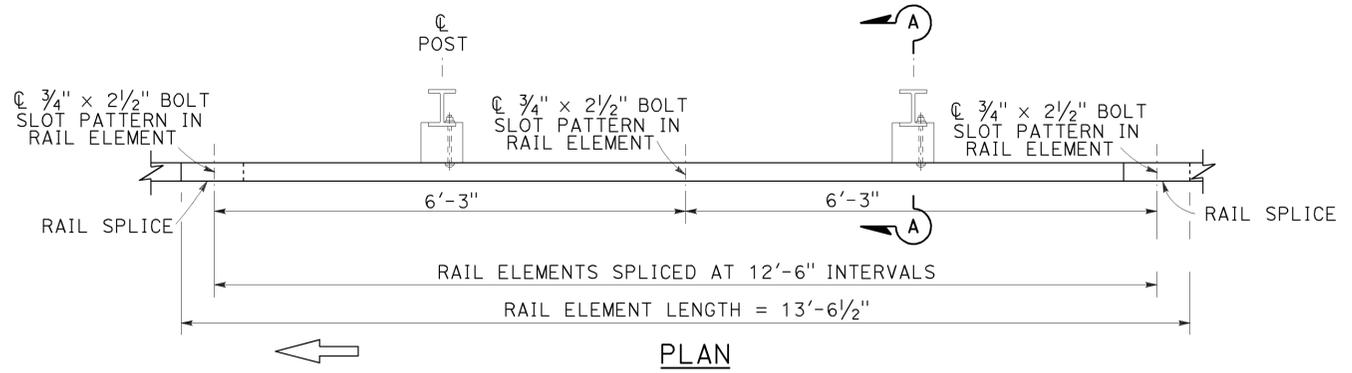
Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

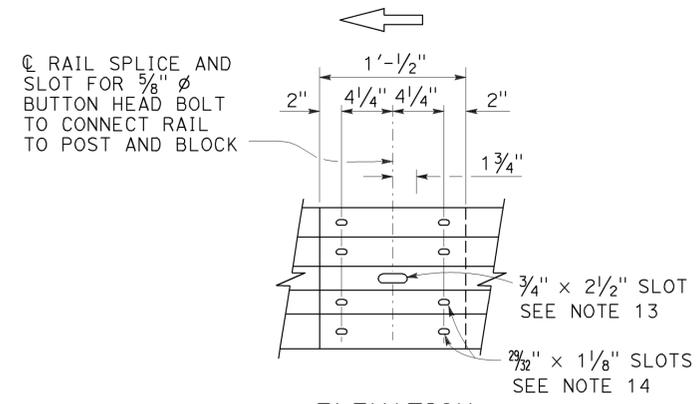
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TO ACCOMPANY PLANS DATED 12-23-13

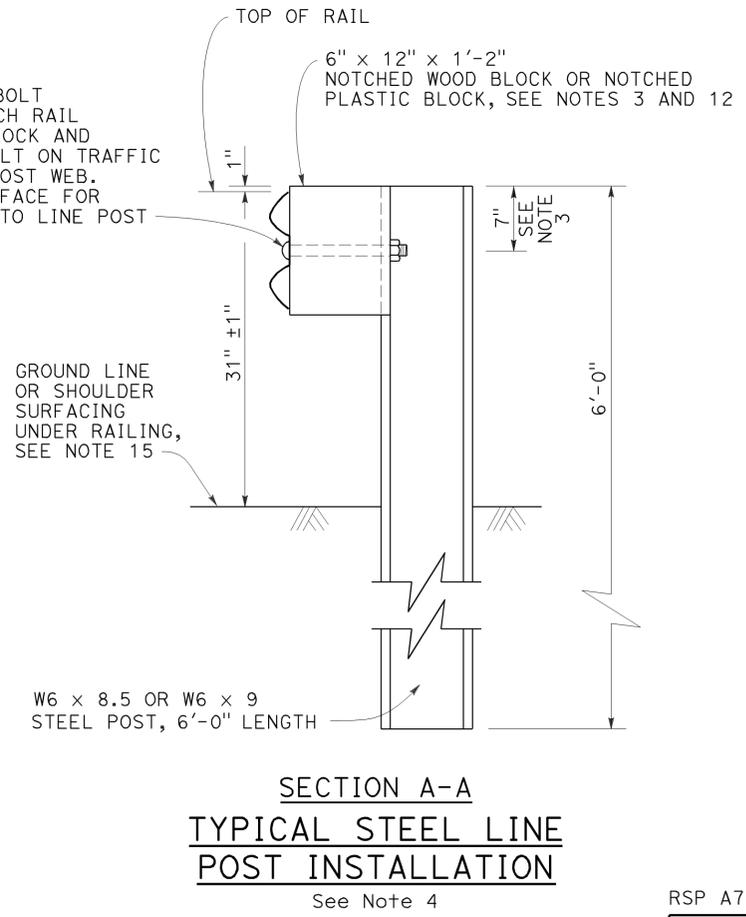
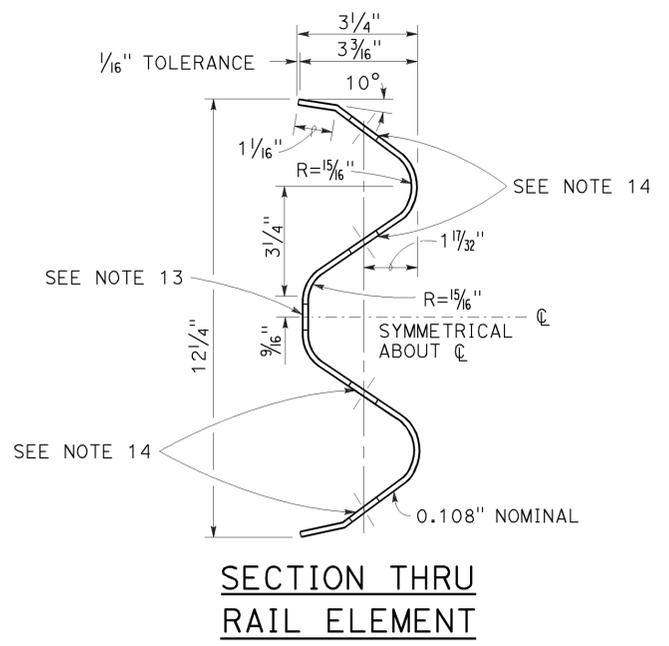
Randell D. Hiatt
REGISTERED PROFESSIONAL ENGINEER
No. C50200
Exp. 6-30-15
CIVIL
STATE OF CALIFORNIA



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



- Connect the overlapped end of the rail elements with 5/8" Ø x 1 3/8" button head oval shoulder splice bolts inserted into the 7/32" x 1 1/8" slots and bolted together with 5/8" Ø 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.



NOTES:

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

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

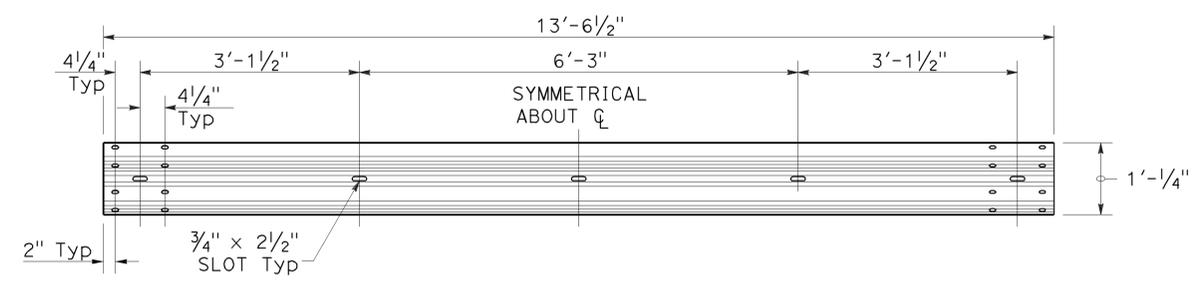
NO SCALE

RSP A77L2 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77L2

2010 REVISED STANDARD PLAN RSP A77L2

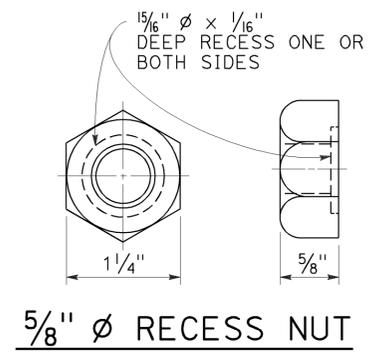
TO ACCOMPANY PLANS DATED 12-23-13



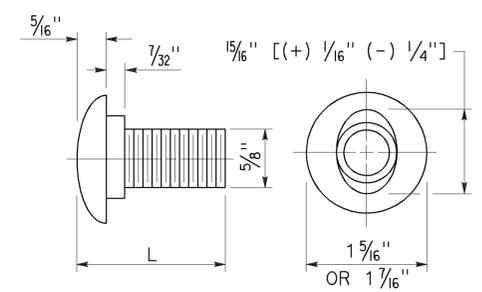
TYPICAL RAIL ELEMENT

NOTE:

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



5/8" Ø RECESS NUT

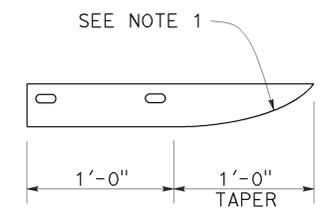


5/8" Ø BUTTON HEAD BOLT

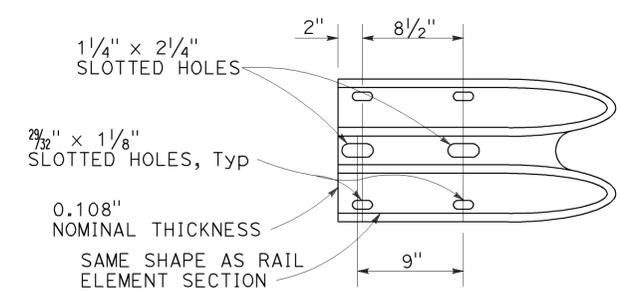
BUTTON HEAD BOLT

L	THREAD LENGTH
1 3/8"	FULL THREAD LENGTH
2"	FULL THREAD LENGTH
10"	4" Min THREAD LENGTH
18"	4" Min THREAD LENGTH
20"	4" Min THREAD LENGTH
22"	4" Min THREAD LENGTH
26"	4" Min THREAD LENGTH
36"	4" Min THREAD LENGTH
** 2 3/4"	2" Min THREAD LENGTH
** 19"	4" Min THREAD LENGTH

** For nested rail applications.



PLAN



**ELEVATION
END CAP
(TYPE A)**

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM
STANDARD HARDWARE**

NO SCALE

RSP A77M1 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77M1

2010 REVISED STANDARD PLAN RSP A77M1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	16	38

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

November 15, 2013
PLANS APPROVAL DATE

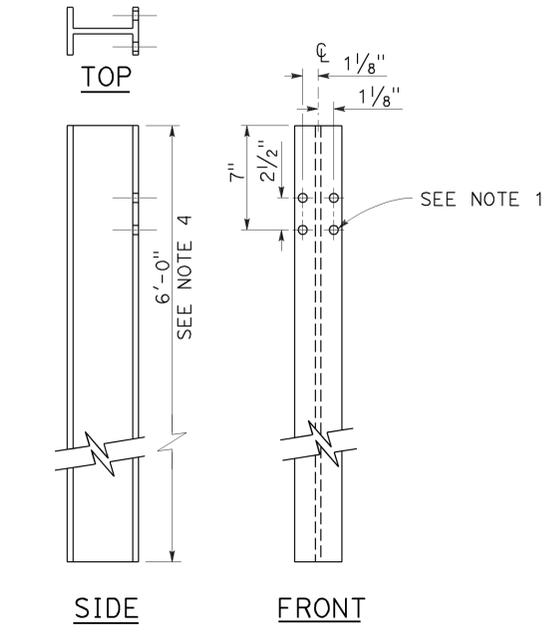
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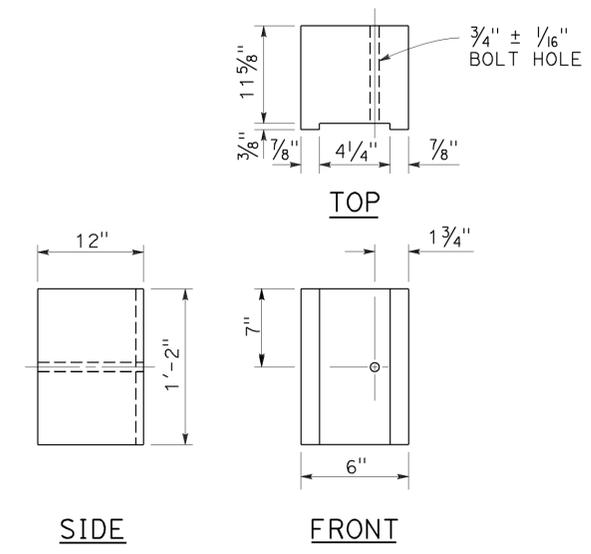
TO ACCOMPANY PLANS DATED 12-23-13

NOTES:

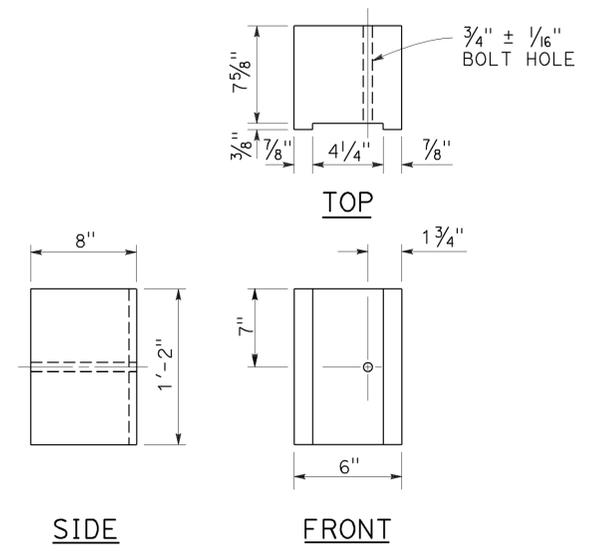
1. All holes in steel post shall be 1 3/8" Dia maximum.
2. Dimensions shown for wood block are nominal.
3. Notched face of block faces steel post.
4. 6'-0" length posts to be used for typical roadway installation. See Revised Standard Plan RSP A77N3.
5. See Revised Standard Plan RSP A77L3 for use of 6" x 8" and 8" x 8" notched wood blocks.
6. This post and 8" x 12" block combination to be used for line post sections of MGS on narrow roadways and where strengthened line post sections of MGS are warranted to shield fixed objects.



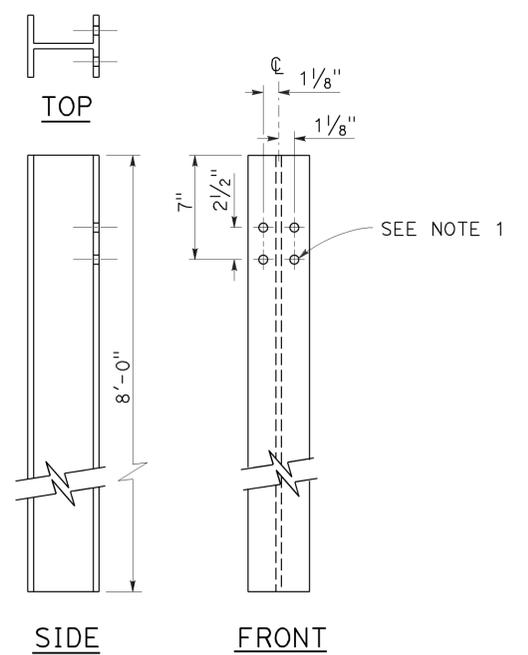
W6 x 9 OR W6 x 8.5
STEEL POST
See Note 4



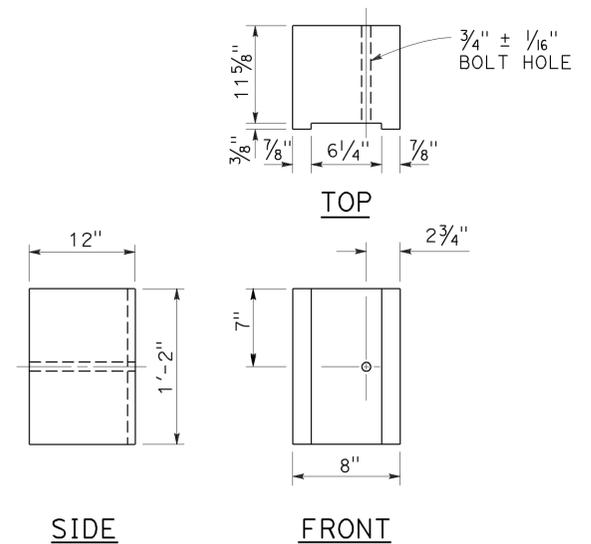
6" x 12"
NOTCHED WOOD BLOCK
See Notes 2 and 3



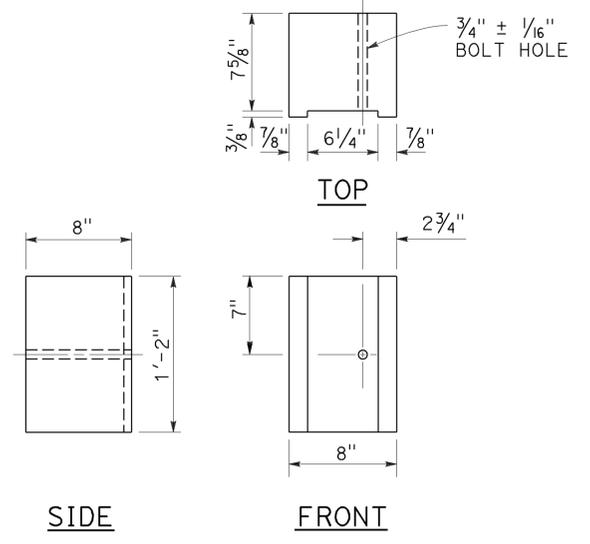
6" x 8"
NOTCHED WOOD BLOCK
Only for use with metal beam guard railing. See Note 5



W6 x 15
STEEL POST
See Note 6



8" x 12"
NOTCHED WOOD BLOCK
See Notes 2 and 3



8" x 8"
NOTCHED WOOD BLOCK
Only for use with metal beam guard railing. See Note 5

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

MIDWEST GUARDRAIL SYSTEM
STEEL POST AND
NOTCHED WOOD BLOCK DETAILS

NO SCALE

RSP A77N2 DATED NOVEMBER 15, 2013 SUPERSEDES RSP A77N2
DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77N2

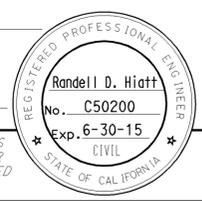
2010 REVISED STANDARD PLAN RSP A77N2

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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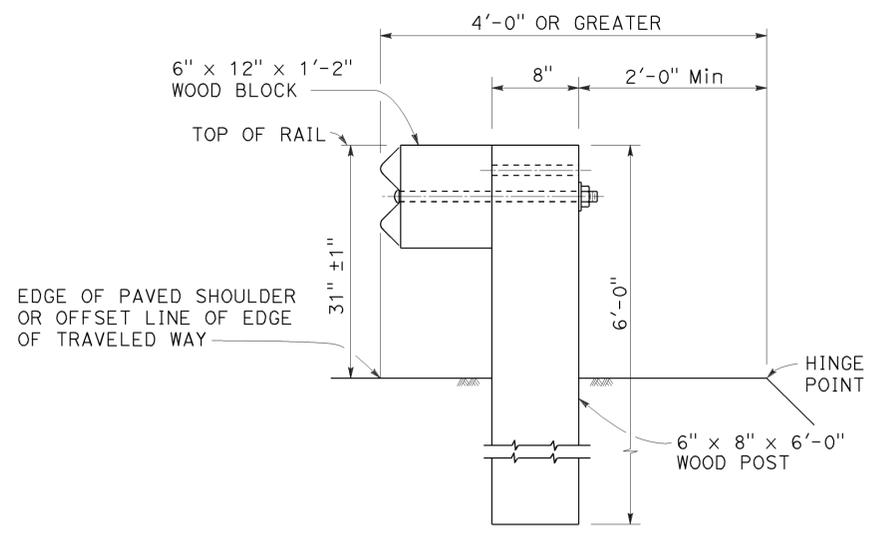
Randell D. Hiatt
REGISTERED CIVIL ENGINEER

November 15, 2013
PLANS APPROVAL DATE

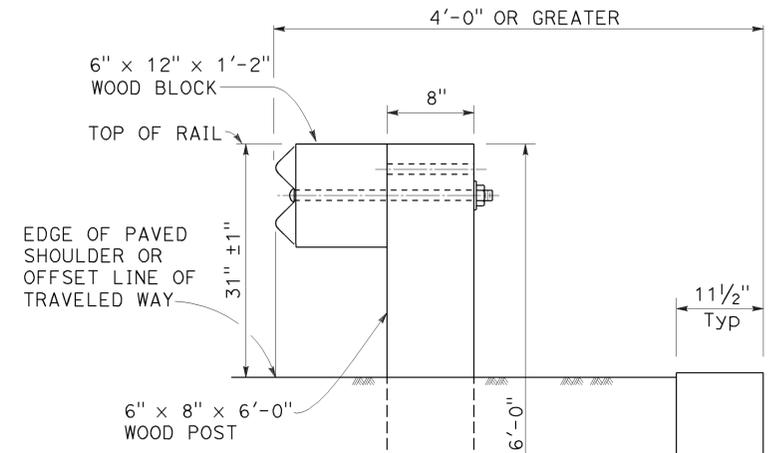
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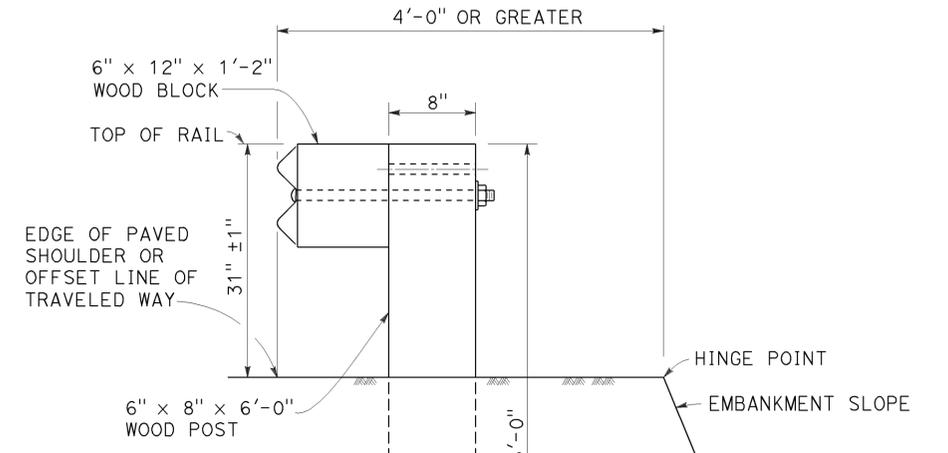
TO ACCOMPANY PLANS DATED 12-23-13



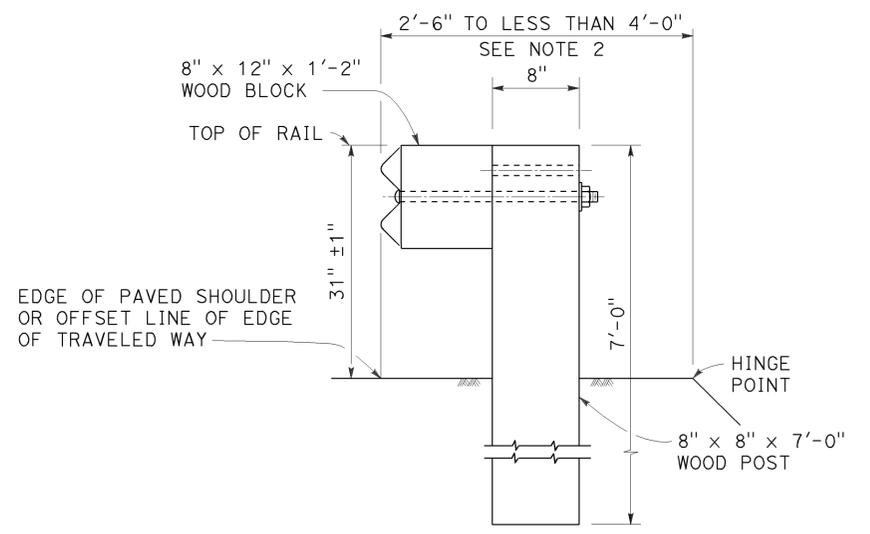
DETAIL A
TYPICAL ROADWAY
INSTALLATION
See Note 1



DETAIL C



DETAIL D



DETAIL B
NARROW ROADWAY
INSTALLATION
See Note 1

POST EMBEDMENT

INSTALLATION AT EARTH RETAINING WALLS

NOTES:

1. These installation details also applicable to steel line post installations. For Detail A, C, and D, where steel line post installations are constructed, W6 x 8.5 or W6 x 9 steel post, 6'-0" in length, with 6" x 12" 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 15 steel post, 8'-0" in length, with 8" x 12" 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 Revised Standard Plan RSP A77L1 and RSP A77L2.
2. Where the distance between the face of the rail and the hinge point is less than 2'-6", see the Project Plans for special details.
3. For dike positioning with MGS installations, see Revised Standard Plan RSP A77N4.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

MIDWEST GUARDRAIL SYSTEM
TYPICAL LINE POST
EMBEDMENT AND
HINGE POINT OFFSET DETAILS

NO SCALE

RSP A77N3 DATED NOVEMBER 15, 2013 SUPERSEDES RSP A77N3
DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77N3

2010 REVISED STANDARD PLAN RSP A77N3

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	18	38

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July 19, 2013
PLANS APPROVAL DATE

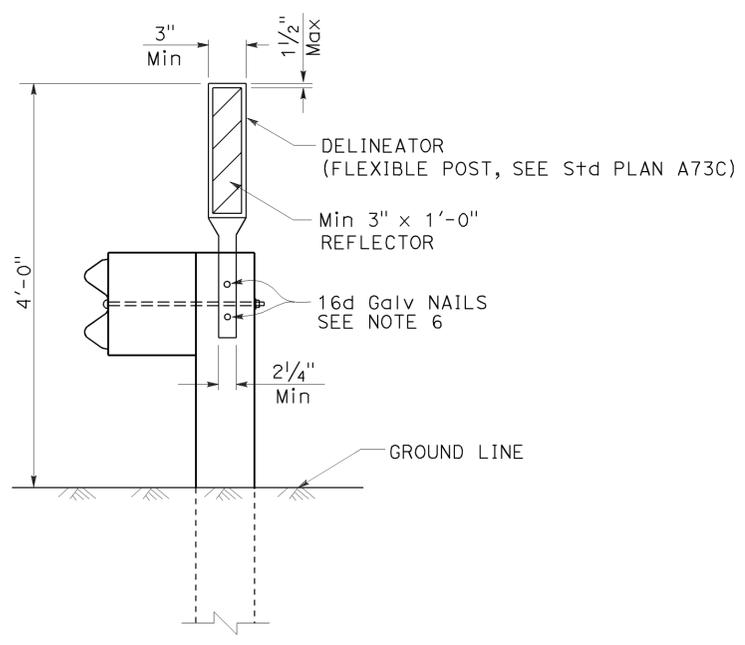
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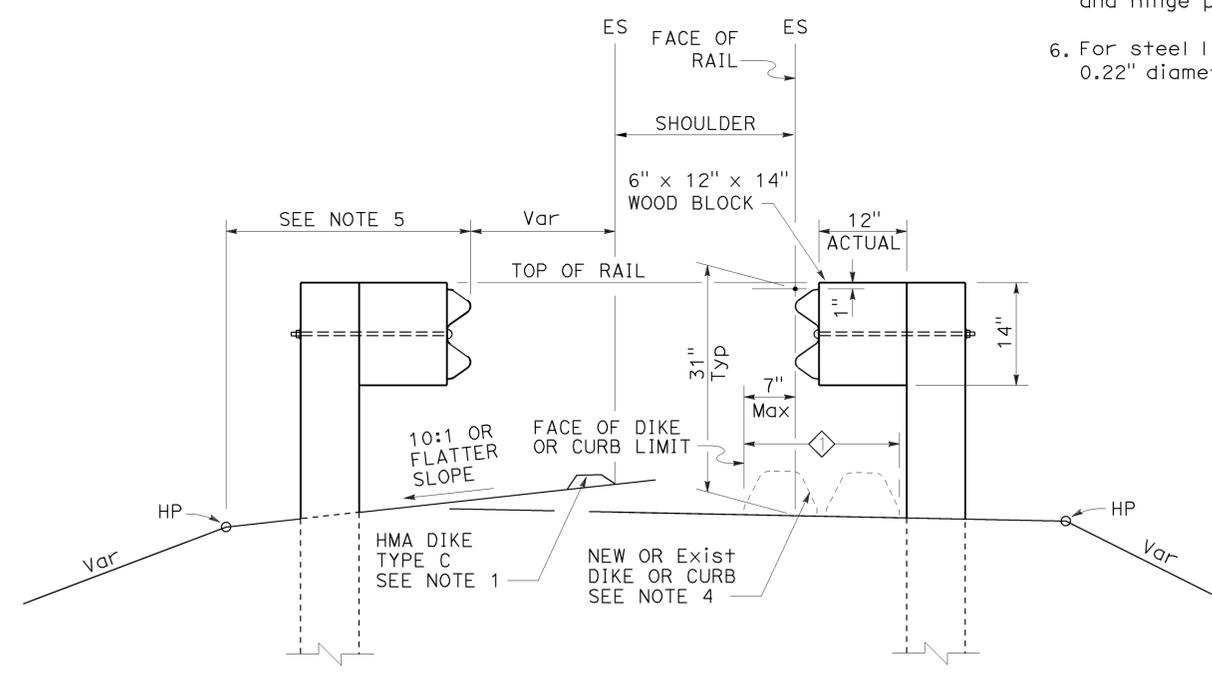
TO ACCOMPANY PLANS DATED 12-23-13

NOTES:

1. When necessary to place dike more than 7" in front of face of MGS, only Type C dike may be used. For dike details, see Revised Standard Plan RSP A87B.
2. For standard railing post embedment, see Revised Standard Plan RSP A77N3.
3. MGS delineation to be used where shown on the Project Plans.
4. When dike or curb is placed under MGS, the maximum height of the dike or curb shall be 6". Mountable dike should not be used. For dike and curb details, see Revised Standard Plans RSP A87A and RSP A87B.
5. For details of typical distance between the face of rail and hinge point, see Revised Standard Plan RSP A77N3.
6. For steel line posts, use 1/4" - 20 self-tapping screws in 0.22" diameter holes or 1/4" bolts in 3/32" diameter holes.



MGS DELINEATION
See Note 3



DIKE POSITIONING
See Note 1

◇ PERMISSIBLE DIKE OR CURB
PLACEMENT AREA

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM
TYPICAL RAILING DELINEATION
AND DIKE POSITIONING DETAILS**
NO SCALE

RSP A77N4 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77N4

2010 REVISED STANDARD PLAN RSP A77N4

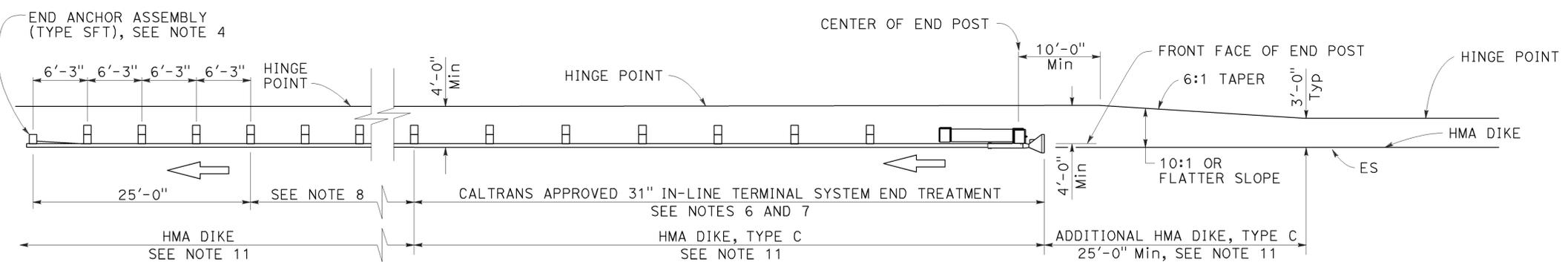
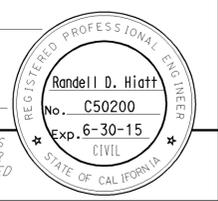
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	19	38

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REGISTERED CIVIL ENGINEER

November 15, 2013
PLANS APPROVAL DATE

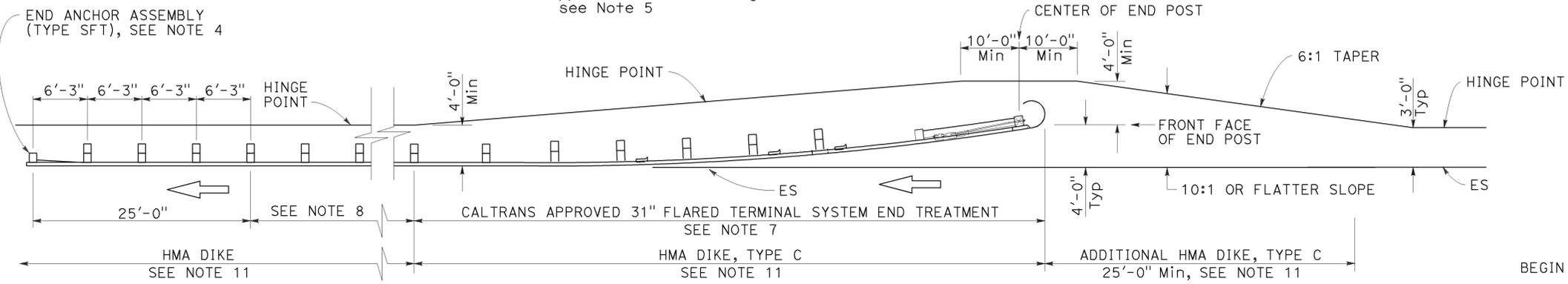
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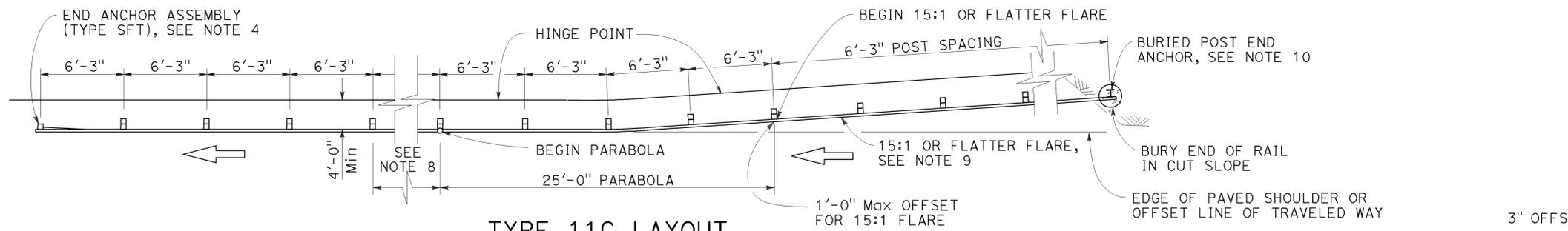
TYPE 11A LAYOUT

(Embankment MGS installation with 31" in-line end treatment at traffic approach end of railing) see Note 5



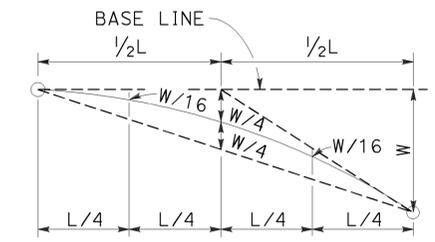
TYPE 11B LAYOUT

(Embankment MGS installation with 31" flared end treatment at traffic approach end of railing) see Note 5

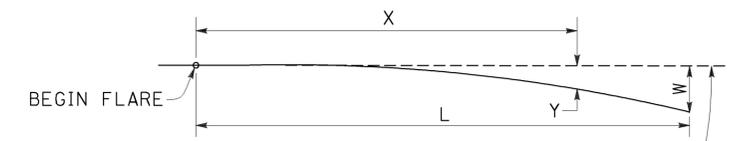


TYPE 11C LAYOUT

(Embankment MGS installation with buried end anchor treatment at traffic approach end of railing) see Notes 5 and 11



TYPICAL PARABOLIC LAYOUT

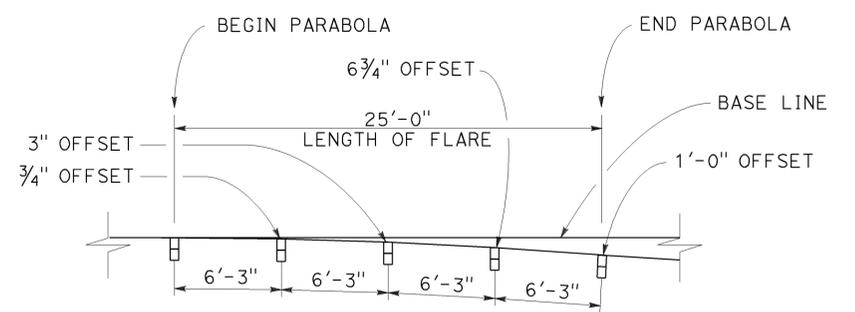


BASE LINE (EDGE OF PAVED SHOULDER OR OFFSET LINE OF EDGE OF TRAVELED WAY)

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

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

PARABOLIC FLARE OFFSETS



TYPICAL FLARE OFFSETS FOR 1 FOOT Max END OFFSET

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR EMBANKMENTS

NO SCALE

RSP A77P1 DATED NOVEMBER 15, 2013 SUPERSEDES RSP A77P1 DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77P1

NOTES:

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

2010 REVISED STANDARD PLAN RSP A77P1

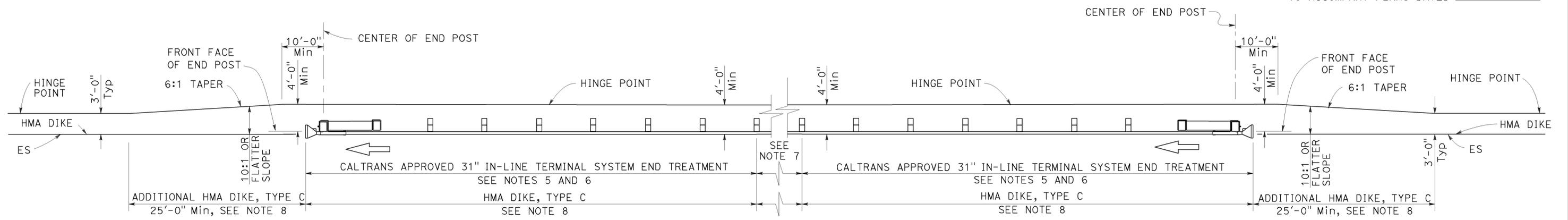
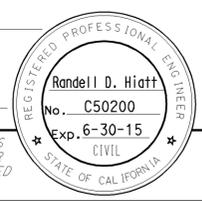
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	20	38

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
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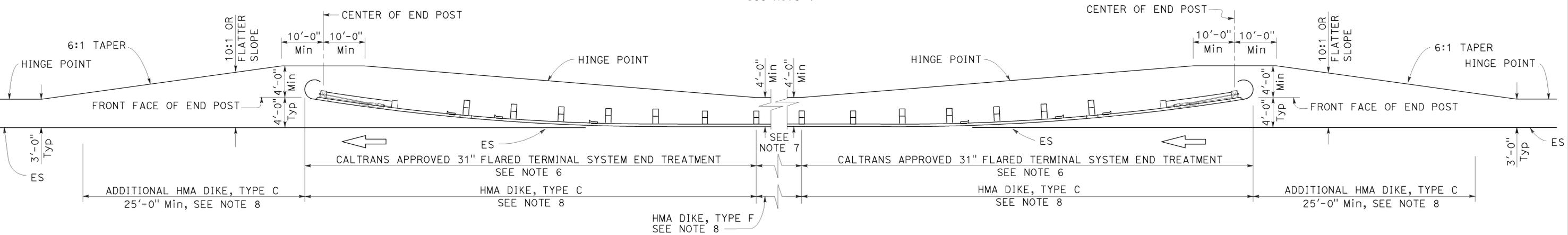
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TYPE 11D LAYOUT

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



TYPE 11E LAYOUT

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

NOTES:

1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77M1, RSP A77N1 and RSP A77N2.
2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 12" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 12" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood post with 6" x 12" x 1'-2" wood blocks where applicable and when specified.
4. Layout Types 11D through 11L, shown on the A77P Series of Standard Plans, are typically used where MGS is recommended to shield embankment slopes and a crashworthy 31" end treatment is required for both directions of traffic.
5. 31" in-line terminal system end treatments are used where site conditions will not accommodate a flared end treatment.
6. The type of 31" terminal system end treatment to be used will be shown on the Project Plans.
7. Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
8. Where placement of dike is required with MGS installations, see Revised Standard Plan RSP A77N4 for dike positioning details.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR
EMBANKMENTS**

NO SCALE

RSP A77P2 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77P2

2010 REVISED STANDARD PLAN RSP A77P2

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	21	38

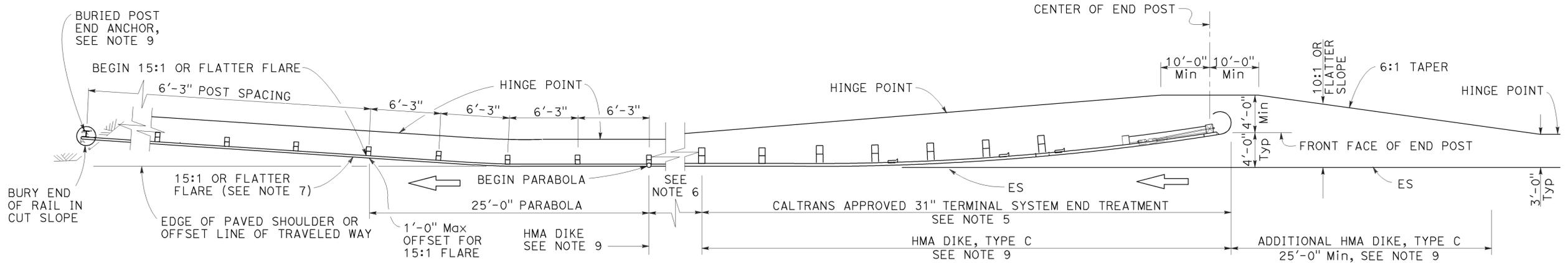
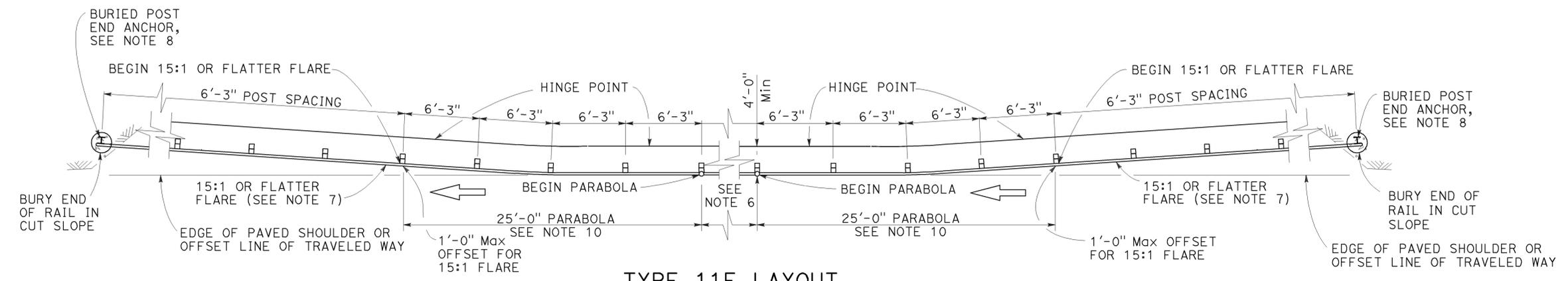
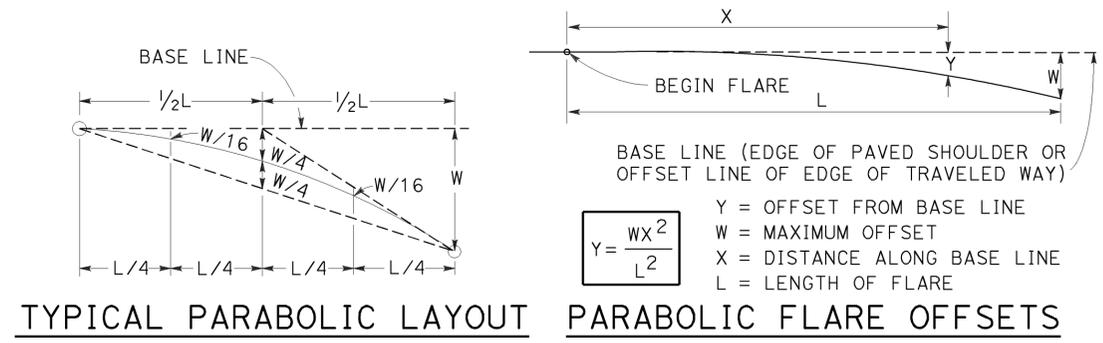
Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

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TO ACCOMPANY PLANS DATED 12-23-13



NOTES:

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77M1, RSP A77N1 and RSP A77N2.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 12" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 12" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood post with 6" x 12" x 1'-2" wood blocks where applicable and when specified.
- Layout Types 11D through 11L, shown on the A77P Series of Standard Plans, are typically used where MGS is recommended to shield embankment slopes and a crashworthy 31" end treatment is required for both directions of traffic.
- The type of 31" terminal system end treatment to be used will be shown on the Project Plans.
- Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
- The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of edge of the traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
- For details of the buried post end anchor used with Type 11F and 11G Layouts, see Revised Standard Plan RSP A77T2.
- Where placement of dike is required with MGS installations, see Revised Standard Plan RSP A77N4 for dike positioning details.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P1.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR
EMBANKMENTS**

NO SCALE

RSP A77P3 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77P3

2010 REVISED STANDARD PLAN RSP A77P3

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	22	38

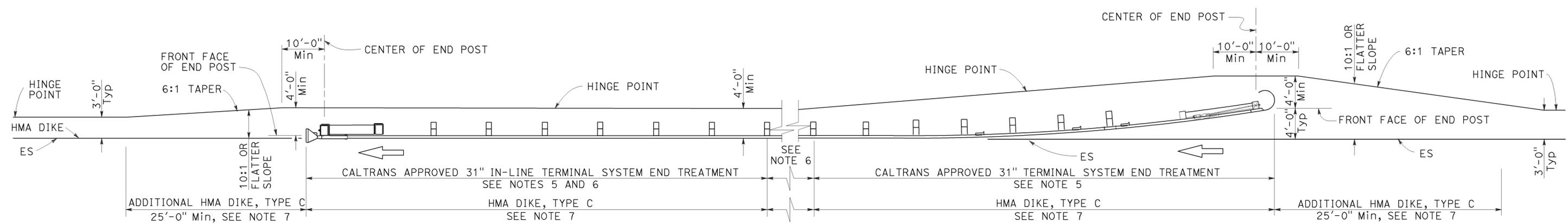
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July 19, 2013
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TO ACCOMPANY PLANS DATED 12-23-13



TYPE 11H LAYOUT

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

NOTES:

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

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
**MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR
EMBANKMENTS**
NO SCALE

RSP A77P4 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77P4

2010 REVISED STANDARD PLAN RSP A77P4

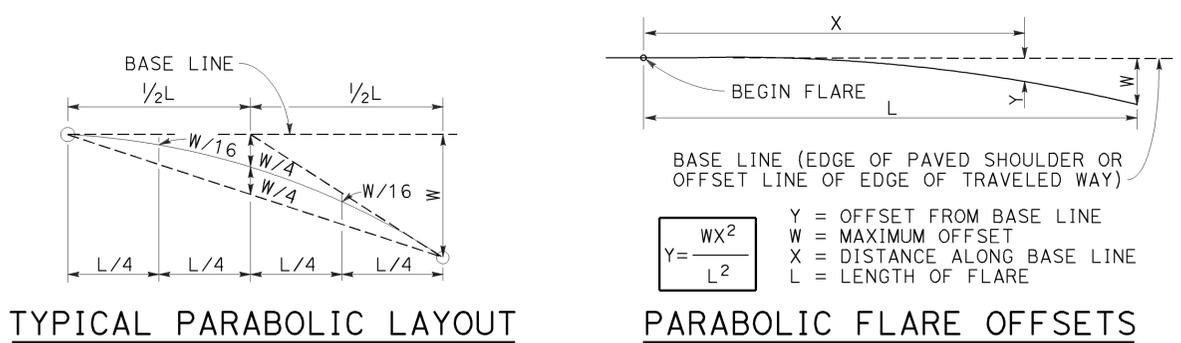
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	23	38

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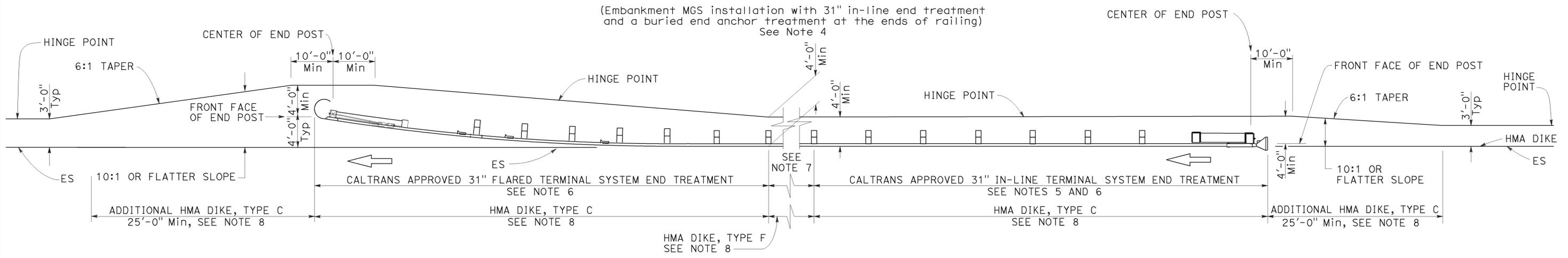
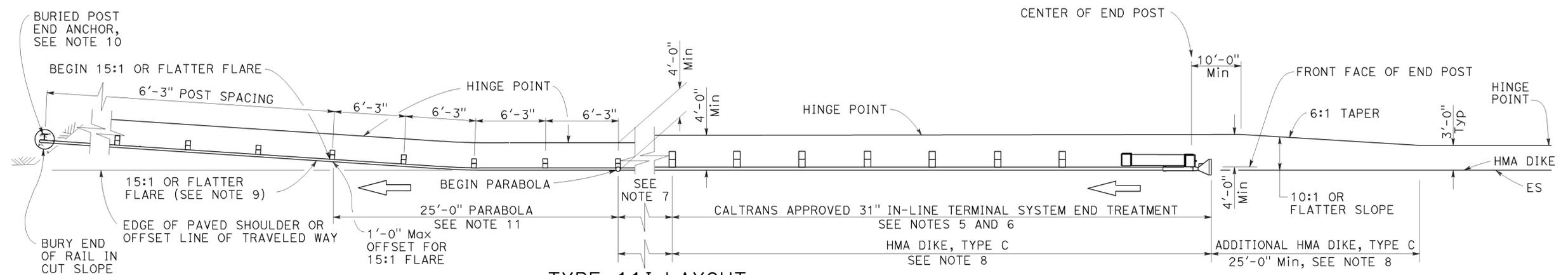
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TO ACCOMPANY PLANS DATED 12-23-13



NOTES:

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

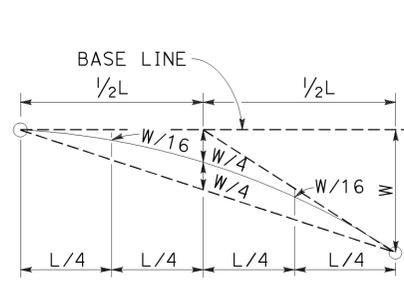
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR
EMBANKMENTS**

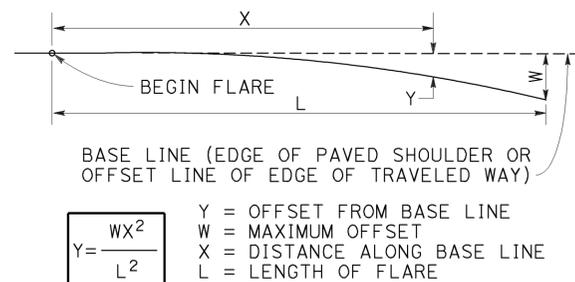
NO SCALE

RSP A77P5 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

2010 REVISED STANDARD PLAN RSP A77P5

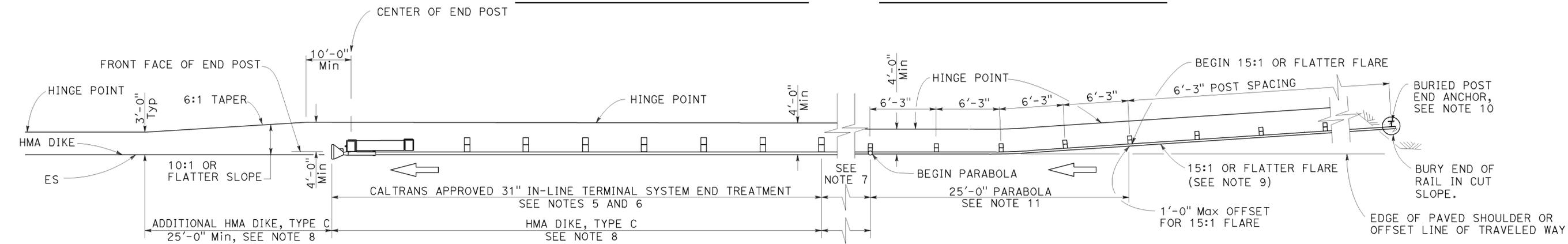


TYPICAL PARABOLIC LAYOUT



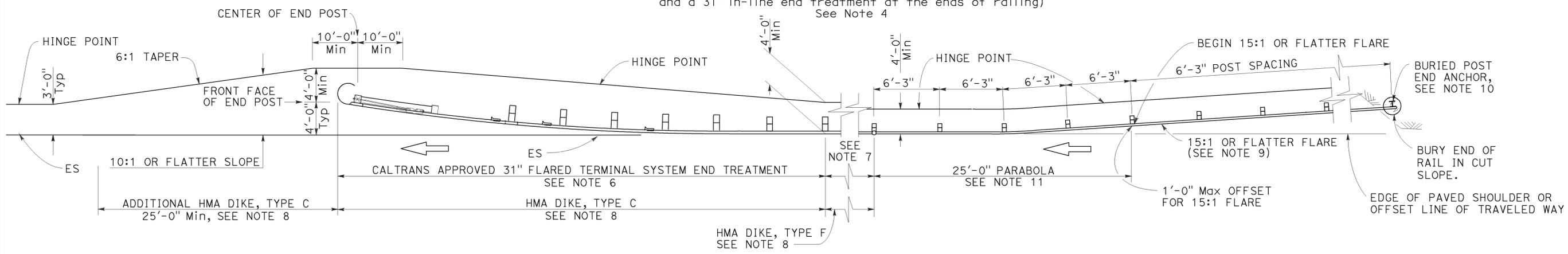
PARABOLIC FLARE OFFSETS

TO ACCOMPANY PLANS DATED 12-23-13



TYPE 11K LAYOUT

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



TYPE 11L LAYOUT

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

NOTES:

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

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**MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR
EMBANKMENTS**

NO SCALE

RSP A77P6 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

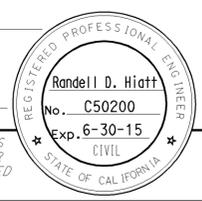
2010 REVISED STANDARD PLAN RSP A77P6

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	25	38

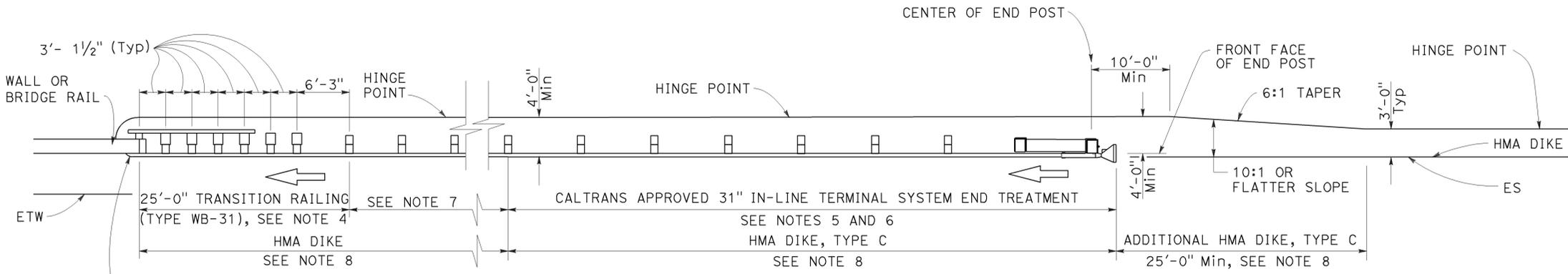
Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

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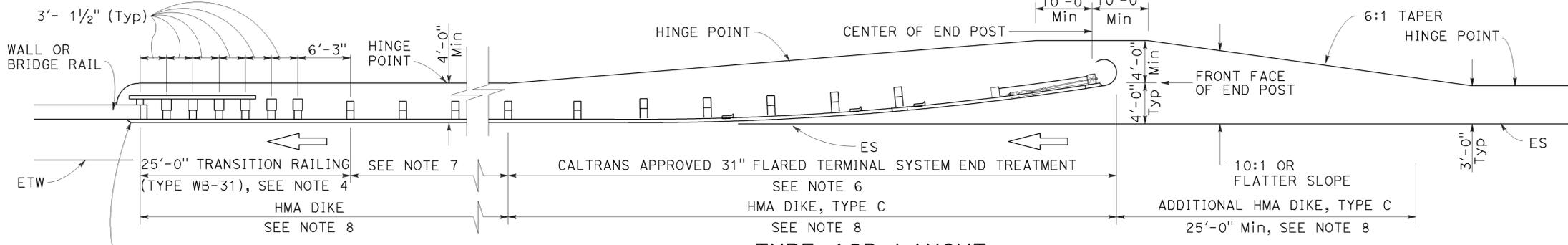


TO ACCOMPANY PLANS DATED 12-23-13



TYPE 12A LAYOUT

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



TYPE 12B LAYOUT

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

NOTES:

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

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

RSP A77Q1 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77Q1

2010 REVISED STANDARD PLAN RSP A77Q1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	26	38

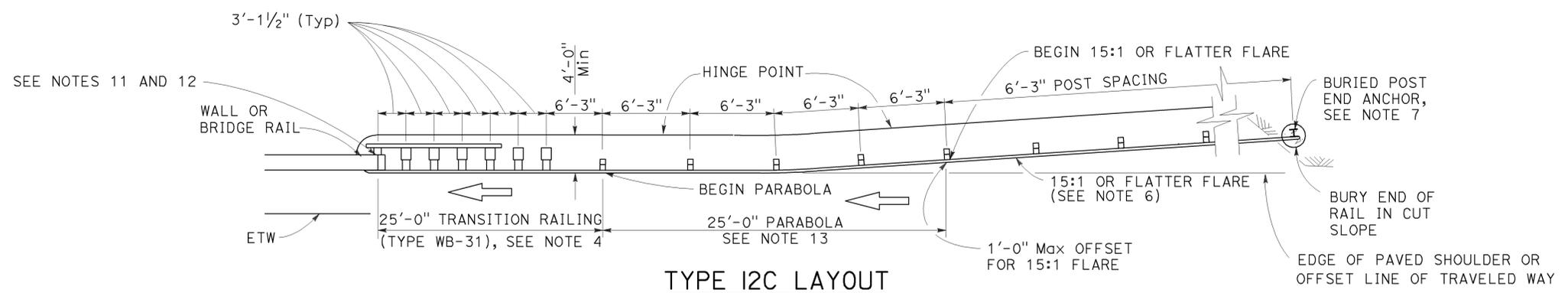
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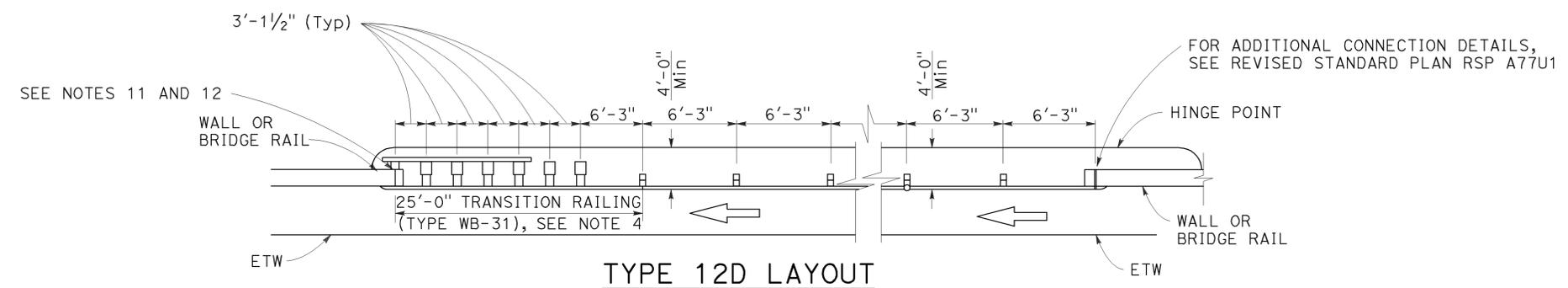
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TO ACCOMPANY PLANS DATED 12-23-13



TYPE 12C LAYOUT

(MGS installation at structure approach with a Buried end anchor treatment at traffic approach end of railing)
See Notes 8 and 9

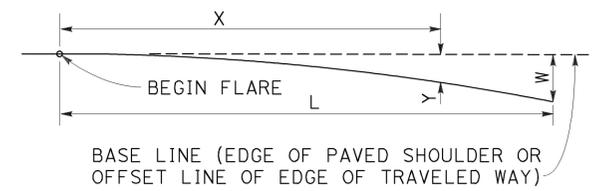


TYPE 12D LAYOUT

(Continuous MGS installation between structures)
See Notes 5 and 9

NOTES:

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77M1, RSP A77N1 and RSP A77N2.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" m wood with 6" x 12" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 12" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 12" x 1'-2" wood blocks where applicable and when specified.
- For Transition Railing (Type WB-31) details for Types 12C and 12D Layouts, see Revised Standard Plan RSP A77U4.
- Type 12D layout is typically used where continuous MGS is recommended between structures.
- The 15:1 or flatter flare for Type 12C Layout is based on the edge of the paved shoulder or offset line of edge of the traveled way. The length of MGS with 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 12C Layout, see Revised Standard Plan RSP A77T2.
- Where placement of dike is required with MGS installations, see Revised Standard Plan RSP A77N4 for dike positioning details.
- Type 12C Layout is typically used:
 - To the right of approaching traffic, at the end of the structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
 - To the left of approaching traffic, at each of a structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
 - To the right of approaching traffic at the end of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.
 - To the right of approaching traffic at the end of the structure on multilane freeways or expressways with decked median on the bridge.
- See Revised Standard Plan RSP A77Q3 for typical layout used left of approaching traffic at the ends of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.
- For additional details of typical connections to bridge rail, see Connection Detail AA on Revised Standard Plans RSP A77U1 and RSP A77U2 and Connection Detail FF on Revised Standard Plans RSP A77V1 and RSP A77V2.
- For additional details of a typical connection to walls or abutments, see Revised Standard Plan RSP A77U3.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P1.

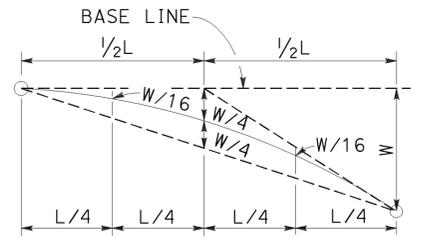


BASE LINE (EDGE OF PAVED SHOULDER OR OFFSET LINE OF EDGE OF TRAVELED WAY)

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

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

PARABOLIC FLARE OFFSETS



TYPICAL PARABOLIC LAYOUT

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR
STRUCTURE APPROACH
AND BETWEEN STRUCTURES**

NO SCALE

RSP A77Q2 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77Q2

2010 REVISED STANDARD PLAN RSP A77Q2

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	27	38

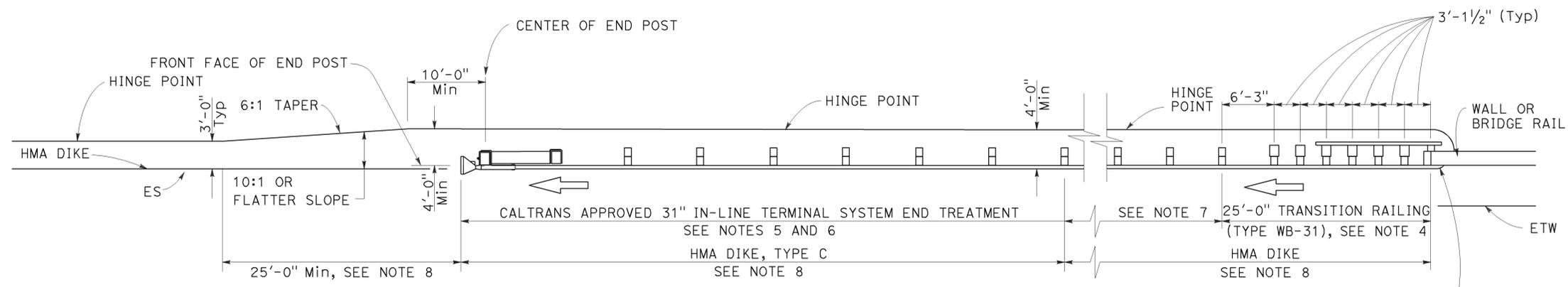
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REGISTERED CIVIL ENGINEER

July 19, 2013
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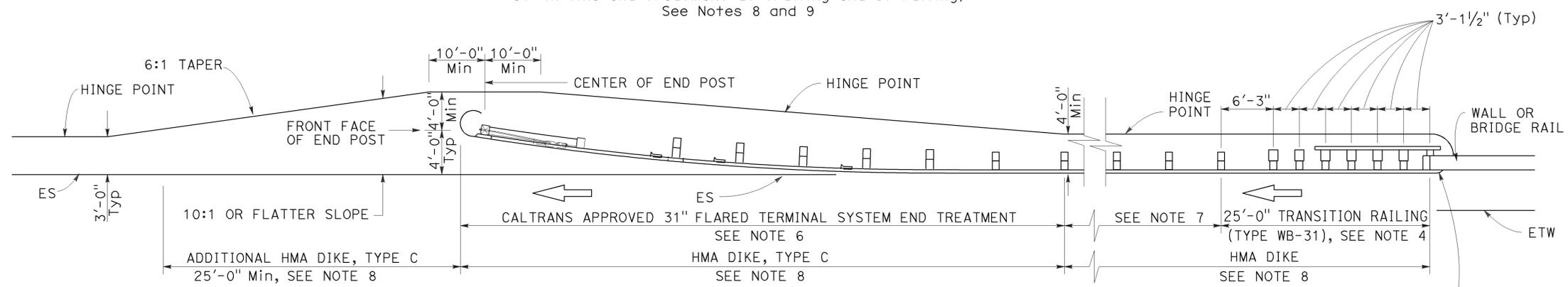
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STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED 12-23-13



TYPE 12AA LAYOUT

(MGS installation at structure departure with 31" in-line end treatment at trailing end of railing)
See Notes 8 and 9



TYPE 12BB LAYOUT

(MGS installation at structure departure with 31" flared end treatment at trailing end of railing)
See Notes 8 and 9

NOTES:

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77M1, RSP A77N1 and RSP A77N2.
- MGS post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 12" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 12" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 12" x 1'-2" wood blocks where applicable and when specified.
- For Transition Railing (Type WB-31) details for Types 12AA and 12BB Layouts, see Revised Standard Plan RSP A77U4.
- 31" in-line terminal system treatments are used where site conditions will not accommodate a 31" flared end treatment.
- The type of 31" terminal system to be used will be shown on the Project Plans.
- Dependent on site conditions (embankment height, side slopes, other fixed objects), it may be advisable to construct additional MGS (a length equal to multiples of 12'-6" with 6'-3" post spacing) between the transition railing and 31" end treatments.
- Where placement of dike is required with MGS installations, see Revised Standard Plan RSP A77N4 for dike positioning details.
- Type 12AA or Type 12BB Layouts are typically used to the right of traffic departing a structure on two-way conventional highways where the roadbed width across the structure is less than 40 feet.
- For additional details of typical connections to bridge rail, see Connection Detail CC on Revised Standard Plan RSP A77U2 and Connection Detail HH on Revised Standard Plan RSP A77V2.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
**MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR
STRUCTURE DEPARTURE**
NO SCALE

RSP A77Q4 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77Q4

2010 REVISED STANDARD PLAN RSP A77Q4

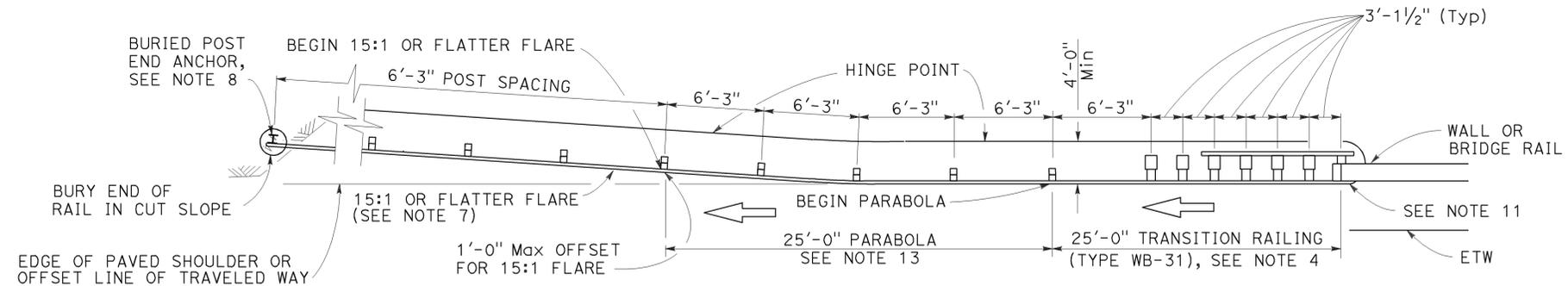
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	28	38

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

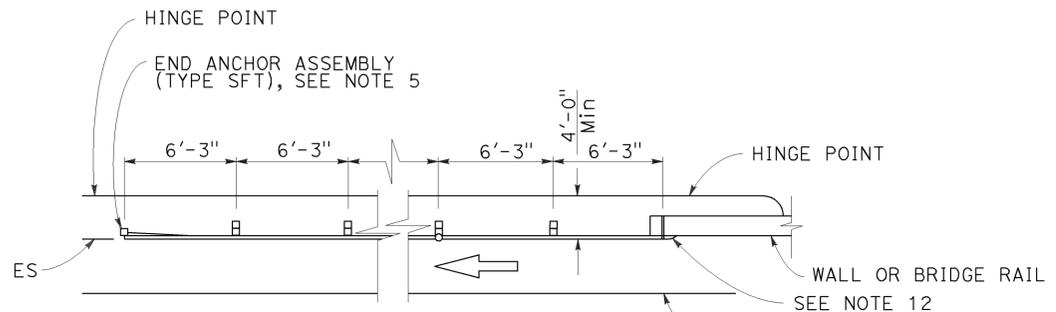
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REGISTERED PROFESSIONAL ENGINEER
No. C50200
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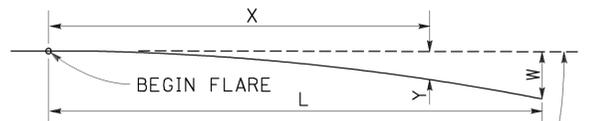
TYPE 12CC LAYOUT

(MGS installation at structure departure with a Buried end anchor treatment at trailing end of railing)
See Notes 9 and 10



TYPE 12DD LAYOUT

(MGS installation at structure departure With end anchor assembly at trailing end of railing)
See Notes 6 and 9

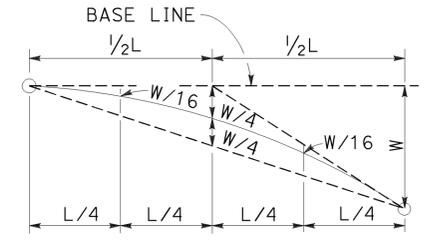


BASE LINE (EDGE OF PAVED SHOULDER OR OFFSET LINE OF EDGE OF TRAVELED WAY)

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

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

PARABOLIC FLARE OFFSETS



TYPICAL PARABOLIC LAYOUT

NOTES:

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77M1, RSP A77N1 and RSP A77N2.
- MSG 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 12" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 12" 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 12" x 1'-2" wood blocks where applicable and when specified.
- For Transition Railing (Type WB-31) details for Type 12CC Layout, see Revised Standard Plan RSP A77U4.
- For details of End Anchor Assembly (Type SFT) used with Type 12DD Layout, see Revised Standard Plan RSP A77S1.
- Type 12DD layout is typically used to the right of traffic departing a structure on two-way conventional highways where the roadbed width across the structure is equal to or greater than 40 feet and MGS is recommended (embankment height, side slopes, other fixed objects). Length of railing to be equal to multiples of 12'-6". For MGS connection details to bridge rail, see Revised Standard Plans RSP A77U1 and RSP A77V1. For MGS connection details to wall, see Revised Standard Plan RSP A77U3.
- The 15:1 or flatter flare for Type 12CC Layout is based on the edge of the paved shoulder or offset line of edge of the traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
- For details of the buried post end anchor used with Type 12CC Layout, see Revised Standard Plan RSP A77T2.
- Where placement of dike is required with MGS installations, see Revised Standard Plan RSP A77N4 for dike positioning details.
- Type 12CC Layout is typically used to the right of traffic departing a structure on two-way conventional highways where the roadbed width across the structure is less than 40 feet.
- For additional details of a typical connection to bridge rail for Layout Type 12CC, see Connection Detail CC on Revised Standard Plan RSP A77U2 and Connection Detail HH on Revised Standard Plan RSP A77V2.
- For additional details of a typical connection to bridge rail for Layout Type 12DD, see Connection Detail BB on Revised Standard Plan RSP A77U1 and Connection Detail GG on Revised Standard Plan RSP A77V1.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P1.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

RSP A77Q5 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77Q5

2010 REVISED STANDARD PLAN RSP A77Q5

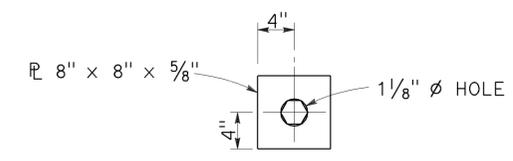
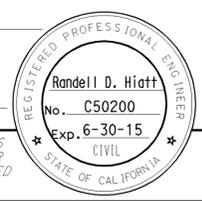
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	29	38

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

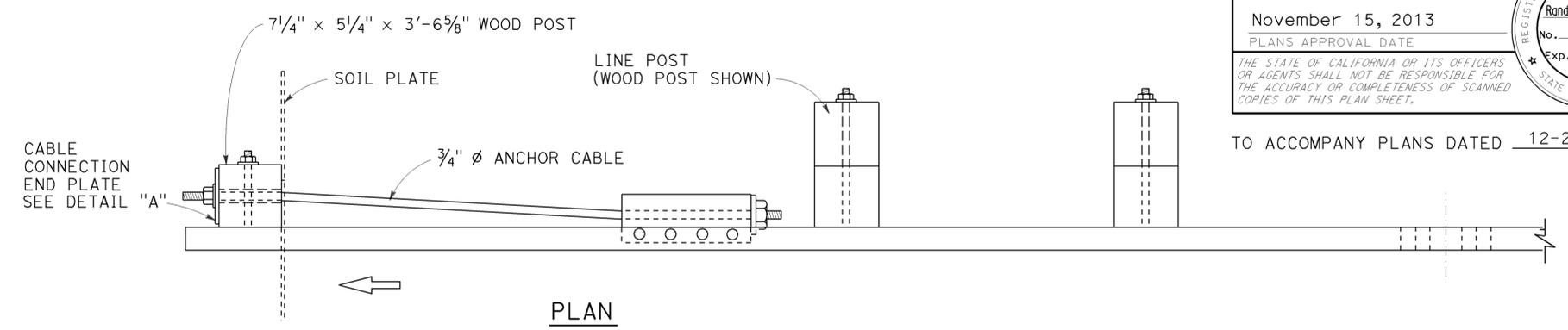
November 15, 2013
PLANS APPROVAL DATE

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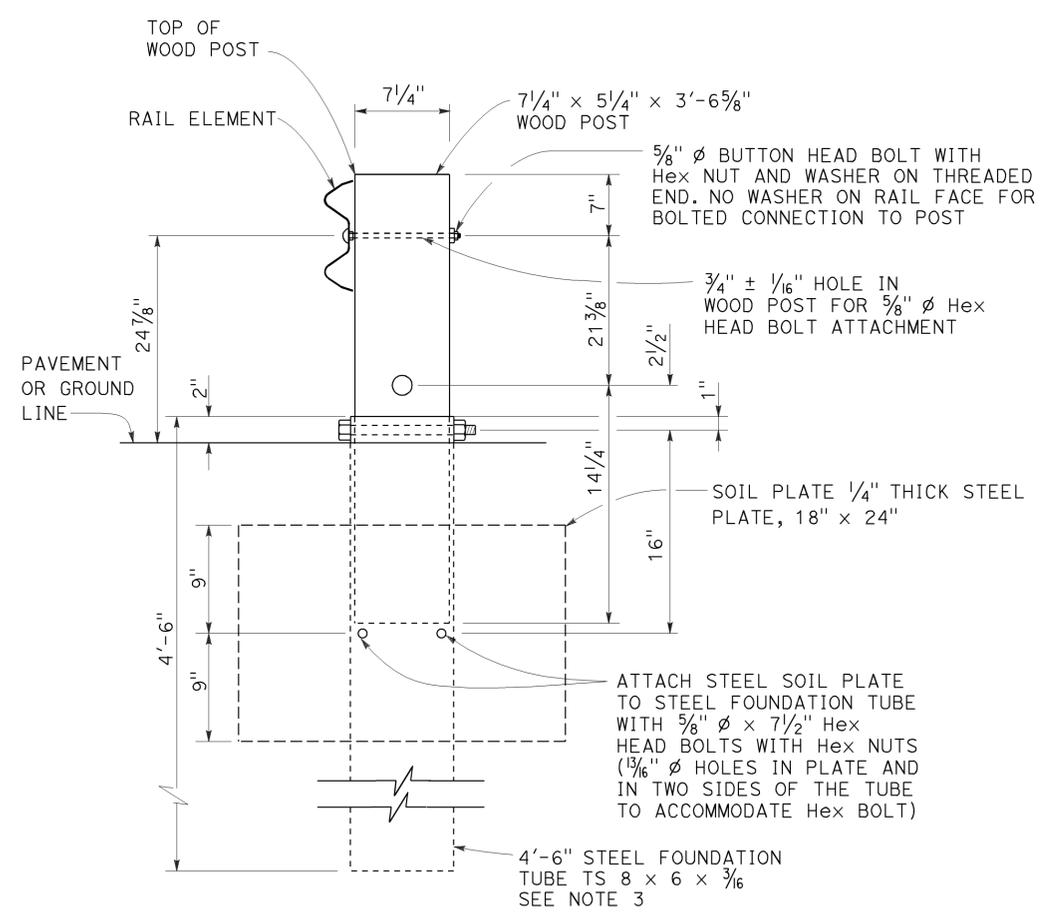
TO ACCOMPANY PLANS DATED 12-23-13



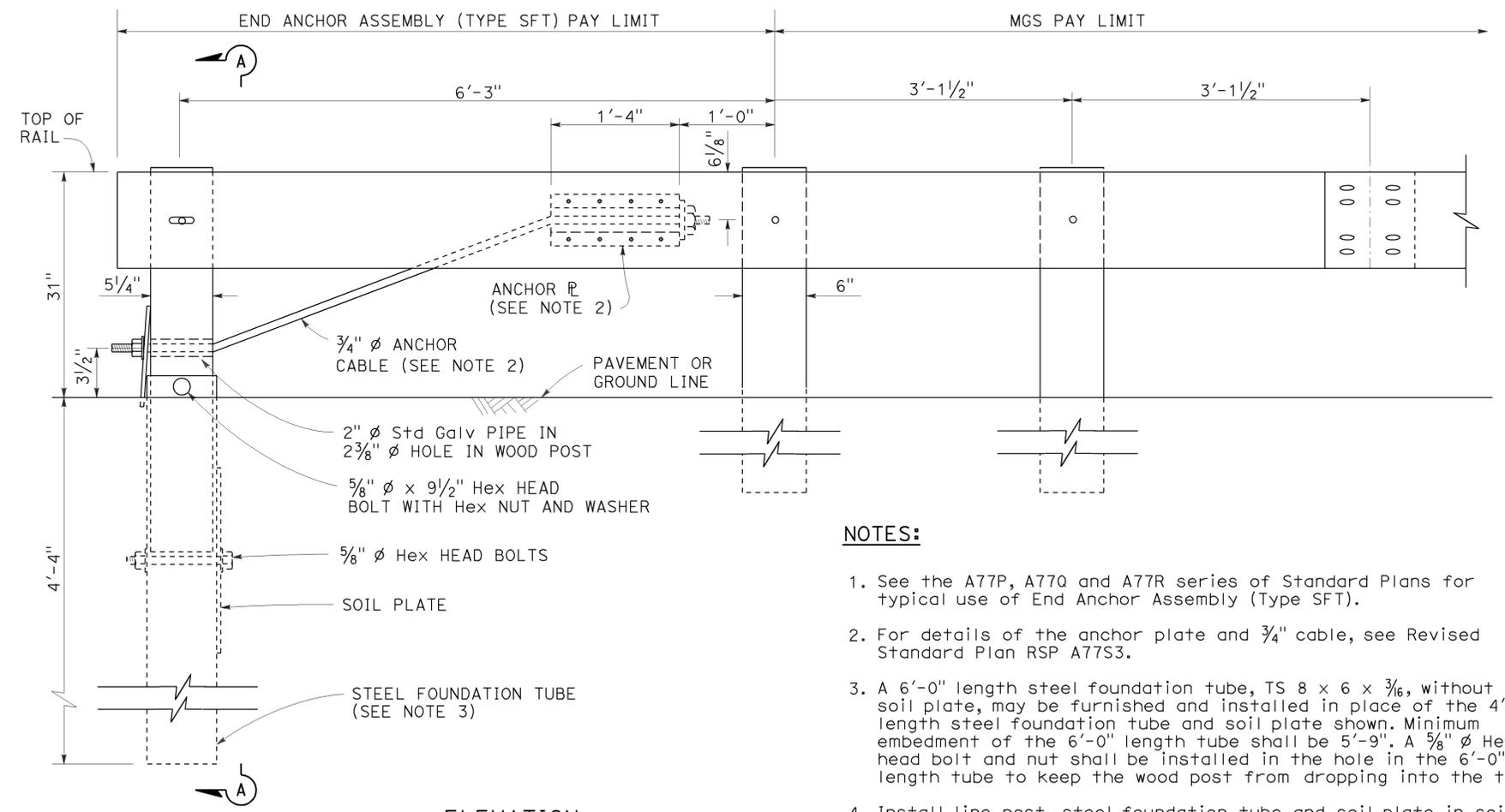
DETAIL "A"
CABLE CONNECTION
END PLATE



PLAN



SECTION A-A



ELEVATION

END ANCHOR
ASSEMBLY (TYPE SFT)
See Note 1

NOTES:

1. See the A77P, A77Q and A77R 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 Revised Standard Plan RSP A77S3.
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. Install line post, steel foundation tube and soil plate in soil.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
MIDWEST GUARDRAIL SYSTEM
END ANCHOR ASSEMBLY
(TYPE SFT)

NO SCALE

RSP A77S1 DATED NOVEMBER 15, 2013 SUPERSEDES RSP A77S1 DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77S1

2010 REVISED STANDARD PLAN RSP A77S1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	30	38

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

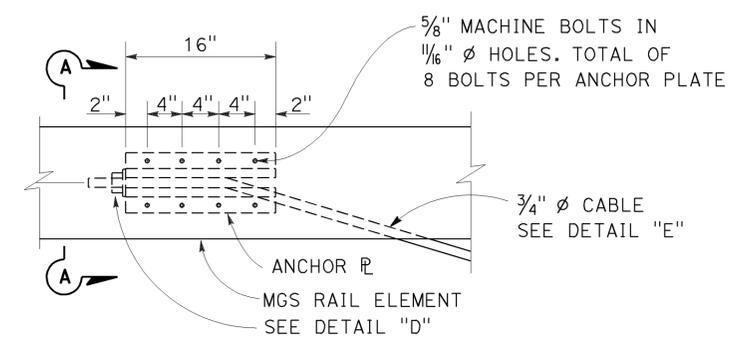
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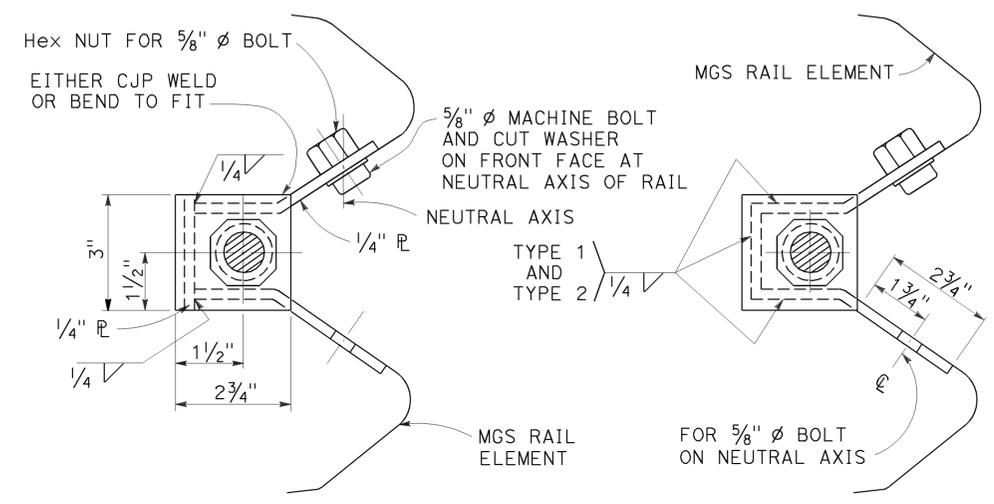
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TO ACCOMPANY PLANS DATED 12-23-13

NOTE:
See Revised Standard Plans RSP A77S1, RSP A77S2 and RSP A77T1 for typical use of anchor cable and anchor plate.

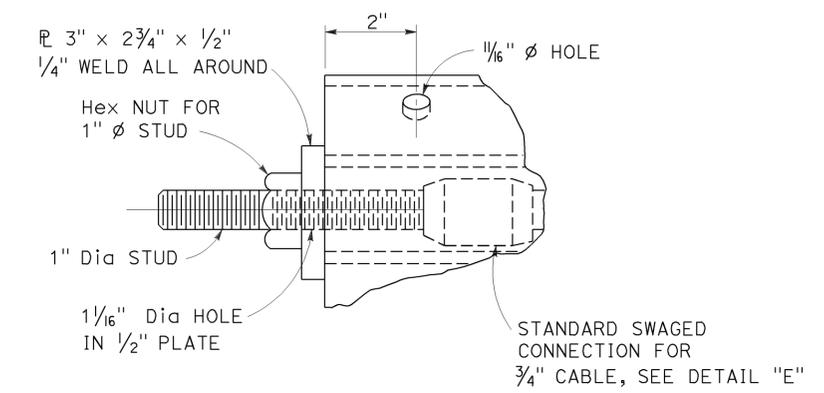


ANCHOR PLATE DETAIL
(MGS shown, TBB similar)

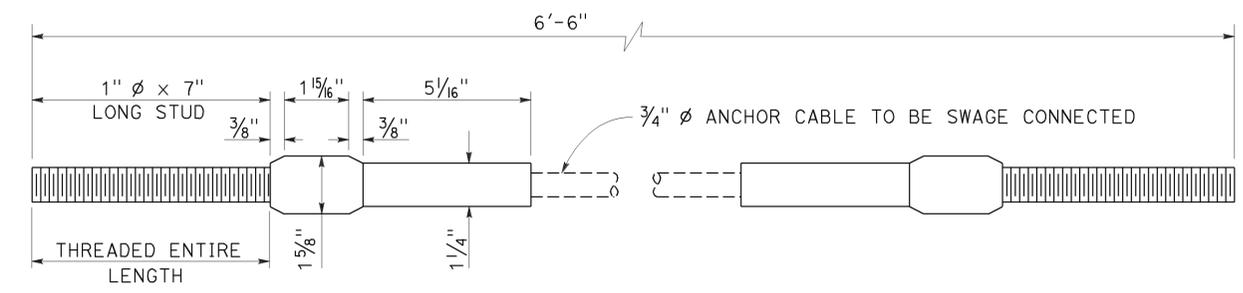


NOTE:
Dimensioning applies to both types.

SECTION A-A (ALTERNATIVE TYPE 1) **SECTION A-A (ALTERNATIVE TYPE 2)**



DETAIL "D"



ANCHOR CABLE WITH SWAGED FITTING AND STUD
DETAIL "E"

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**METAL RAILING
ANCHOR CABLE AND
ANCHOR PLATE DETAILS**

NO SCALE
RSP A77S3 DATED NOVEMBER 15, 2013 SUPERSEDES RSP A77S3
DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

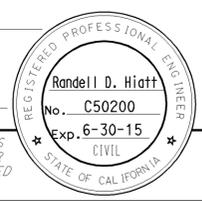
2010 REVISED STANDARD PLAN RSP A77S3

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	31	38

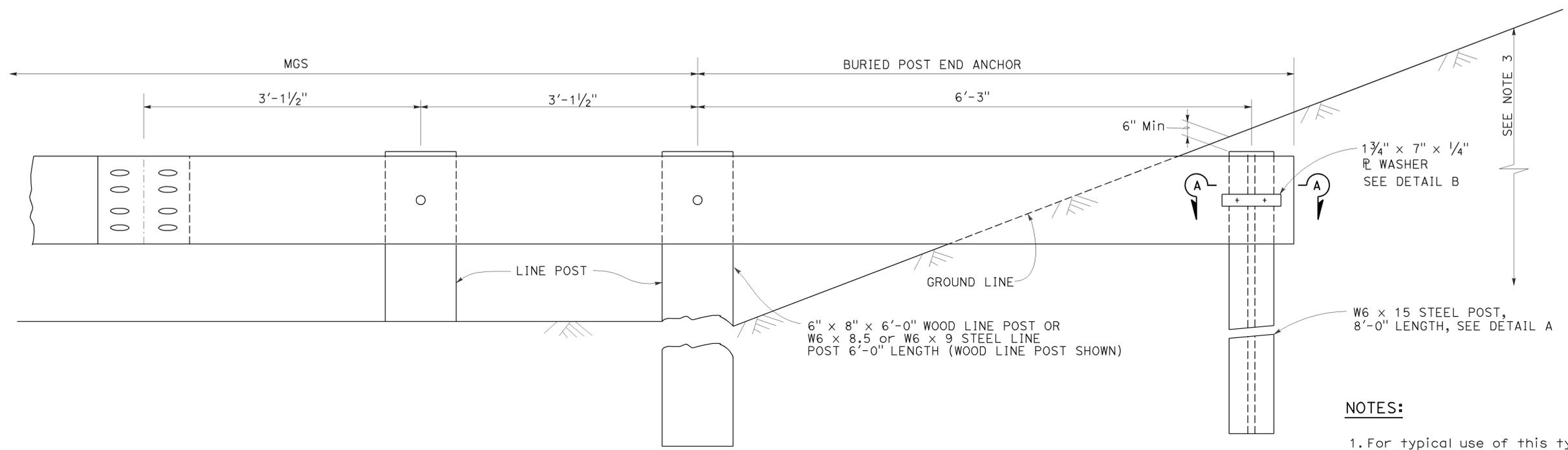
Randell D. Hiatt
REGISTERED CIVIL ENGINEER

November 15, 2013
PLANS APPROVAL DATE

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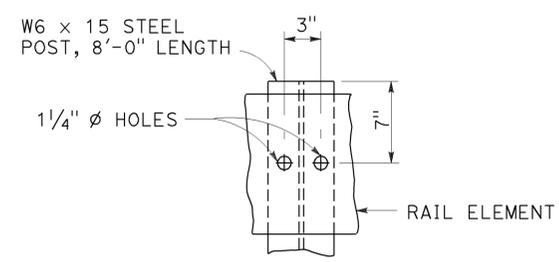
TO ACCOMPANY PLANS DATED 12-23-13



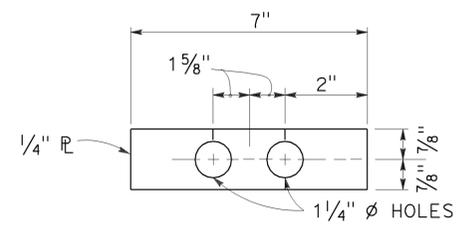
BURIED POST END ANCHOR
See Note 3

NOTES:

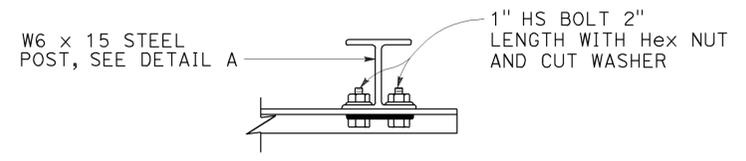
1. For typical use of this type of end anchor with MGS see the A77P, A77Q and A77R Series of the Standard Plans.
2. Holes excavation in the slope to construct the buried post end anchor shall be backfilled with selected earth, placed in layers approximately 1'-0" thick. Each layer shall be moistened and thoroughly compacted.
3. The buried post end anchor shall only be constructed at those locations where the slope perpendicular to the roadway is non-traversable.



DETAIL A



DETAIL B



SECTION A-A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
**MIDWEST GUARDRAIL SYSTEM
BURIED POST END ANCHOR**
NO SCALE

RSP A77T2 DATED NOVEMBER 15, 2013 SUPERSEDES RSP A77T2
DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77T2

2010 REVISED STANDARD PLAN RSP A77T2

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	32	38

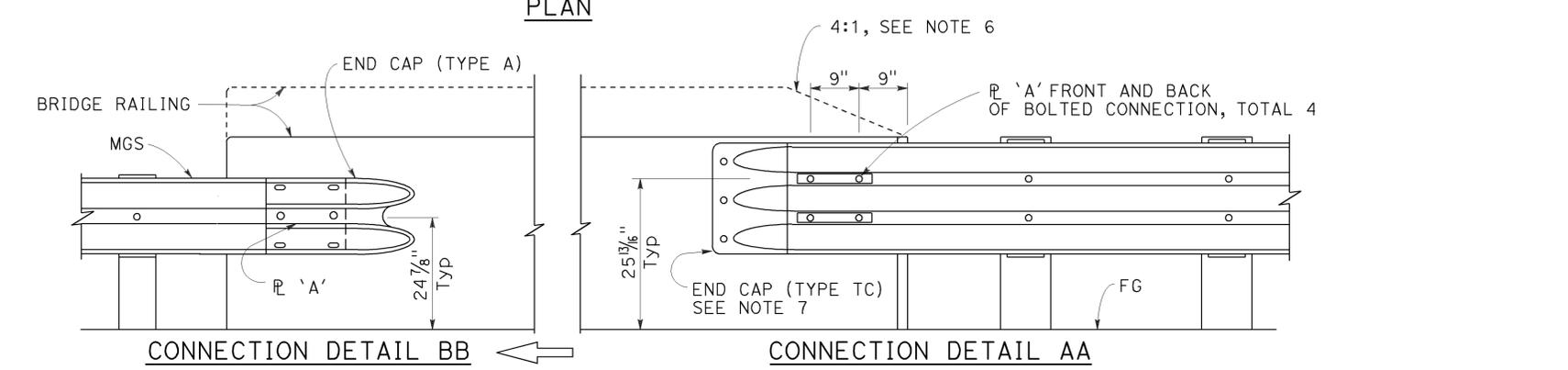
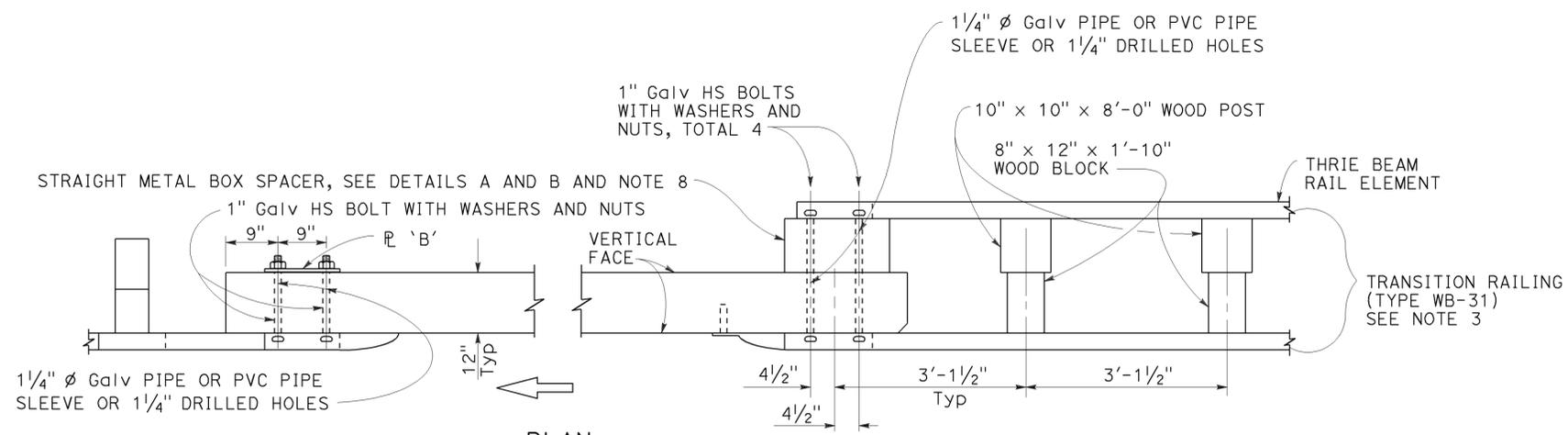
Randell D. Hiatt
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July 19, 2013
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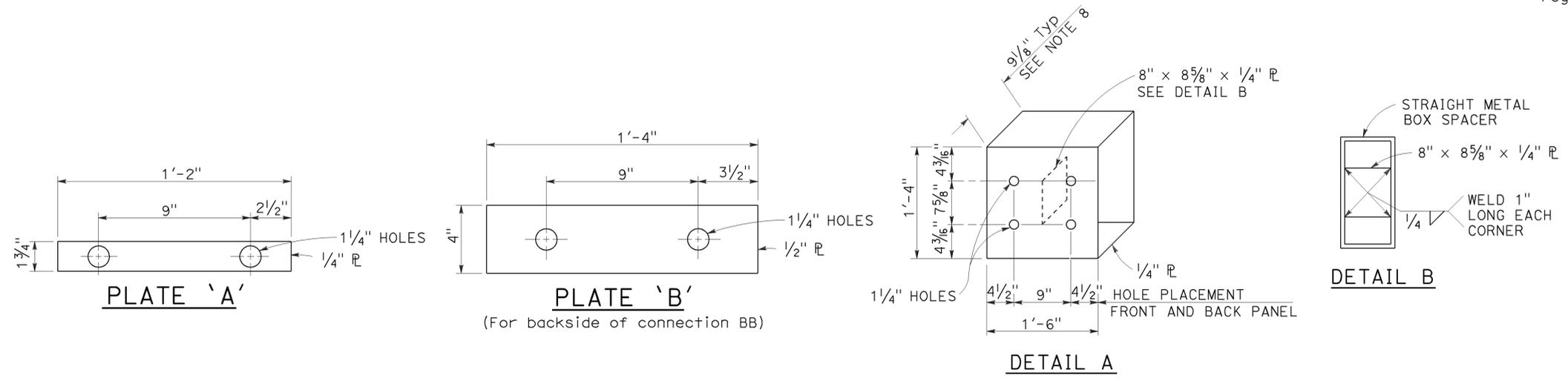
TO ACCOMPANY PLANS DATED 12-23-13



MIDWEST GUARDRAIL SYSTEM CONNECTION TO BRIDGE RAILING WITHOUT SIDEWALK

NOTES:

1. See Revised Standard Plan RSP A77U2 for additional connection details to bridges without sidewalks.
2. Additional details of posts, blocks and hardware are shown on Revised Standard Plans RSP A77M1, RSP A77N1 and RSP A77N2.
3. For additional details of Transition Railing (Type WB-31), see Revised Standard Plan RSP A77U4. Transition Railing (Type WB-31) transitions the 12 gauge MGS railing section to a heavier gage nested three beam railing section which is connected to the concrete bridge railing.
4. For typical use of Connection Detail AA, see Layout Types 12A and 12B on Revised Standard Plan RSP A77Q1, Layout Types 12C and 12D on Revised Standard Plan RSP A77Q2, and Layout Type 12E on Revised Standard Plan RSP A77Q3.
5. For typical use of Connection Detail BB, see Layout Type 12D (structure departure railing connection) on Revised Standard Plan RSP A77Q2 and Layout Type 12DD on Revised Standard Plan RSP A77Q5.
6. Where the height of the bridge railing exceeds the height of the three beam railing by more than 1" at Connection Detail AA, taper the top of the end of the bridge railing at 4:1 to match the top elevation of the three beam rail.
7. For details of End Cap (Type TC), see Revised Standard Plan RSP A77U4.
8. See Revised Standard Plan RSP A77U4 for additional details regarding depth dimension for straight metal box spacer.



STRAIGHT METAL BOX SPACER

MIDWEST GUARDRAIL SYSTEM CONNECTIONS TO BRIDGE RAILINGS WITHOUT SIDEWALKS DETAILS No. 1

NO SCALE

RSP A77U1 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77U1

2010 REVISED STANDARD PLAN RSP A77U1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	33	38

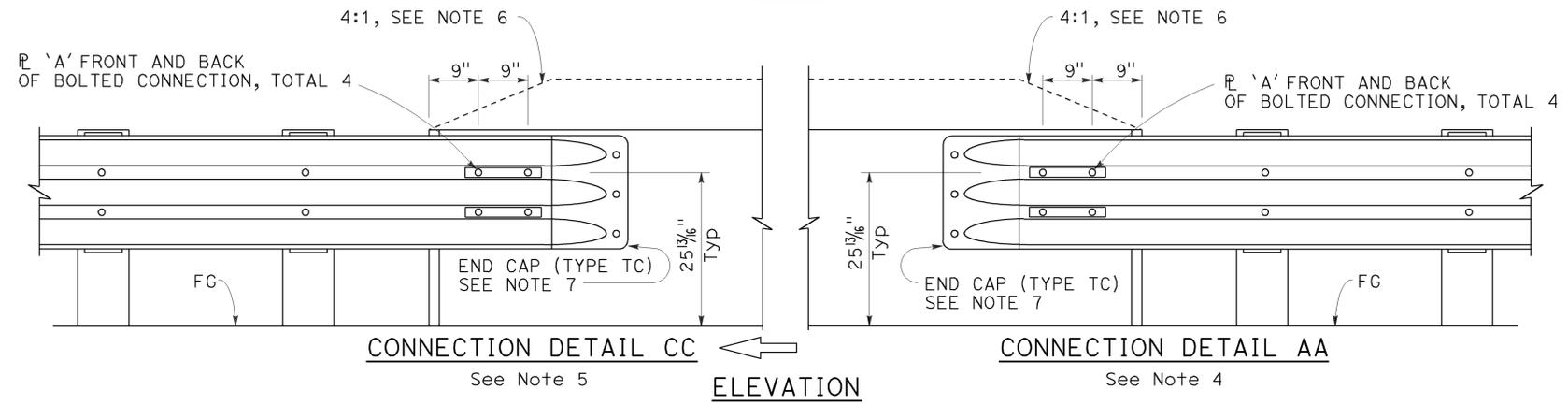
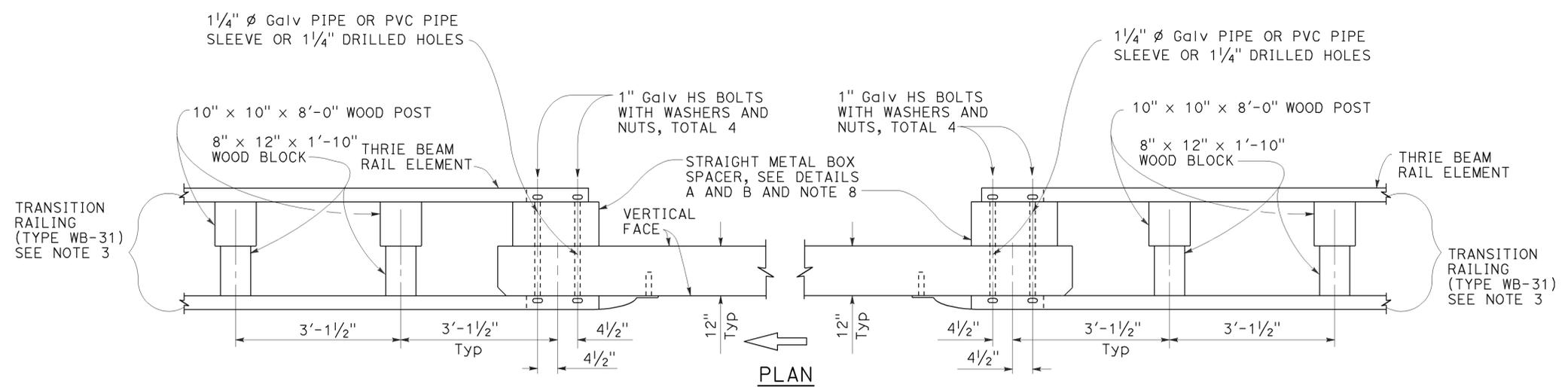
Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
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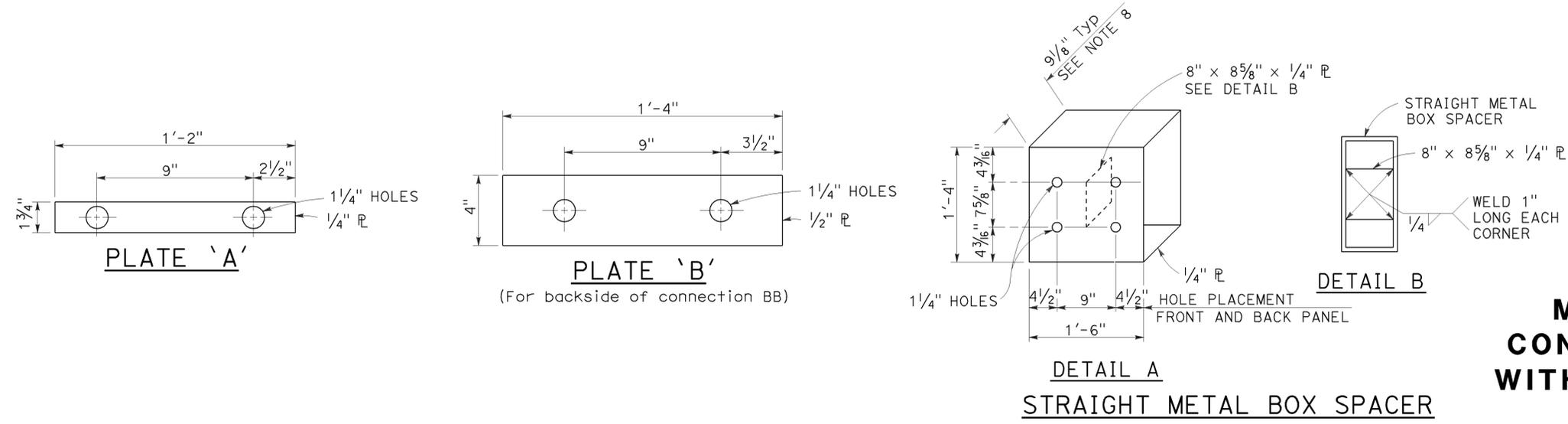
TO ACCOMPANY PLANS DATED 12-23-13



MIDWEST GUARDRAIL SYSTEM CONNECTION TO BRIDGE RAILING WITHOUT SIDEWALK

NOTES:

1. See Revised Standard Plan RSP A77U1 for additional connection details to bridges without sidewalks.
2. Additional details of posts, blocks and hardware are shown on Revised Standard Plans RSP A77M1, RSP A77N1 and RSP A77N2.
3. For additional details of Transition Railing (Type WB-31), see Revised Standard Plan RSP A77U4. Transition Railing (Type WB-31) transitions the 12 gauge MGS railing section to a heavier gage nested thrie beam railing section which is connected to the concrete bridge railing.
4. For typical use of Connection Detail AA, see Layout Types 12A and 12B on Revised Standard Plan RSP A77Q1, Layout Types 12C and 12D on Revised Standard Plan RSP A77Q2, and Layout Type 12E on Revised Standard Plan RSP A77Q3.
5. For typical use of Connection Detail CC, see Layout Types 12AA and 12BB on Revised Standard Plan RSP A77Q4 and Layout Type 12CC on Revised Standard Plan RSP A77Q5.
6. Where the height of the bridge railing exceeds the height of the thrie beam railing by more than 1" at Connection Detail AA and connection Detail CC, taper the top of the end of the bridge railing at 4:1 to match the top elevation of the thrie beam railing.
7. For details of End Cap (Type TC), see Revised Standard Plan RSP A77U4.
8. See Revised Standard Plan RSP A77U4 for additional details regarding depth dimension for straight metal box spacer.



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM
CONNECTIONS TO BRIDGE RAILINGS
WITHOUT SIDEWALKS DETAILS No. 2**

NO SCALE

RSP A77U2 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

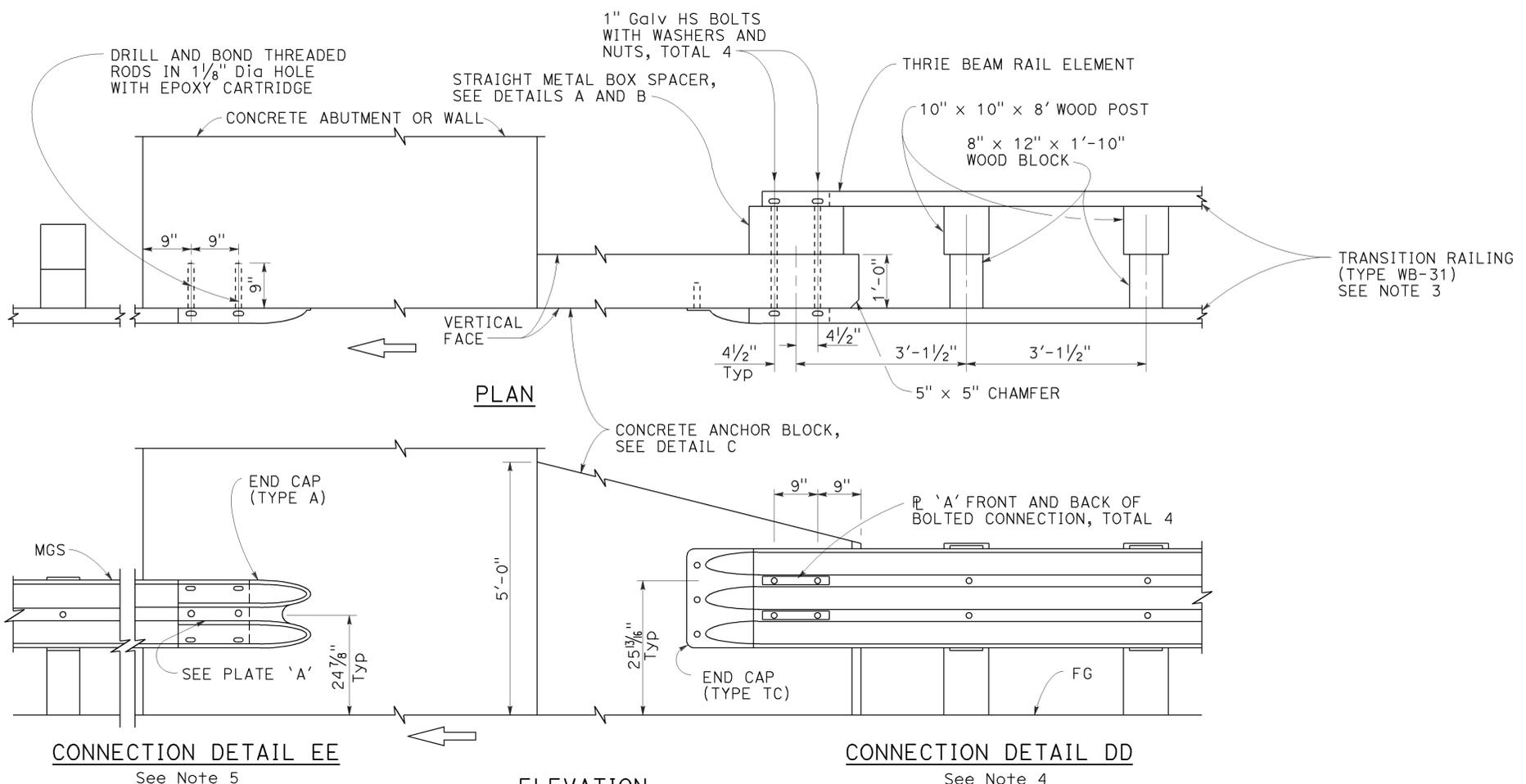
REVISED STANDARD PLAN RSP A77U2

2010 REVISED STANDARD PLAN RSP A77U2

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	34	38

RANDALL D. HIATT
 REGISTERED CIVIL ENGINEER
 July 19, 2013
 PLANS APPROVAL DATE
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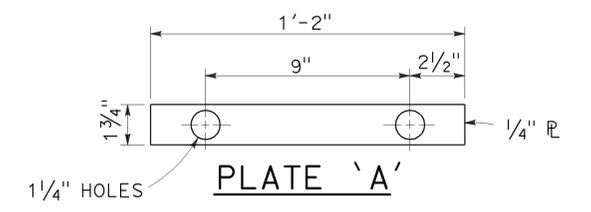
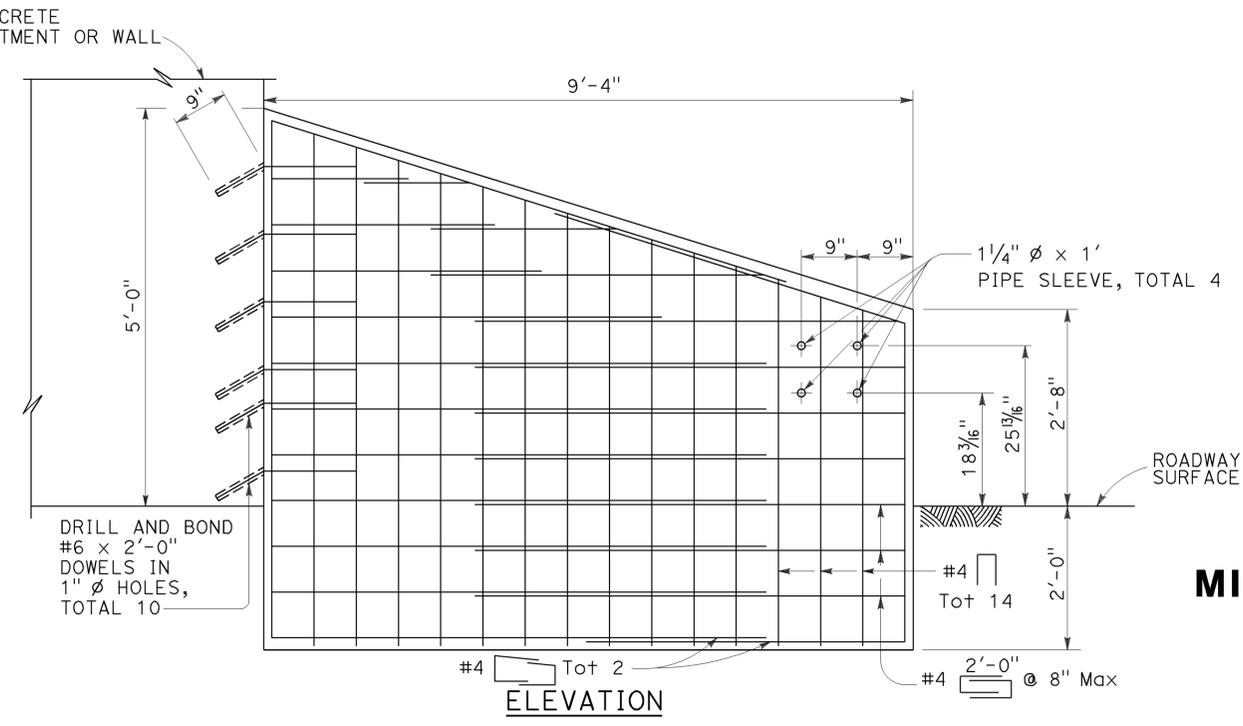
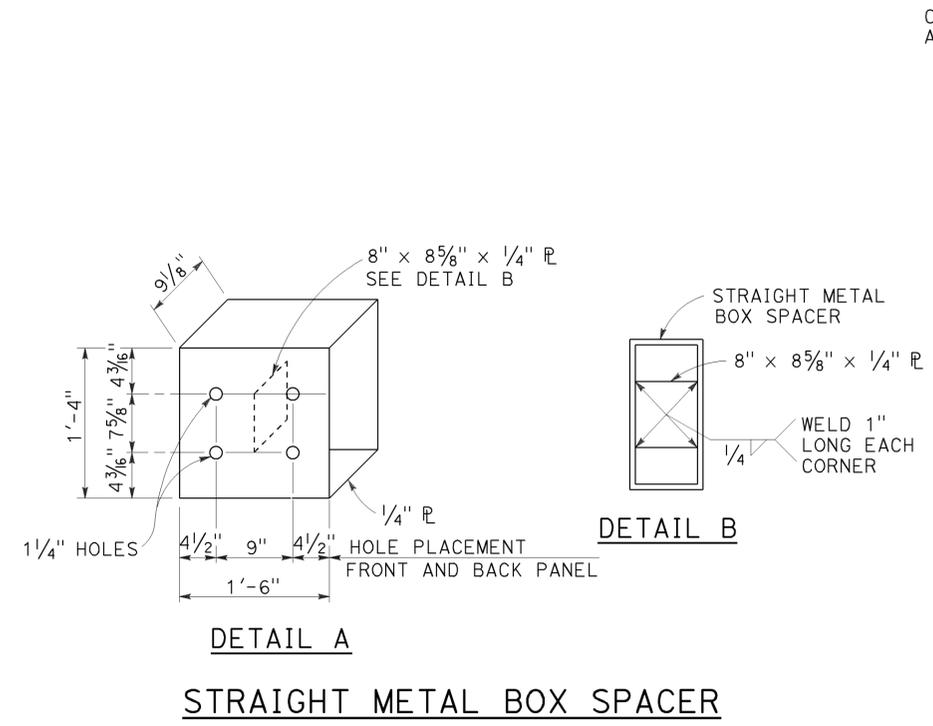
TO ACCOMPANY PLANS DATED 12-23-13



NOTES:

1. These connection details apply to abutments and walls.
2. Additional details of posts, blocks and hardware are shown on Revised Standard Plans RSP A77M1, RSP A77N1 and RSP A77N2.
3. For additional details of Transition Railing (Type WB-31), see Revised Standard Plan RSP A77U4. Transition Railing (Type WB-31) transitions the 12 gauge MGS railing section to a heavier gage nested thrie beam railing section which is connected to the concrete anchor block.
4. For typical use of Connection Details DD, see Layout Types 12A and 12B on Revised Standard Plan RSP A77Q1 and Layout Types 12C and 12D on Revised Standard Plan RSP A77Q2.
5. For typical use of Connection Detail EE, see Layout Type 12D on Revised Standard Plan RSP A77Q2 and Layout Type 12DD on Revised Standard Plan RSP A77Q5.

MIDWEST GUARDRAIL SYSTEM CONNECTION TO ABUTMENT OR WALL



MIDWEST GUARDRAIL SYSTEM CONNECTIONS TO ABUTMENTS AND WALLS

NO SCALE

RSP A77U3 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A77U3

2010 REVISED STANDARD PLAN RSP A77U3

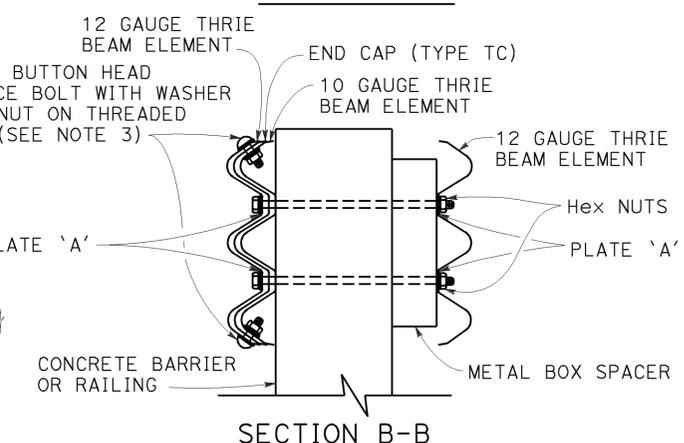
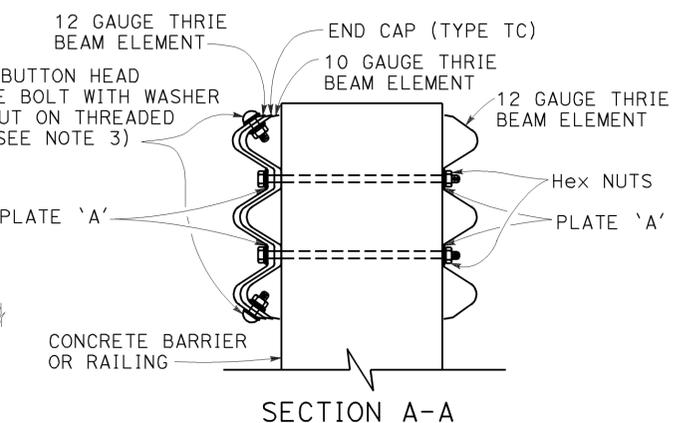
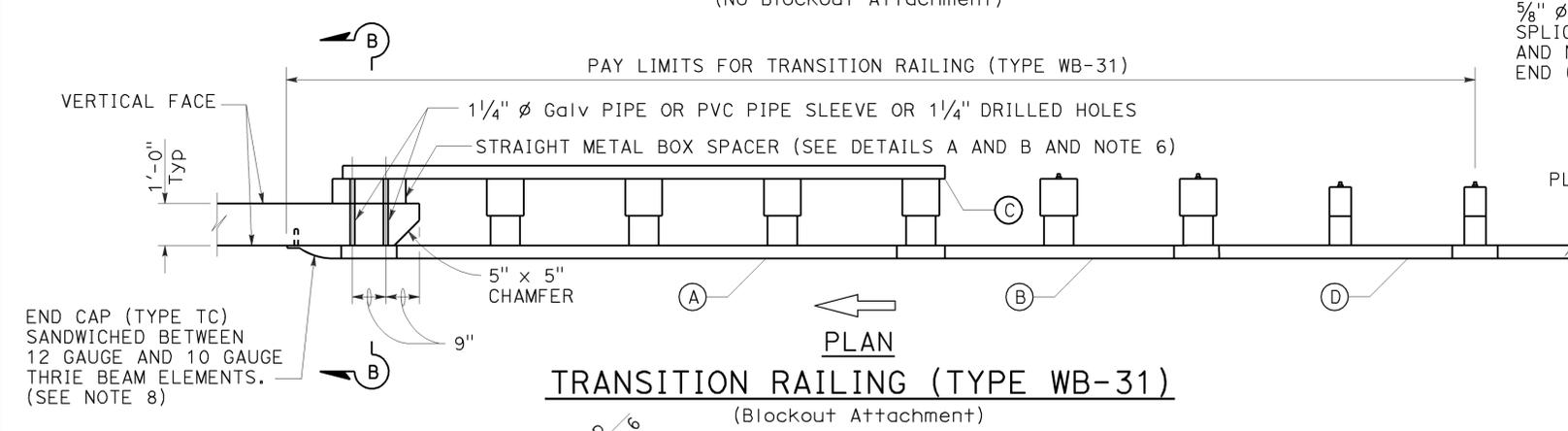
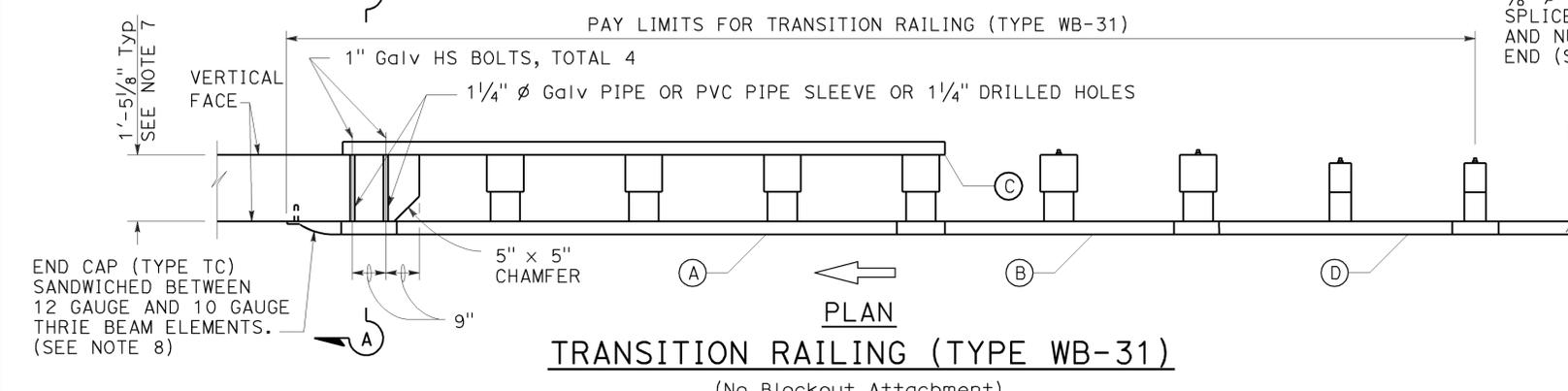
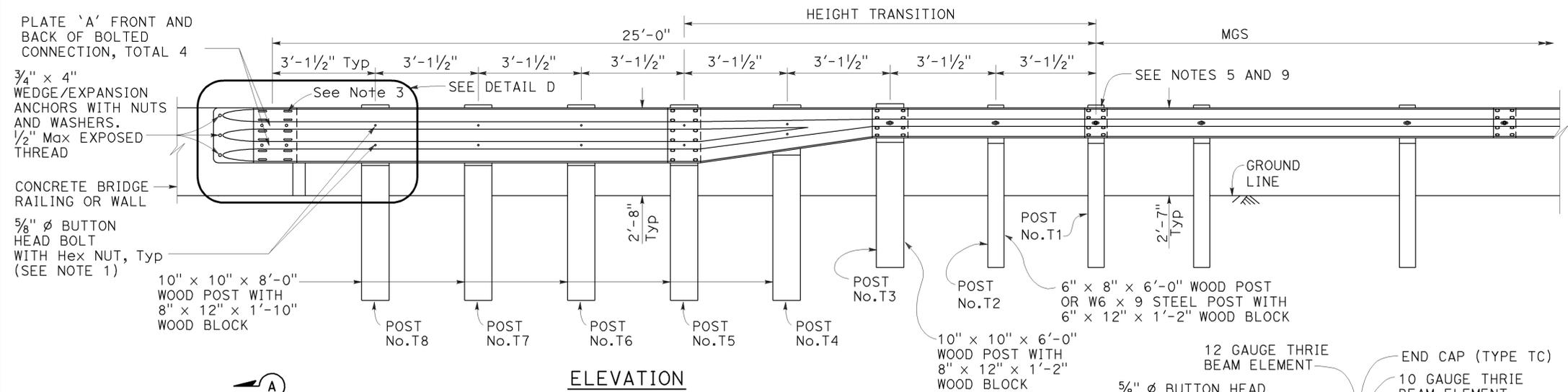
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	35	38

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

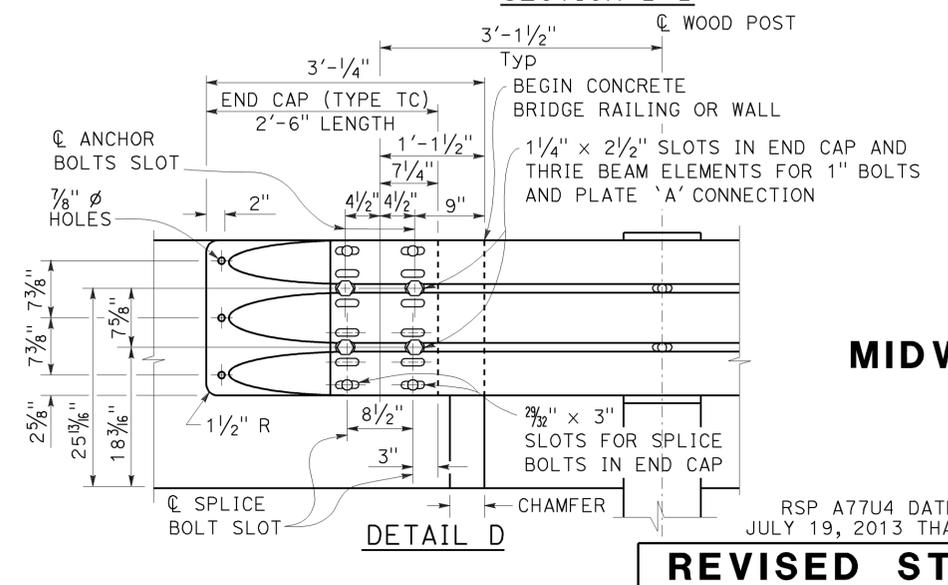
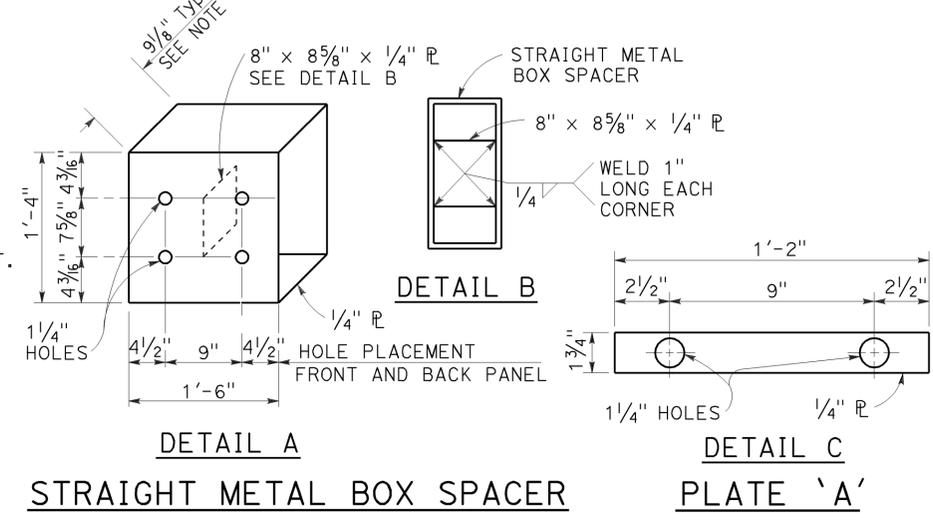
November 15, 2013
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- LEGEND:**
- (A) NESTED THRIE BEAM ELEMENTS (ONE 12 GAUGE ELEMENT NESTED OVER ONE 10 GAUGE ELEMENT).
 - (B) ONE ASYMMETRICAL 10 GAUGE "W" BEAM TO THRIE BEAM ELEMENT.
 - (C) ONE 12 GAUGE THRIE BEAM ELEMENT.
 - (D) ONE 10 GAUGE "W" BEAM RAIL ELEMENT (7'-3/2" LENGTH)
- 10 GAUGE = 0.138" THICK
12 GAUGE = 0.108" THICK



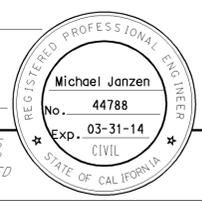
- NOTES:** TO ACCOMPANY PLANS DATED 12-23-13
1. Use 5/8" ϕ Button head bolts and hex nuts for connections to posts. No washer on rail face for bolted connections to post.
 2. The nested rail elements, end cap, and "W" beam to thrie beam element may be spliced together prior to bolting the elements to the wood post and concrete barrier or railing.
 3. Exterior splice bolt holes for rail element splices at Post No. T5 and the connection to the concrete barrier or railing shall be the standard 2 3/32" x 1 1/8" slot size. Interior splice bolt holes at these locations may be increased up to 1 1/4" ϕ . Only the top 4 and the bottom 4 splice bolts with washers and nuts are required for rail splices at Post No. T5 and the connection to the concrete barrier or railing.
 4. The top elevation of Posts No. T2 through No. T7 shall not project more than 1" above the top elevation of the rail element.
 5. Typically, the railing connected to Transition Railing (Type WB-31) will be either standard railing section of MGS with height transition ratio of 150:1 or a Caltrans approved 31" end treatment attached to Post No. T1.
 6. The depth of the metal box spacer varies from the 9/8" to 1 1/2" and is dependent on the width of the concrete railing or wall. The combined dimension for the depth of the metal box spacer plus the width of railing or wall is typically 21 1/8". Where the space between the backside of the concrete railing or wall and the rear thrie beam element is less than 1 1/2", metal plates similar to Plate 'A' are to be used as spacers.
 7. Where the width of the concrete railing or wall is greater than 17 1/8", wood blocks are to be used to fill the space created between the backside of Posts No. T5 through No. T8 and the rear thrie beam element. These wood blocks shall be 8" in width and 1'-2" in length. The dimension between the front thrie beam element and the rear thrie beam element is to match the width of the concrete railing or wall.
 8. End cap may be installed over 12 gauge and 10 gauge thrie beam elements where transition railing is installed on the departure end of bridge railing.
 9. Conform standard railing section height to 31" at Post No. T1 using height transition ratio of 150:1.

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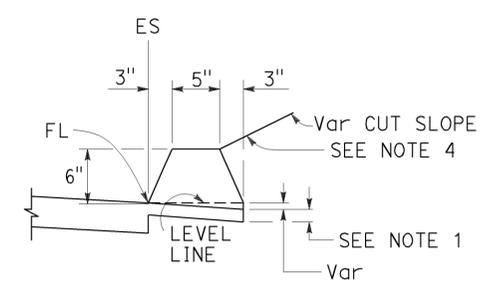
**MIDWEST GUARDRAIL SYSTEM
TRANSITION RAILING
(TYPE WB-31)**
NO SCALE

RSP A77U4 DATED NOVEMBER 15, 2013 SUPERSEDES RSP A77U4 DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

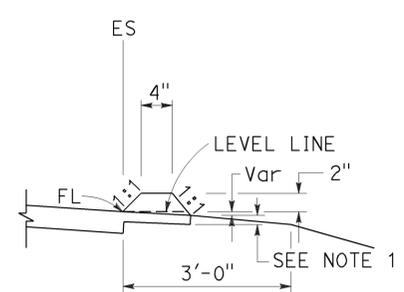
2010 REVISED STANDARD PLAN RSP A77U4



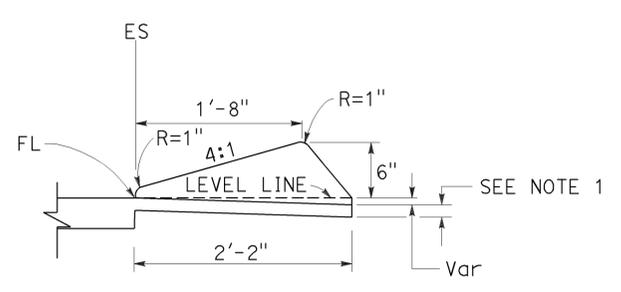
TO ACCOMPANY PLANS DATED 12-23-13



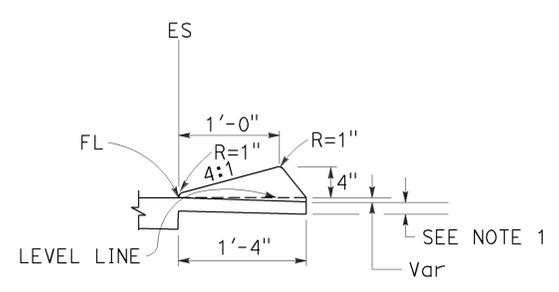
TYPE A
See Note 3



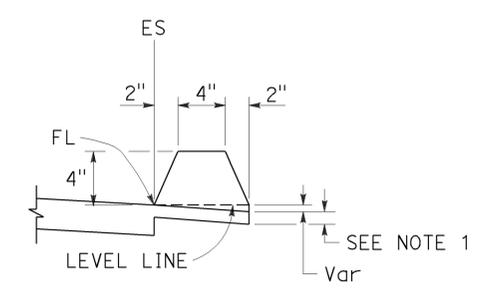
TYPE C



TYPE D

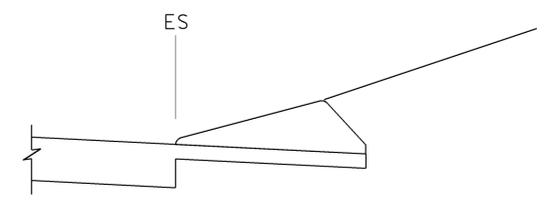


TYPE E

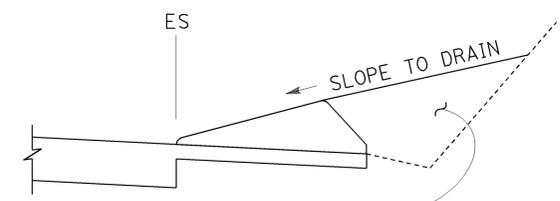


TYPE F
See Note 5

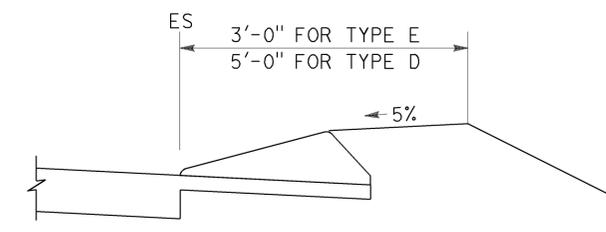
DIKES



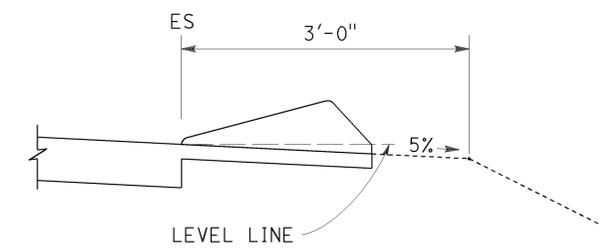
CASE C-1
Cut Slope



CASE C-2
Cut Slope



CASE F



CASE R
See Note 2

TYPE D AND E BACKFILL DETAILS

NOTES:

1. For HMA shoulders only, extend top layer of HMA placed on the shoulder under dike with no joint at the ES. For projects with OGFC shoulders, do not extend OGFC under dike. See project plans for modified dike detail.
2. Case R applies to retrofit only projects where restrictive conditions do not provide enough width for Case F backfill.
3. Type A dike only to be used where restrictive slope conditions do not provide enough width to use Type D or Type E dike.
4. Fill and compact with excavated material to top of dike.
5. Use Type F dike, where dike is required with guard railing installations. See Revised Standard Plan RSP A77N4 for dike positioning details.

DIKE QUANTITIES

TYPE	CUBIC YARDS PER LINEAR FOOT
A	0.0135
C	0.0038
D	0.0293
E	0.0130
F	0.0066

Quantities based on 5% cross slope.

STATE OF CALIFORNIA
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HOT MIX ASPHALT DIKES

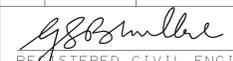
NO SCALE

RSP A87B DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN A87B
DATED MAY 20, 2011 - PAGE 120 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A87B

2010 REVISED STANDARD PLAN RSP A87B

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	37	38


 REGISTERED CIVIL ENGINEER
 July 19, 2013
 PLANS APPROVAL DATE



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

TO ACCOMPANY PLANS DATED 12-23-13

TABLE 1

TAPER LENGTH CRITERIA AND CHANNELIZING DEVICE SPACING							
SPEED (S)	MINIMUM TAPER LENGTH * FOR WIDTH OF OFFSET 12 FEET (W)				MAXIMUM CHANNELIZING DEVICE SPACING		
	TANGENT 2L	MERGING L	SHIFTING L/2	SHOULDER L/3	Z **		
					TAPER	TANGENT	CONFLICT
mph	ft	ft	ft	ft	ft	ft	ft
20	160	80	40	27	20	40	10
25	250	125	63	42	25	50	12
30	360	180	90	60	30	60	15
35	490	245	123	82	35	70	17
40	640	320	160	107	40	80	20
45	1080	540	270	180	45	90	22
50	1200	600	300	200	50	100	25
55	1320	660	330	220	55	110	27
60	1440	720	360	240	60	120	30
65	1560	780	390	260	65	130	32
70	1680	840	420	280	70	140	35

* - For other offsets, use the following merging taper length formula for L:
 For speed of 40 mph or less, $L = WS^2/60$
 For speed of 45 mph or more, $L = WS$

Where: L = Taper length in feet
 W = Width of offset in feet
 S = Posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

** - Use for taper and tangent sections where there are no pavement markings or where there is a conflict between existing pavement markings and channelizers (CA).

TABLE 2

LONGITUDINAL BUFFER SPACE AND FLAGGER STATION SPACING				
SPEED *	Min D **	DOWNGRADE Min D ***		
		-3%	-6%	-9%
		ft	ft	ft
20	115	116	120	126
25	155	158	165	173
30	200	205	215	227
35	250	257	271	287
40	305	315	333	354
45	360	378	400	427
50	425	446	474	507
55	495	520	553	593
60	570	598	638	686
65	645	682	728	785
70	730	771	825	891

* - Speed is posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph
 ** - Longitudinal buffer space or flagger station spacing
 *** - Use on sustained downgrade steeper than -3 percent and longer than 1 mile.

TABLE 3

ADVANCE WARNING SIGN SPACING			
ROAD TYPE	DISTANCE BETWEEN SIGNS *		
	A	B	C
	ft	ft	ft
URBAN - 25 mph OR LESS	100	100	100
URBAN - MORE THAN 25 mph TO 40 mph	250	250	250
URBAN - MORE THAN 40 mph	350	350	350
RURAL	500	500	500
EXPRESSWAY / FREEWAY	1000	1500	2640

* - The distances are approximate, are intended for guidance purposes only, and should be applied with engineering judgment. These distances should be adjusted by the Engineer for field conditions, if necessary, by increasing or decreasing the recommended distances.

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM TABLES FOR LANE AND RAMP CLOSURES

NO SCALE

RSP T9 DATED JULY 19, 2013 SUPERSEDES RSP T9 DATED APRIL 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP T9

2010 REVISED STANDARD PLAN RSP T9

NOTES:

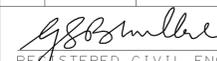
See Revised Standard Plan RSP T9 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

Unless otherwise specified in the special provisions, all temporary warning signs shall have black legend on fluorescent orange background.

California codes are designated by (CA). Otherwise, Federal (MUTCD) codes are shown.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB, SLO	166	R25.5/R34.9	38	38

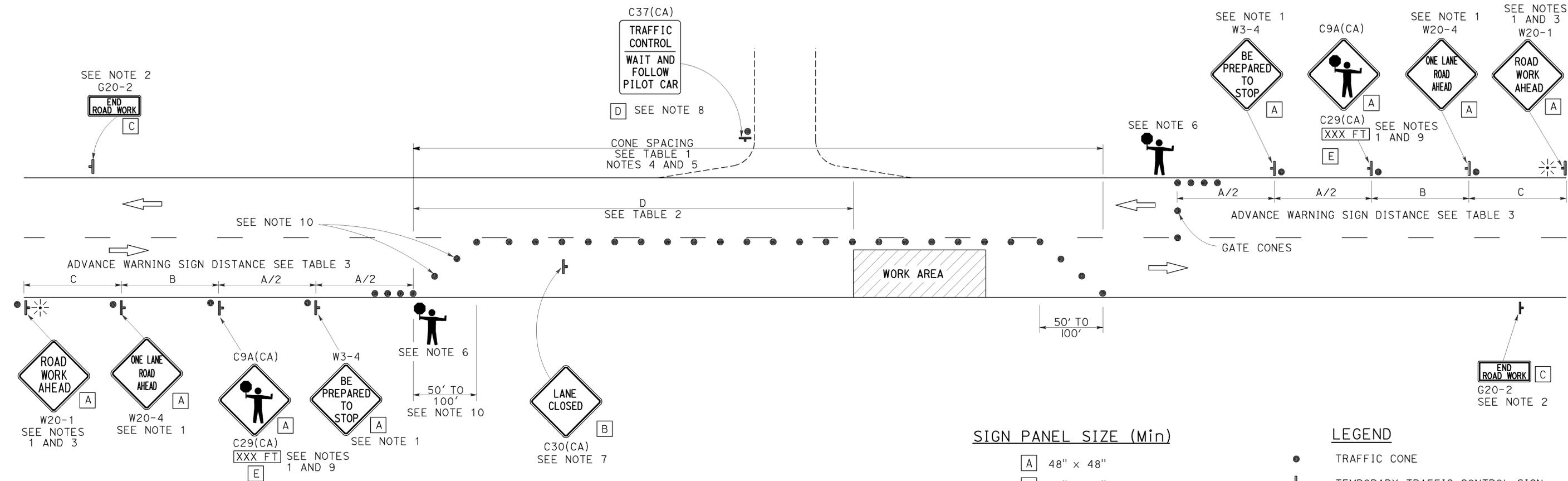

 REGISTERED CIVIL ENGINEER
 April 19, 2013
 PLANS APPROVAL DATE



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

TO ACCOMPANY PLANS DATED 12-23-13

TYPICAL LANE CLOSURE WITH REVERSIBLE CONTROL



NOTES:

- Each advance warning sign in each direction of travel shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
- A G20-2 "END ROAD WORK" sign, as appropriate, shall be placed at the end of the lane control unless the end of work area is obvious, or ends within a larger project's limits.
- If the W20-1 sign would follow within 2000' of a stationary W20-1 or G20-1 "ROAD WORK NEXT _____ MILES", use a W20-4 sign for the first advance warning sign.
- All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
- Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.
- Additional advance flaggers may be required. Flagger should stand in a conspicuous place, be visible to approaching traffic as well as approaching vehicles after the first vehicle has stopped. During the hours of darkness, the flagging station and flagger shall be illuminated and clearly visible to approaching traffic. The illumination footprint of the lighting on the ground shall be at least 20' in diameter. Place a minimum of four cones at 50' intervals in advance of flagger station as shown.
- Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work areas. They are optional if the work area is visible from the flagger station.
- When a pilot car is used, place a C37(CA) "TRAFFIC CONTROL-WAIT AND FOLLOW PILOT CAR" sign with black legend on white background at all intersections, driveways and alleys without a flagger within traffic control area. Signs shall be clean and visible at all times. Where traffic can not be effectively self-regulated, at least one flagger shall be used at each intersection within traffic control area.
- An optional C29(CA) sign may be placed below the C9A(CA) sign.
- Either traffic cones or barricades shall be placed on the taper. Barricades shall be Type I, II, or III.

SIGN PANEL SIZE (Min)

- A 48" x 48"
- B 30" x 30"
- C 36" x 18"
- D 36" x 42"
- E 20" x 7"

LEGEND

- TRAFFIC CONE
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ⚡ PORTABLE FLASHING BEACON
- 👤 FLAGGER

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
**TRAFFIC CONTROL SYSTEM
 FOR LANE CLOSURE ON
 TWO LANE CONVENTIONAL
 HIGHWAYS**
 NO SCALE

RSP T13 DATED APRIL 19, 2013 SUPERSEDES STANDARD PLAN T13
 DATED MAY 20, 2011 - PAGE 241 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP T13

2010 REVISED STANDARD PLAN RSP T13