

INDEX OF PLANS

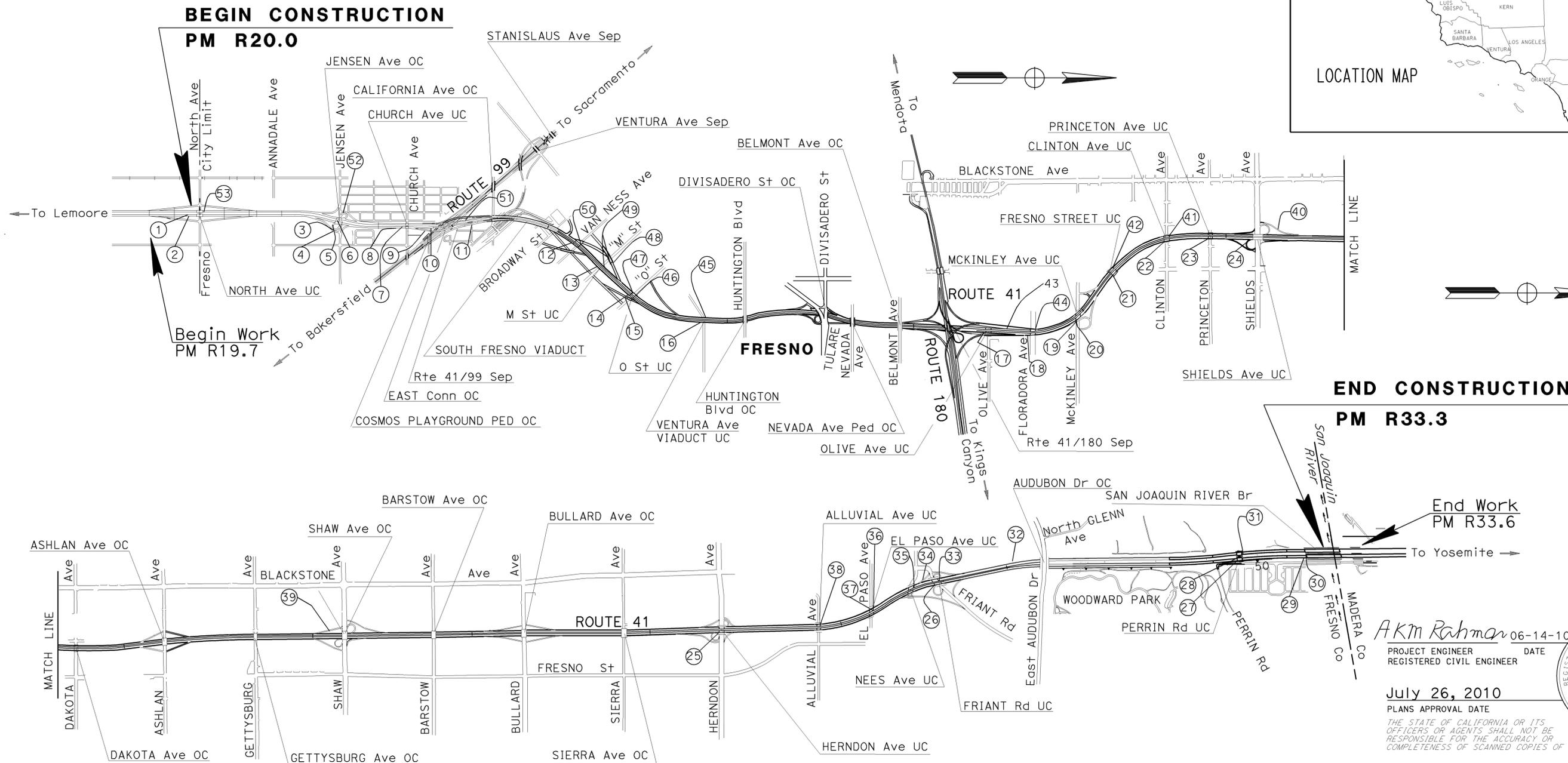
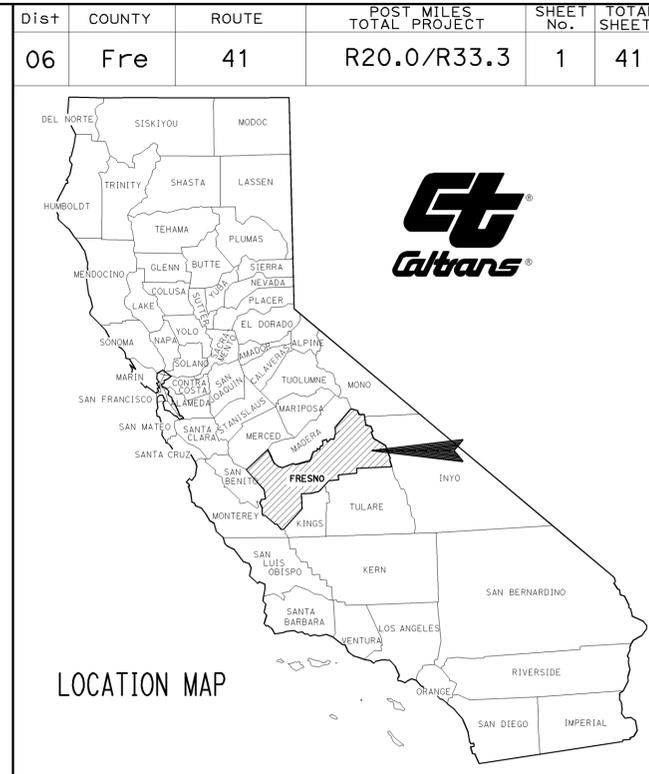
SHEET No.	DESCRIPTION
1	TITLE AND LOCATION MAP
2	LOCATION OF CONSTRUCTION
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27	CONSTRUCTION AREA SIGNS
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31-41	REVISED STANDARD PLANS

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

STATE OF CALIFORNIA **ACHSNHG-P041(118)E**  
**DEPARTMENT OF TRANSPORTATION**  
**PROJECT PLANS FOR CONSTRUCTION ON**  
**STATE HIGHWAY**

**IN FRESNO COUNTY IN FRESNO AT VARIOUS LOCATIONS**  
**FROM NORTH AVENUE UNDERCROSSING**  
**TO MADERA COUNTY LINE**

TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2006



PROJECT MANAGER  
**VICTOR SHAW**  
 DESIGN ENGINEER  
**GETACHEW ESHETE**

**Akm Rahman** 06-14-10  
 PROJECT ENGINEER DATE  
 REGISTERED CIVIL ENGINEER  
**AKM F. RAHMAN**  
 No. 74163  
 Exp. 6/30/11  
 CIVIL  
 STATE OF CALIFORNIA

July 26, 2010  
 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."

NO SCALE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	2	41

*AKM Rahman* 06-14-10  
REGISTERED CIVIL ENGINEER DATE

7-26-10  
PLANS APPROVAL DATE

AKM F. RAHMAN  
No. 74163  
Exp 6/30/11  
CIVIL

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### LOCATIONS OF CONSTRUCTION

DIRECTION	LOCATION No. Ⓝ	POST MILE	DESCRIPTION
NB	1	R20.08	NORTH Ave UC (L+)
	2	R20.08	NORTH Ave UC (R+)
	3	R21.00	JENSEN OFF-RAMP (L+)
	4	R21.00	JENSEN OFF-RAMP (R+)
	5	R21.08	EB JENSEN LOOP ON-RAMP
	6	R21.11	JENSEN Ave OC
	7	R21.60	CHURCH Ave UC (L+)
	8	R21.60	CHURCH Ave UC (R+)
	9	R21.68	NB OFF TO NB Rte 99 (L+)
	10	R21.94	41/99 Sep Br 42-266 (R+)
	11	R22.11	FRESNO VIADUCT (R+)
	12	R22.64	VAN NESS UC (R+)
	13	R22.80	"M" STREET UC (R+)
	14	R22.95	"O" STREET UC (R+)
	15	R23.01	NB ON-RAMP FROM "M" St (R+)
	16	R23.07	VENTURA Ave Via 42-278(R+)
	17	R24.75	OLIVE Ave UC (R+)
	18	R25.00	FLORADORA Ave OH (R+)
	19	R25.27	MCKINLEY OFF-RAMP (R+)
	20	R25.27	MCKINLEY Ave UC
	21	R25.60	FRESNO St UC (R+)
	22	R25.95	CLINTON Ave UC (R+)
	23	R26.21	PRINCETON Ave UC (R+)
	24	R26.46	SHIELDS Ave UC (R+)
	25	R28.62	HERNDON Ave UC (R+)
	26	R31.69	FRIANT Rd UC (R+)
	27	R32.86	PERRIN Rd UC (R+)
	28	R32.86	PERRIN Rd UC (L+)
	29	RR33.34	SAN JOAQUIN RIVER Br (R+)
	30	RR33.34	SAN JOAQUIN RIVER Br (L+)

DIRECTION Ⓝ	LOCATION No.	POST MILE	DESCRIPTION
SB	31	R32.89	PERRIN Rd UC (L+)
	32	R31.81	FRIANT Rd SIGN
	33	R31.68	FRIANT Rd UC (L+)
	34	R31.55	SB ON FROM EB FRIANT
	35	R31.5	NEES Ave UC (L+)
	36	R31.20	EL PASO Ave UC (R+)
	37	R31.20	EL PASO Ave UC (L+)
	38	R30.95	ALLUVIAL Ave UC (R+)
	39	R28.32	SB ON-RAMP FROM EB SHAW
	40	R26.68	SB OFF-RAMP TO SHIELDS
	41	R25.95	CLINTON Ave UC (R+)
	42	R25.60	FRESNO St UC (R+)
	43	R24.75	OLIVE Ave UC (R+)
	44	R23.50	FLORADORA Ave UC (R+)
	45	R23.07	VENTURA Ave Via (R+)
	46	R22.95	"O" St UC (R+)
	47	R22.95	"O" St UC (R+) DEPARTURE
	48	R22.80	SB OFF-RAMP TO "M" St (R+)
	49	R22.80	"M" St UC (R+)
	50	R22.65	VAN NESS Ave UC (R+)
	51	R21.79	41/99 SEPERATION
	52	R20.945	SB LOOP-ON FROM JENSEN Ave
	53	R20.11	NORTH Ave UC (L+)

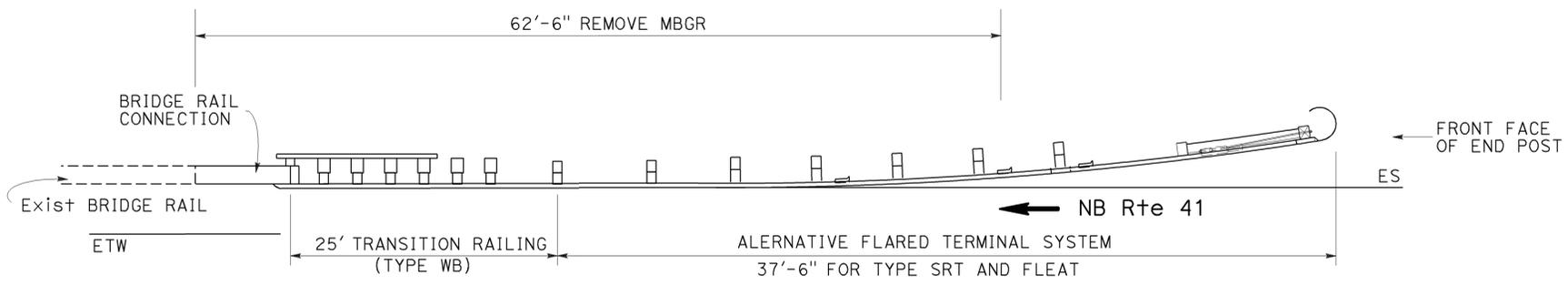
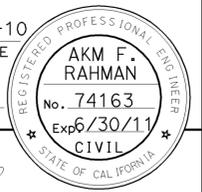
### LOCATION OF CONSTRUCTION LC-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 DESIGN  
 FUNCTIONAL SUPERVISOR  
 GETACHEW ESHETE  
 CALCULATED/DESIGNED BY  
 CHECKED BY  
 AKM RAHMAN  
 KHALID CHAOUT  
 REVISED BY  
 DATE REVISED

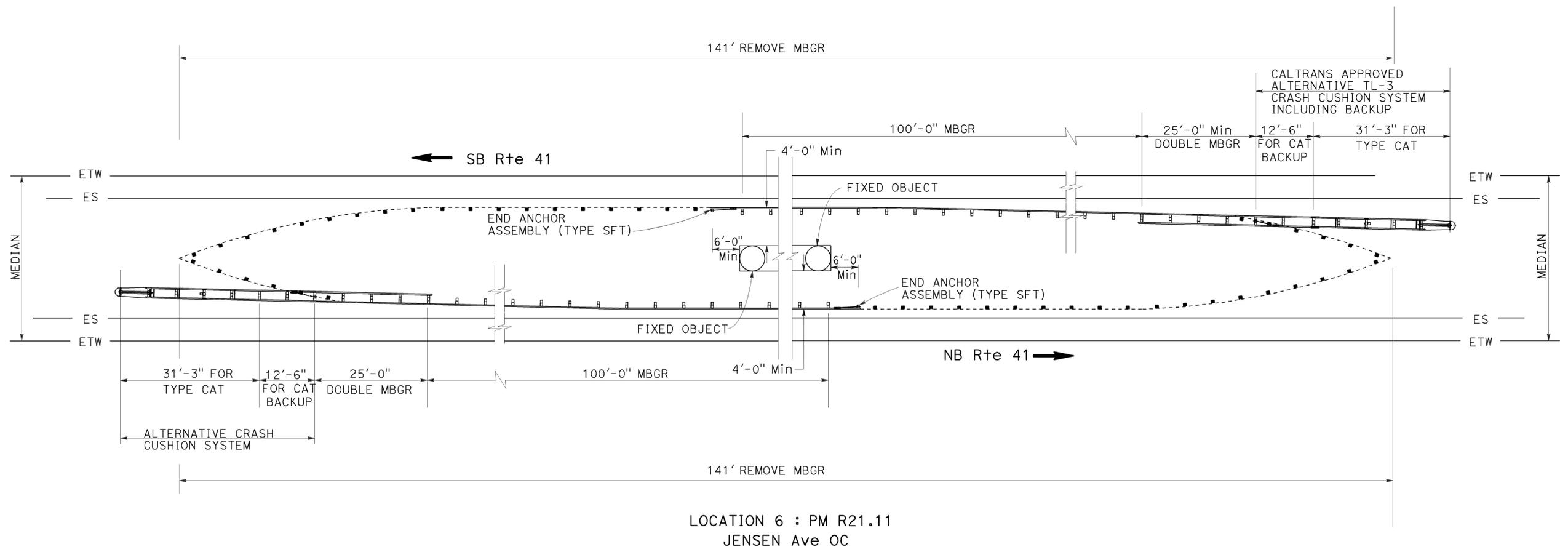
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 07-25-10 TIME PLOTTED => 15:53



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	4	41
AKM Rahman		06-14-10		REGISTERED CIVIL ENGINEER DATE	
7-26-10		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>					



- LOCATION 3: NB PM R21.0 JENSEN OFF-RAMP (L+)
- LOCATION 4: NB PM R21.0 JENSEN OFF-RAMP (R+)
- LOCATION 5: NB PM R21.08 JENSEN LOOP ON-RAMP
- LOCATION 9: NB PM R21.68 NB OFF TO NB Rte 99 (L+)
- LOCATION 14: NB PM R22.95 "O" S+ UC (R+)
- LOCATION 24: NB PM R26.46 SHIELDS Ave UC (R+)



LOCATION 6 : PM R21.11  
JENSEN Ave OC

**EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS**

**CONSTRUCTION DETAILS**  
NO SCALE **C-2**

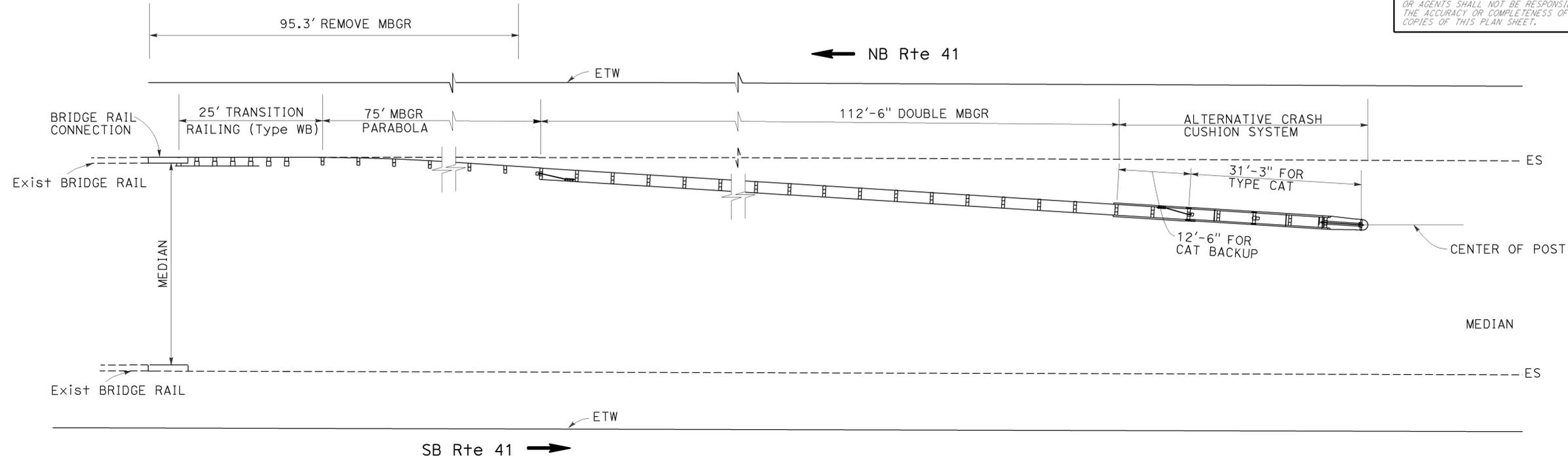
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 DESIGN  
 FUNCTIONAL SUPERVISOR: GETACHEW ESHETE  
 CALCULATED/DESIGNED BY: AKM RAHMAN  
 CHECKED BY: WILLIAM LEON  
 REVISED BY: AKM RAHMAN  
 DATE REVISED: WILLIAM LEON

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	5	41

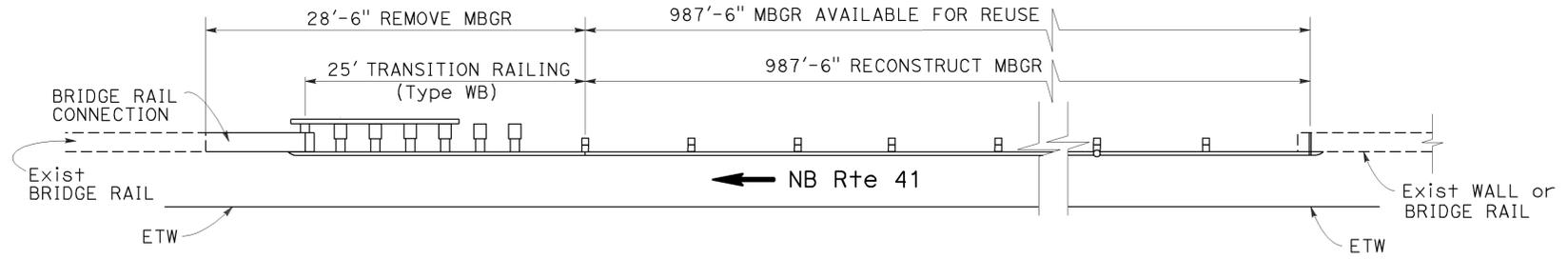
AKM Rahman 06-14-10  
 REGISTERED CIVIL ENGINEER DATE  
 7-26-10  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 AKM F. RAHMAN  
 No. 74163  
 Exp 6/30/11  
 CIVIL  
 STATE OF CALIFORNIA

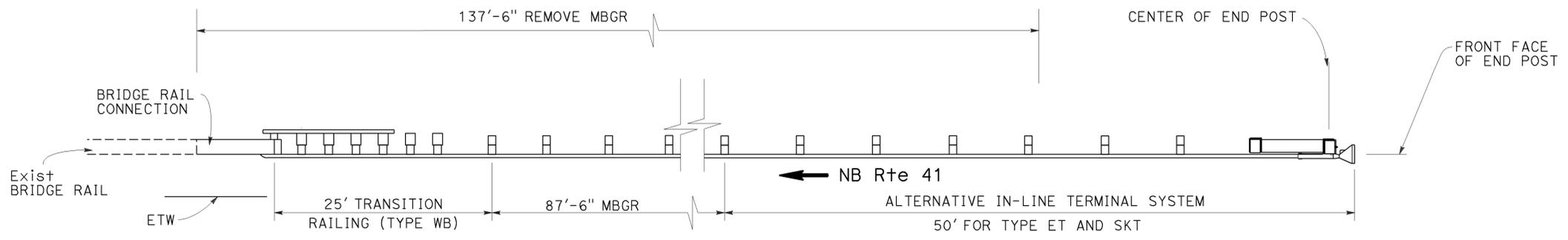
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



LOCATION 7 : NB PM R21.60  
CHURCH Ave UC (L+)



LOCATION 8 NB PM R21.60 CHURCH Ave UC (R+)



LOCATION 10: NB PM R21.94 Rte 41/99 Sep Br (R+)

EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS

**CONSTRUCTION DETAILS**  
NO SCALE **C-3**

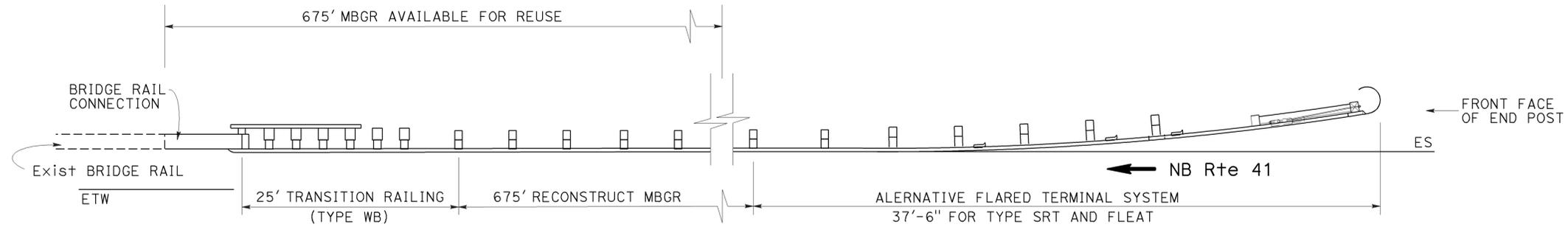
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 DESIGN  
 Caltrans®  
 FUNCTIONAL SUPERVISOR  
 GETACHEW ESHETE  
 CALCULATED/DESIGNED BY  
 CHECKED BY  
 AKM RAHMAN  
 WILLIAM LEON  
 REVISED BY  
 DATE REVISED

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	6	41

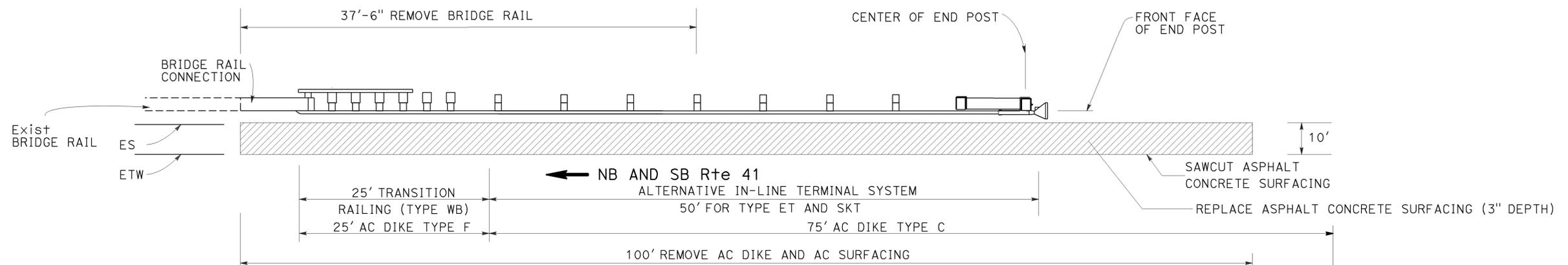
A.K.M. Rahman 06-14-10  
 REGISTERED CIVIL ENGINEER DATE  
 7-26-10  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 AKM F. RAHMAN  
 No. 74163  
 Exp 6/30/11  
 CIVIL  
 STATE OF CALIFORNIA

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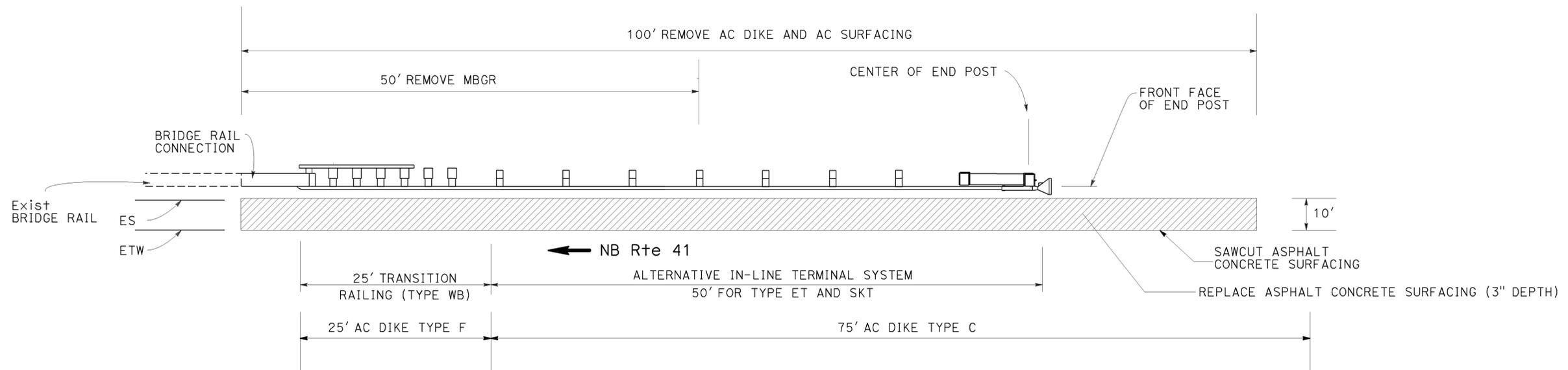


LOCATION 11: NB PM R22.11 FRESNO VIADUCT (R+)



LOCATION 12: NB PM R22.64 VAN NEES UC (R+)

LOCATION 50: SB PM R22.64 VAN NEES UC (R+), EXCLUDING REPLACE ASPHALT CONCRETE SURFACING



LOCATION 13: NB PM R22.80 "M" St UC (R+)

EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS

**CONSTRUCTION DETAILS**  
NO SCALE **C-4**

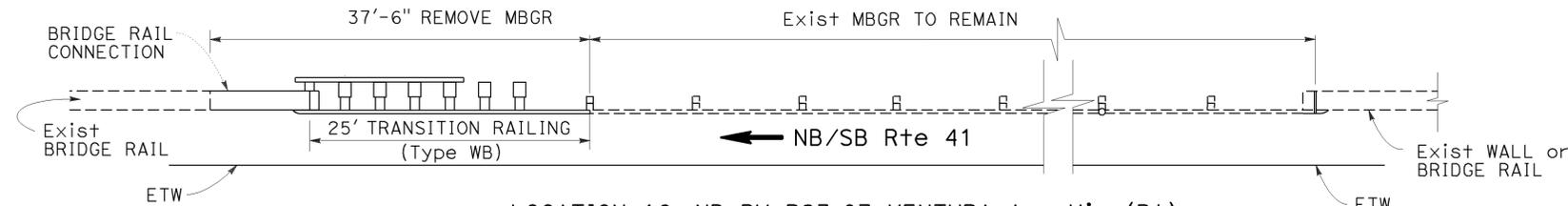
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**Caltrans**  
 DESIGN  
 FUNCTIONAL SUPERVISOR: GETACHEW ESHETE  
 CHECKED BY: AKM RAHMAN, WILLIAM LEON  
 REVISIONS: REVISED BY: AKM RAHMAN, WILLIAM LEON; DATE: 06-14-10; DATE: 07-26-10

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	7	41

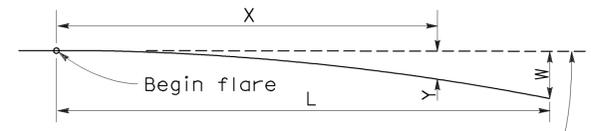
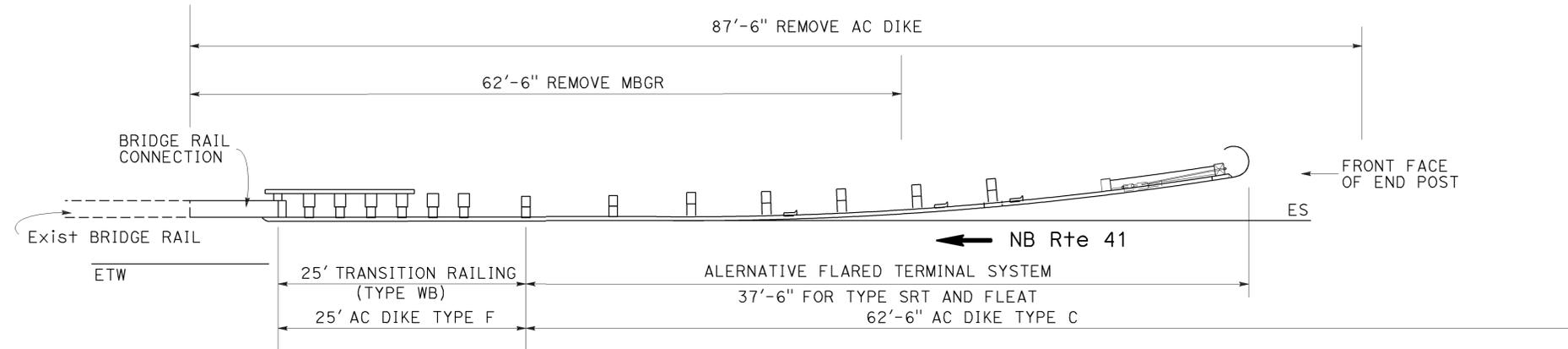
AKM Rahman 06-14-10  
 REGISTERED CIVIL ENGINEER DATE  
 7-26-10  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 AKM F. RAHMAN  
 No. 74163  
 Exp 6/30/11  
 CIVIL  
 STATE OF CALIFORNIA

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- LOCATION 16: NB PM R23.07 VENTURA Ave Via (R+)
- LOCATION 18: NB PM R25.00 FLORADORA Ave OH (R+)
- LOCATION 19: NB PM R25.27 MCKINLEY OFF-RAMP (R+)
- LOCATION 22: NB PM R25.95 CLINTON Ave UC (R+)
- LOCATION 23: NB PM R26.21 PRINCETON Ave UC (R+)
- LOCATION 36: SB PM R31.20 EL PASO Ave UC (R+)
- LOCATION 38: SB PM R30.95 ALLUVIAL Ave UC (R+)
- LOCATION 41: SB PM R25.95 CLINTON Ave UC (R+)
- LOCATION 42: SB PM R25.60 FRESNO St UC (R+)
- LOCATION 44: SB PM R23.50 FLORADORA Ave UC (R+)



Base Line (Edge of paved shoulder or offset line of edge of traveled way)

Y = Offset from base line

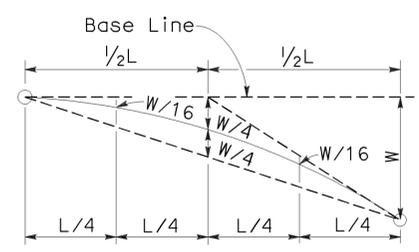
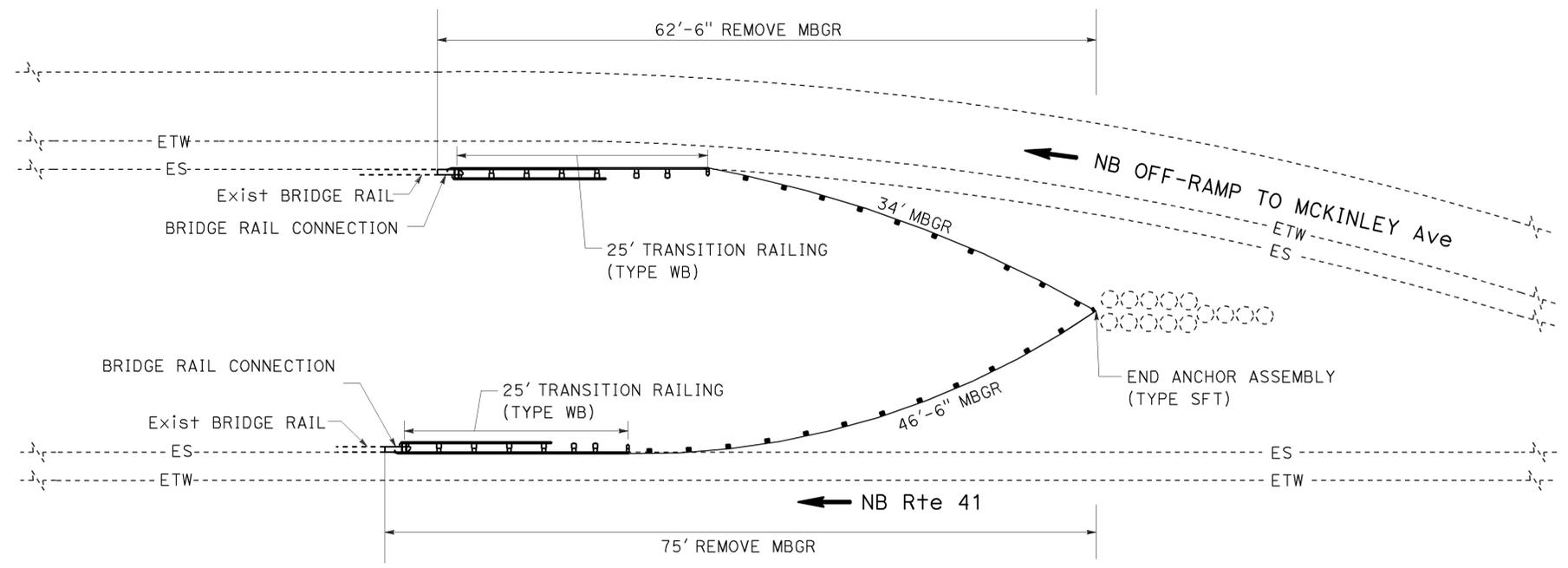
W = Maximum offset

X = Distance along base line

L = Length of flare

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

**PARABOLIC FLARE OFFSETS**



**TYPICAL PARABOLIC LAYOUT**

**CONSTRUCTION DETAILS**

NO SCALE C-5

**EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 Et Caltrans®  
 FUNCTIONAL SUPERVISOR: GETACHEW ESHETE  
 CALCULATED/DESIGNED BY: AKM RAHMAN  
 CHECKED BY: WILLIAM LEON  
 REVISED BY: [blank]  
 DATE REVISED: [blank]

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UNIT 1475

PROJECT NUMBER & PHASE 0600000421

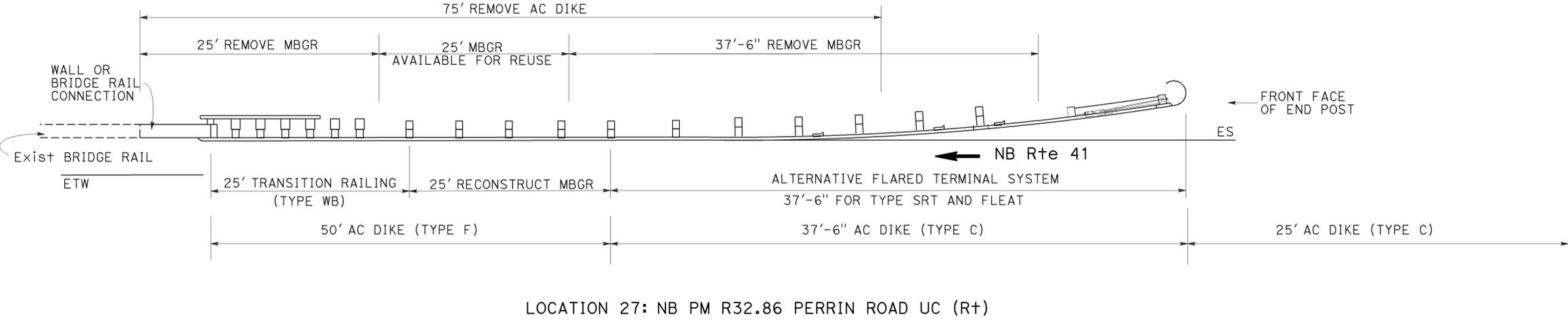
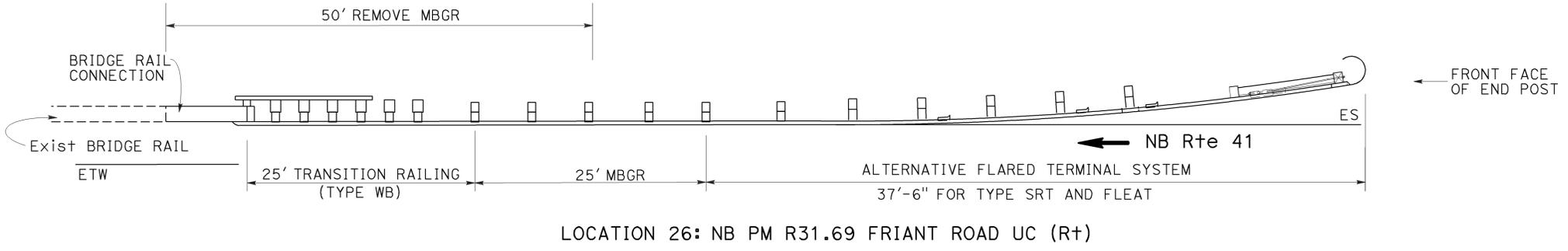
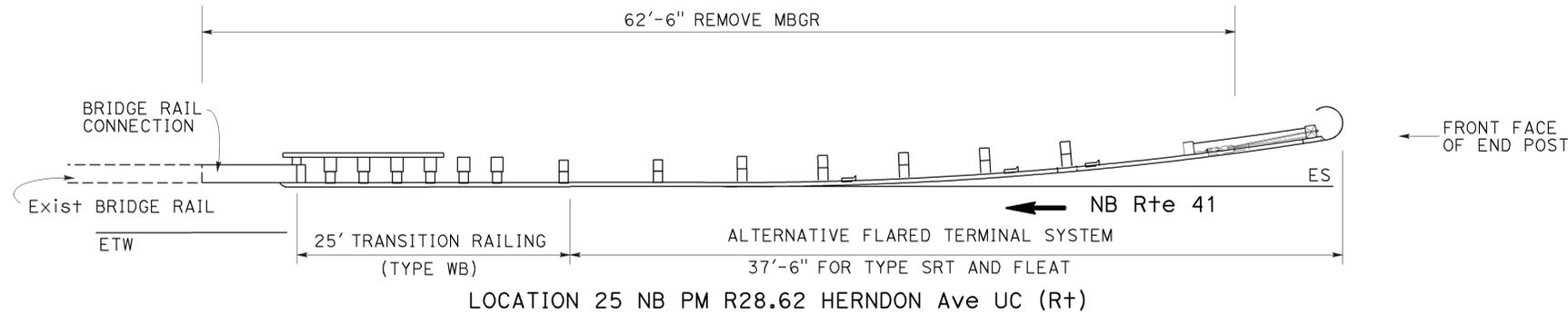
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 07-25-10 TIME PLOTTED => 15:54

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	FRE	41	R20.0/R33.3	8	41

AKM Rahman 06-14-10  
 REGISTERED CIVIL ENGINEER DATE  
 7-26-10  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 AKM F. RAHMAN  
 No. 74163  
 Exp 6/30/11  
 CIVIL  
 STATE OF CALIFORNIA

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**EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS**

**CONSTRUCTION DETAILS C-6**  
NO SCALE

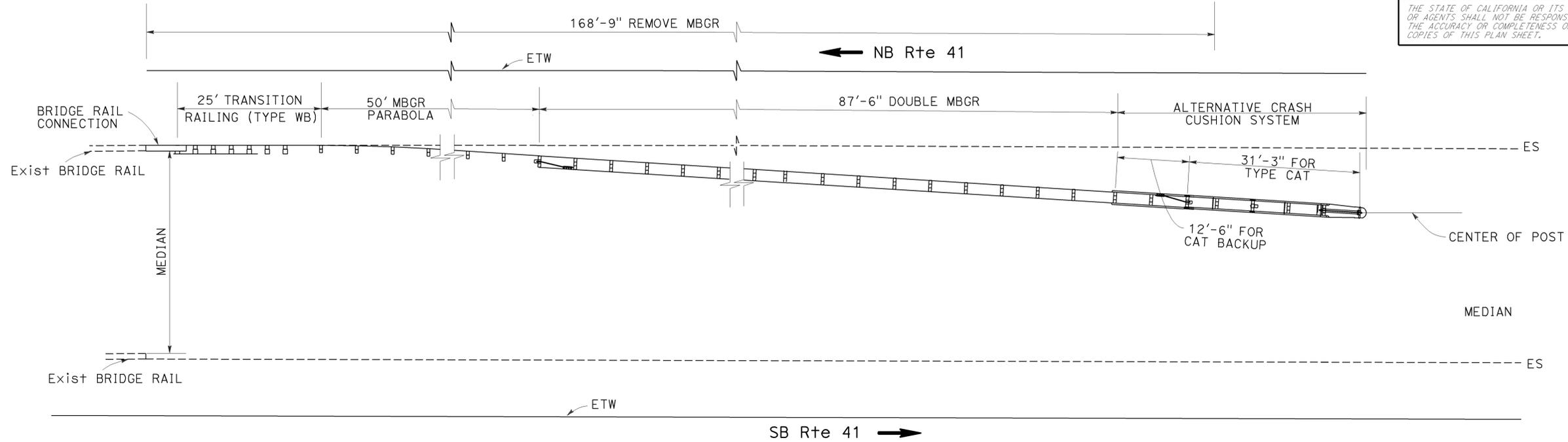
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 DESIGN  
 FUNCTIONAL SUPERVISOR: GETACHEW ESHETE  
 CALCULATED/DESIGNED BY: CHECKED BY:  
 AKM RAHMAN WILLIAM LEON  
 REVISED BY: DATE REVISED:

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	FRE	41	R20.0/R33.3	9	41

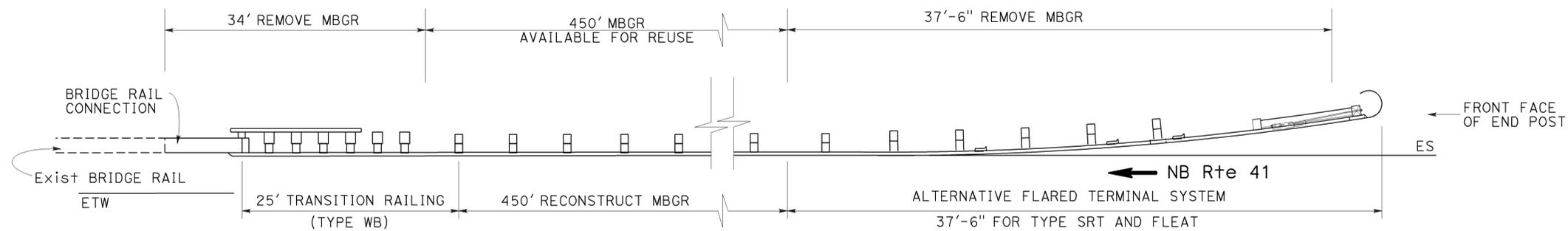
AKM Rahman 06-14-10  
 REGISTERED CIVIL ENGINEER DATE  
 7-26-10  
 PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER  
 AKM F. RAHMAN  
 No. 74163  
 Exp 6/30/11  
 CIVIL  
 STATE OF CALIFORNIA



LOCATION 28 : NB PM R32.86  
PERRIN Rd UC (L+)



LOCATION 29: NB PM RR33.34 SAN JOAQUIN RIVER Br (R+)

EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS

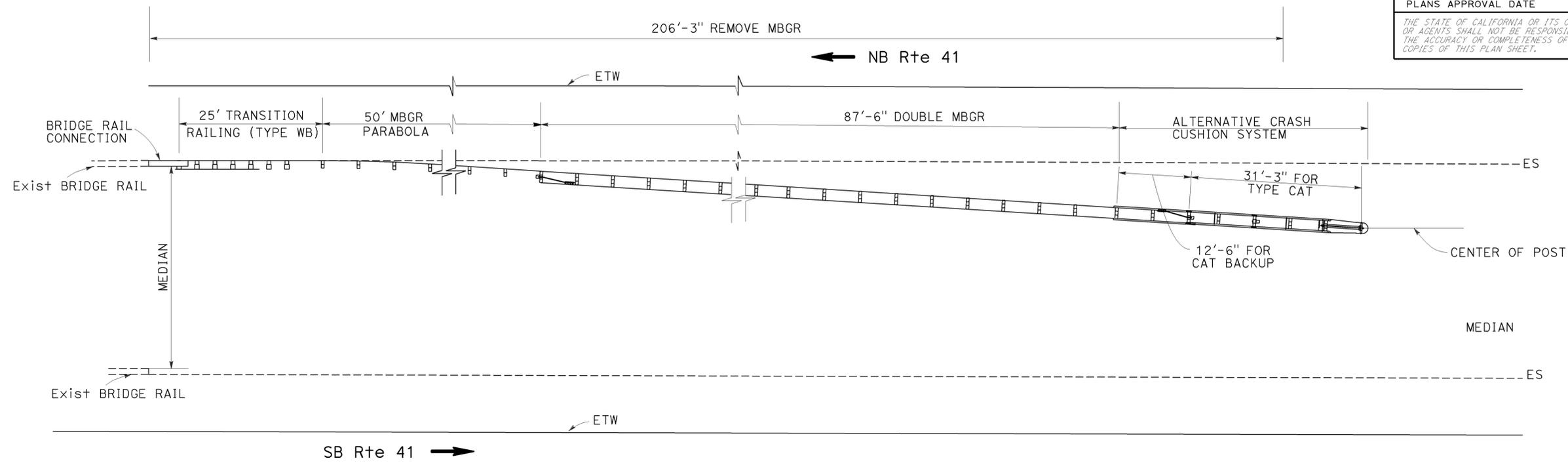
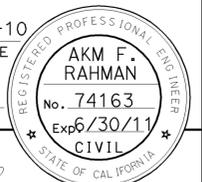
CONSTRUCTION DETAILS

NO SCALE

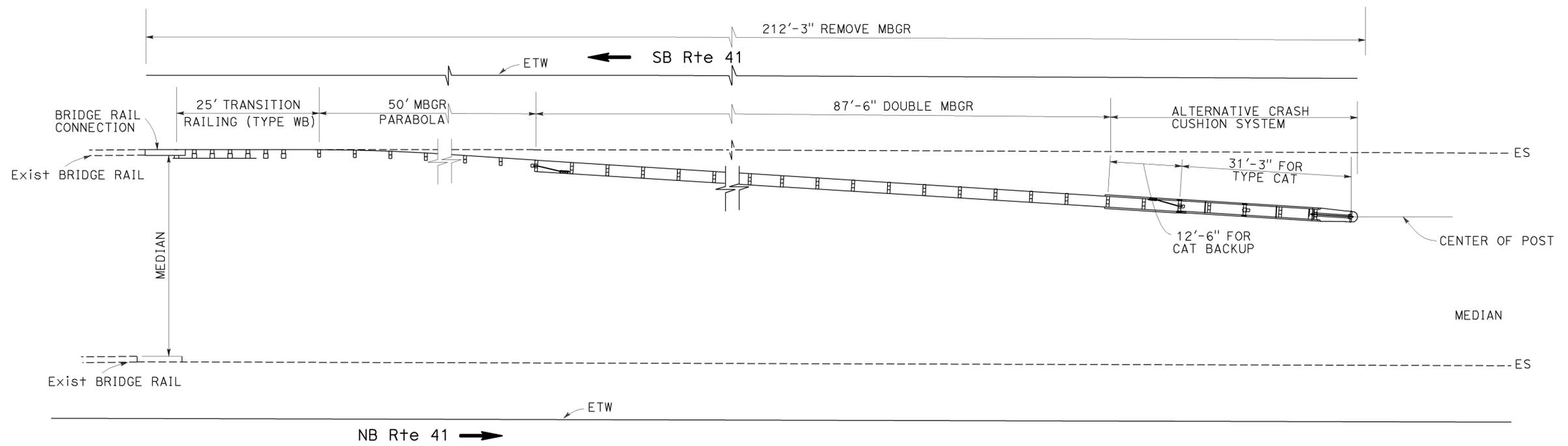
C-7

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 FUNCTIONAL SUPERVISOR  
 GETACHEW ESHETE  
 CALCULATED/DESIGNED BY  
 CHECKED BY  
 AKM RAHMAN  
 WILLIAM LEON  
 REVISED BY  
 DATE REVISED

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	10	41
AKM Rahman			06-14-10	REGISTERED CIVIL ENGINEER DATE	
7-26-10			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>					



LOCATION 30 : NB PM R33.34  
SAN JOAQUIN RIVER Br (L+)



LOCATION 31 : SB PM R32.89  
PERRIN Rd UC (L+)

**EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS**

**CONSTRUCTION DETAILS**

NO SCALE

**C-8**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 DESIGN  
 FUNCTIONAL SUPERVISOR: GETACHEW ESHETE  
 REVISIONS: [Blank]  
 REVISOR: [Blank]  
 DATE: [Blank]  
 CHECKED BY: [Blank]  
 DESIGNED BY: [Blank]  
 WILLIAM LEON  
 AKM RAHMAN

LAST REVISION: [Blank] DATE PLOTTED => 06-JAN-2011  
TIME PLOTTED => 15:54

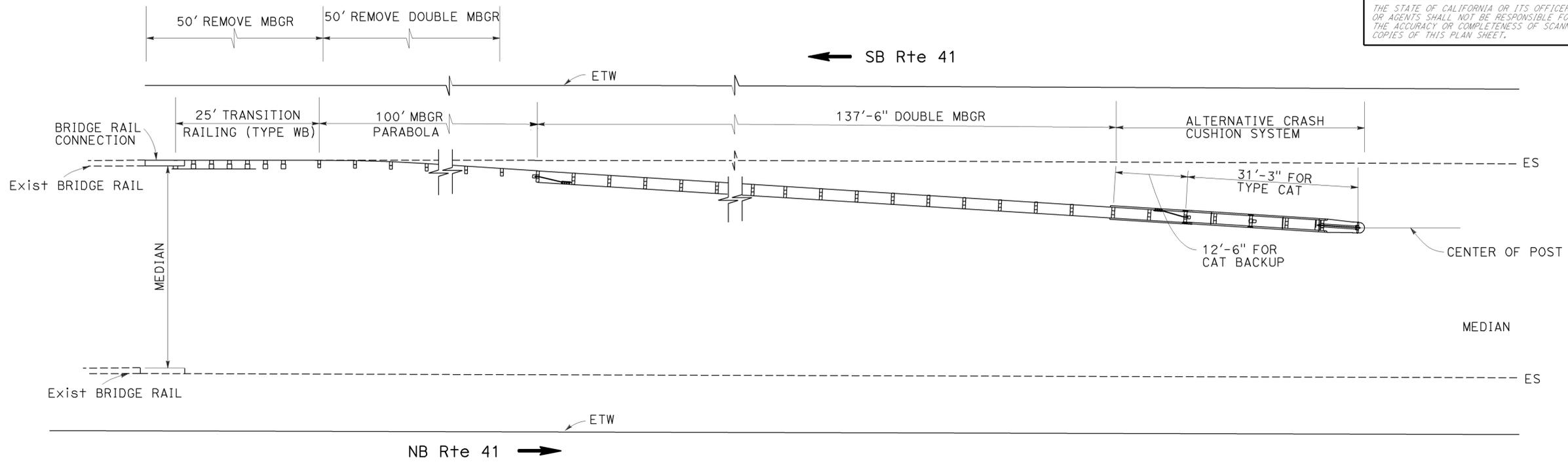
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	11	41

AKM Rahman 06-14-10  
REGISTERED CIVIL ENGINEER DATE

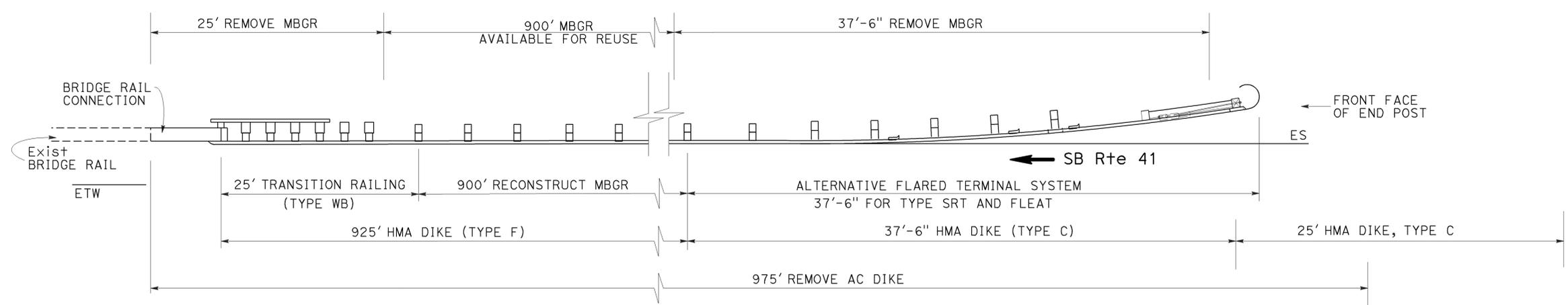
7-26-10  
PLANS APPROVAL DATE

AKM F. RAHMAN  
No. 74163  
Exp 6/30/11  
CIVIL

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



LOCATION 33 : SB PM R31.68  
FRIANT Rd UC (L+)



LOCATION 34: SB PM R31.55, SB ON RAMP FROM EB FRIANT

EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS

CONSTRUCTION DETAILS  
NO SCALE    C-9

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

REVISOR BY DATE  
AKM RAHMAN  
WILLIAM LEON  
CALCULATED/DESIGNED BY  
CHECKED BY

FUNCTIONAL SUPERVISOR  
GETACHEW ESHETE

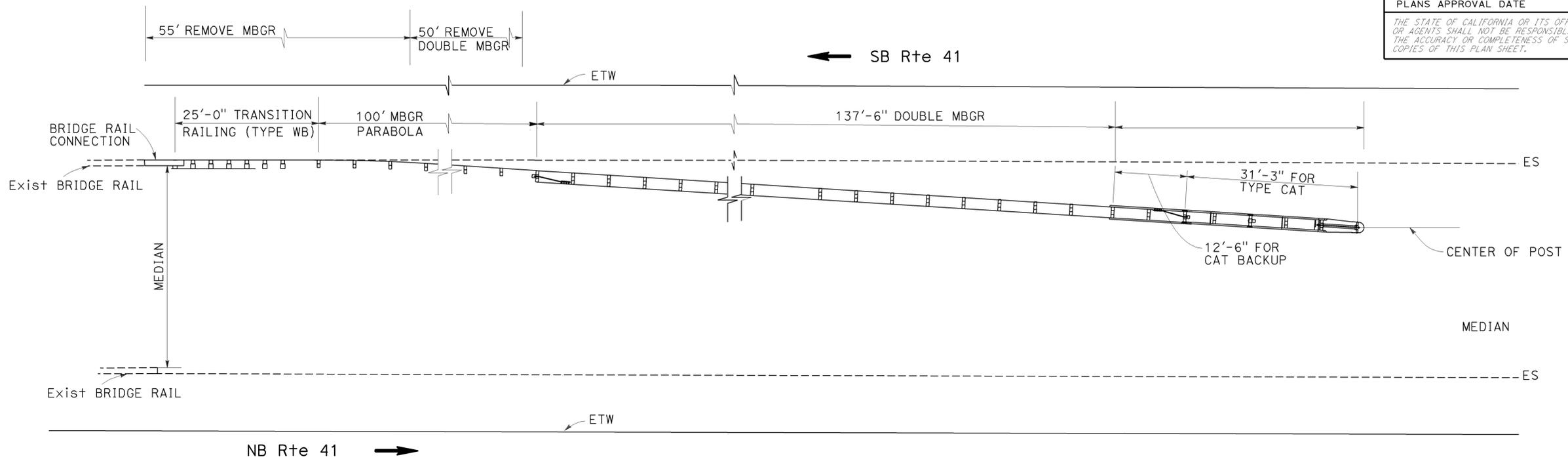
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	12	41

AKM Rahman 06-14-10  
 REGISTERED CIVIL ENGINEER DATE

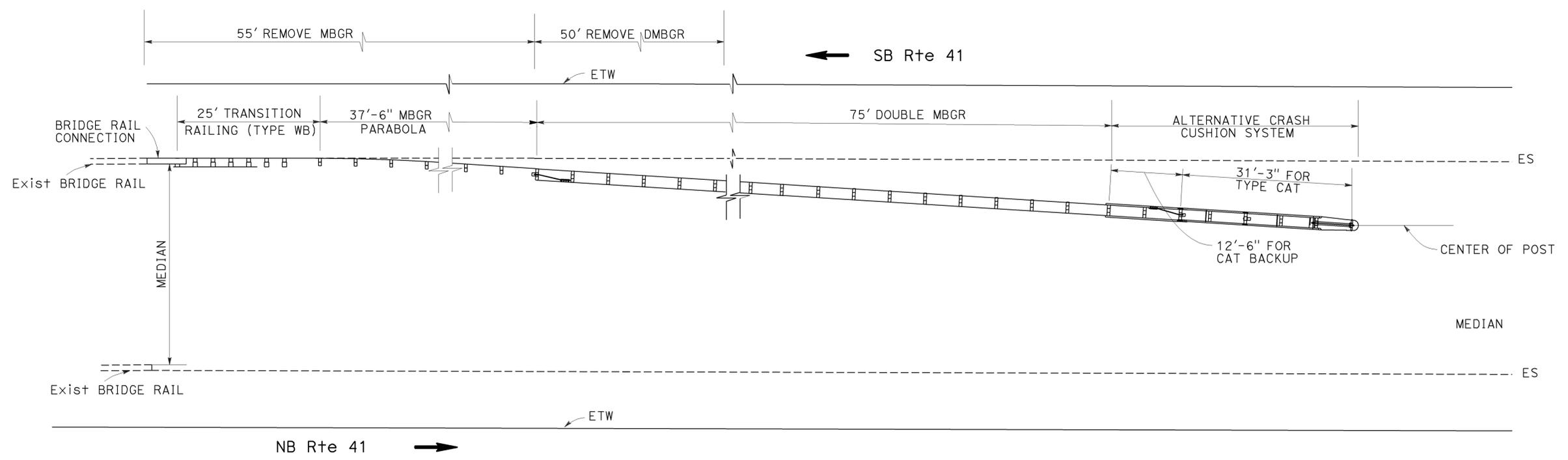
7-26-10  
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AKM F. RAHMAN  
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 Exp 6/30/11  
 CIVIL

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LOCATION 35 : SB PM R31.50  
 NEES Ave UC (L+)



LOCATION 37 : SB PM R31.20  
 EL PASO Ave UC (L+)

EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS

**CONSTRUCTION DETAILS**  
 NO SCALE  
**C-10**

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

FUNCTIONAL SUPERVISOR  
 GETACHEW ESHETE

REVISOR BY  
 AKM RAHMAN  
 WILLIAM LEON

CALCULATED/DESIGNED BY  
 CHECKED BY

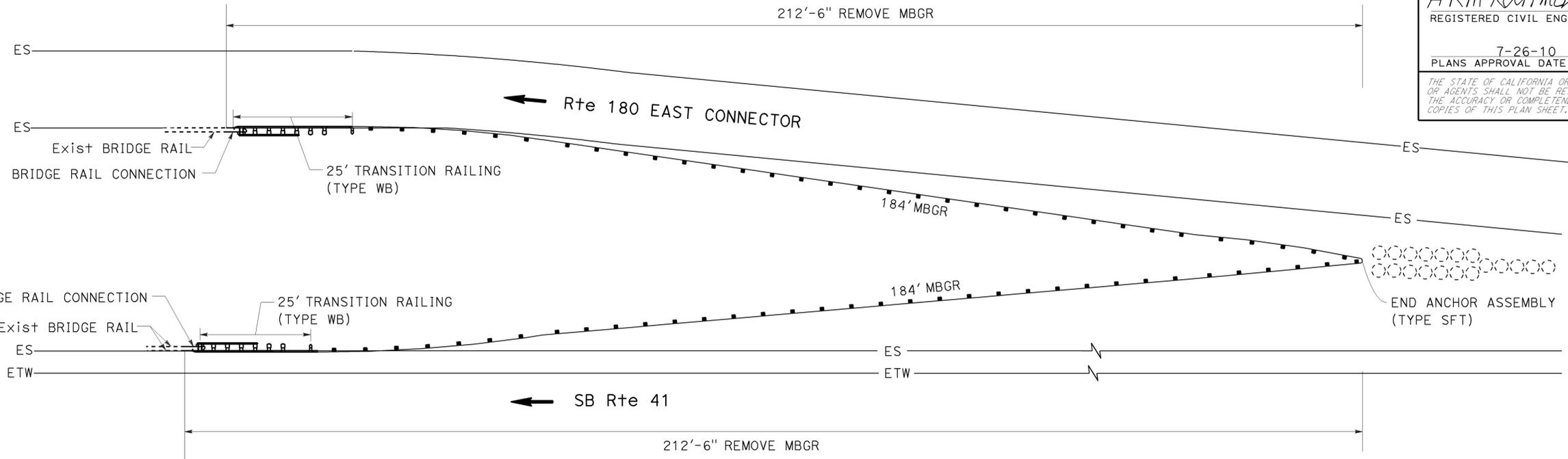
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	13	41

AKM Rahman 06-14-10  
 REGISTERED CIVIL ENGINEER DATE

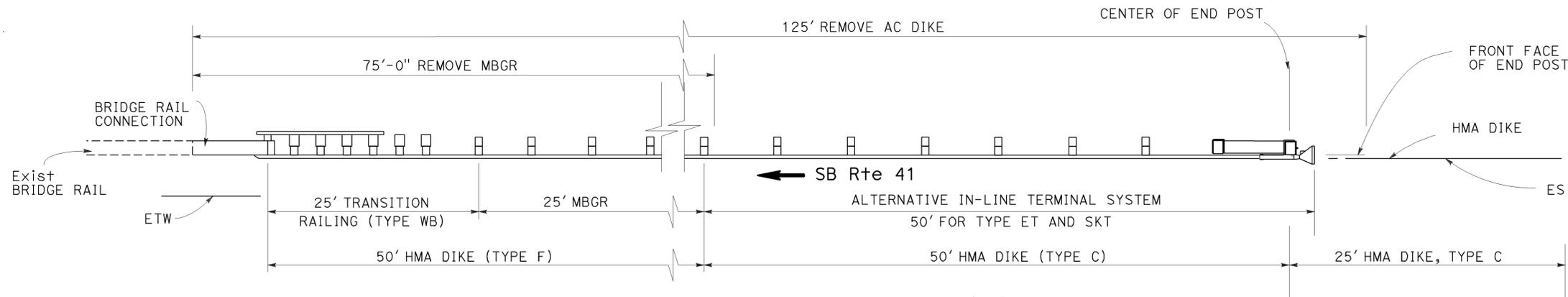
7-26-10  
 PLANS APPROVAL DATE

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.

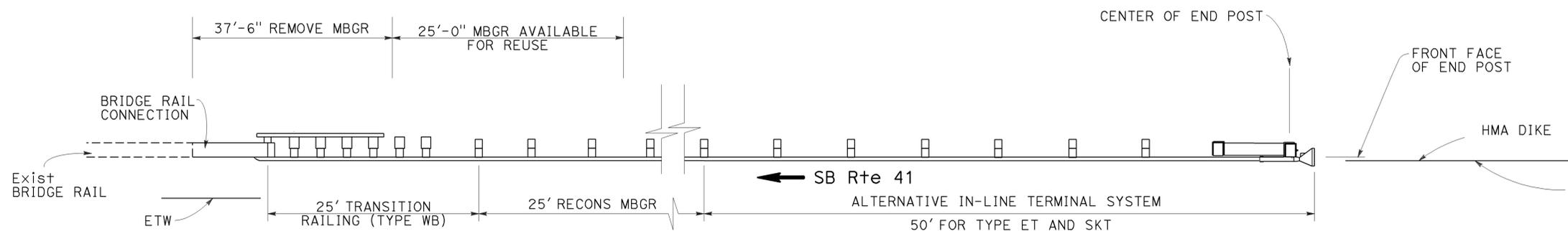
AKM F. RAHMAN  
 No. 74163  
 Exp 6/30/11  
 CIVIL



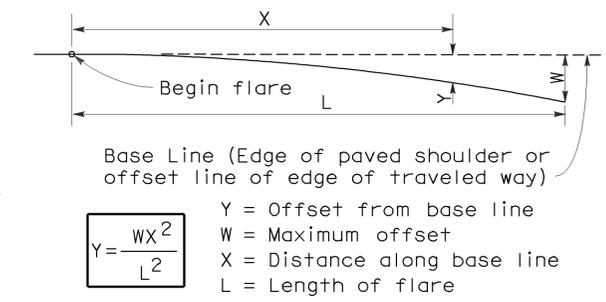
LOCATION 43: SB PM R24.75 OLIVE Ave UC (R+)



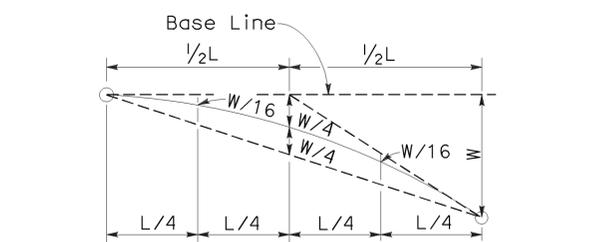
LOCATION 45: SB PM R23.07 VENTURA Ave Via (R+)



LOCATION 46: SB PM R22.95 "0" S+ UC (R+)



**PARABOLIC FLARE OFFSETS**



**TYPICAL PARABOLIC LAYOUT**

**EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS**

**CONSTRUCTION DETAILS**  
 NO SCALE **C-11**

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

FUNCTIONAL SUPERVISOR  
 GETACHEW ESHETE

REVISOR  
 AKM RAHMAN  
 WILLIAM LEON

DESIGNER  
 AKM RAHMAN  
 WILLIAM LEON

DATE  
 06-14-10

LAST REVISION | DATE PLOTTED => 06-JAN-2011 07-25-10 TIME PLOTTED => 15:54

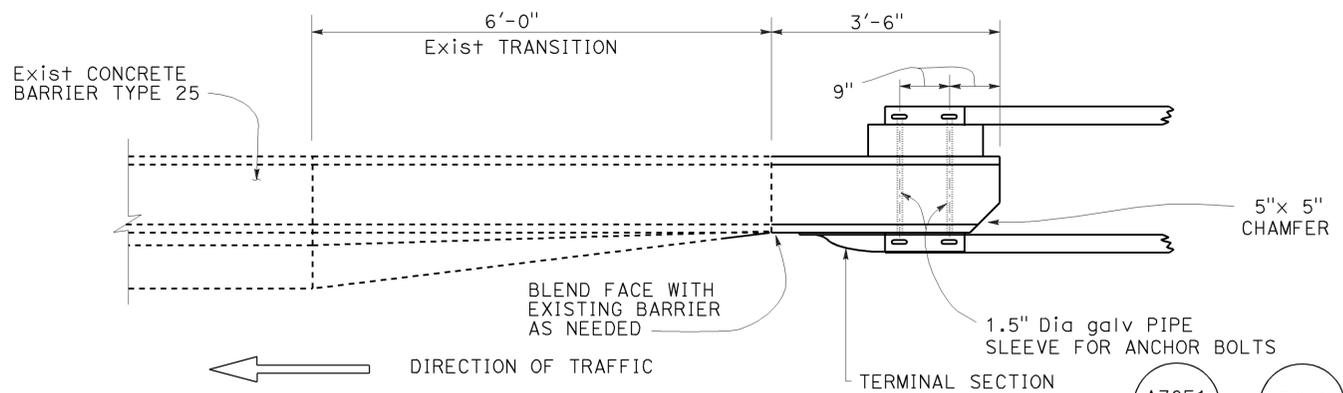


Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	15	41

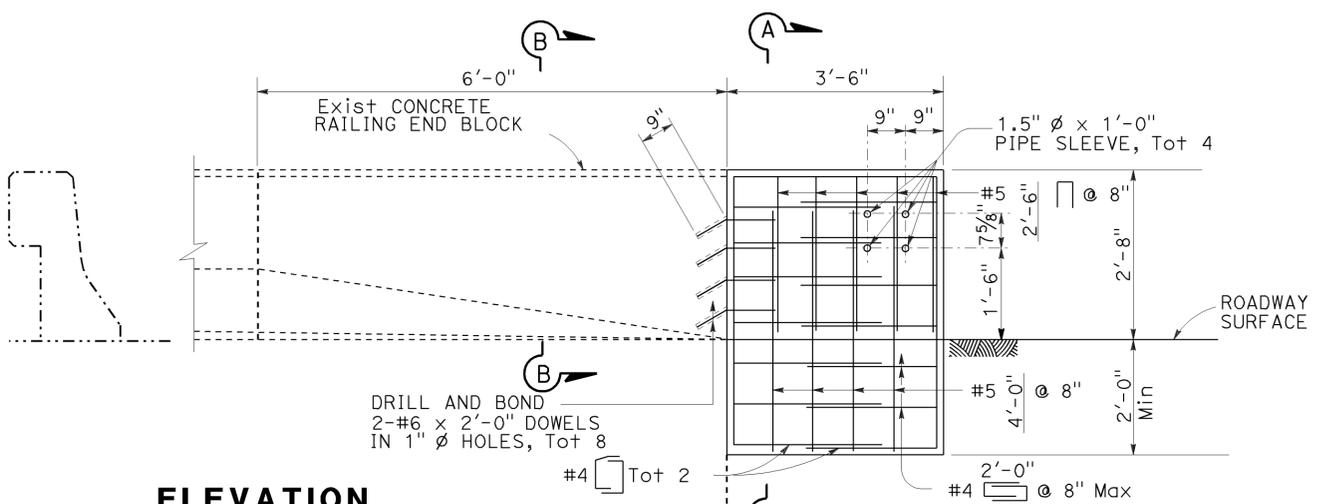
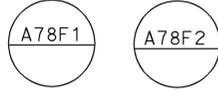
AKM Rahman 06-14-10  
REGISTERED CIVIL ENGINEER DATE  
7-26-10  
PLANS APPROVAL DATE

AKM F. RAHMAN  
No. 74163  
Exp 6/30/11  
CIVIL

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

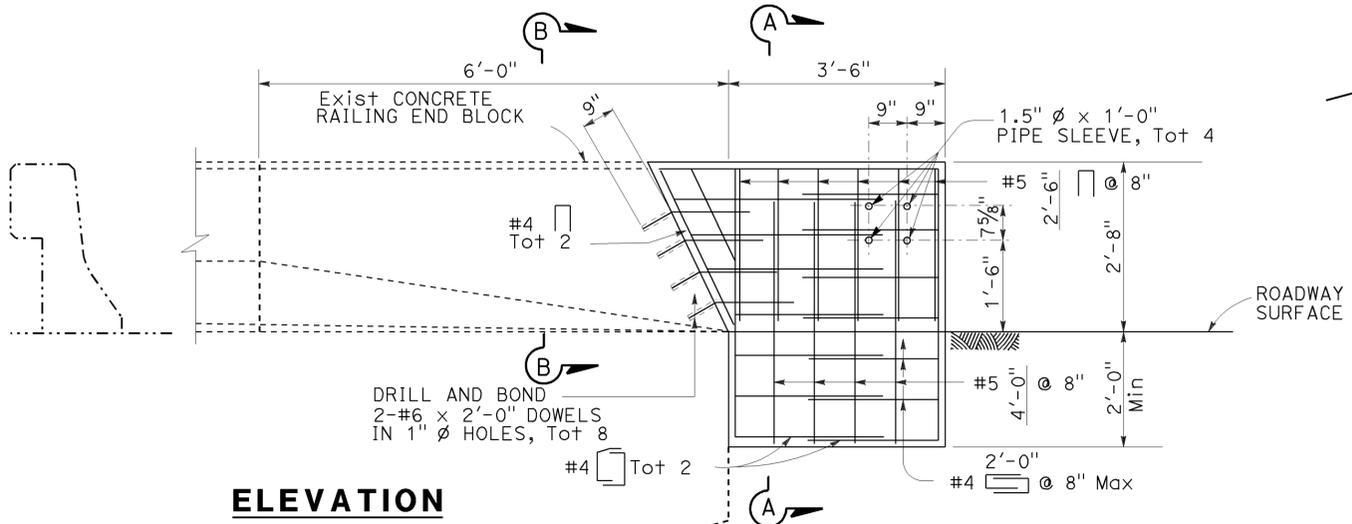


**PLAN**



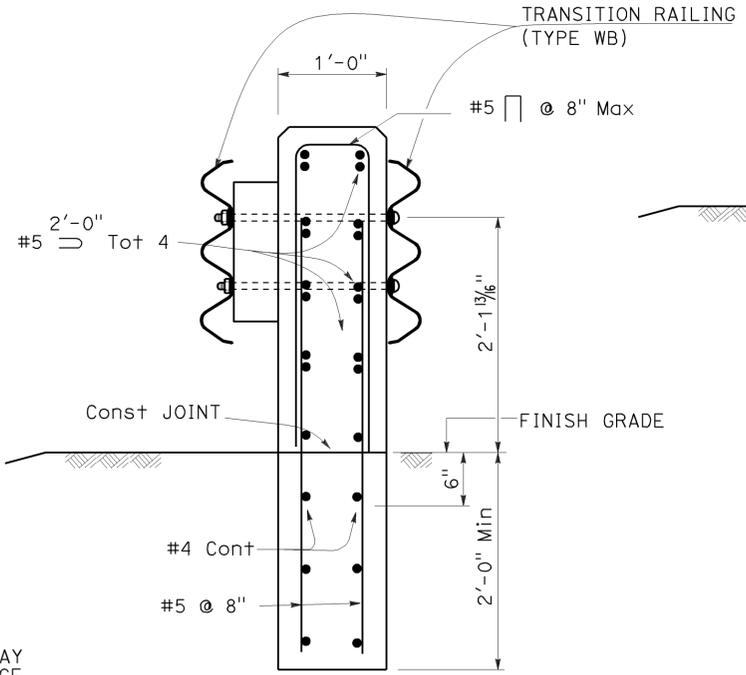
**ELEVATION**

**BRIDGE CONNECTION TYPE 25A**

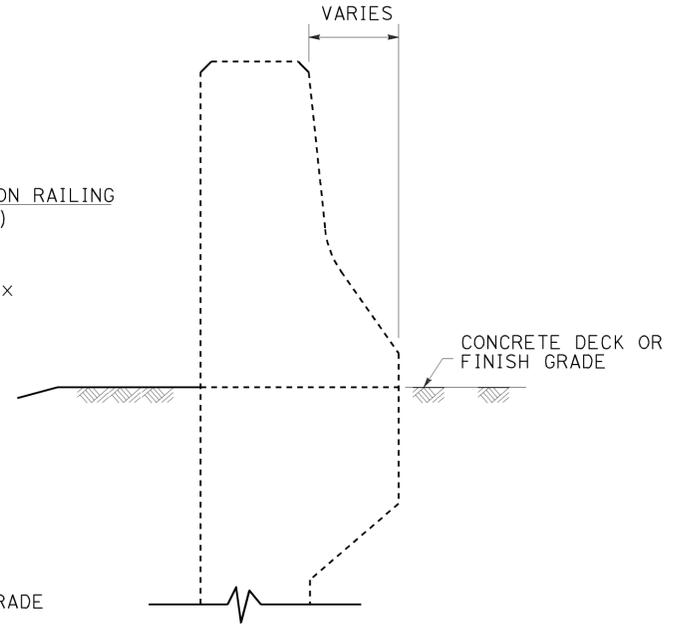


**ELEVATION**

**BRIDGE CONNECTION TYPE 25**



**SECTION A-A**



**SECTION B-B**

EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS

**CONSTRUCTION DETAILS**

NO SCALE

**C-13**

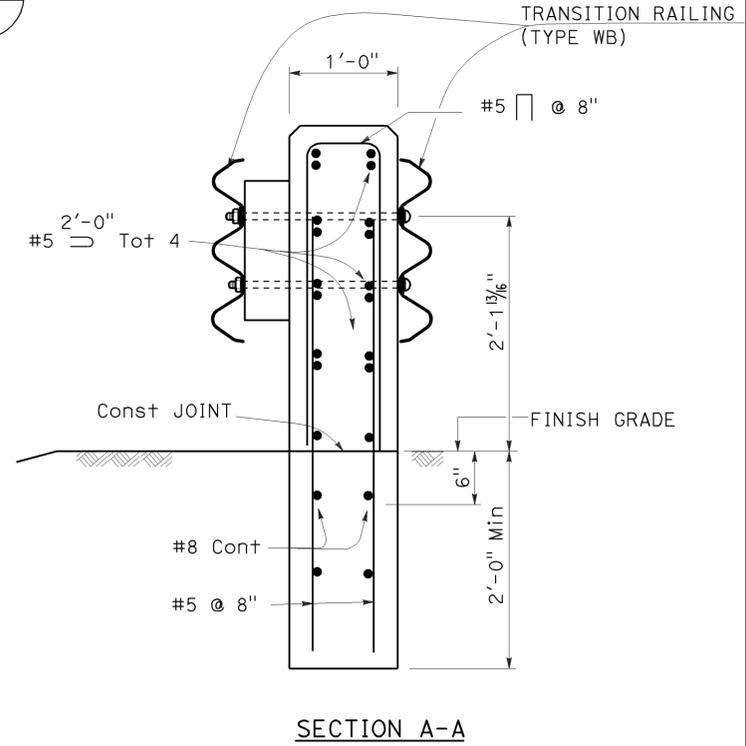
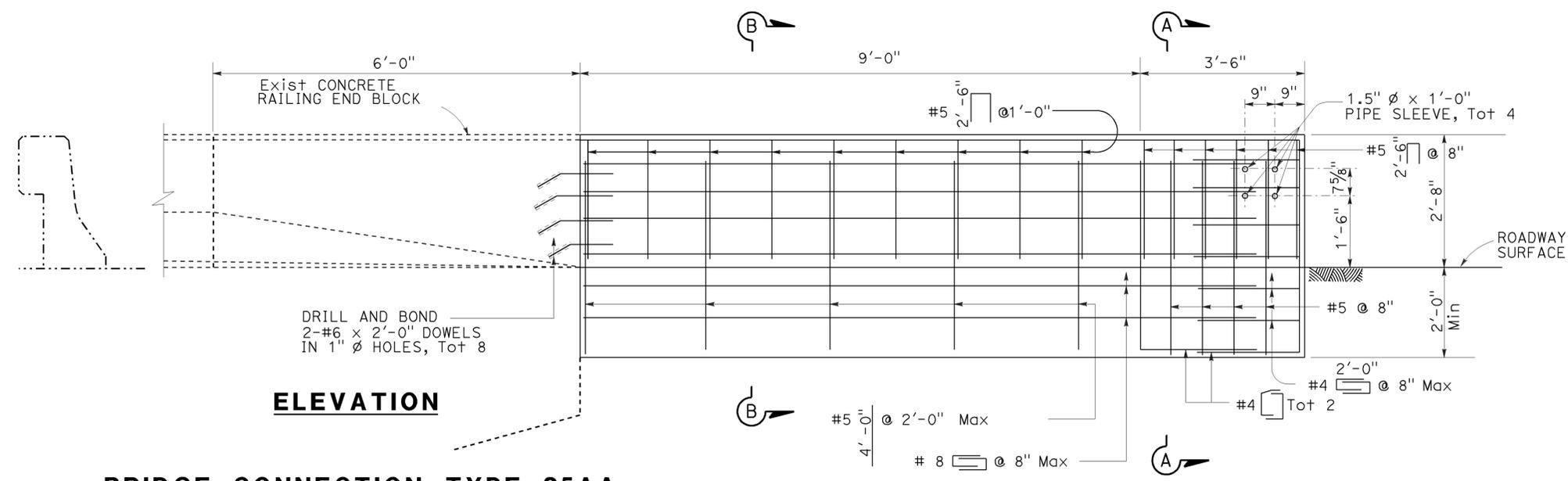
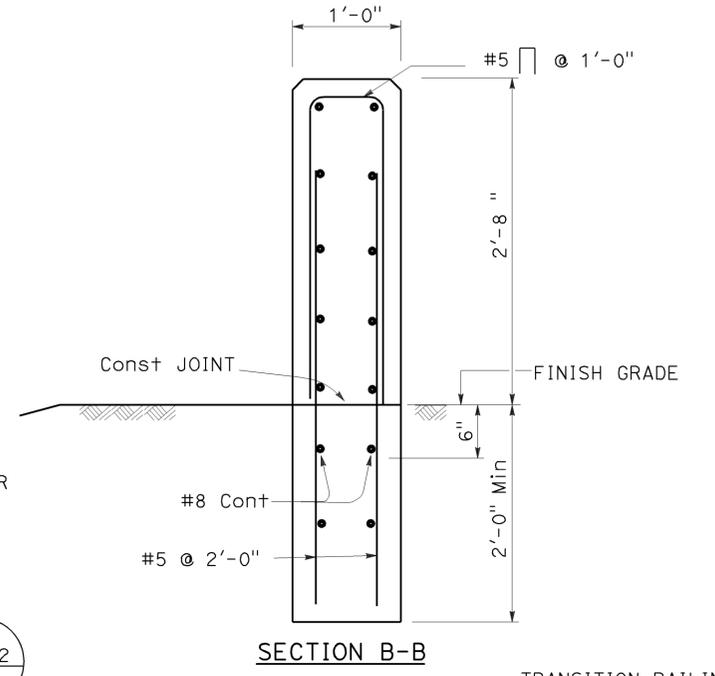
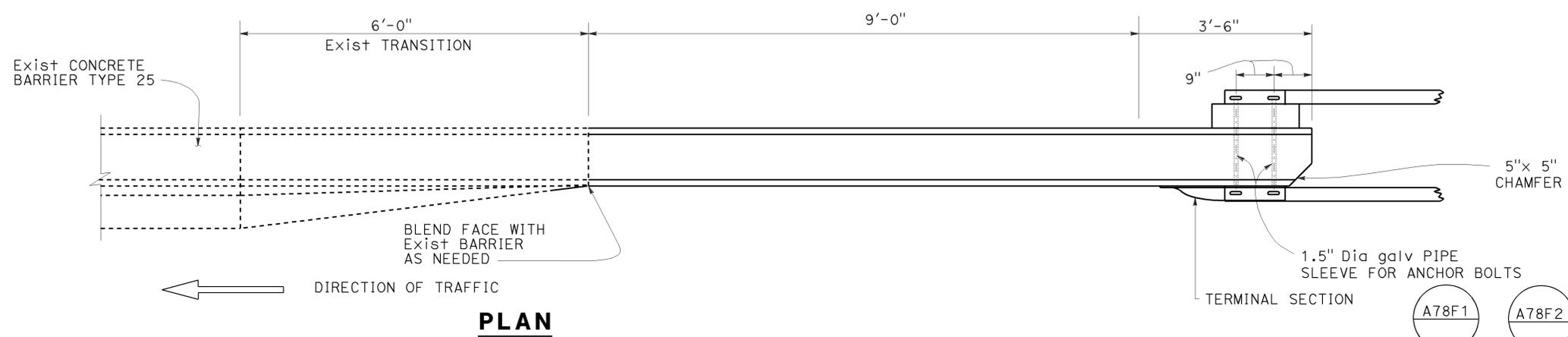
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
DESIGN  
FUNCTIONAL SUPERVISOR: GETACHEW ESHETE  
REVISOR: AKM RAHMAN  
DATE: TRIET LY  
CALCULATED/DESIGNED BY: [Blank]  
CHECKED BY: [Blank]  
REVISOR: [Blank]  
DATE: [Blank]

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	16	41

AKM Rahman 06-14-10  
 REGISTERED CIVIL ENGINEER DATE  
 7-26-10  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 AKM F. RAHMAN  
 No. 74163  
 Exp 6/30/11  
 CIVIL  
 STATE OF CALIFORNIA

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



**BRIDGE CONNECTION TYPE 25AA**

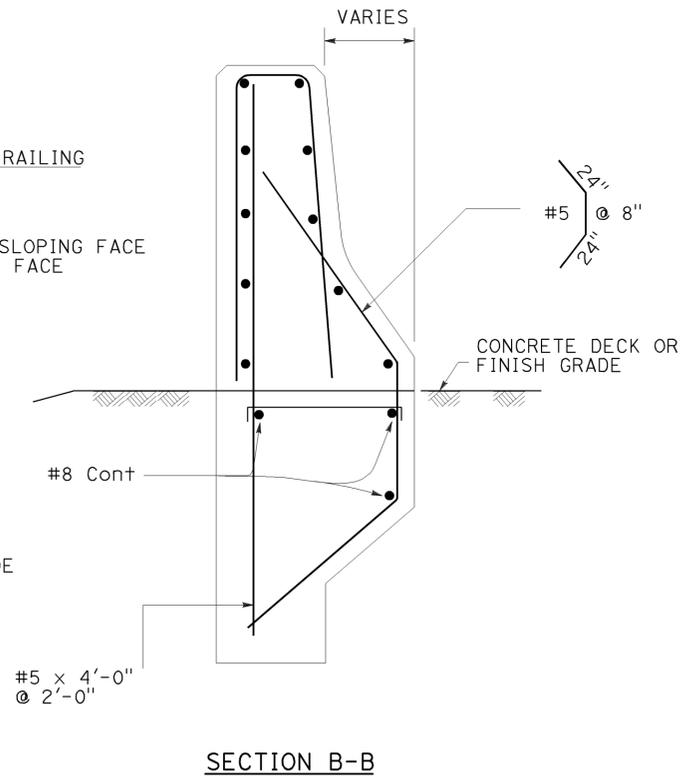
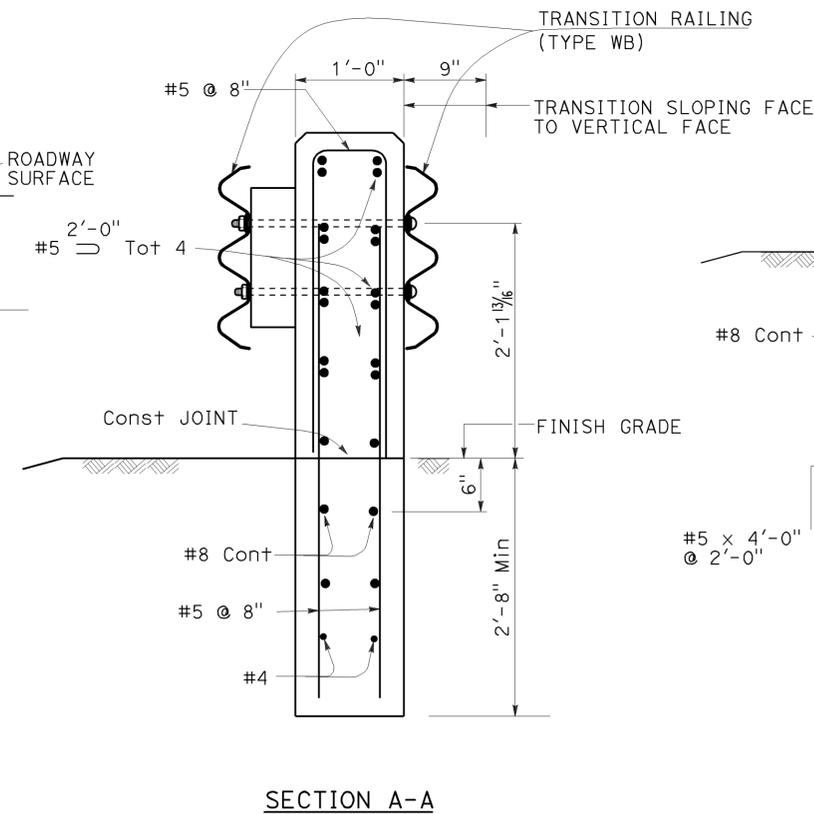
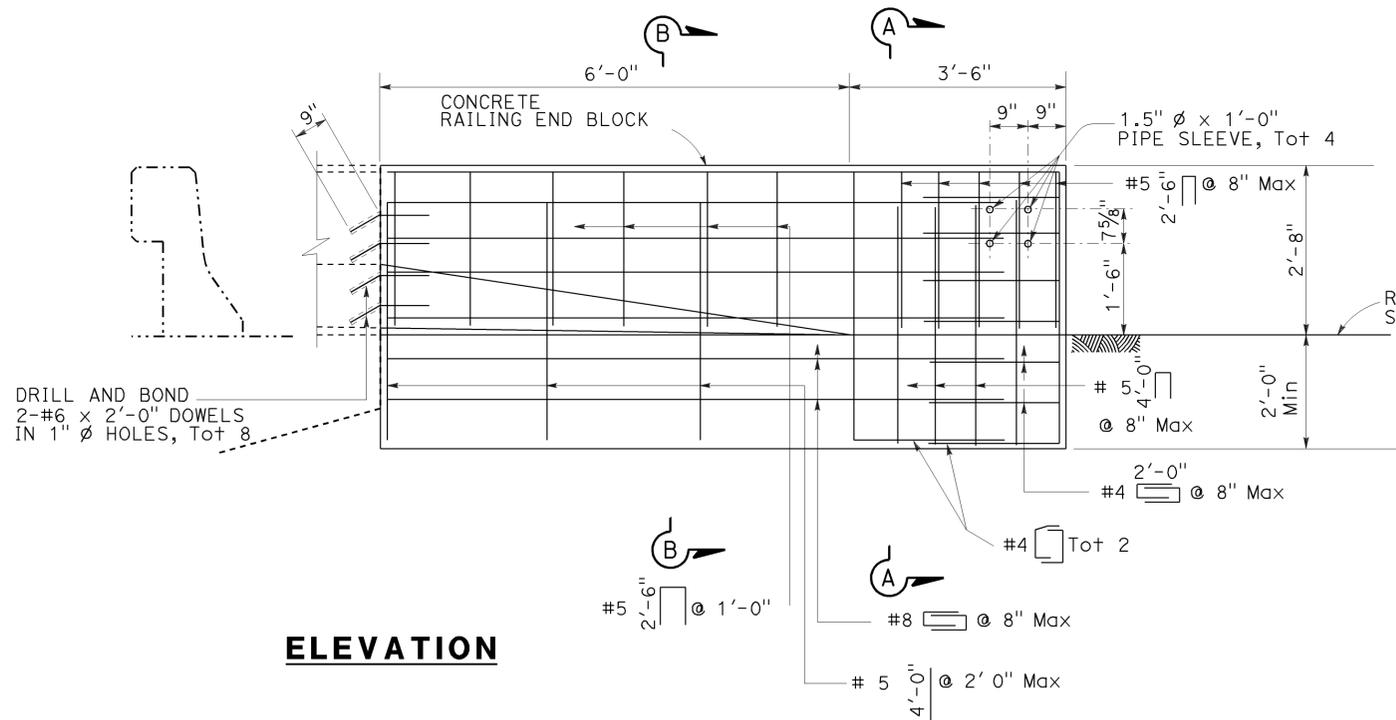
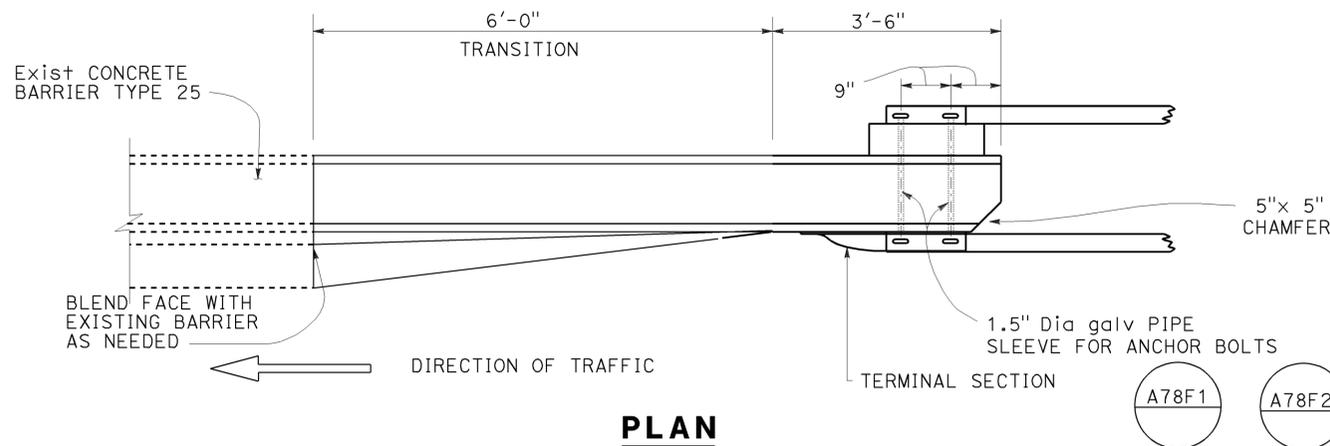
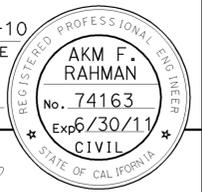
**CONSTRUCTION DETAILS**

**EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS**

NO SCALE **C-14**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 Caltrans®  
 FUNCTIONAL SUPERVISOR: GETACHEW ESHETE  
 CALCULATED/DESIGNED BY: CHECKED BY:  
 AKM RAHMAN TRIET LY  
 REVISED BY: DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	17	41
AKM Rahman				06-14-10	
REGISTERED CIVIL ENGINEER				DATE	
				7-26-10	
				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>					



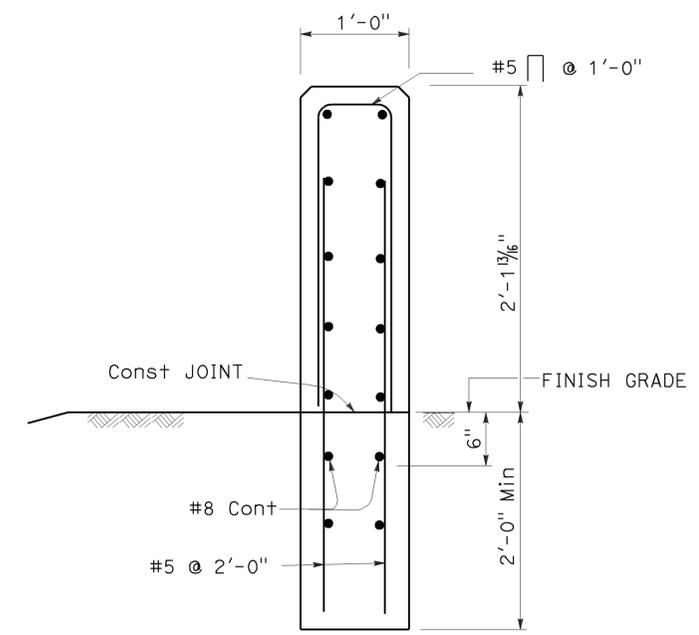
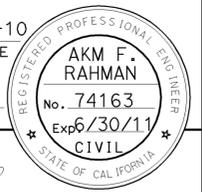
**ELEVATION**  
**BRIDGE CONNECTION TYPE 25AB**

EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS

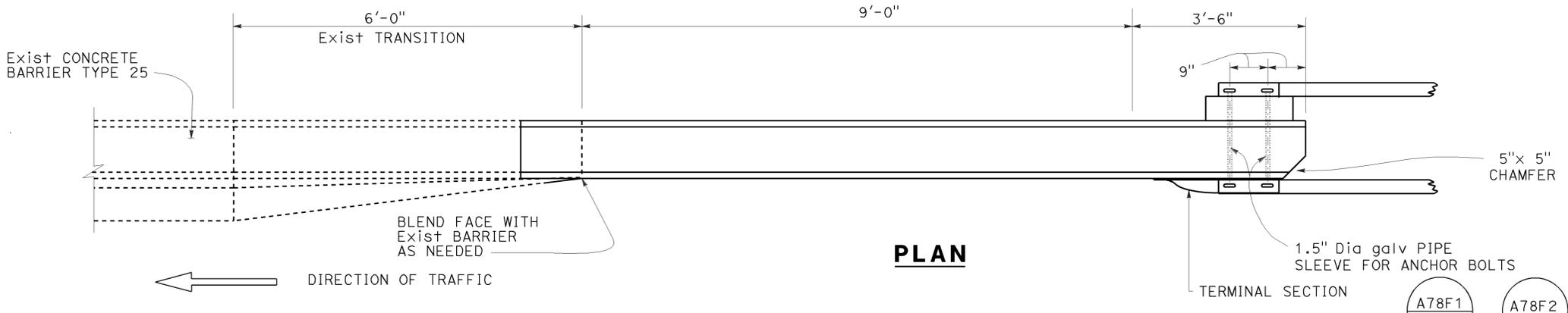
**CONSTRUCTION DETAILS**  
NO SCALE **C-15**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
Caltrans®  
DESIGN  
FUNCTIONAL SUPERVISOR: GETACHEW ESHETE  
CALCULATED/DESIGNED BY: AKM RAHMAN  
CHECKED BY: TRIET LY  
REVISOR: AKM RAHMAN  
DATE: 06-14-10  
REVISION: 07-25-10

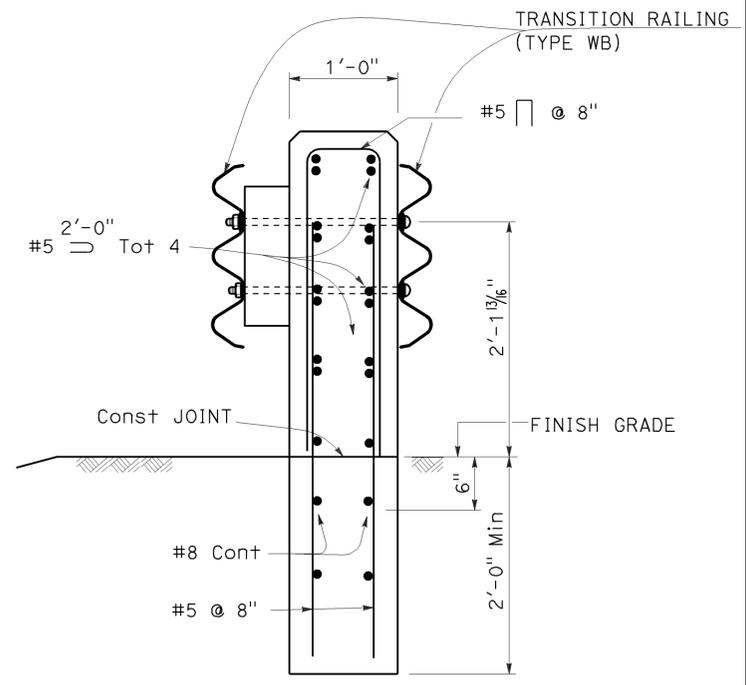
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/33.3	18	41
AKM Rahman			06-14-10	REGISTERED CIVIL ENGINEER DATE	
7-26-10			PLANS APPROVAL DATE		
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					



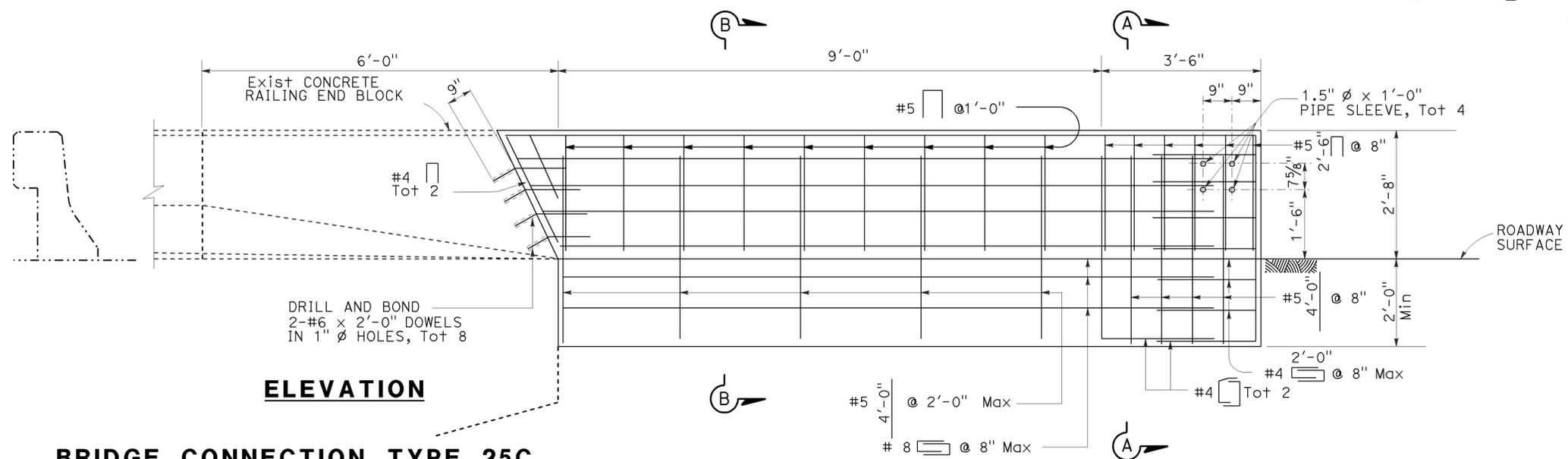
SECTION B-B



PLAN



SECTION A-A



ELEVATION

BRIDGE CONNECTION TYPE 25C

CONSTRUCTION DETAILS

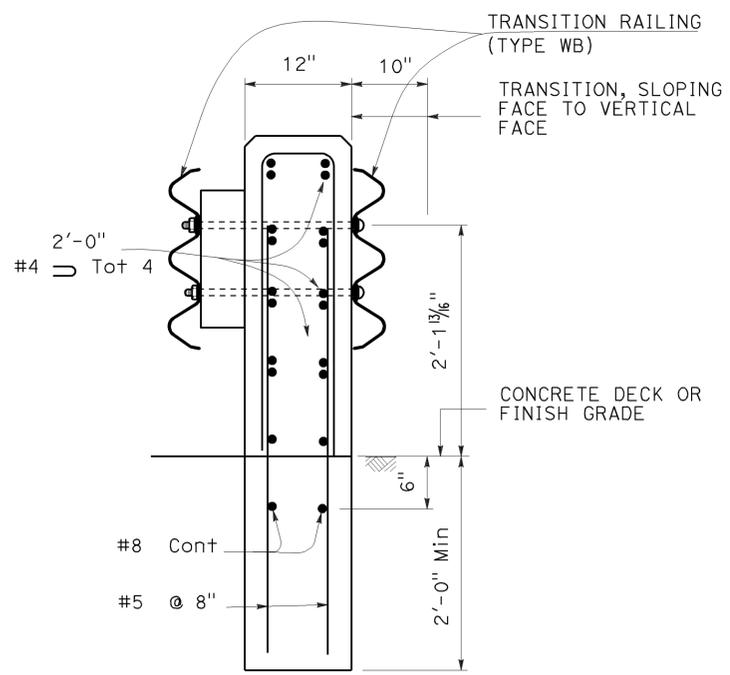
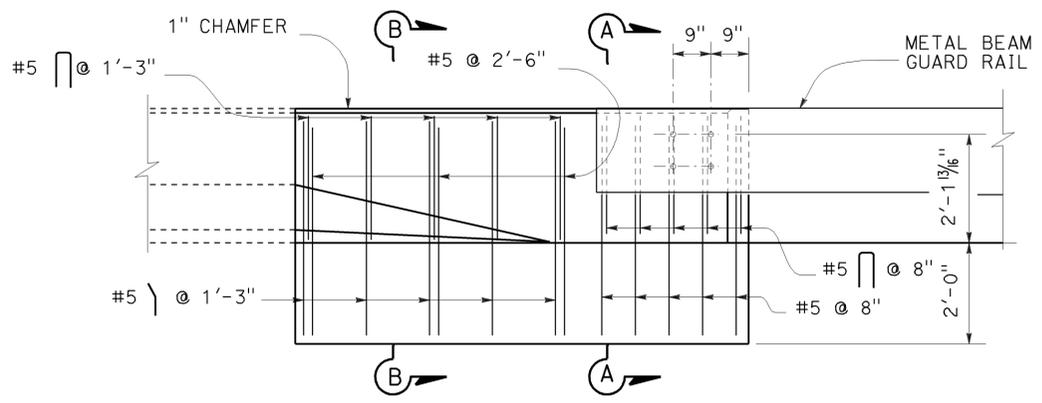
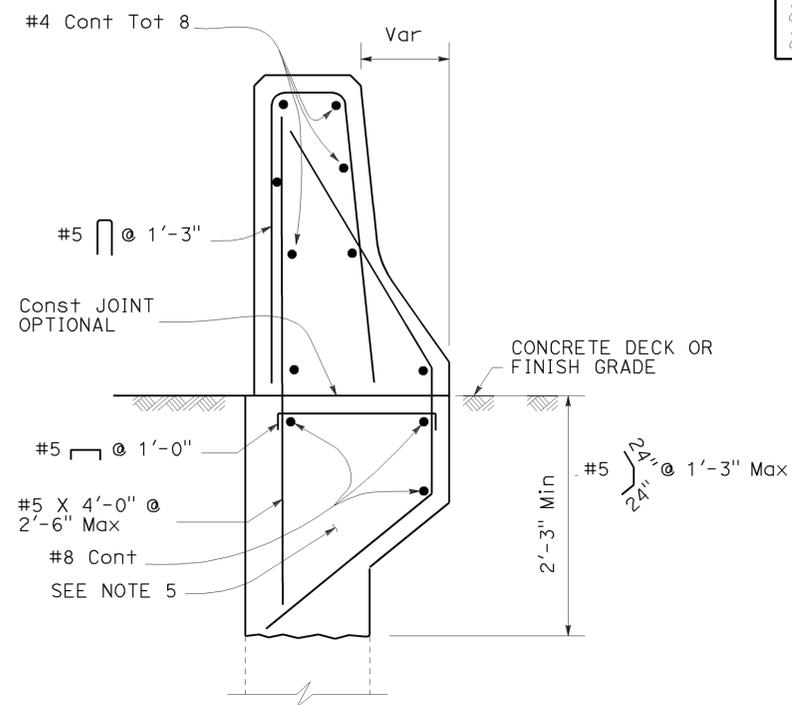
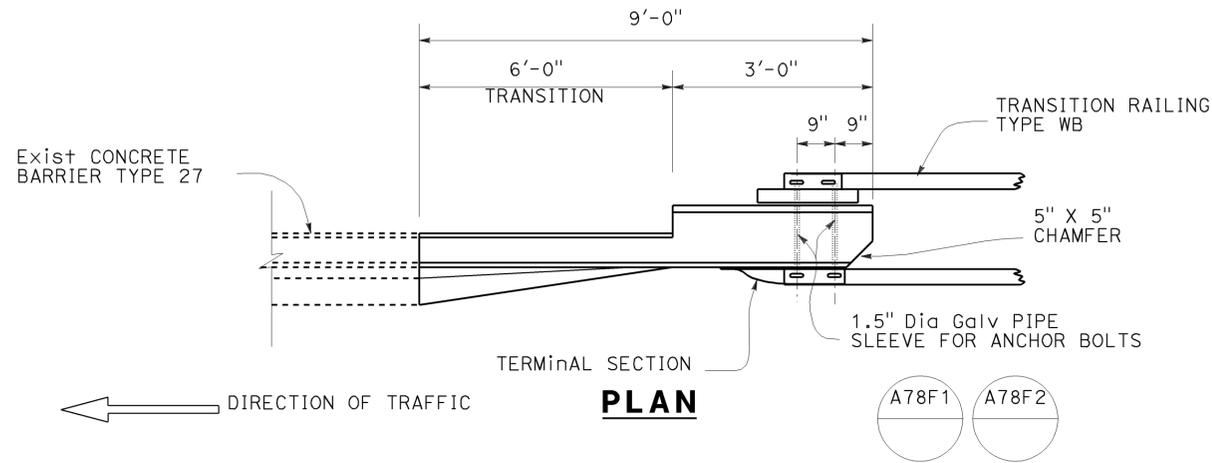
EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS

NO SCALE

C-16

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN
FUNCTIONAL SUPERVISOR	GETACHEW ESHETE
REVISOR	AKM RAHMAN
DATE	TRTET LY
REVISION	REVISOR
DATE	DATE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	19	41
AKM Rahman 06-14-10					
REGISTERED CIVIL ENGINEER DATE					
7-26-10 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>					



**BRIDGE CONNECTION TYPE 27**

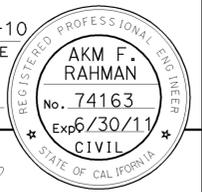
**EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS**

**CONSTRUCTION DETAILS**

NO SCALE **C-17**

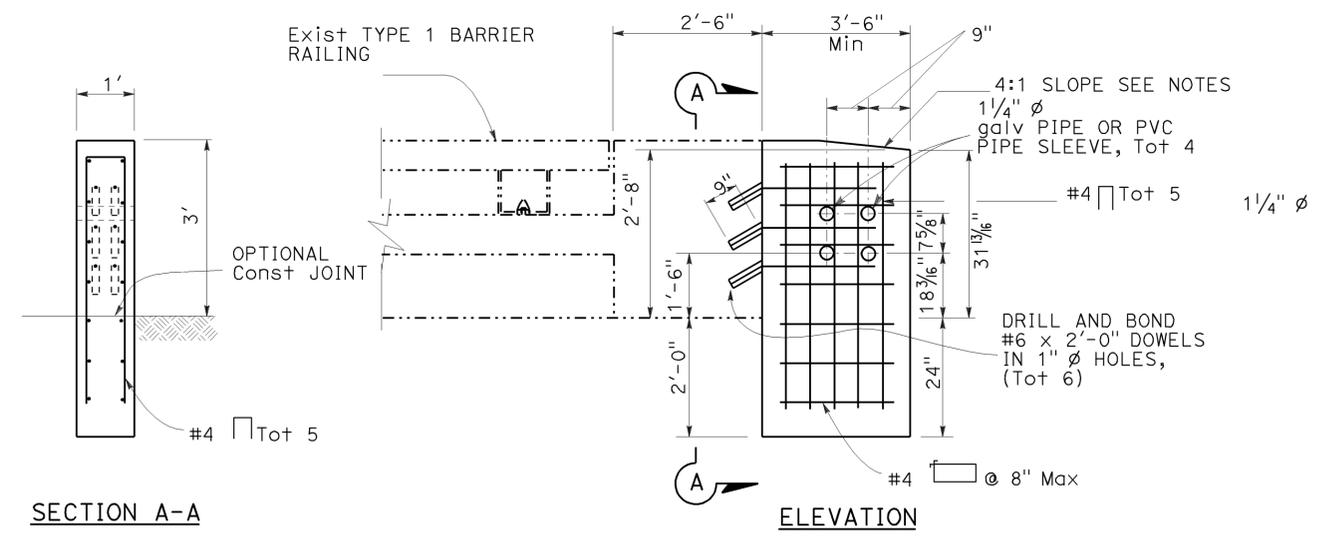
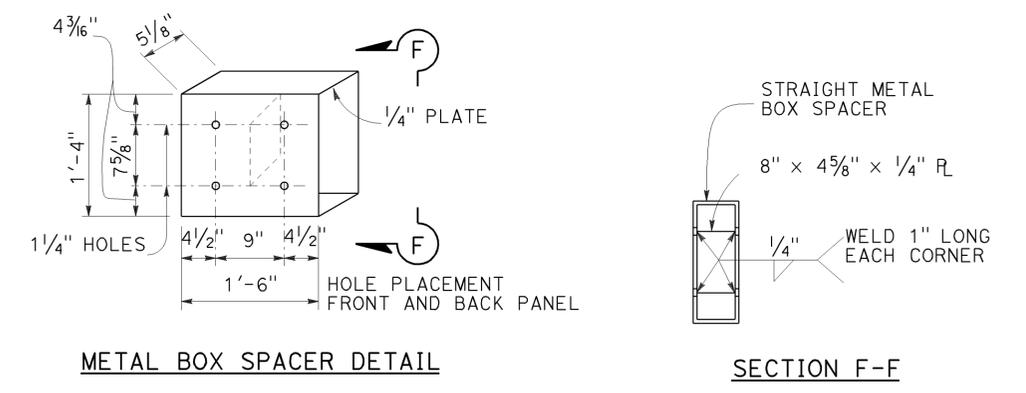
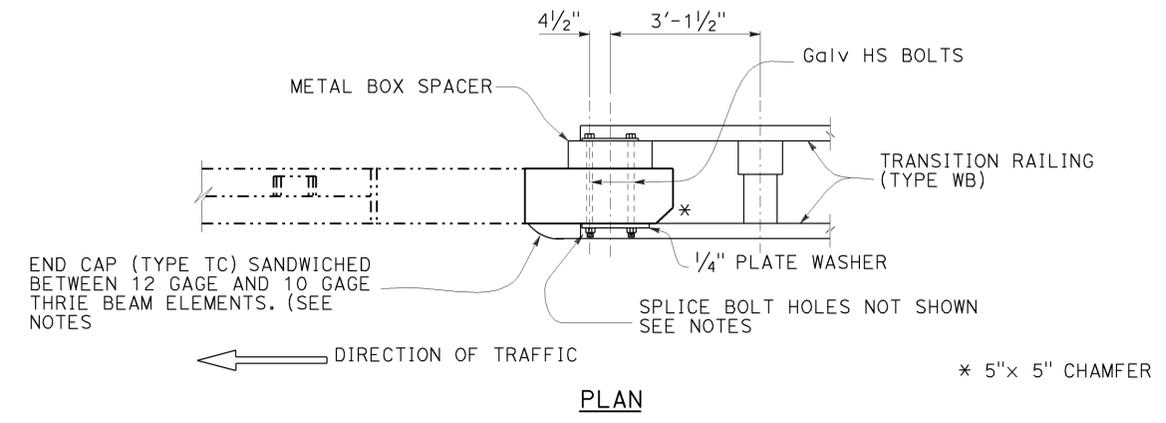
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN
FUNCTIONAL SUPERVISOR	GETACHEW ESHETE
CALCULATED/DESIGNED BY	CHECKED BY
AKM RAHMAN	TRIEU LY
REVISOR BY	DATE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	20	41
AKM Rahman			06-14-10	REGISTERED CIVIL ENGINEER DATE	
7-26-10			PLANS APPROVAL DATE		
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

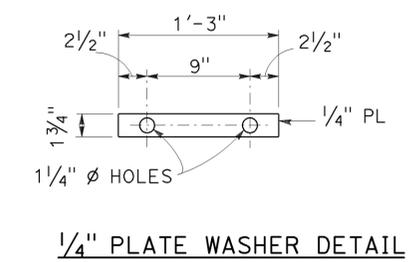
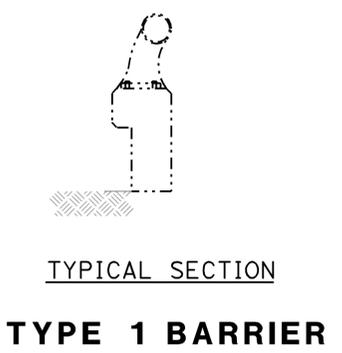


**NOTES ( Sht C-18 AND C-19):**

1. WHEN END SECTION IS CALLED FOR, MODIFY TYPICAL TERMINAL SECTION TO FIT. SEE METAL BOX SPACER DETAIL.
2. CUT AND REMOVE PORTION OF TYPE 1, AND BAGR AS REQUIRED.
3. EXTERIOR SPLICE BOLT HOLES SHALL BE THE STANDARD  $\frac{29}{32}$ " x  $\frac{1}{8}$ " SLOT SIZE FOR RAIL SPLICES AT POST #14 AND THE CONNECTION TO THE CONCRETE BARRIER OR RAILING. INTERIOR SPLICE BOLT HOLES MAY BE INCREASED UP TO  $\frac{1}{4}$ " Dia AND WASHERS SHALL BE USED WITH SPLICE BOLTS ON BACK SIDE OF RAIL ELEMENT AT POST #T4 AND CONNECTION TO THE CONCRETE BARRIER OR RAILING.
4. TAPER THE TOP OF THE END OF BRIDGE RAILING AT 4:1 TO MATCH THE TOP ELEVATION OF THE MBGR ELEMENT.
5. IF RAIL IS NOT CONTINUOUS OVER 2 POSTS, USE SPLICE AT EXPANSION JOINT.



**BRIDGE CONNECTION TYPE 1**

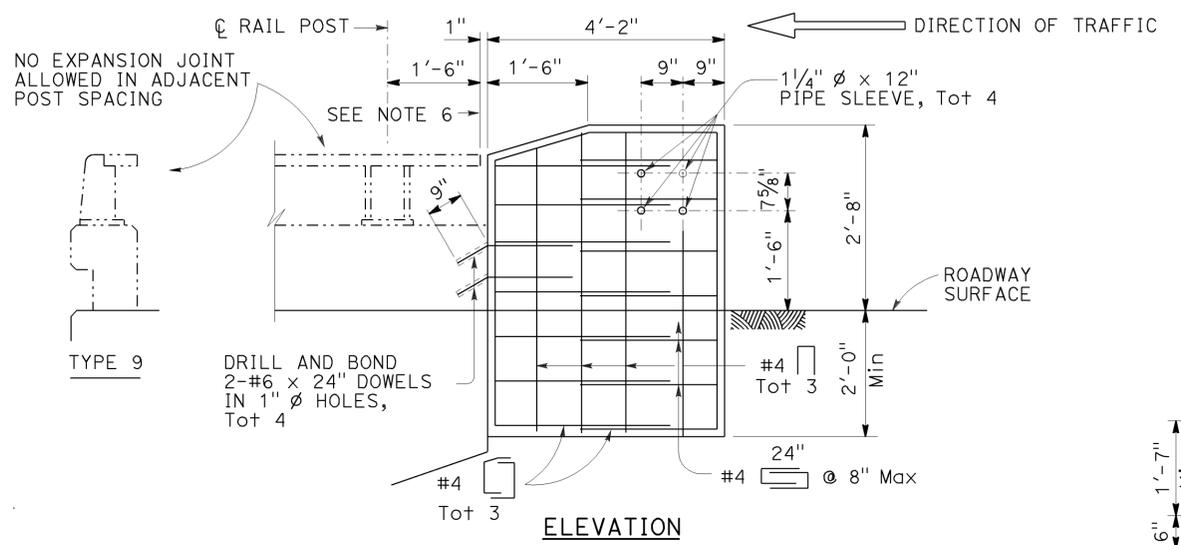
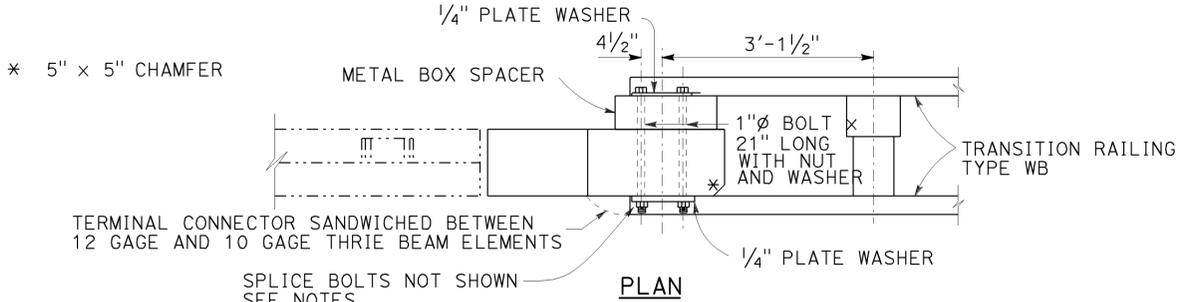


**EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS**

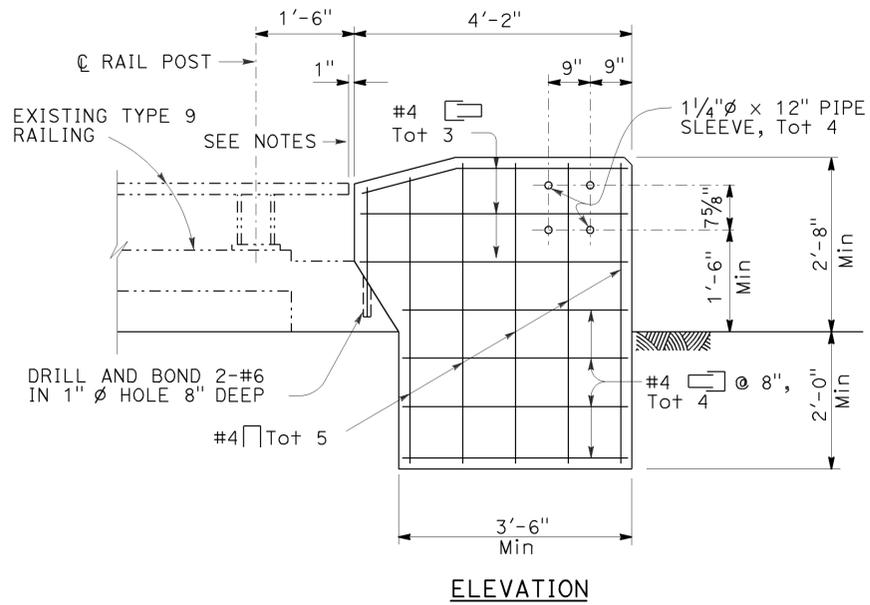
**CONSTRUCTION DETAILS**  
NO SCALE  
**C-18**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
DESIGN  
FUNCTIONAL SUPERVISOR: GETACHEW ESHETE  
REVISOR: AKM RAHMAN  
DATE: 06-14-10

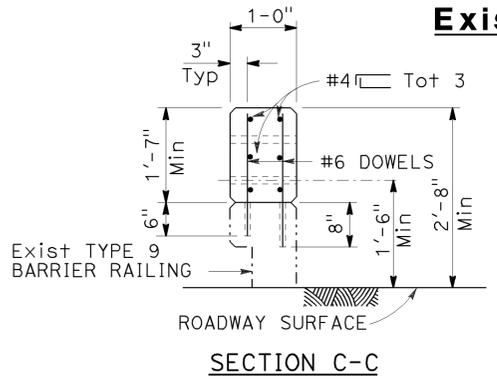
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	21	41
AKM Rahman 06-14-10					
REGISTERED CIVIL ENGINEER DATE					
7-26-10 PLANS APPROVAL DATE					
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					



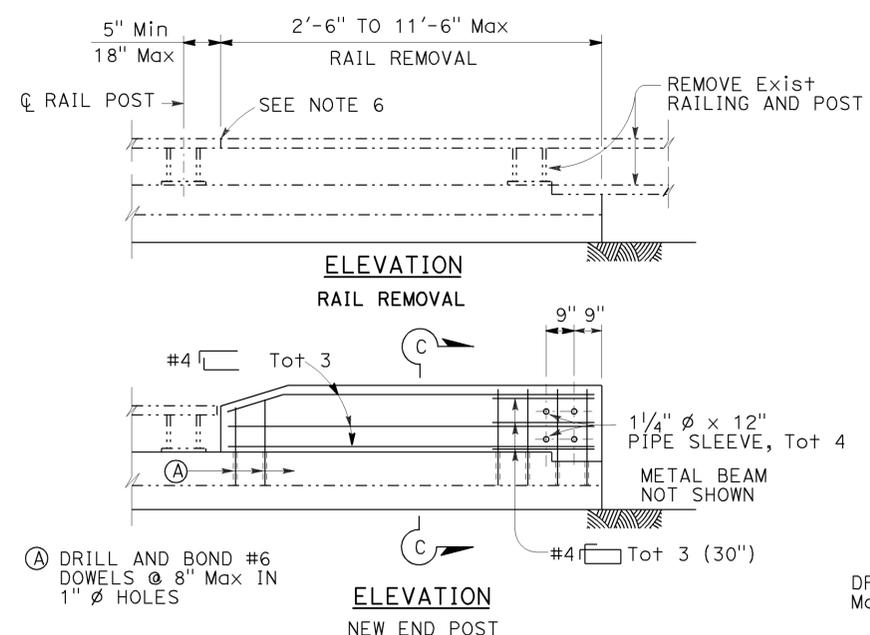
**Exist BARRIER RAILING TYPE 9 ALTERNATIVE 1**



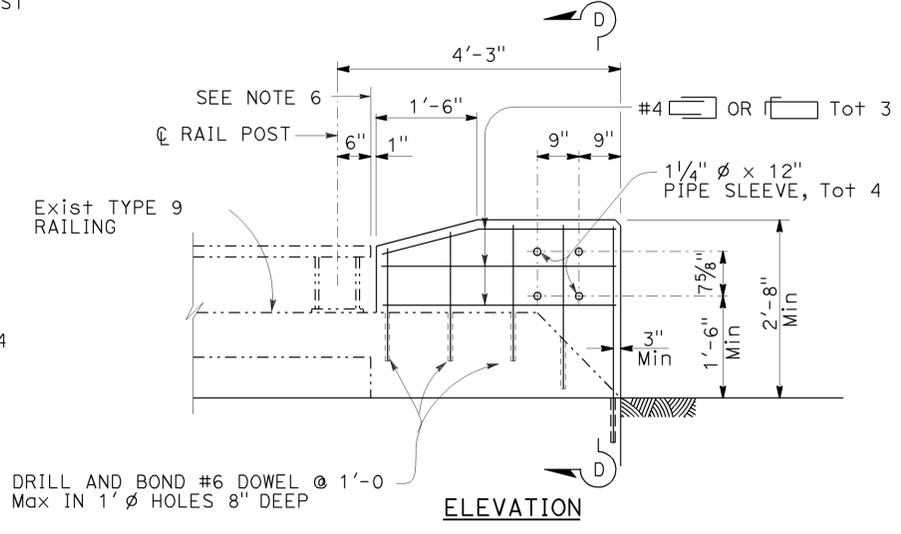
**Exist BARRIER RAILING TYPE 9 ALTERNATIVE 3**



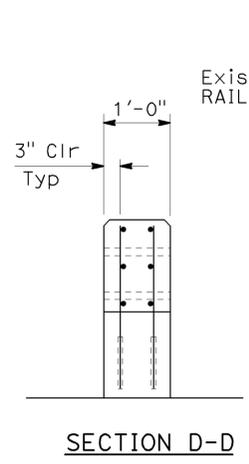
**SECTION C-C**



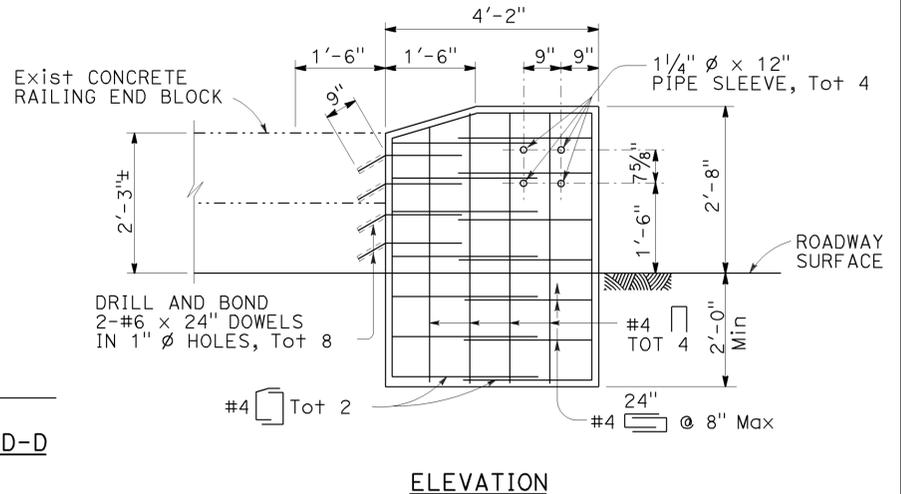
**Exist BARRIER RAILING TYPE 9 ALTERNATIVE 2**



**Exist BARRIER RAILING TYPE 9 ALTERNATIVE 4**



**SECTION D-D**



**Exist BARRIER RAILING TYPE 9 ALTERNATIVE 5**

**CONSTRUCTION DETAILS C-19**

EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS

NO SCALE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION DESIGN

FUNCTIONAL SUPERVISOR: GETACHEW ESHETE

REVISOR: AKM RAHMAN, DATE: 06-14-10

DESIGNER: AKM RAHMAN, DATE: 06-14-10

CHECKER: AKM RAHMAN, DATE: 06-14-10

APPROVER: AKM RAHMAN, DATE: 06-14-10

USER: s113541, FILE: 060e010ga019.dgn

RELATIVE BORDER SCALE: 1/4" = 1'-0"

UNIT: 1475

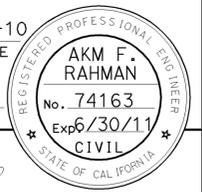
PROJECT NUMBER & PHASE: 0600000421

DATE PLOTTED: 07-25-10

TIME PLOTTED: 15:54

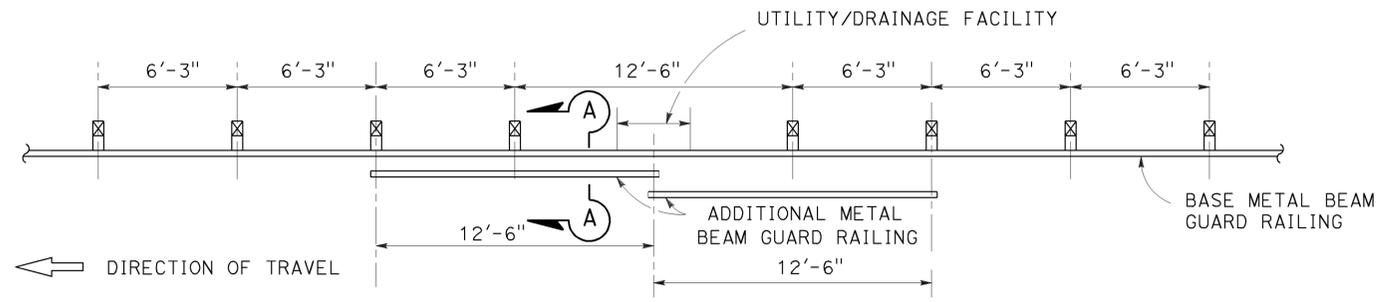
BORDER LAST REVISED: 7/2/2010

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	22	41
AKM Rahman			06-14-10	REGISTERED CIVIL ENGINEER DATE	
7-26-10			PLANS APPROVAL DATE		
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

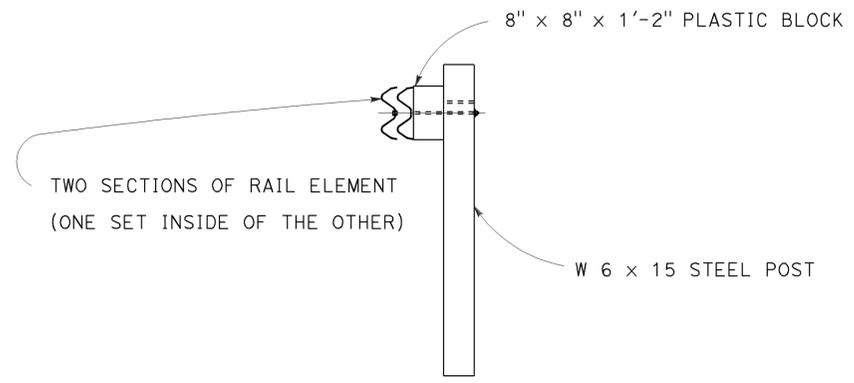


**NOTES (THIS SHEET):**

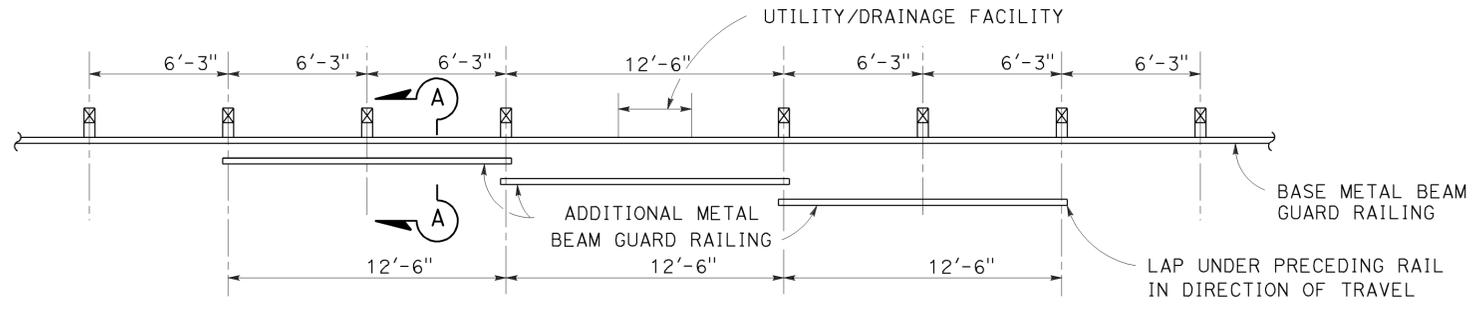
1. LOCATIONS OF NESTED MBGR AS DIRECTED BY THE ENGINEER.
2. OFFSET THE ADDITIONAL METAL BEAM GUARD RAILING SPLICES 6'-3" FROM THE BASE METAL BEAM GUARD RAILING SPLICES.
3. FOR DIKE POSITIONING WITH GUARD RAILING INSTALLATIONS, SEE STANDARD PLAN A77C4.



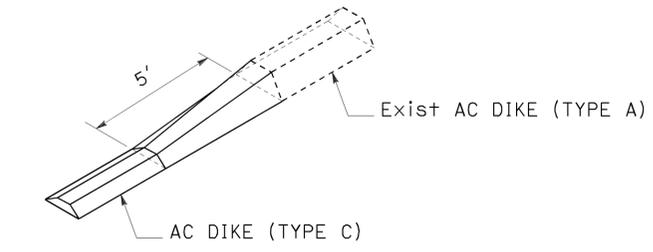
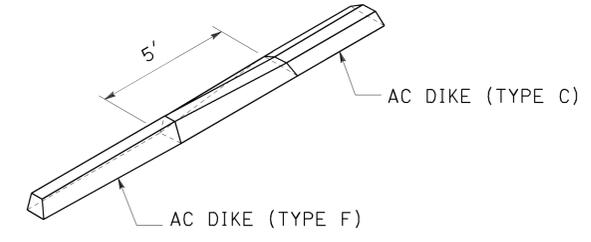
**CASE 1**  
ONE POST OMITTED (SPLICE IN CENTER)



**SECTION A-A**  
SEE NOTE 4

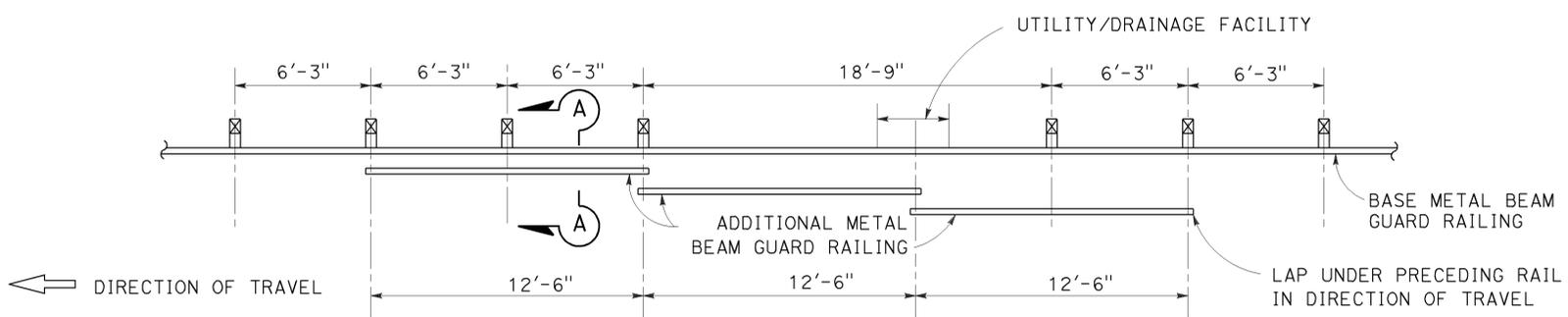


**CASE 2**  
ONE POST OMITTED (SPLICE AT POSTS)



**HMA DIKE TRANSITION DETAILS**

SEE NOTES



**CASE 3**  
TWO POSTS OMITTED

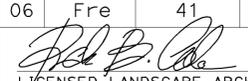
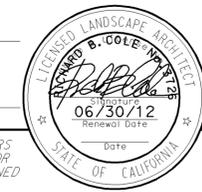
**LONG SPAN NESTED GUARD RAILING**  
**EXISTING UTILITY FACILITIES HAVE NOT BEEN SHOWN ON THE PLANS**

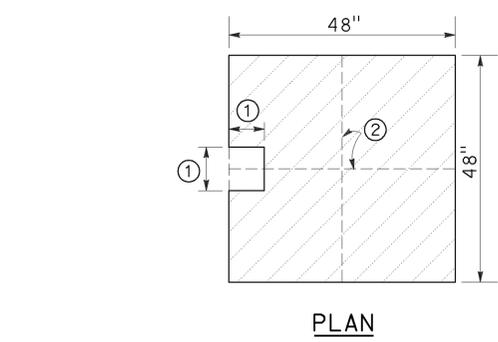
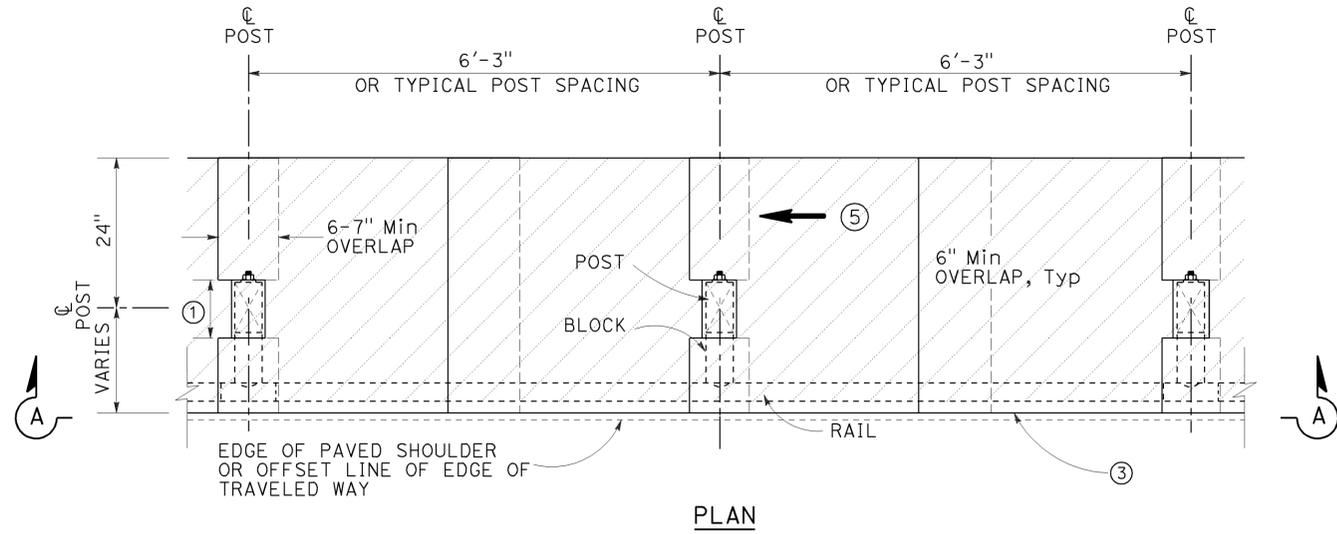
**CONSTRUCTION DETAILS**

NO SCALE

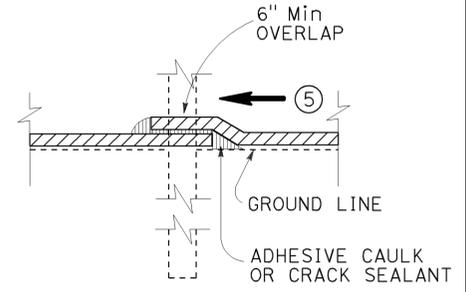
**C-20**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION DESIGN  
 AKM RAHMAN  
 AKM RAHMAN  
 GETACHEW ESHETE  
 07-25-10 15:55

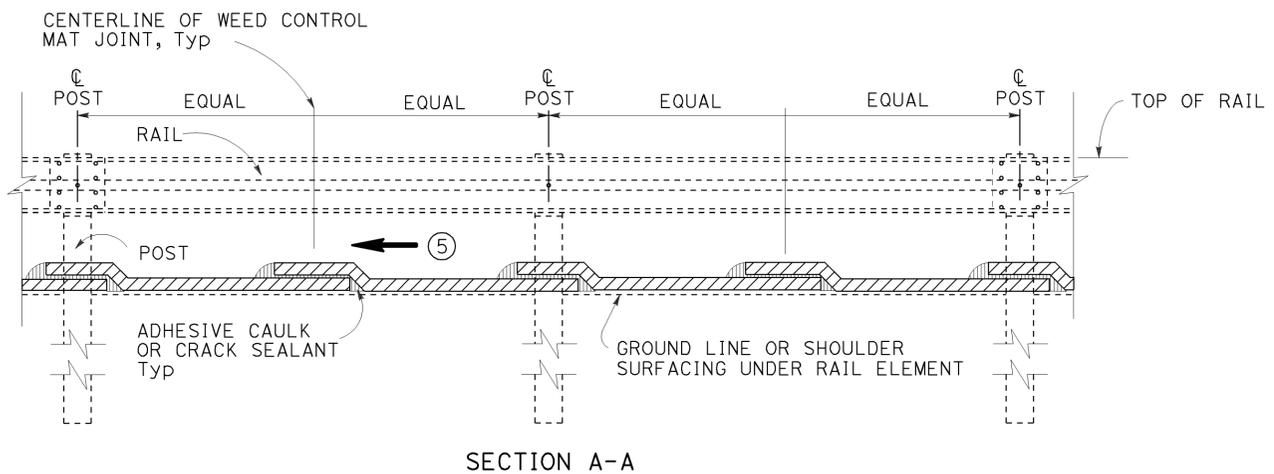
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	23	41
 LICENSED LANDSCAPE ARCHITECT					
7-26-10 PLANS APPROVAL DATE					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					



**WEED CONTROL MAT (RUBBER)  
TYPICAL TILE SECTION**



**TYPICAL SECTION  
AT POST**

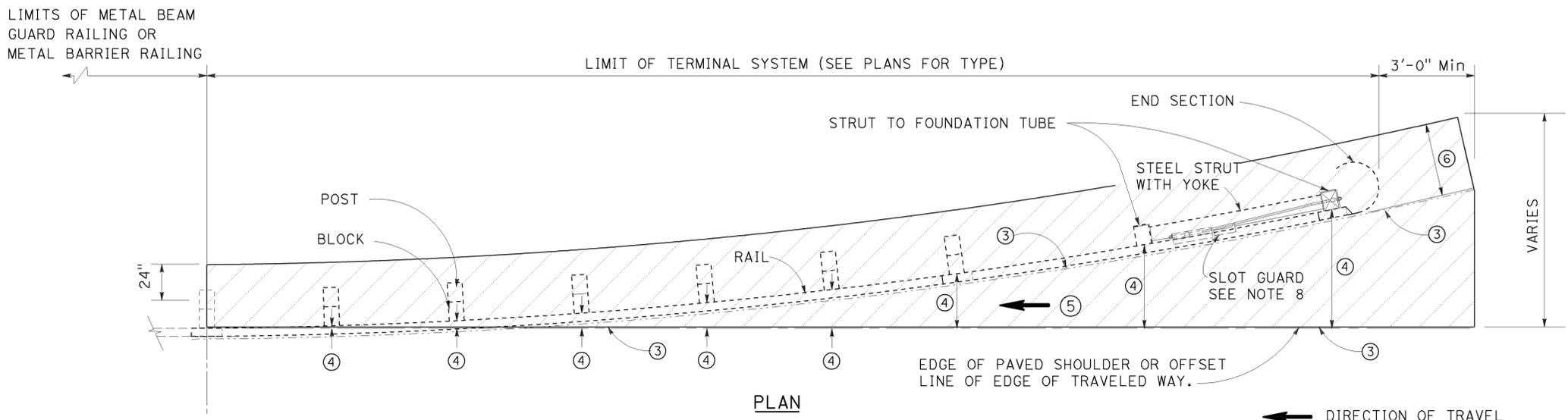


**WEED CONTROL MAT (RUBBER) UNDER MBGR**

**WEED CONTROL MAT (RUBBER) UNDER POST**

**LEGEND:**  
 WEED CONTROL MAT (RUBBER)

- NOTES (THIS SHEET):**
- CUTOUT DIMENSIONS TO FIT SNUGLY AROUND WOOD OR METAL POST FOR MBGR. (SEE PLANS FOR EXACT SIZE AND DIMENSIONS)
  - WEED CONTROL MAT (RUBBER) TILE MAY BE COMPRISED OF FOUR - 24" X 24" TILE MATS.
  - TRIM WEED CONTROL MAT (RUBBER) FLUSH WITH EDGE OF SHOULDER, PAVEMENT OR WEED MAT. FILL JOINTS AND OPENINGS WITH ADHESIVE CAULKING OR CRACK SEALANT.
  - SEE STANDARD PLANS FOR CORRESPONDING POST OFFSET DIMENSIONS FOR TERMINAL SYSTEM.
  - LAP WEED CONTROL MAT IN DIRECTION OF WATER FLOW.
  - DIMENSION: 3'-0" OR GREATER. ALIGN WITH RAIL AT END SECTION.



**WEED CONTROL MAT (RUBBER) AT MBGR TERMINAL SYSTEM**

**CONSTRUCTION DETAILS**  
 NO SCALE **C-21**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 LANDSCAPE ARCHITECTURE  
 SENIOR LANDSCAPE ARCHITECT  
 ELBERT COX  
 CALCULATED/DESIGNED BY  
 CHECKED BY  
 HENRY BARNES  
 RICHARD COLE  
 REVISED BY  
 DATE REVISED

LAST REVISION | DATE PLOTTED => 06-JAN-2011  
 07-25-10 TIME PLOTTED => 1:51:55

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	24	41

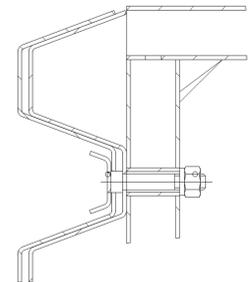
AKM Rahman 06-14-10  
REGISTERED CIVIL ENGINEER DATE  
7-26-10  
PLANS APPROVAL DATE

AKM F. RAHMAN  
No. 74163  
Exp. 6/30/11  
CIVIL

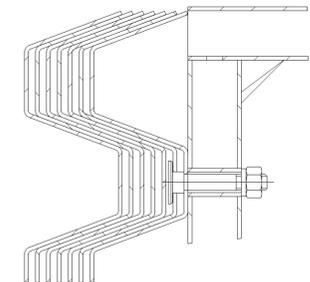
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

**NOTES (THIS SHEET):**

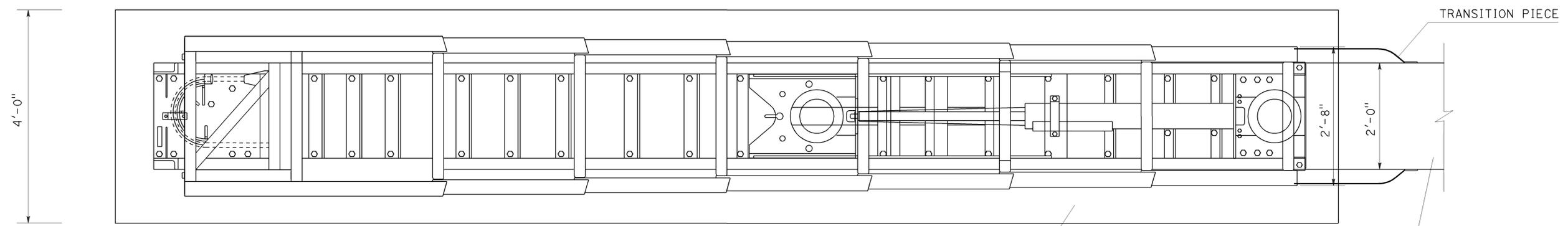
1. FOR TRANSITION PANEL AND REINFORCEMENT DETAILS SEE MANUFACTURER'S DETAILS.
2. FOR ALL ACCESSORIES TO CRASH CUSHION (TYPE SMART SCI100GM) AS WELL AS ADDITIONAL DETAILS SEE MANUFACTURER'S DETAILS.
3. FOR CONCRETE PAD REINFORCEMENTS SEE MANUFACTURER'S DETAILS.
4. CROSS SLOPE AT TOP OF CONCRETE PAD NOT TO EXCEED 1:12, CROSS SLOPE SHOULD NOT VARY MORE THAN 1:48.



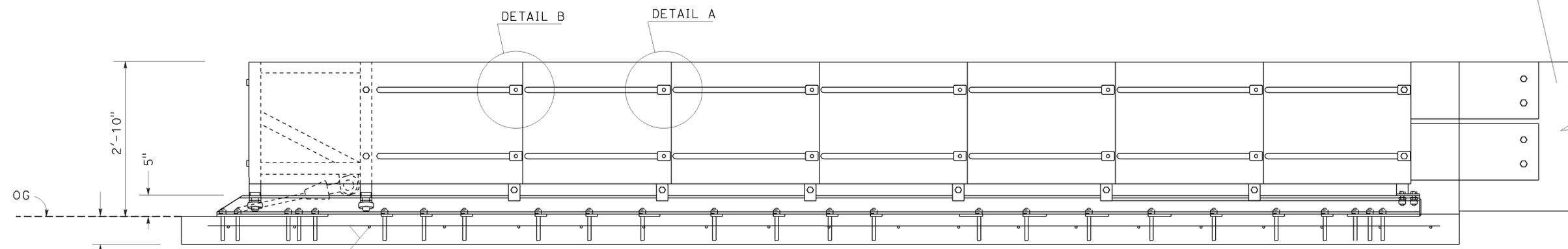
**DETAIL B**



**DETAIL A**



**PLAN VIEW**



**ELEVATION**

**CRASH CUSHION (TYPE SMART SCI100GM)**

**CONSTRUCTION DETAILS**

NO SCALE

**C-22**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN
FUNCTIONAL SUPERVISOR	GETACHEW ESHETE
CALCULATED/DESIGNED BY	CHECKED BY
AKM RAHMAN	AKM RAHMAN
REVISOR	DATE

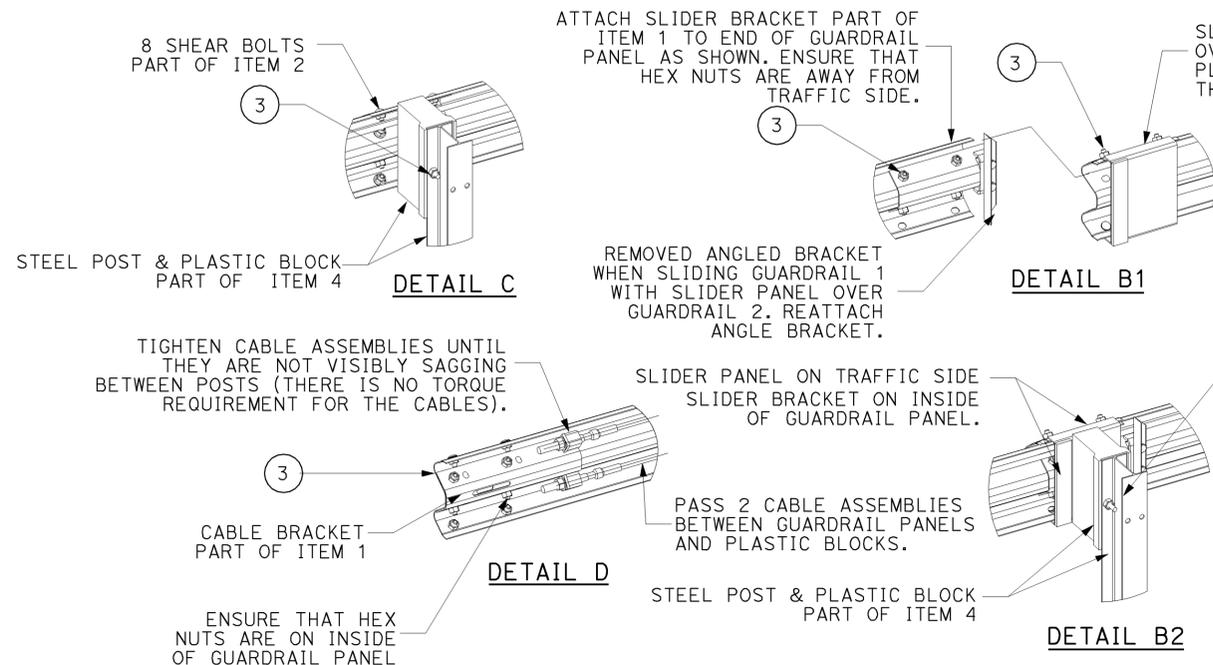
**NOTES: (THIS SHEET)**

1. SEE MANUFACTURER PLANS FOR ADDITIONAL DETAILS AND DIMENSIONS NOT SHOWN ON PLANS.
2. SYSTEM TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
3. ONLY TIGHTEN THE CABLE ASSEMBLIES USING THE NUTS AT THE CABLE BRACKET (SEE DETAIL D). DO NOT TIGHTEN THE CABLES AT THE FRONT OF THE GROUND ANCHOR.
4. WHEN DRIVING STEEL POST, ENSURE THAT A DRIVING CAP WITH TIMBER OR PLASTIC INSERT IS USED TO PREVENT DAMAGE TO THE GALVANIZING TO THE TOP OF THE STEEL POST.

**LEGEND**

- | ITEM | DESCRIPTION                         |
|------|-------------------------------------|
| ①    | X-TENSION TERMINAL COMPONENT KIT    |
| ②    | X-TENSION HARDWARE KIT              |
| ③    | X-TENSION SYSTEM HARDWARE KIT       |
| ④    | X-TENSION GUARDRAIL COMPONENT KIT 3 |
| ⑤    | I-BEAM POST, MIDDLE, X350           |

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	25	41
AKM Rahman			06-14-10	DATE	
REGISTERED CIVIL ENGINEER			No. 74163		
PLANS APPROVAL DATE			7-26-10	Exp. 6/30/11	
<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>					

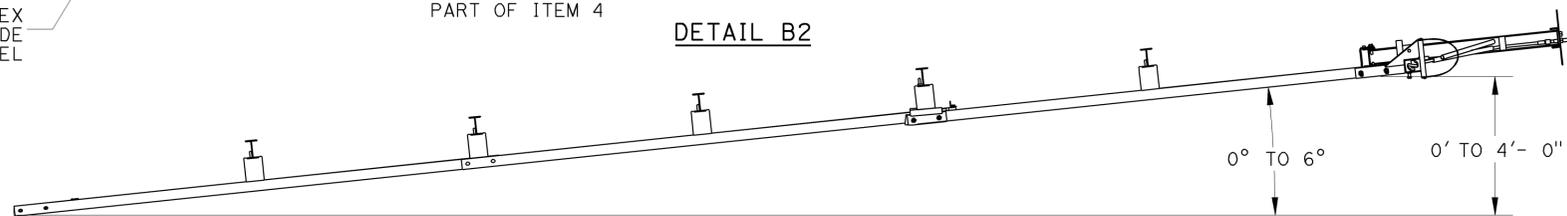
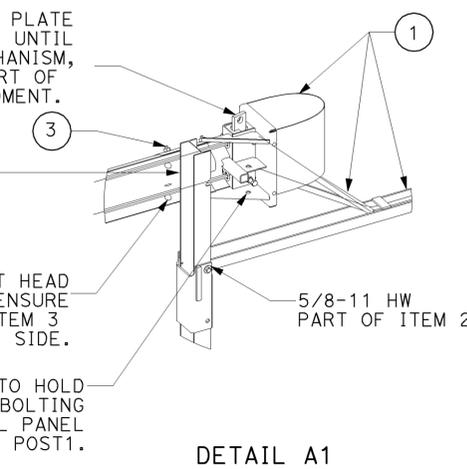


USING A PRY BAR TURN FRICTION PLATE PART OF ITEM 1 COUNTER CLOCKWISE UNTIL IS COMPLETELY AGAINST LOCKING MECHANISM, SECURE IN PLACE USING 4 BOLTS PART OF ITEM 2 ON SIDE OF IMPACT HEAD WELDMENT.

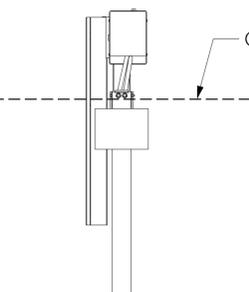
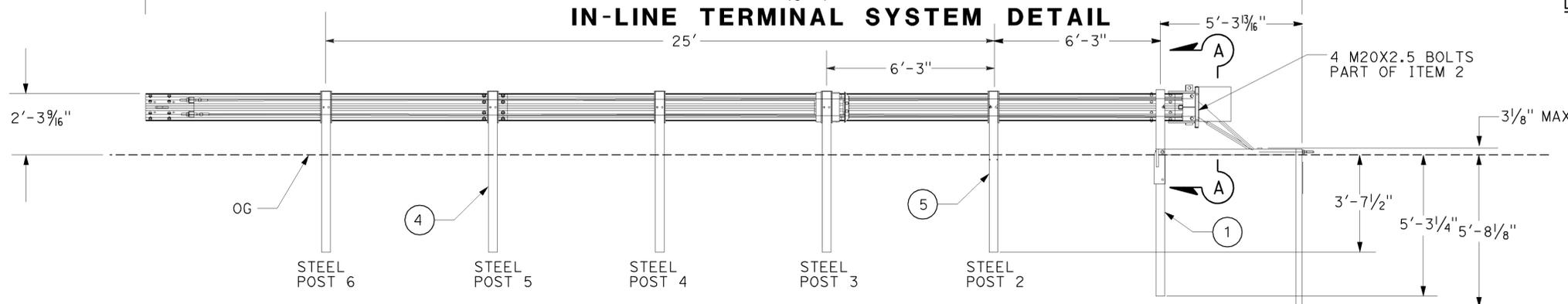
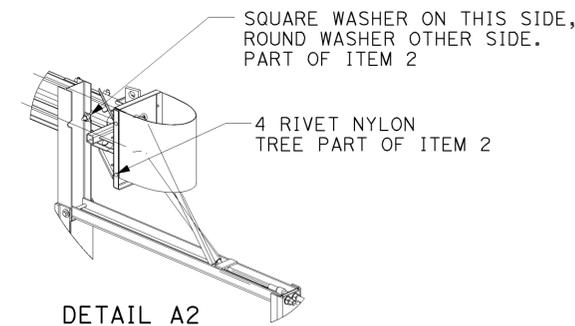
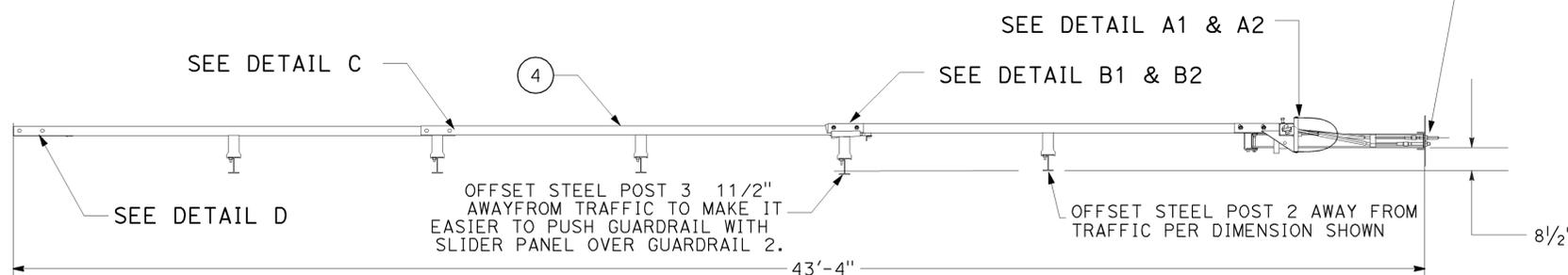
NO PLASTIC BLOCK AT STEEL POST 1

WHEN MOUNTING IMPACT HEAD WELDMENT TO GUARD RAIL ENSURE THAT HEX NUTS PART OF ITEM 3 ARE ON TRAFFIC SIDE.

USE PLASTIC BLOCKS TO HOLD HEAD WELDMENT UP WHILE BOLTING IT TO THE GUARD RAIL PANEL AND STEEL POST1.



PASS CABLE ASSEMBLY UNDER THE STEEL STRAP ON THE GROUND STRUT AND FORWARD THROUGH THE HOLES AT FRONT END OF GROUND STRUT. THEN PASS CABLE ASSEMBLY THROUGH LOWER HOLE IN IMPACT HEAD WELDMENT AND THROUGH FRICTION PLATE AND OUT THE BACK SIDE OF THE IMPACT HEAD. (REPEAT FOR SECOND CABLE ASSEMBLY TO PASS THROUGH UPPER HOLE IN IMPACT HEAD WELDMENT).



**CONSTRUCTION DETAILS C-23**  
NO SCALE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
Caltrans®  
FUNCTIONAL SUPERVISOR: GETACHEW ESHETE  
DESIGN  
REVISOR: AKM RAHMAN  
DATE: 06-14-10  
CHECKED BY: AKM RAHMAN  
CALCULATED/DESIGNED BY: AKM RAHMAN  
BORDER LAST REVISED 7/2/2010

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	26	41

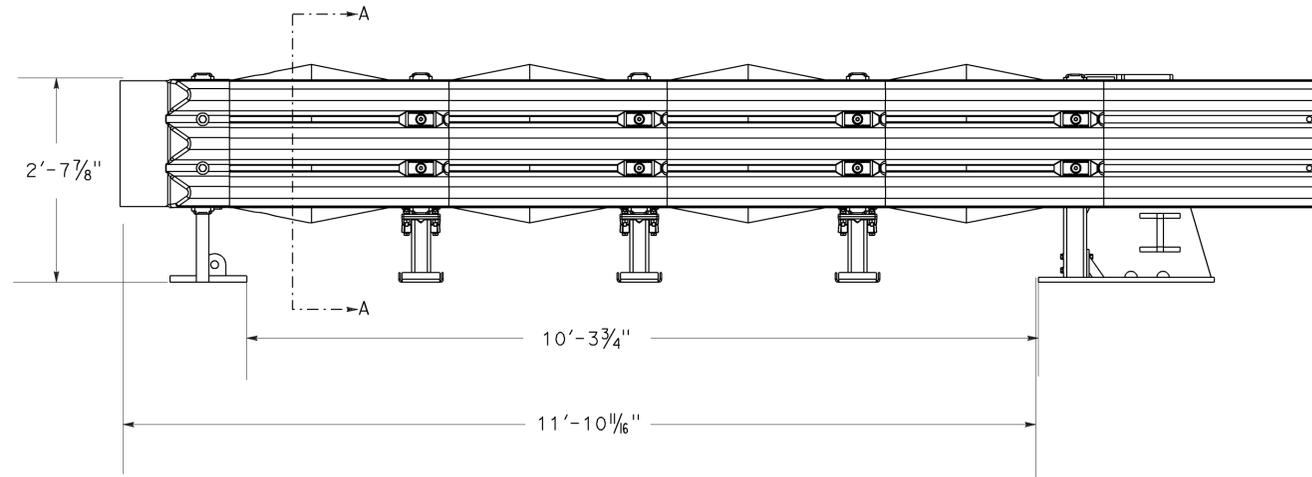
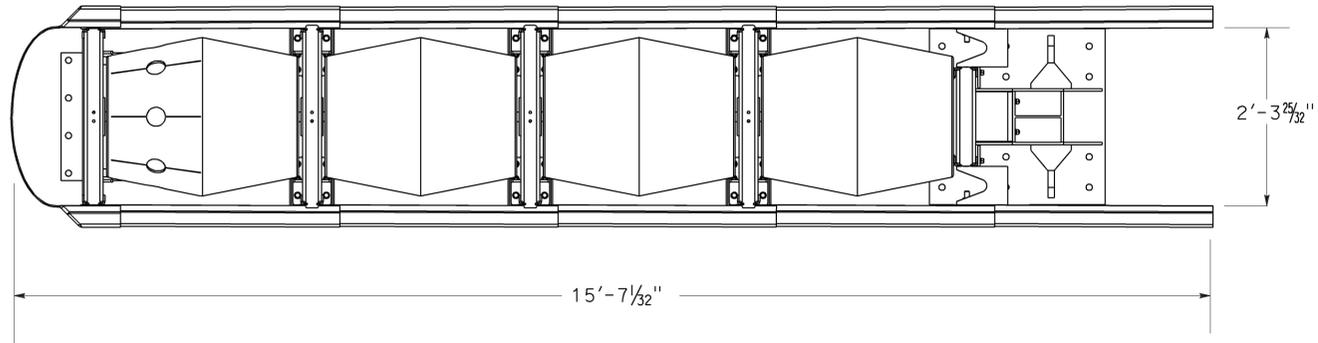
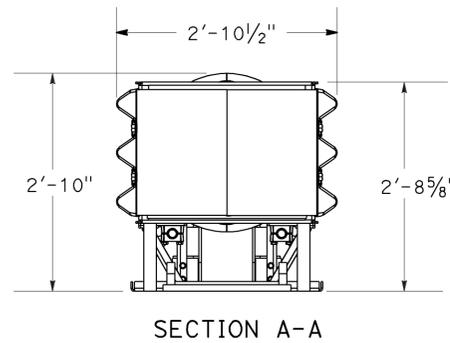
*AKM Rahman* 06-14-10  
 REGISTERED CIVIL ENGINEER DATE  
 7-26-10  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 AKM F. RAHMAN  
 No. 74163  
 Exp. 6/30/11  
 CIVIL  
 STATE OF CALIFORNIA

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

**NOTE (THIS SHEET):**

INSTALLATION TO COMPLY WITH MANUFACTURER'S INSTRUCTIONS. FOR ADDITIONAL INFORMATION AND ALL ACCESSORIES FOR TAU-II SYSTEM, SEE MANUFACTURER'S DETAILS. TO GET TO THE MANUFACTURER'S WEB SITE, GO TO : [HTTP://BARRIERSYSTEMSINC.COM/](http://BARRIERSYSTEMSINC.COM/).



**CRASH CUSHION (TYPE TAU-II)  
MODEL No. 30T070CBC**

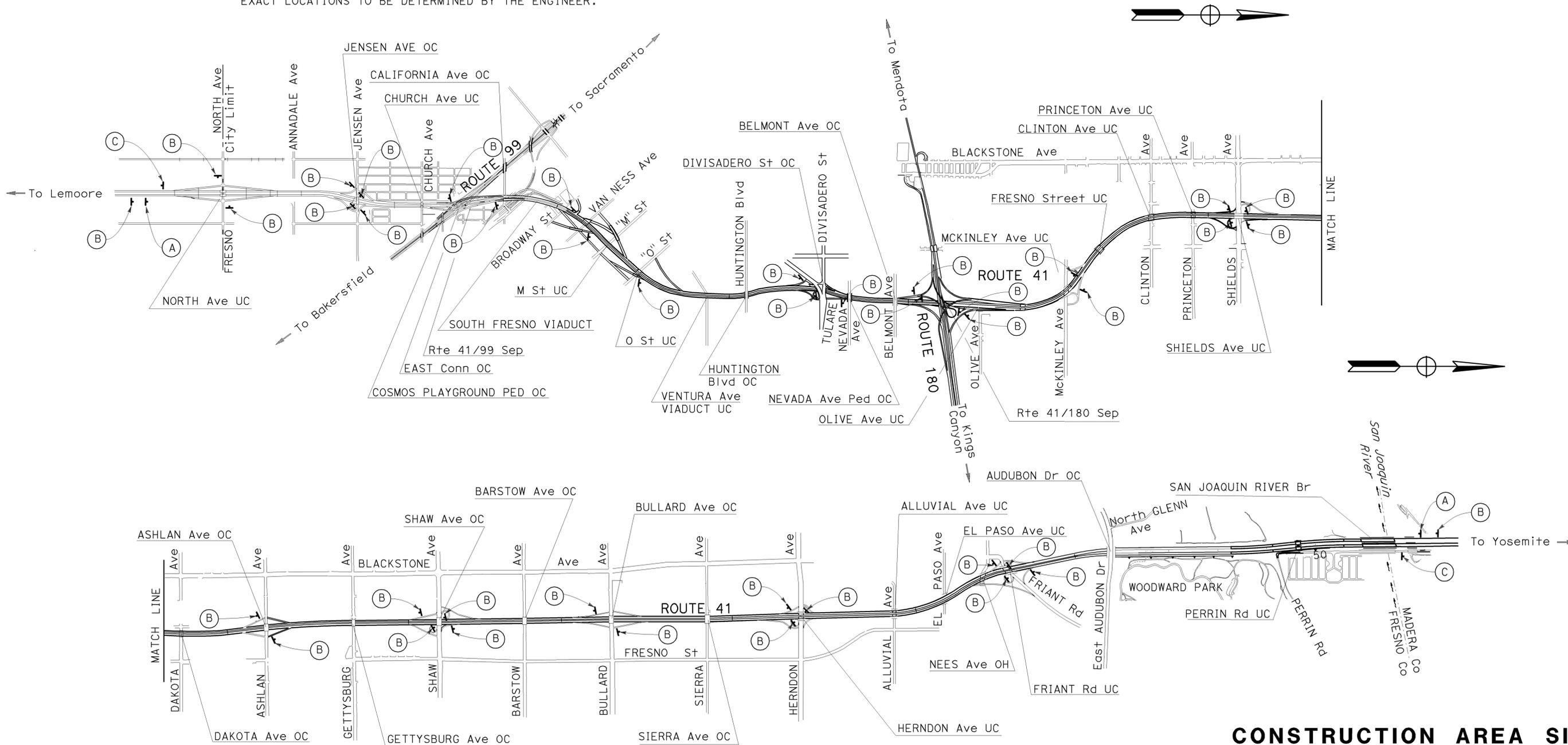
**CONSTRUCTION DETAILS**  
NO SCALE **C-24**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN
Caltrans	
FUNCTIONAL SUPERVISOR	GETACHEW ESHETE
CALCULATED/DESIGNED BY	CHECKED BY
AKM RAHMAN	AKM RAHMAN
REVISED BY	DATE
	REVISED

# STATIONARY MOUNTED CONSTRUCTION AREA SIGNS

SIGN (No)	SIGN CODE	PANEL SIZE (INCH)	SIGN MESSAGE	No. OF POST AND SIZE (inch)	NUMBER OF SIGNS
(A)	G20-1	48" x 24"	ROAD WORK NEXT 15 MILES	1- 4" x 6"	2
(B)	W20-1	48" x 48"	ROAD WORK AHEAD	1- 6" x 6"	41
(C)	G20-2	48" x 24"	END ROAD WORK	1- 4" x 6"	2

NOTES: 1. SIGN LOCATIONS SHOWN ARE APPROXIMATE ONLY.  
EXACT LOCATIONS TO BE DETERMINED BY THE ENGINEER.



THIS PLAN ACCURATE FOR CONSTRUCTION AREA SIGNS ONLY

## CONSTRUCTION AREA SIGN

NO SCALE

**CS-1**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	27	41
Amrajit S. Dhillon REGISTERED CIVIL ENGINEER			02/11/10 DATE		
7-26-10 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** TRAFFIC DESIGN  
 FUNCTIONAL SUPERVISOR: MOHAMMED QATAMI  
 CALCULATED/DESIGNED BY: AMARJIT DHILLON  
 CHECKED BY: HASSAN M TAHA  
 REVISED BY: DATE  
 REVISIONS:

LAST REVISION: DATE PLOTTED => 06-JAN-2011  
 07-25-10 TIME PLOTTED => 15:55

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	28	41

*AKM Rahman* 06-14-10  
REGISTERED CIVIL ENGINEER DATE

7-26-10  
PLANS APPROVAL DATE

AKM F. RAHMAN  
No. 74163  
Exp 6/30/11  
CIVIL

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

### SUMMARY OF QUANTITIES

DIRECTION	LOCATION No.	CONSTRUCTION DETAILS SHEET No.	POST MILE	DESCRIPTION	LAYOUT TYPE (N)	REMOVE MBGR	REMOVE DOUBLE MBGR	REMOVE TERMINAL SYSTEM (N)	REMOVE CAA (N)	REMOVE BRIDGE RAILING	MBGR AVAILABLE FOR REUSE (N)	RECONSTRUCT MBGR (STEEL POST)	MBGR (STEEL POST)	DOUBLE MBGR (STEEL POST)	RECONSTRUCT DOUBLE MBGR (STEEL POST)	ALTERNATIVE IN-LINE TERMINAL SYSTEM	ALTERNATIVE FLARED TERMINAL SYSTEM	END ANCHOR ASSEMBLY (Type SFT)	ALTERNATIVE CRASH CUSHION SYSTEM	X-TENSION GUARDRAIL TERMINAL SYSTEM	TRANSITION RAILING (Type WB)	WEED CONTROL MAT (RUBBER)	MINOR CONCRETE (MINOR STRUCTURES)	BRIDGE RAIL CONNECTION TYPE (N)	REMARKS
						LF	LF	EA	EA	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	SOYD	CY		
NB	1	C-1	R20.08	NORTH Ave UC (L+)	12E	12.5			1		300.0	75.0			112.5				1		1	72.9	0.69	25	
	2	C-1	R20.08	NORTH Ave UC (R+)	12B	37.5		1			862.5	862.5					1				1	287.5	0.69	25	
	3	C-2	R21.00	JENSEN OFF-RAMP (L+)	12B	62.5		1									1				1	12.5	1.65	25AB	
	4	C-2	R21.00	JENSEN OFF-RAMP (R+)	12B	62.5		1									1				1	12.5	1.45	27	
	5	C-2	R21.08	EB JENSEN LOOP ON-RAMP	12B	62.5		1									1				1	12.5	1.65	25AB	
	6	C-2	R21.11	JENSEN Ave OC	14A	282.0							200.0	50.0				2	2			112.5			
	7	C-3	R21.60	CHURCH Ave UC (L+)	12E	95.3		1					75.0	112.5					1		1	77.1	0.69	25	
	8	C-3	R21.60	CHURCH Ave UC (R+)	12D	28.5					987.5	987.5									1	329.2	0.69	25	
	9	C-2	R21.68	NB OFF TO NB Rte 99 (L+)	12B	62.5		1									1				1	12.5	0.61	25A	
	10	C-3	R21.94	41/99 Sep Br 42-266 (R+)	12A	137.5		1					87.5			1					1	29.2	0.69	25	
	11	C-4	R22.11	FRESNO VIADUCT (R+)	12B				1		675.0	675.0					1				1	237.5	0.61	1	
	12	C-4	R22.64	VAN NESS UC (R+)	12A					37.5						1					1	16.7	0.40	9 A1+ 2	
	13	C-4	R22.80	"M" STREET UC (R+)	12A	50.0										1					1	16.7	1.65	25AB	
	14	C-2	R22.95	"O" STREET UC (R+)	12B	62.5		1									1				1	12.5	1.65	25AB	
	15		R23.01	NB ON-RAMP FROM "M" St (R+)	12A	287.5			1				237.5							1	1	95.8	1.65	25AB	REMOVE ALL EXISTING MBGR AND BUILT NEW
	16	C-5	R23.07	VENTURA Ave Via 42-278(R+)	12D	37.5															1		2.17	25AA	
	17	C-5	R24.75	OLIVE Ave UC (R+)	12B	62.5		1									1				1	12.5	1.65	25AB	
	18	C-5	R25.00	FLORADORA Ave OH (R+)	12D	37.5															1		2.17	25AA	
	19	C-5	R25.27	MCKINLEY OFF-RAMP (R+)	12D	37.5															1		2.17	25AA	
	20	C-5	R25.27	MCKINLEY Ave UC		137.5			1				80.5					1			2	60.1	0.61	25A	INSTEAD OF SFT USE WB
	21		R25.60	FRESNO St UC (R+)	12D	32.5															1		2.17	25AA	REMOVE MBGR FOR WB AND Br CONNECTION
	22	C-5	R25.95	CLINTON Ave UC (R+)	12D	37.5															1		2.17	25AA	
	23	C-5	R26.21	PRINCETON Ave UC (R+)	12D	37.5															1		2.17	25AA	
	24	C-2	R26.46	SHIELDS Ave UC (R+)	12B	62.5		1									1				1	12.5	0.61	25A	
	25	C-6	R28.62	HERNDON Ave UC (R+)	12B	62.5		1									1				1		0.69	25	
	26	C-6	R31.69	FRIANT Rd UC (R+)	12B	50.0							25.0				1				1	20.8	0.61	25A	
	27	C-6	R32.86	PERRIN Rd UC (R+)	12B	62.5		1			25.0	25.0					1				1	8.3	1.65	25AB	
	28	C-7	R32.86	PERRIN Rd UC (L+)	12E	168.8		1					50.0	87.5					1		1	60.4	0.69	25	
	29	C-7	RR33.34	SAN JOAQUIN RIVER Br (R+)	12B	71.5		1			450.0	450.0					1				1	150.0	0.69	25	
	30	C-8	RR33.34	SAN JOAQUIN RIVER Br (L+)	12E	206.3		1					50.0	87.5					1		1	89.6	0.69	25	
				SUB-TOTAL 1		2347.4		15	4	37.5	3300.0	3075.0	805.5	337.5	112.5	3	13	3	6	1	30	1751.8	35.68		

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

### SUMMARY OF QUANTITIES Q-1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	29	41

AKM Rahman 06-14-10  
REGISTERED CIVIL ENGINEER DATE

7-26-10  
PLANS APPROVAL DATE

AKM F. RAHMAN  
No. 74163  
Exp 6/30/11  
CIVIL

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

### SUMMARY OF QUANTITIES

DIRECTION	LOCATION No.	CONSTRUCTION DETAILS SHEET No.	POST MILE	DESCRIPTION	LAYOUT TYPE (N)	REMOVE MBGR	REMOVE DOUBLE MBGR	REMOVE TERMINAL SYSTEM (N)	REMOVE CAA (N)	REMOVE BRIDGE RAILING	MBGR AVAILABLE FOR REUSE (N)	RECONSTRUCT MBGR (STEEL POST)	MBGR (STEEL POST)	DOUBLE MBGR (STEEL POST)	RECONSTRUCT DOUBLE MBGR (STEEL POST)	ALTERNATIVE IN-LINE TERMINAL SYSTEM	ALTERNATIVE FLARED TERMINAL SYSTEM	END ANCHOR ASSEMBLY (Type SFT)	ALTERNATIVE CRASH CUSHION SYSTEM	X-TENSION GUARDRAIL TERMINAL SYSTEM	TRANSITION RAILING (Type WB)	WEED CONTROL MAT (RUBBER)	MINOR CONCRETE (MINOR STRUCTURES)	BRIDGE RAIL CONNECTION TYPE (N)	REMARKS	
				DESCRIPTION		LF	LF	EA	EA	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	SQ YD	CY			
SB	31	C-8	R32.89	PERRIN Rd UC (Lt)	12E	212.3		1					50.0	87.5					1		1	60.4	0.69	25		
	32		R31.81	FRIANT Rd SIGN	16B	79.0			1				37.5									25.0			REMOVE ALL EXISTING MBGR	
	33	C-9	R31.68	FRIANT Rd UC (Lt)	12E	50.0	50.0						100.0	137.5						1	1	1	93.8	0.69	25	
	34	C-9	R31.55	SB ON FROM EB FRIANT	12B	62.5			1			900.0	900.0									1	42.5	0.69	25	
	35	C-10	R31.5	NEES Ave UC (Lt)	12E	55.0	50.0			1				100.0	137.5					1		1	93.8	0.69	25	
	36	C-5	R31.20	EL PASO Ave UC (Rt)	12D	37.5																1		0.69	25	
	37	C-10	R31.20	EL PASO Ave UC (Lt)	12E	55.0	50.0			1				37.50	75.0					1		1	52.1	0.69	25	
	38	C-5	R30.95	ALLUVIAL Ave UC (Rt)	12D	37.5																1		2.21	25C	
	39		R28.32	SB ON-RAMP FROM EB SHAW	11B				1			425.0	425.0						1	1			154.2			RE-BUILT THE WHOLE SYSTEM
	40		R26.68	SB OFF-RAMP TO SHIELDS	11B				1														12.5			
	41	C-5	R25.95	CLINTON Ave UC (Rt)	12D	37.5																1		2.17	25AA	
	42	C-5	R25.60	FRESNO St UC (Rt)	12D	37.5																1		2.17	25AA	
	43	C-11	R24.75	OLIVE Ave UC (Rt)			425.0			1				368.0					1			2	114.6	0.61	25A	
	44	C-5	R23.50	FLORADORA Ave UC (Rt)	12D	37.5																1		2.17	25AA	
	45	C-11	R23.07	VENTURA Ave Via (Rt)	12A	75.0				1				25.0			1					1	25.0	1.65	25AB	
	46	C-11	R22.95	"O" St UC (Rt)	12A	37.5				1		25.0	25.0				1					1	30.0	1.65	25AB	
	47		R22.95	"O" St UC (Rt) DEPARTURE	12DD														1							
	48		R22.80	SB OFF-RAMP TO "M" St (Rt)	12A	50.0				1				25.0			1					1	25.0	1.65	25AB	REMOVE ALL EXISTING MBGR & RE-BUILT
	49	C-12	R22.80	"M" St UC (Rt)			100.0							31.0					1			2	10.3	1.65	25AB	
	50		R22.65	VAN NESS Ave UC (Rt)	12A						37.5						1					1	16.7	0.40	9 Alt 2	
	51	C-12	R21.79	41/99 SEPERATION	12B	37.5			1			25.0	25.0					1				1	20.8	0.61	25A	
	52		R20.945	SB LOOP-ON FROM JENSEN Ave	11B				1									1					12.5			
	53	C-12	R20.11	NORTH Ave UC (Lt)	12E	212.5	50.0							75.0	112.5					1		1	77.1	0.69	25	
					SUB-TOTAL 2		1638.8	200.0	6	7	37.5	1375.0	1337.5	849.0	550.0		4	6	5	5		20	866.3	21.77		
					SUB-TOTAL 1		2347.4		15	4	37.5	3300.0	3075.0	805.5	337.5	112.5	3	13	3	6	1	30	1751.8	35.68		
				GRAND TOTAL		3986.2	200.0			75.0		4412.5	1654.5	887.5	112.5	7	19	8	11	1	50	2618.1	57.45			

\* SEE SHEET Q-3

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

### SUMMARY OF QUANTITIES Q-2

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	30	41

*AKM Rahman* 06-14-10  
 REGISTERED CIVIL ENGINEER DATE  
 7-26-10  
 PLANS APPROVAL DATE

AKM F. RAHMAN  
 No. 74163  
 Exp 6/30/11  
 CIVIL

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

### RESET ROADSIGN SIGN

DIRECTION	LOCATION No.	POST MILE	DESCRIPTION	ONE POST
				EA
NB	2	R20.08	NORTH Ave UC (R+)	1
NB	3	R21.00	JENSEN OFF-RAMP (L+)	1
NB	4	R21.00	JENSEN OFF-RAMP (R+)	1
NB	7	R21.60	CHURCH Ave UC (L+)	1
NB	8	R21.60	CHURCH Ave UC (R+)	1
NB	9	R21.68	NB OFF TO NB Rte 99 (L+)	1
NB	10	R21.94	41/99 Sep Br 42-266 (R+)	1
NB	11	R22.11	FRESNO VIADUCT (R+)	2
NB	12	R22.64	VAN NESS UC (R+)	1
NB	13	R22.80	"M" STREET UC (R+)	2
NB	15	R23.01	NB ON-RAMP FROM "M" St (R+)	1
NB	16	R23.07	VENTURA Ave Via 42-278 (R+)	2
NB	17	R24.75	OLIVE Ave UC (R+)	2
NB	18	R25.00	FLORADORA Ave OH (R+)	2
NB	19	R25.27	MCKINLEY OFF-RAMP (R+)	1
NB	20	R25.27	MCKINLEY Ave UC	4
NB	22	R25.95	CLINTON Ave UC (R+)	2
NB	23	R26.21	PRINCETON Ave UC (R+)	2
NB	24	R26.46	SHIELDS Ave UC (R+)	2
NB	25	R28.62	HERNDON Ave UC (R+)	2
NB	26	R31.69	FRIANT Rd UC (R+)	2
NB	27	R32.86	PERRIN Rd UC (R+)	2
NB	28	R32.86	PERRIN Rd UC (L+)	1
NB	29	RR33.34	SAN JOAQUIN RIVER Br (R+)	2
NB	30	RR33.34	SAN JOAQUIN RIVER Br (L+)	1
NB	31	R32.89	PERRIN Rd UC (L+)	1
NB	33	R31.68	FRIANT Rd UC (L+)	1
NB	34	R31.55	SB ON FROM EB FRIANT	1
NB	35	R31.50	NEES Ave UC (L+)	1
NB	36	R31.20	EL PASO Ave UC (R+)	2
NB	38	R30.95	ALLUVIAL Ave UC (R+)	2
NB	41	R25.95	CLINTON Ave UC (R+)	1
NB	42	R25.60	FRESNO St UC (R+)	2
NB	43	R24.75	OLIVE Ave UC (R+)	3
NB	44	R23.50	FLORADORA Ave UC (R+)	2
NB	45	R23.07	VENTURA Ave Via (R+)	1
NB	46	R22.95	"O" St UC (R+)	1
NB	47	R22.95	"O" St UC (R+) DEPARTURE	1
NB	48	R22.80	SB OFF-RAMP TO "M" St (R+)	1
NB	49	R22.80	"M" St UC (R+)	2
NB	53	R20.11	NORTH Ave UC (L+)	1
			TOTAL	63

### HMA DIKE QUANTITIES

DIRECTION	LOCATION No.	CONSTRUCTION DETAILS SHEET No.	POST MILE	DESCRIPTION	REMOVE ASPHALT CONCRETE DIKE	PLACE HOT MIX ASPHALT DIKE (TYPE F)	PLACE HOT MIX ASPHALT DIKE (TYPE C)	MINOR HOT MIX ASPHALT
					LF	LF	LF	TON
NB	12	C-10	R22.64	VAN NEES Ave UC (R+)	100.0	25.0	75.0	0.95
NB	13	C-9	R22.80	"M" STREET UC (R+)	100.0	25.0	75.0	0.95
NB	17	C-6	R24.75	OLIVE AVE UC (R+)	87.5	25.0	62.5	0.86
NB	27	C-7	R32.86	PERRIN Rd UC (R+)	75.0	50.0	62.5	1.19
SB	34	C-8	R31.55	SB ON FROM EB FRIANT	975.0	925.0	62.5	12.72
SB	45	C-10	R23.07	VENTURA Ave Via (R+)	125.0	50.0	75.0	1.28
SB	51	C-8	R21.79	Rte 41/99 SEPERATION	94.0	50.0	62.5	1.19
				TOTAL	1556.5	1150.0	475.0	19.14

### MISCELLANEOUS WORK

DIRECTION	LOCATION No.	CONSTRUCTION DETAILS SHEET No.	POST MILE	DESCRIPTION	REMOVE CONCRETE BARRIER	REPLACE ASPHALT CONCRETE SURFACING
					LF	CY
NB	4	C-6	R21.0	JENSEN OFF-RAMP (R+)	6.0	
NB	12	C-10	R22.64	VAN NEES UC (R+)		9.3
NB	13	C-9	R22.80	"M" STREET UC (R+)		9.3
				TOTAL	6.0	18.6

### OBJECT MARKER

POST MILE	LOCATION	OBJECT MARKER (TYPE L-1)
		EA
R20.08	NORTH Ave UC (R+)	1
R21.00	JENSEN OFF-RAMP (L+)	1
R21.00	JENSEN OFF-RAMP (R+)	1
R21.08	EB JENSEN LOOP ON-RAMP	1
R21.68	NB OFF TO NB Rte 99 (L+)	1
R21.94	41/99 Sep Br 42-266 (R+)	1
R22.11	FRESNO VIADUCT (R+)	1
R22.64	VAN NESS UC (R+)	1
R22.80	"M" STREET UC (R+)	1
R22.95	"O" STREET UC (R+)	1
R24.75	OLIVE Ave UC (R+)	1
R26.46	SHIELDS Ave UC (R+)	1
R28.62	HERNDON Ave UC (R+)	1
R31.69	FRIANT Rd UC (R+)	1
R32.86	PERRIN Rd UC (R+)	1
RR33.34	SAN JOAQUIN RIVER Br (R+)	1
R31.81	FRIANT Rd SIGN	1
R31.55	SB ON FROM EB FRIANT	1
R28.32	SB ON-RAMP FROM EB SHAW	1
R26.68	SB OFF-RAMP TO SHIELDS	1
R23.07	VENTURA Ave Via (R+)	1
R22.95	"O" St UC (R+)	1
R22.80	SB OFF-RAMP TO "M" St (R+)	1
R22.65	VAN NESS Ave UC (R+)	1
R21.79	41/99 SEPERATION	1
R20.945	SB LOOP-ON FROM JENSEN Ave	1
	TOTAL	26

## SUMMARY OF QUANTITIES Q-3

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	31	41

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

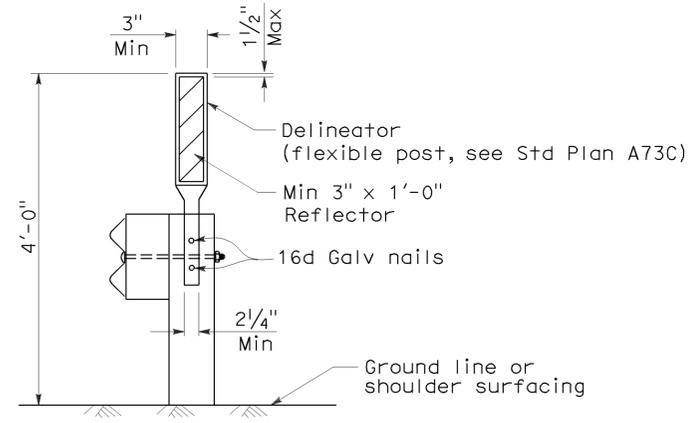
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REGISTERED PROFESSIONAL ENGINEER  
Randell D. Hiatt  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA

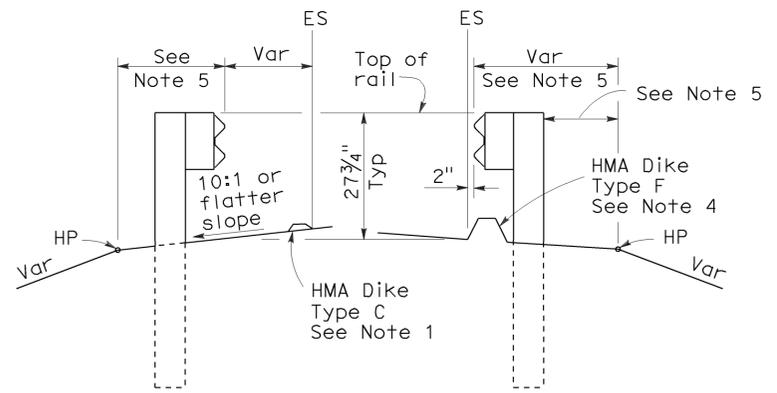
To accompany plans dated 7-26-10

**NOTES:**

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



**GUARD RAILING DELINEATION**  
See Note 3



**DIKE POSITIONING**  
See Note 1

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

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

**REVISED STANDARD PLAN RSP A77C4**

2006 REVISED STANDARD PLAN RSP A77C4

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	32	41

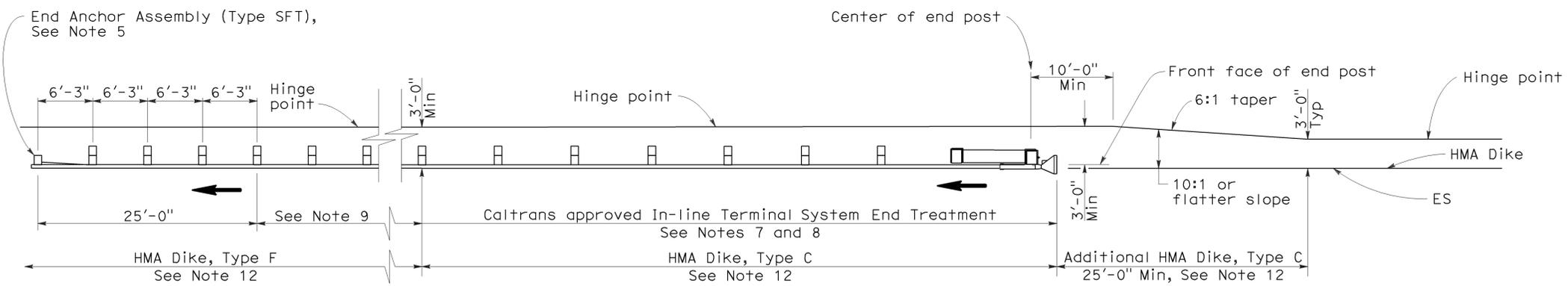
Randell D. Hiatt  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

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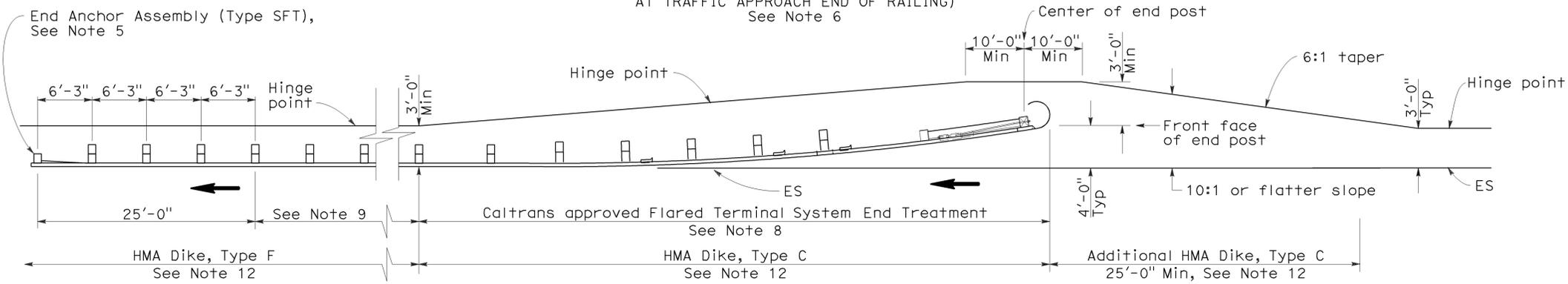
To accompany plans dated 7-26-10

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



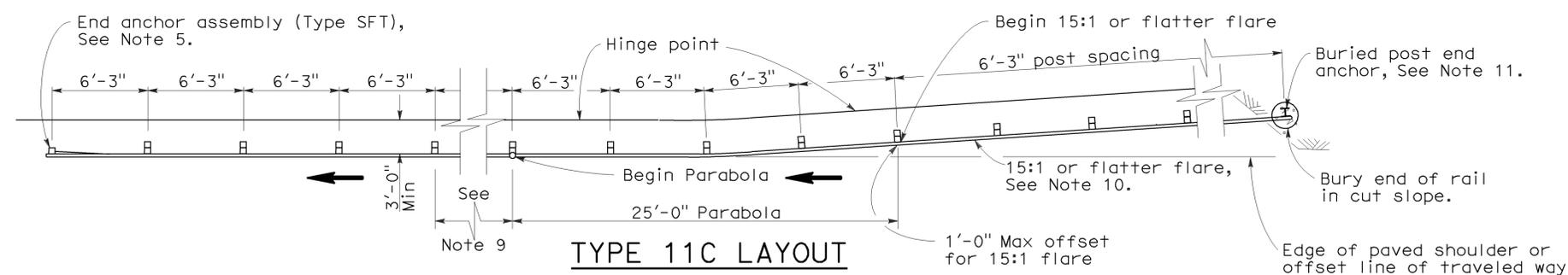
**TYPE 11A LAYOUT**

(EMBANKMENT GUARD INSTALLATION WITH IN-LINE END TREATMENT AT TRAFFIC APPROACH END OF RAILING)  
See Note 6



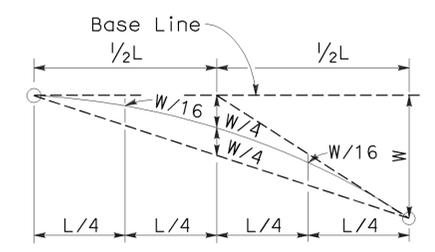
**TYPE 11B LAYOUT**

(EMBANKMENT GUARD RAILING INSTALLATION WITH FLARED END TREATMENT AT TRAFFIC APPROACH END OF RAILING)  
See Note 6

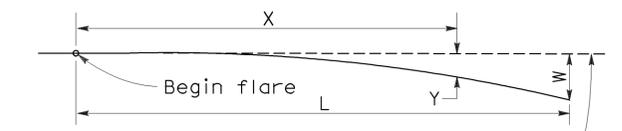


**TYPE 11C LAYOUT**

(EMBANKMENT GUARD RAILING INSTALLATION WITH BURIED END ANCHOR TREATMENT AT TRAFFIC APPROACH END OF RAILING)  
See Notes 6 and 12



**TYPICAL PARABOLIC LAYOUT**

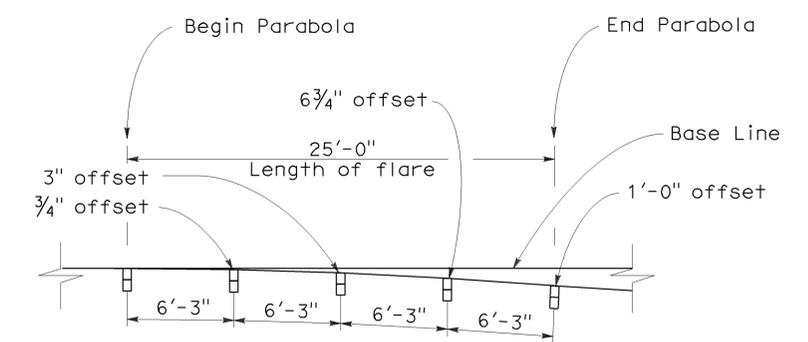


Base Line (Edge of paved shoulder or offset line of edge of traveled way)

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

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**

**NOTES:**

- Line post, blocks and hardware to be used are shown on Standard Plans A77A1, A77A2, A77B1, A77C1, and A77C2.
- Guard rail post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or recycled plastic blocks may be used for 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- Direction of adjacent traffic indicated by  $\rightarrow$ .
- For End Anchor Assembly (Type SFT) details, see Standard Plan A77H1.
- Layout Types 11A, 11B or 11C are typically used where guard railing is recommended to shield embankment slopes and a crashworthy end treatment is required for only one direction of traffic.
- In-line Terminal System End Treatments are used where site conditions will not accommodate a flared end treatment.
- The type of 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 guard railing (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 guard railing within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
- For details of the buried post end anchor used with Type 11C Layout, see Standard Plan A77I2.
- Where placement of dike is required with guard railing installations, see Revised Standard Plan RSP A77C4 for dike positioning details.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**METAL BEAM GUARD RAILING  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**  
NO SCALE

RSP A77E1 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77E1  
DATED MAY 1, 2006 - PAGE 48 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77E1**

2006 REVISED STANDARD PLAN RSP A77E1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	33	41

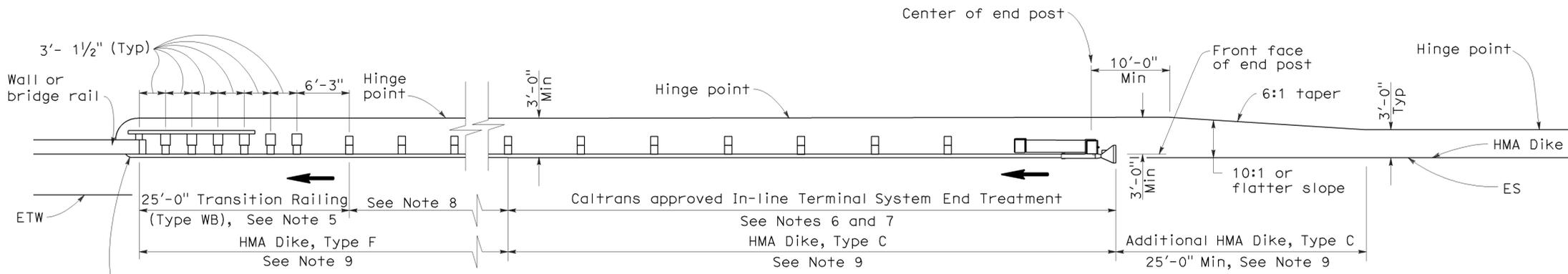
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

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

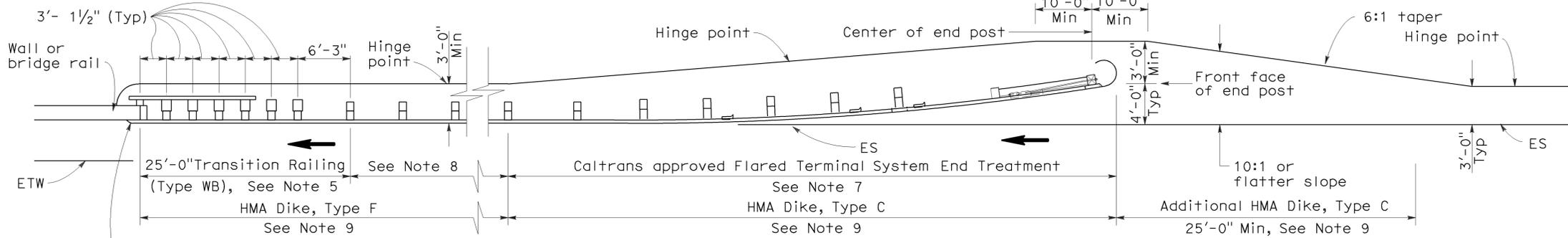
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To accompany plans dated 7-26-10



**TYPE 12A LAYOUT**

(GUARD RAILING INSTALLATION AT STRUCTURE APPROACH WITH AN IN-LINE END TREATMENT AT TRAFFIC APPROACH END OF RAILING)  
See Notes 10



**TYPE 12B LAYOUT**

(GUARD RAILING INSTALLATION AT STRUCTURE APPROACH WITH A FLARED END TREATMENT AT TRAFFIC APPROACH END OF RAILING)  
See Notes 10

**NOTES:**

- Line post, blocks and hardware to be used are shown on Standard Plans A77A1, A77A2, A77B1, A77C1 and A77C2.
- Guard rail post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- Direction of adjacent traffic indicated by  $\rightarrow$ .
- For Transition Railing (Type WB) details for Types 12A and 12B Layouts, see Standard Plan A77J4.
- In-line Terminal System End Treatments are used where site conditions will not accommodate a flared end treatment.
- The type 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.

- Where placement of dike is required with guard railing installations, see Revised Standard Plan RSP A77C4 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 A77F3 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 A77J1 and RSP A77J2 and Connection Detail FF on Standard Plans A77K1 and A77K2.
- For additional details of a typical connection to walls or abutments, see Standard Plan A77J3.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL BEAM GUARD RAILING  
TYPICAL LAYOUTS FOR  
STRUCTURE APPROACH**

NO SCALE

RSP A77F1 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77F1  
DATED MAY 1, 2006 - PAGE 54 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77F1**

2006 REVISED STANDARD PLAN RSP A77F1

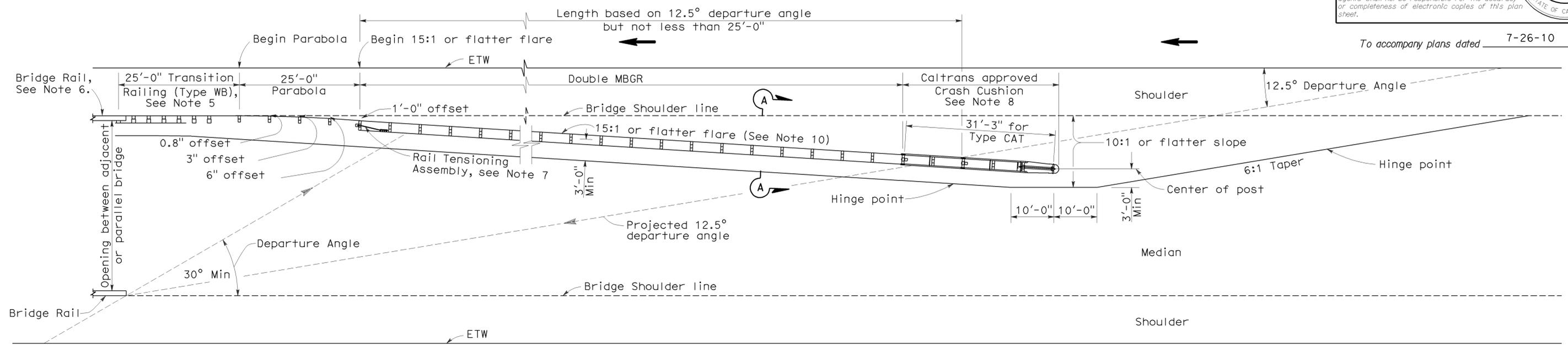
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	34	41

Randell D. Hiatt  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

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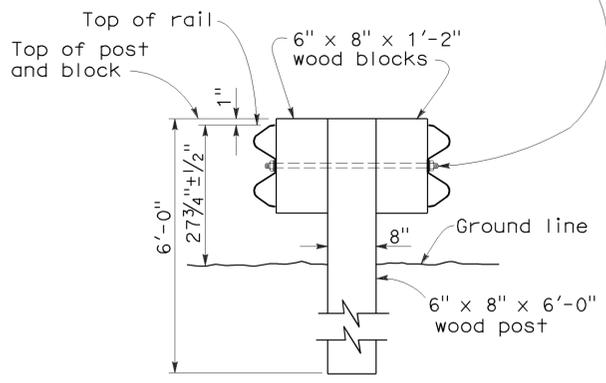
REGISTERED PROFESSIONAL ENGINEER  
Randell D. Hiatt  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA



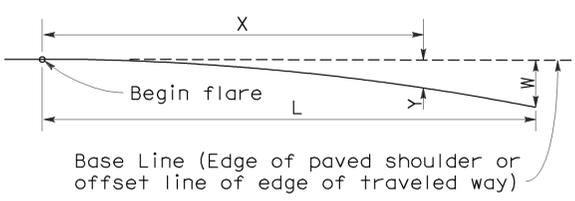
To accompany plans dated 7-26-10

**TYPE 12E LAYOUT**  
See Note 10

5/8" Ø Button head bolt with hex nut or 5/8" Ø Rod, threaded both ends, with hex nuts. 1/2" Max exposed threads after hex nut(s) tightened. No washer on rail faces for bolted connection to line post.

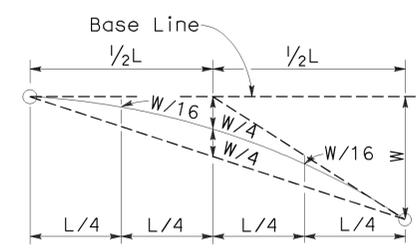


**SECTION A-A**  
**TYPICAL DOUBLE METAL BEAM GUARD RAILING**



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

**PARABOLIC FLARE OFFSETS**



**TYPICAL PARABOLIC LAYOUT**

**NOTES:**

- Line post, blocks and hardware to be used are shown on Standard Plans A77A1, A77A2, A77B1, A77C1 and A77C2.
- Guard railing post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood line posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- Direction of adjacent traffic indicated by →.
- For Transition Railing (Type WB) details, see Standard Plan A77J4.
- For additional details of a typical connection to bridge rail, see Connection Detail AA on Revised Standard Plan RSP A77J1.
- For Rail Tensioning Assembly details, see Standard Plan A77H2.
- The type of Crash Cushion to be used will be shown on the Project Plans.
- Type 12E Layout is typically used left of approaching traffic at the end of each structure on multilane freeways or expressways where a median type barrier is not constructed between separated roadbeds.
- The 15:1 or flatter flare is measured off of the edge of traveled way.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL BEAM GUARD RAILING**  
**TYPICAL LAYOUTS FOR**  
**STRUCTURE APPROACH**

NO SCALE

RSP A77F3 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77F3  
DATED MAY 1, 2006 - PAGE 56 OF THE STANDARD PLANS BOOK DATED MAY 2006.

2006 REVISED STANDARD PLAN RSP A77F3

**NOTES:**

- Line post, blocks and hardware to be used are shown on Standard Plans A77A1, A77A2, A77B1, A77C1 and A77C2.
- Guard railing post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood line posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind standard guard railing section with post spacing of 6'-3". Construct guard railing as shown in the detail "Strengthened Railing Sections for Fixed Objects" on this plan, where the clearance between the face of the railing and the face of a fixed object is less than 4'-0", but not less than 2'-3". Where the clearance is less than 2'-3", a concrete wall or barrier should be constructed to shield the fixed object(s).
- Direction of adjacent traffic indicated by  $\rightarrow$ .

- For End Anchor Assembly (Type SFT) details, see Standard Plan A77H1.
- Type of crash cushion to be used will be shown on the Project Plans.
- Type 15A layout is typically used on multilane freeways or expressways to shield fixed objects in the area between separated one-way roadbeds.
- For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77E1.
- The 15:1 or flatter flare is measured off of the edge of the traveled way.
- W6 x 15 steel post, 8'-0" in length, with 8" x 8" x 1'-2" notched wood block or notched recycled plastic blocks may be used in place of the 10" x 10" x 8'-0" wood post with 8" x 8" x 1'-2" wood block shown in the "Strengthened Railing Sections Detail".

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	35	41

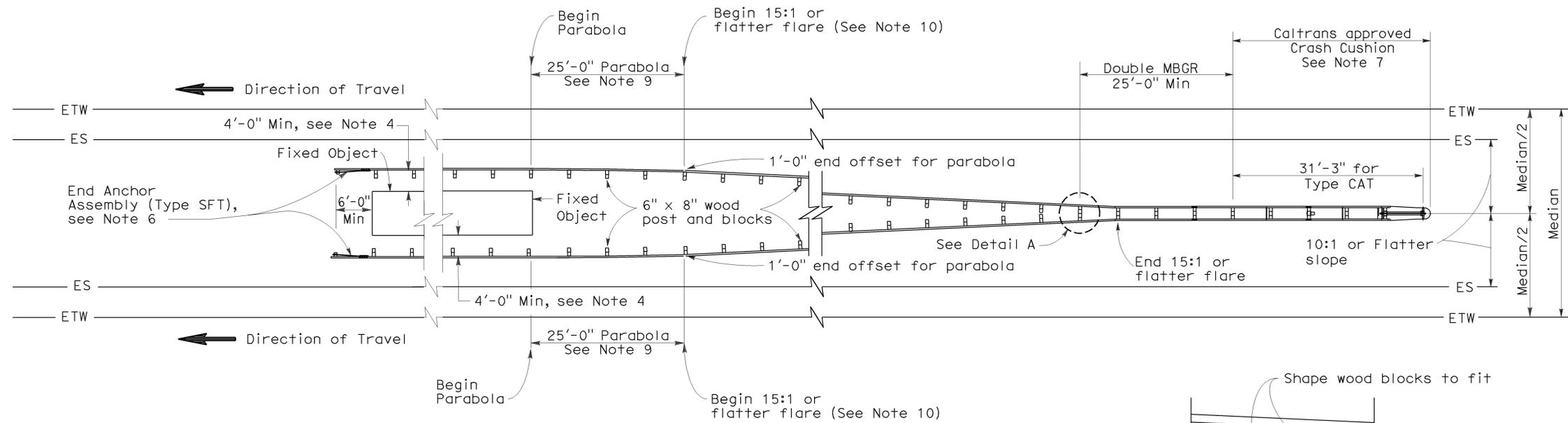
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

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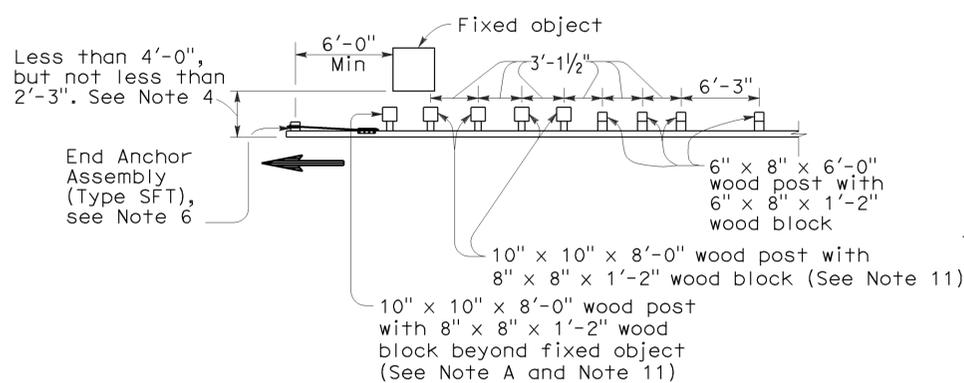
To accompany plans dated 7-26-10

2006 REVISED STANDARD PLAN RSP A77G2



**TYPE 15A LAYOUT**

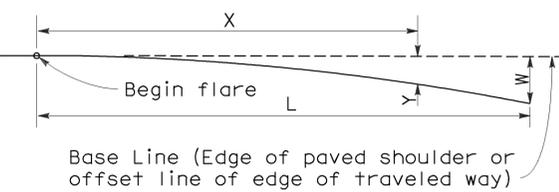
See Note 9



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

**STRENGTHENED RAILING SECTIONS FOR FIXED OBJECT**

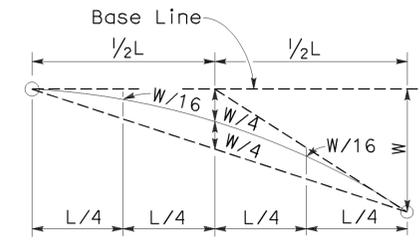
Use strengthened railing sections with Type 15A layout where minimum clearance between the face of the guard railing and the fixed object(s) is less than 4'-0", but not less than 2'-3". See Note 4.



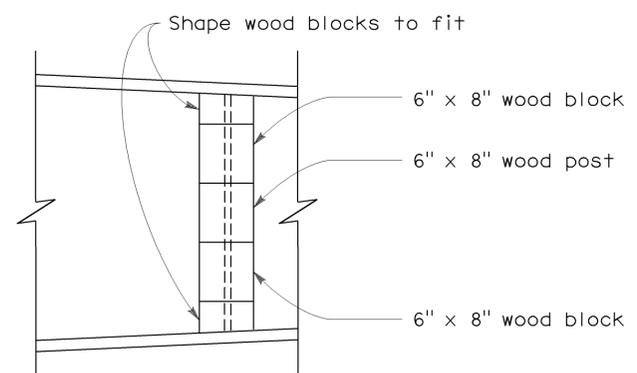
$$Y = \frac{WX^2}{L^2}$$

Y = Offset from base line  
W = Maximum offset  
X = Distance along base line  
L = Length of flare

**PARABOLIC FLARE OFFSETS**



**TYPICAL PARABOLIC LAYOUT**



**DETAIL A**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**METAL BEAM GUARD RAILING  
TYPICAL LAYOUTS FOR  
FIXED OBJECTS  
BETWEEN SEPARATE ROADBEDS  
(ONE-WAY TRAFFIC)**

NO SCALE  
RSP A77G2 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77G2  
DATED MAY 1, 2006 - PAGE 60 OF THE STANDARD PLANS BOOK DATED MAY 2006.  
**REVISED STANDARD PLAN RSP A77G2**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	36	41

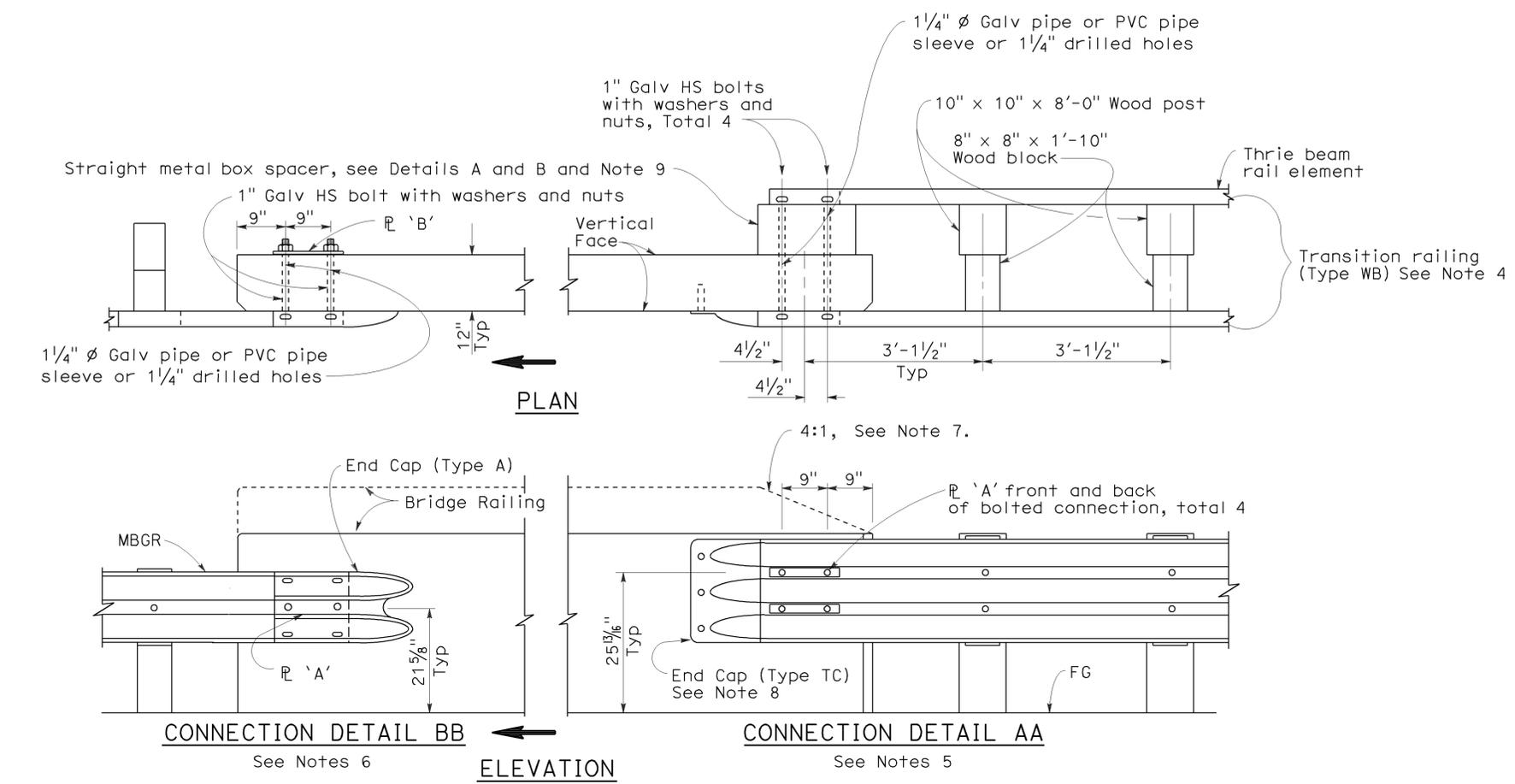
Randell D. Hiatt  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

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

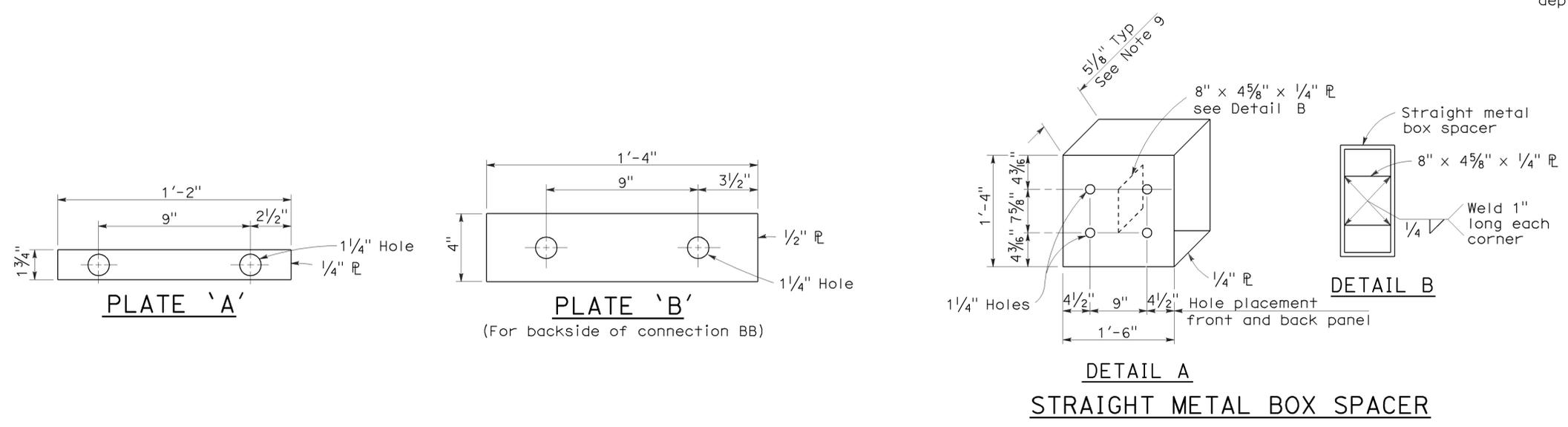
To accompany plans dated 7-26-10



**GUARD RAILING CONNECTION TO BRIDGE RAILING WITHOUT SIDEWALK**

**NOTES:**

1. See Revised Standard Plan RSP A77J2 for additional connection details to bridges without sidewalks.
2. Additional details of posts, blocks and hardware are shown on Standard Plan A77B1, A77C1 and A77C2.
3. Direction of adjacent traffic indicated by  $\rightarrow$ .
4. For additional details of Transition Railing (Type WB), see Standard Plan A77J4. Transition Railing (Type WB) transitions the 12 gage w-beam standard railing section of guard railing to a heavier gage nested thrie beam railing section which is connected to the concrete bridge railing.
5. For typical use of Connection Detail AA, see Layout Types 12A and 12B on Revised Standard Plan RSP A77F1, Layout Types 12C and 12D on Standard Plan A77F2, and Layout Type 12E on Revised Standard Plan RSP A77F3.
6. For typical use of Connection Detail BB, see Layout Type 12D (structure departure railing connection) on Standard Plan A77F2 and Layout Type 12DD on Standard Plan A77F5.
7. Where the height of the bridge railing exceeds the height of the thrie 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 thrie beam rail.
8. For details of End Cap (Type TC), see Standard Plan A77J4.
9. See Standard Plan A77J4 for additional details regarding depth dimension for straight metal box spacer.



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL BEAM GUARD RAILING CONNECTIONS TO BRIDGE RAILINGS WITHOUT SIDEWALKS DETAILS No.1**

NO SCALE

RSP A77J1 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77J1 DATED MAY 1, 2006 - PAGE 72 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77J1**

2006 REVISED STANDARD PLAN RSP A77J1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	37	41

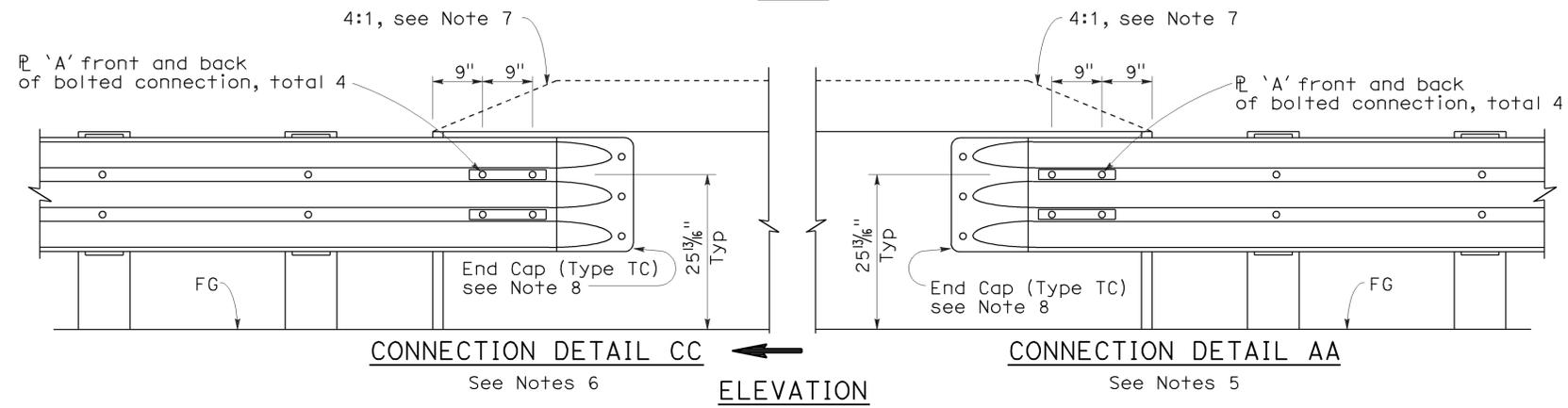
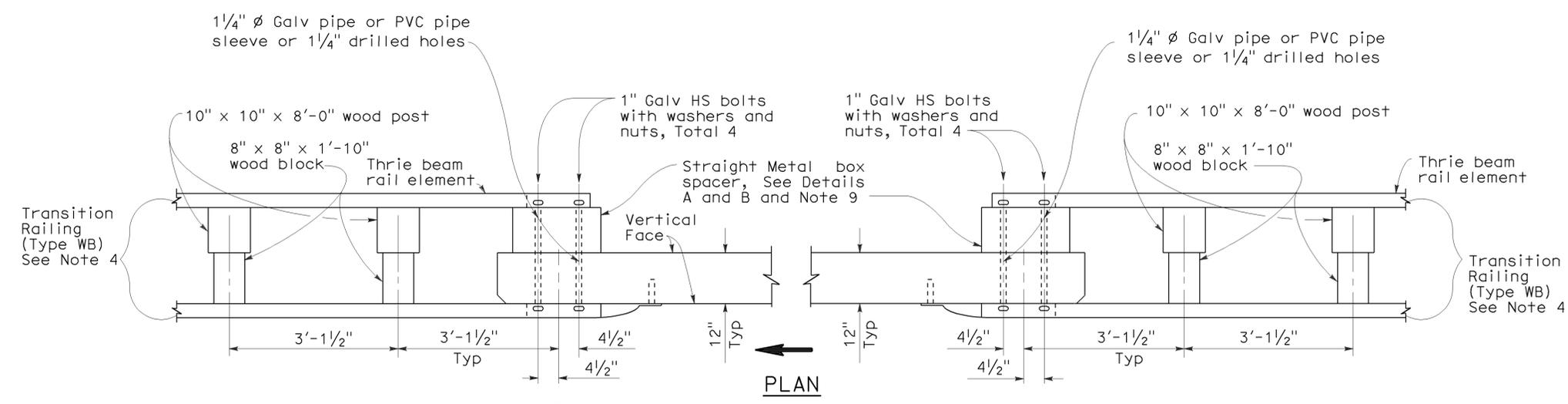
**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA

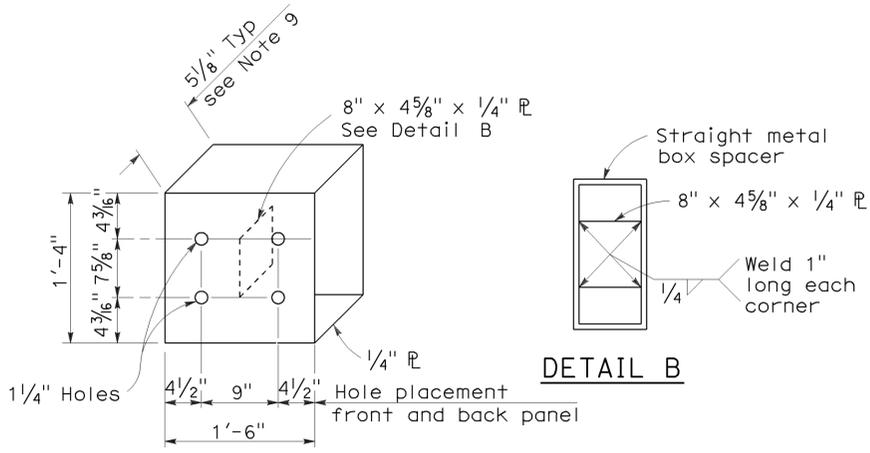
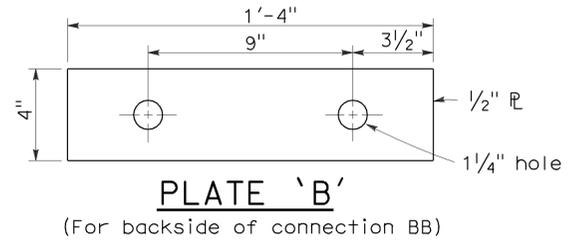
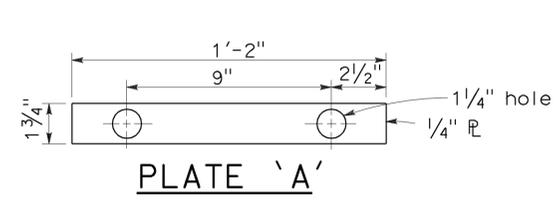
To accompany plans dated 7-26-10



**GUARD RAILING CONNECTION TO BRIDGE RAILING WITHOUT SIDEWALK**

**NOTES:**

1. See Revised Standard Plan RSP A77J1 for additional connection details to bridges without sidewalks.
2. Additional details of posts, blocks and hardware are shown on Standard Plan A77B1, A77C1 and A77C2.
3. Direction of adjacent traffic indicated by →.
4. For additional details of Transition Railing (Type WB), see Standard Plan A77J4. Transition Railing (Type WB) transitions the 12 gage w-beam standard railing section of guard railing to a heavier gage nested thrie beam railing section which is connected to the concrete bridge railing.
5. For typical use of Connection Detail AA, see Layout Types 12A and 12B on Revised Standard Plan RSP A77F1, Layout Types 12C and 12D on Standard Plan A77F2, and Layout Type 12E on Revised Standard Plan RSP A77F3.
6. For typical use of Connection Detail CC, see Layout Types 12AA and 12BB on Standard Plan A77F4 and Layout Type 12CC on Standard Plan A77F5.
7. 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.
8. For details of End Cap (Type TC), see Standard Plans A77J4.
9. See Standard Plans A77J4 for additional details regarding depth dimension for straight metal box spacer.



**DETAIL A  
STRAIGHT METAL BOX SPACER**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL BEAM GUARD RAILING  
CONNECTIONS TO BRIDGE RAILINGS  
WITHOUT SIDEWALKS DETAILS No.2**

NO SCALE  
RSP A77J2 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77J2  
DATED MAY 1, 2006 - PAGE 73 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77J2**

2006 REVISED STANDARD PLAN RSP A77J2

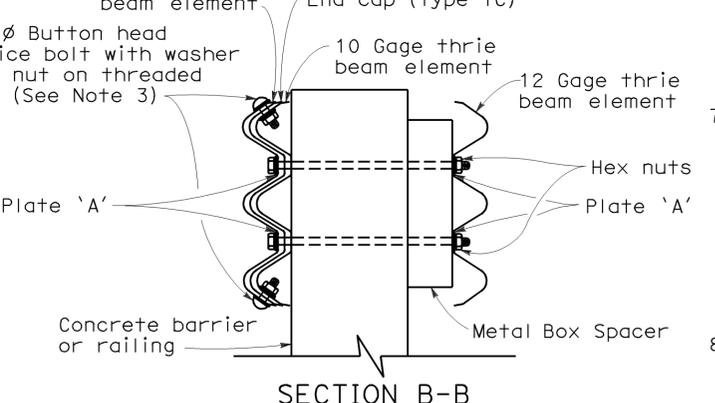
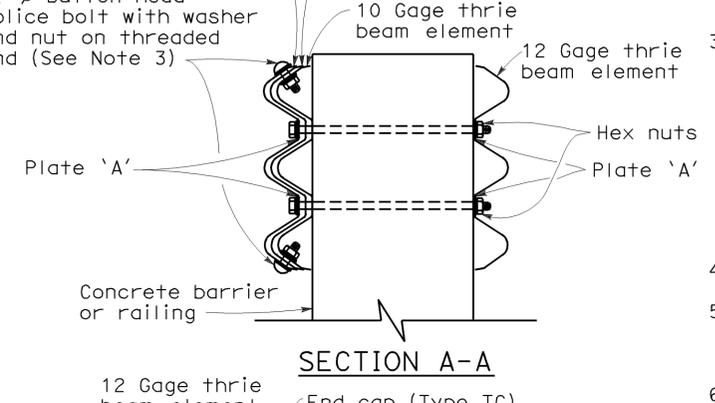
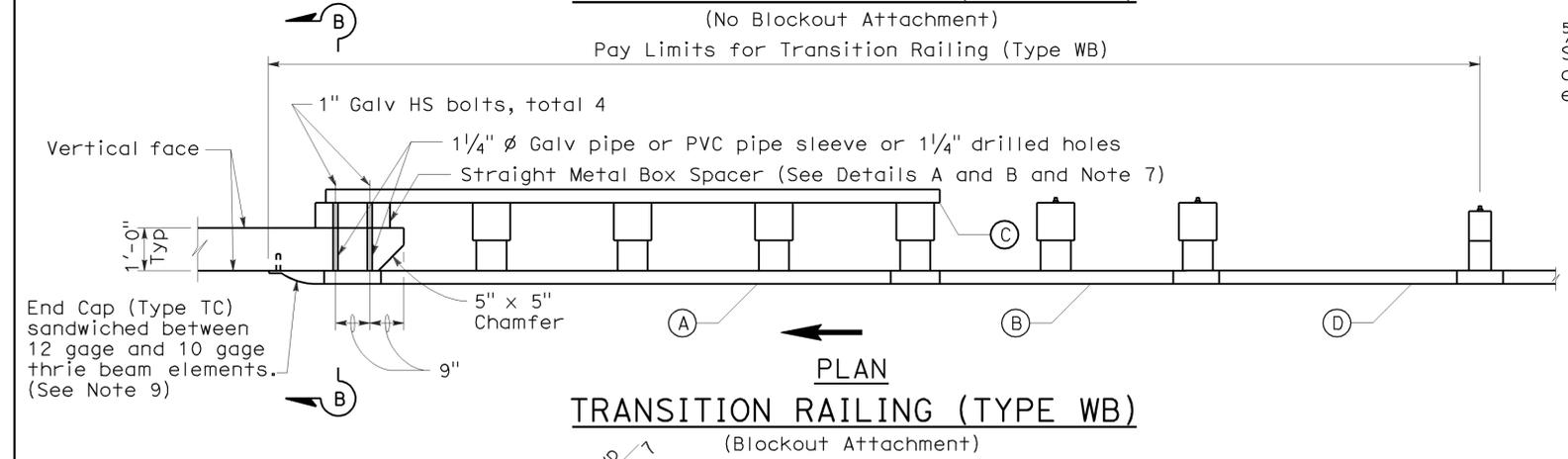
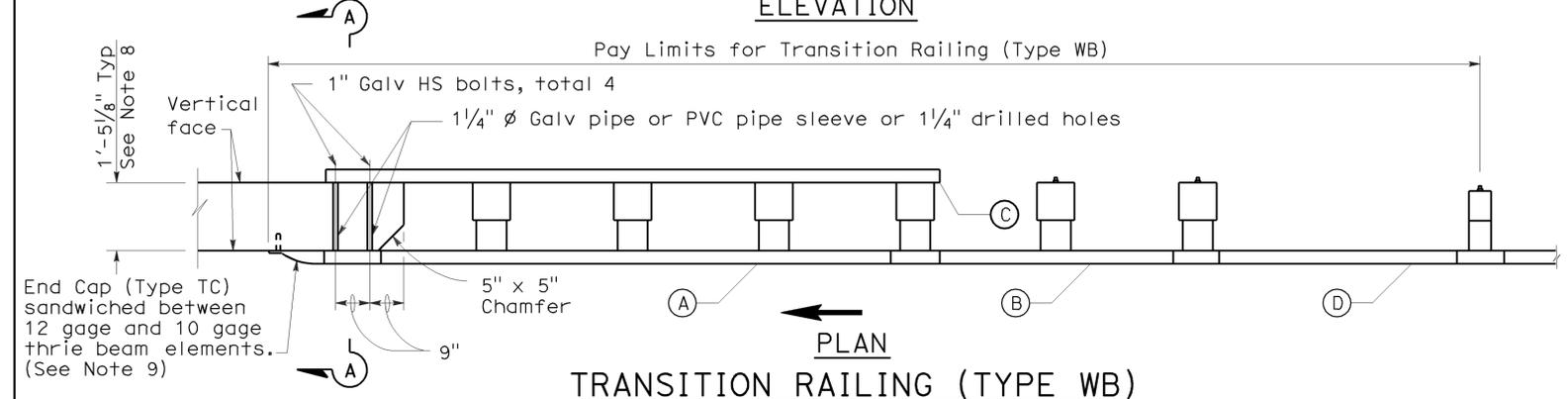
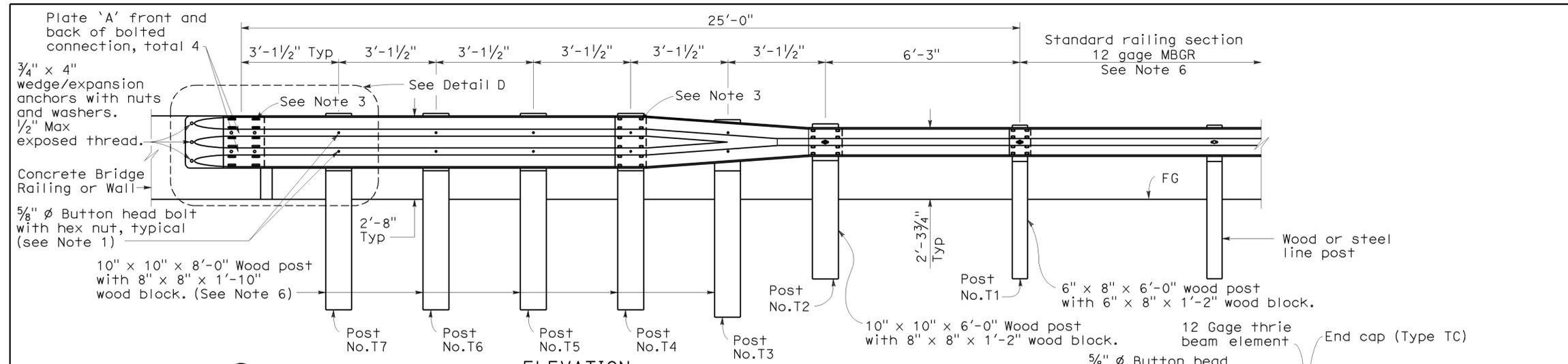
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	38	41

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

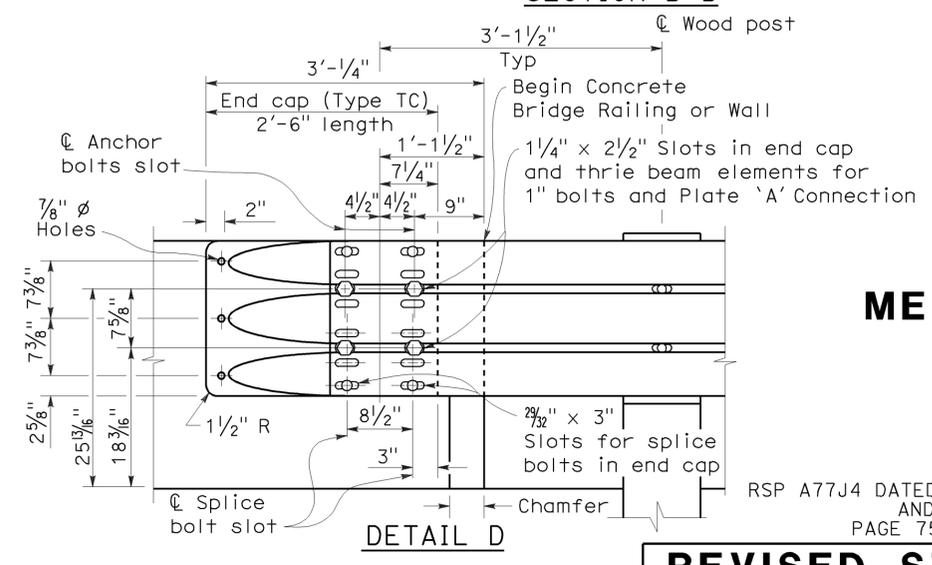
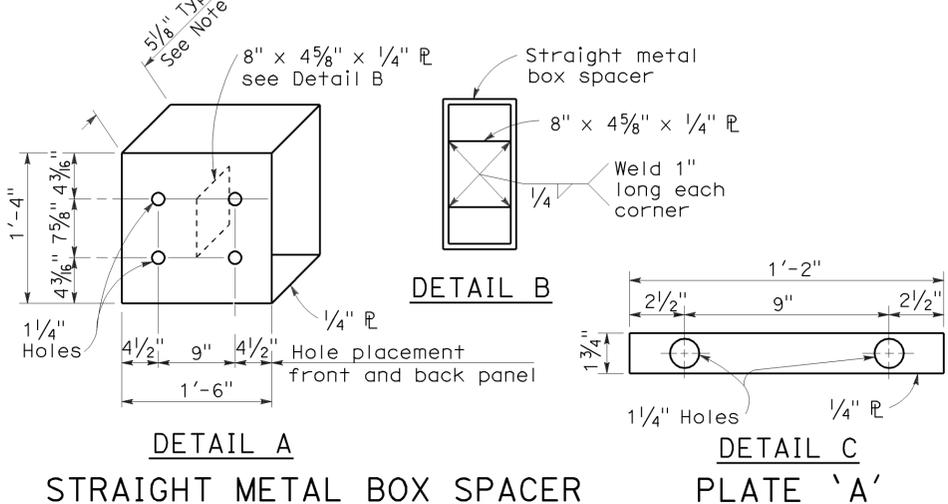
June 5, 2009  
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA



- LEGEND**
- (A) Nested thrie beam elements (one 12 gage element nested over one 10 gage element).
  - (B) One 10 gage "W" beam to thrie beam element.
  - (C) One 12 gage thrie beam element.
  - (D) One 10 gage "W" beam rail element (7'-3 1/2" length)
- 10 gage = 0.135" thick  
12 gage = 0.108" thick



- NOTES:** To accompany plans dated 7-26-10
1. Use 5/8" ø Button head bolts and hex nuts for connections to posts. No washer on rail face for bolted connections to post.
  2. The nested rail elements, end cap, and "W" beam to thrie beam element may be spliced together prior to bolting the elements to the wood post and concrete barrier or railing.
  3. Exterior splice bolt holes for rail element splices at Post No. T4 and the connection to the concrete barrier or railing shall be the standard 29/32" x 1 1/8" slot size. Interior splice bolt holes at these locations may be increased up to 1 1/4" ø. Only the top 2 and the bottom 2 splice bolts with washers and nuts are required for rail splices at Post No. T4 and the connection to the concrete barrier or railing.
  4. Direction of adjacent traffic indicated by →.
  5. The top elevation of Post Nos. T2 through T7 shall not project more than 1" above the top elevation of the rail element.
  6. Typically, the railing connected to Transition Railing (Type WB) will be either standard railing section of metal beam guard railing or an approved Caltrans end treatment attached to Post No. T1.
  7. The depth of the metal box spacer varies from the 5 1/8" 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 17 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.
  8. 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. 4 through No. 7 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.
  9. End cap may be installed over 12 gage and 10 gage thrie beam elements where transition railing is installed on the departure end of bridge railing.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL BEAM GUARD RAILING  
TRANSITION RAILING  
(TYPE WB)**

NO SCALE

RSP A77J4 DATED JUNE 5, 2009 SUPERSEDES RSP A77J4 DATED JUNE 6, 2008  
AND STANDARD PLAN A77J4 DATED MAY 1, 2006 -  
PAGE 75 OF THE STANDARD PLANS BOOK DATED MAY 2006.

2006 REVISED STANDARD PLAN RSP A77J4

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	39	41

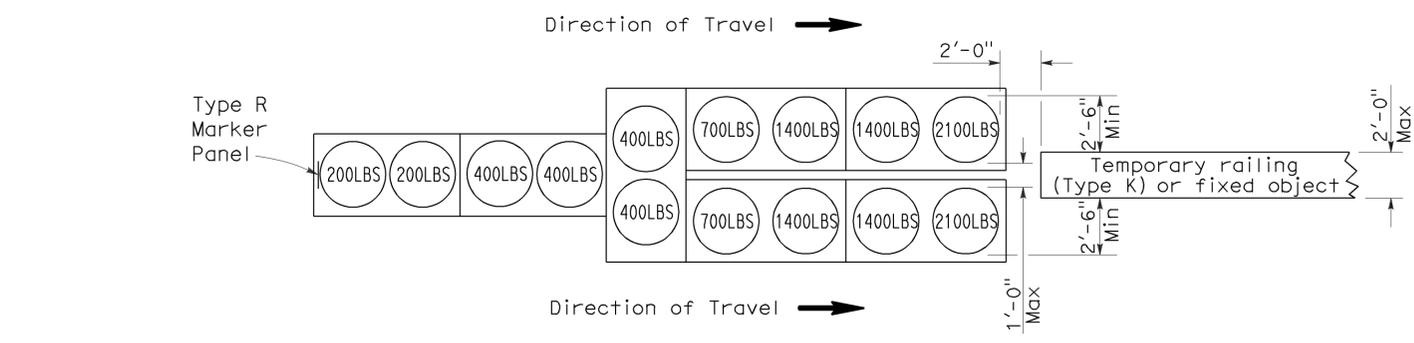
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

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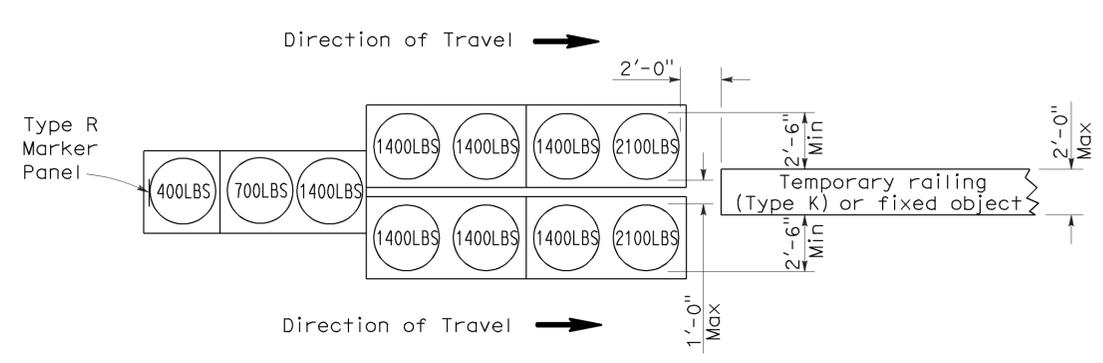
REGISTERED PROFESSIONAL ENGINEER  
Randell D. Hiatt  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA

To accompany plans dated 7-26-10



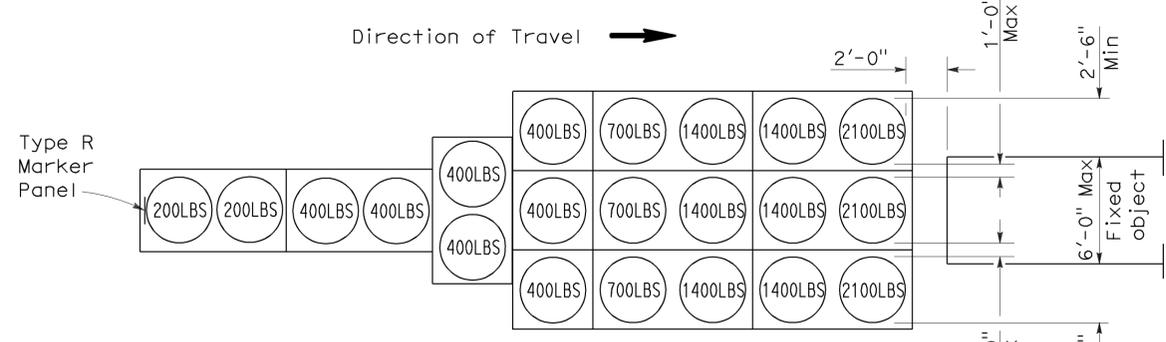
**ARRAY 'TU14'**

Approach speed 45 mph or more



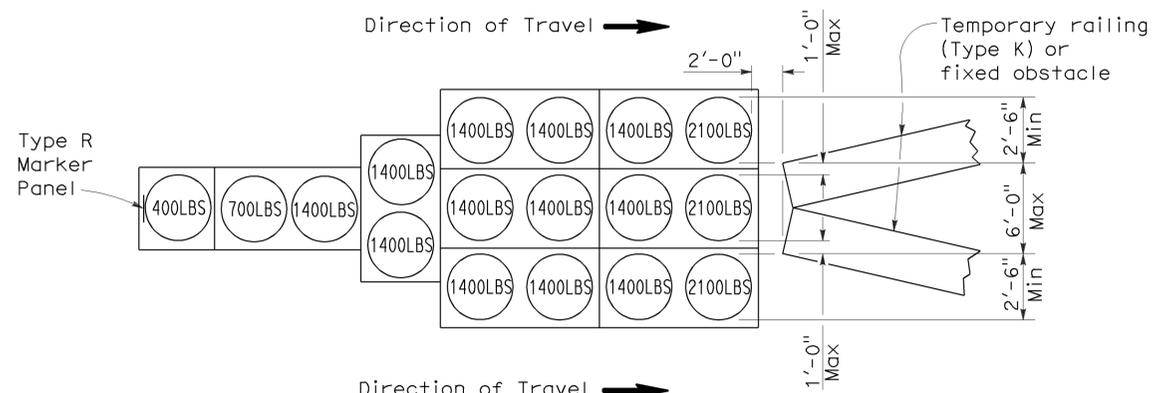
**ARRAY 'TU11'**

Approach speed less than 45 mph



**ARRAY 'TU21'**

Approach speed 45 mph or more

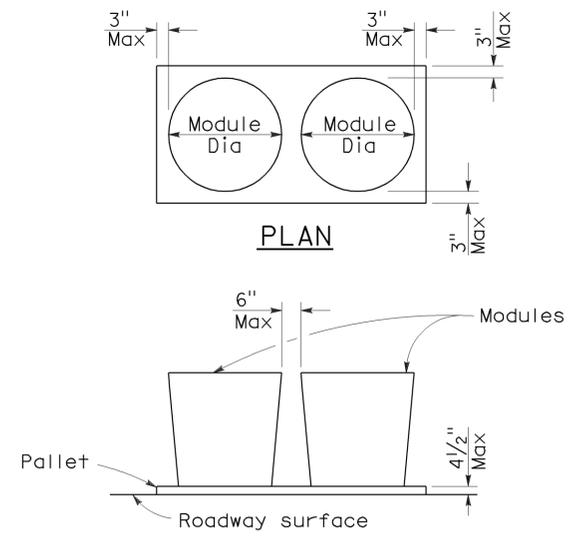


**ARRAY 'TU17'**

Approach speed less than 45 mph

**NOTES:**

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



**CRASH CUSHION PALLET DETAIL**  
See Note 7

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

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

**REVISED STANDARD PLAN RSP T1A**

2006 REVISED STANDARD PLAN RSP T1A

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	40	41

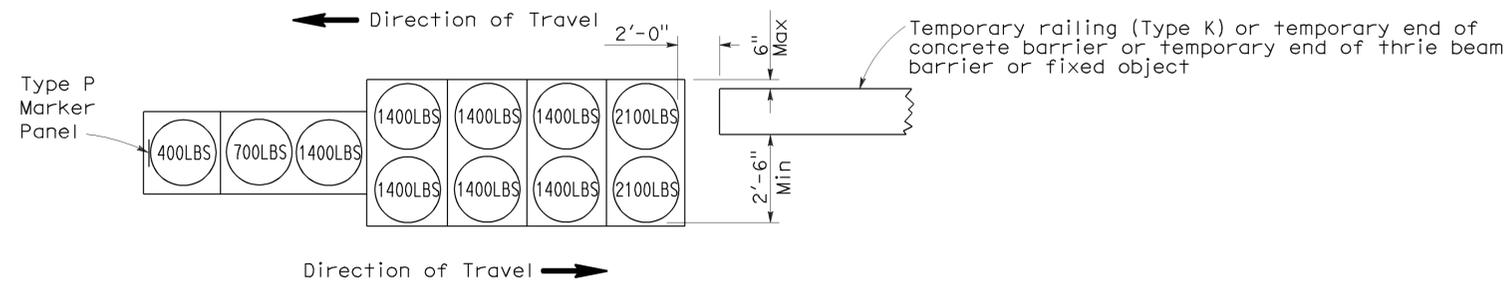
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

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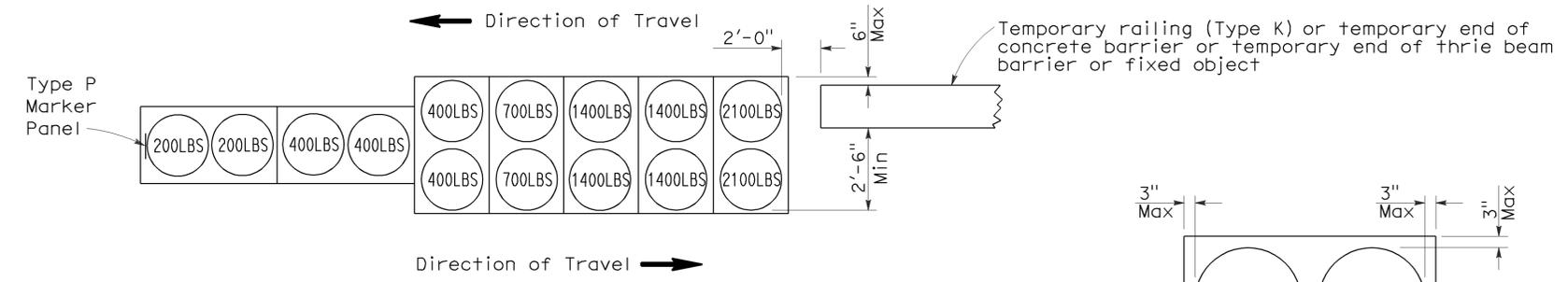
To accompany plans dated 7-26-10

2006 REVISED STANDARD PLAN RSP T1B



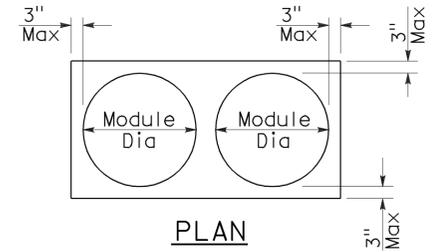
**ARRAY 'TB11'**

Approach speed less than 45 mph

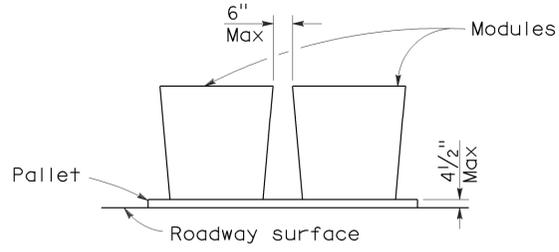


**ARRAY 'TB14'**

Approach speed 45 mph or more



PLAN



ELEVATION

**CRASH CUSHION PALLET DETAIL**

See Note 7

**NOTES:**

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

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

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

**REVISED STANDARD PLAN RSP T1B**

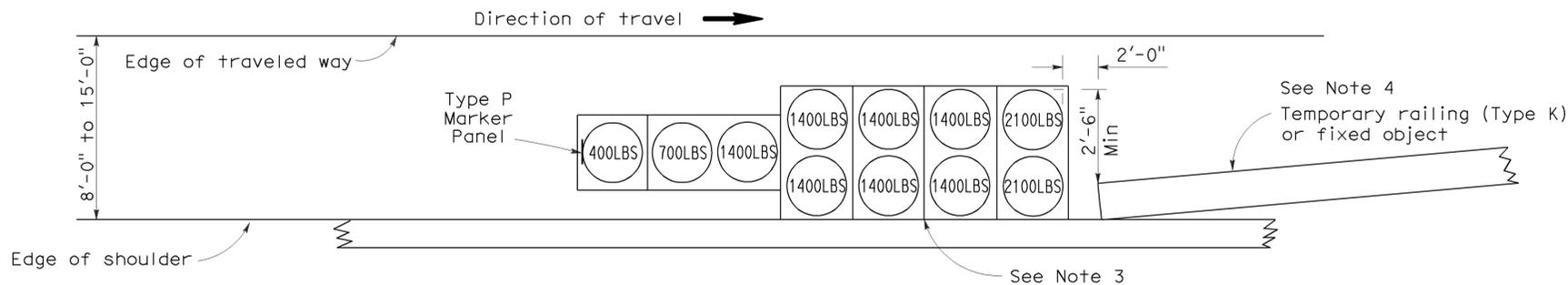
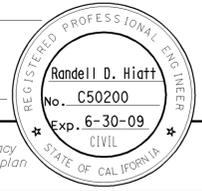
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	Fre	41	R20.0/R33.3	41	41

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

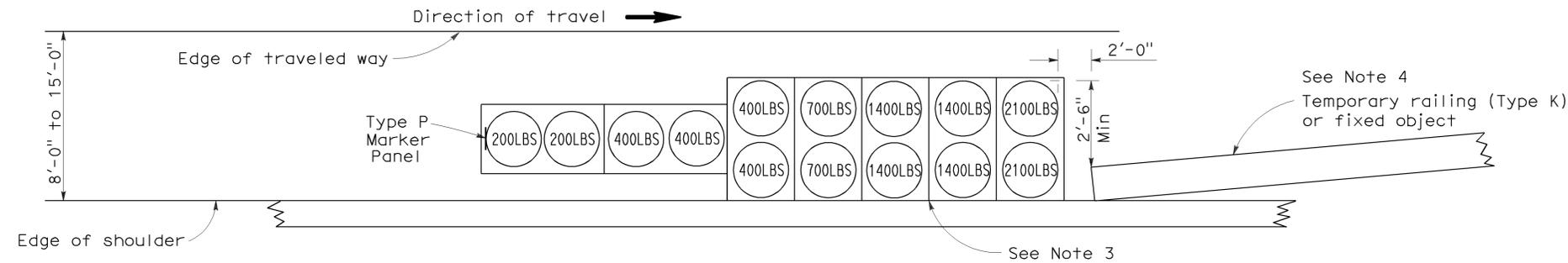
June 6, 2008  
PLANS APPROVAL DATE

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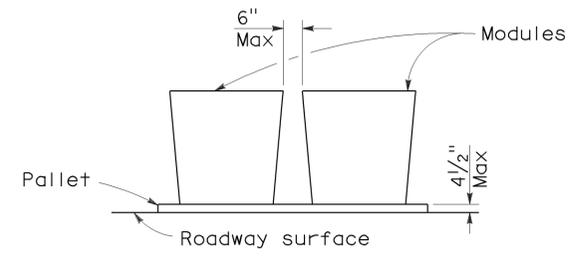
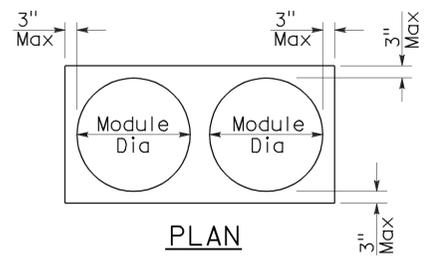
To accompany plans dated 7-26-10



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



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



**CRASH CUSHION PALLET DETAIL**  
See Note 11

**NOTES:**

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

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

RSP T2 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN T2  
DATED MAY 1, 2006 - PAGE 213 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP T2**

2006 REVISED STANDARD PLAN RSP T2