

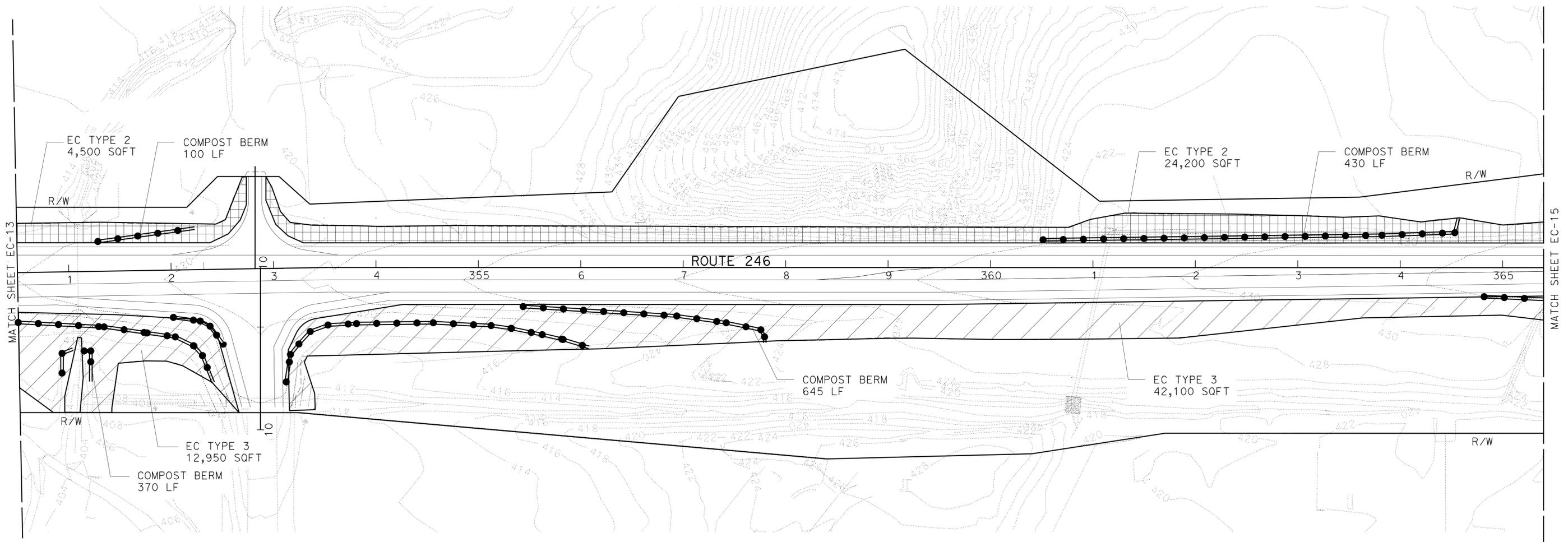
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** LANDSCAPE ARCHITECTURE

SENIOR LANDSCAPE ARCHITECT  
 DENNIS J. REEVES

CALCULATED/DESIGNED BY  
 CHECKED BY  
 PATRICK BOLGER  
 LINDA BAKER

REVISED BY  
 DATE REVISED

**NOTE:**  
 FOR ACCURATE RIGHT OF WAY DATA, CONTACT  
 RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



MATCH SHEET EC-13

MATCH SHEET EC-15

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	301	356

Signature: *[Handwritten Signature]*  
 LICENSED LANDSCAPE ARCHITECT  
 9-29-14  
 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.



APPROVED FOR EROSION CONTROL WORK ONLY

**EROSION CONTROL PLAN**  
**EC-14**  
 SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Et** *Caltrans* LANDSCAPE ARCHITECTURE

SENIOR LANDSCAPE ARCHITECT  
 DENNIS J. REEVES

CALCULATED-DESIGNED BY  
 CHECKED BY

PATRICK BOLGER  
 LINDA BAKER

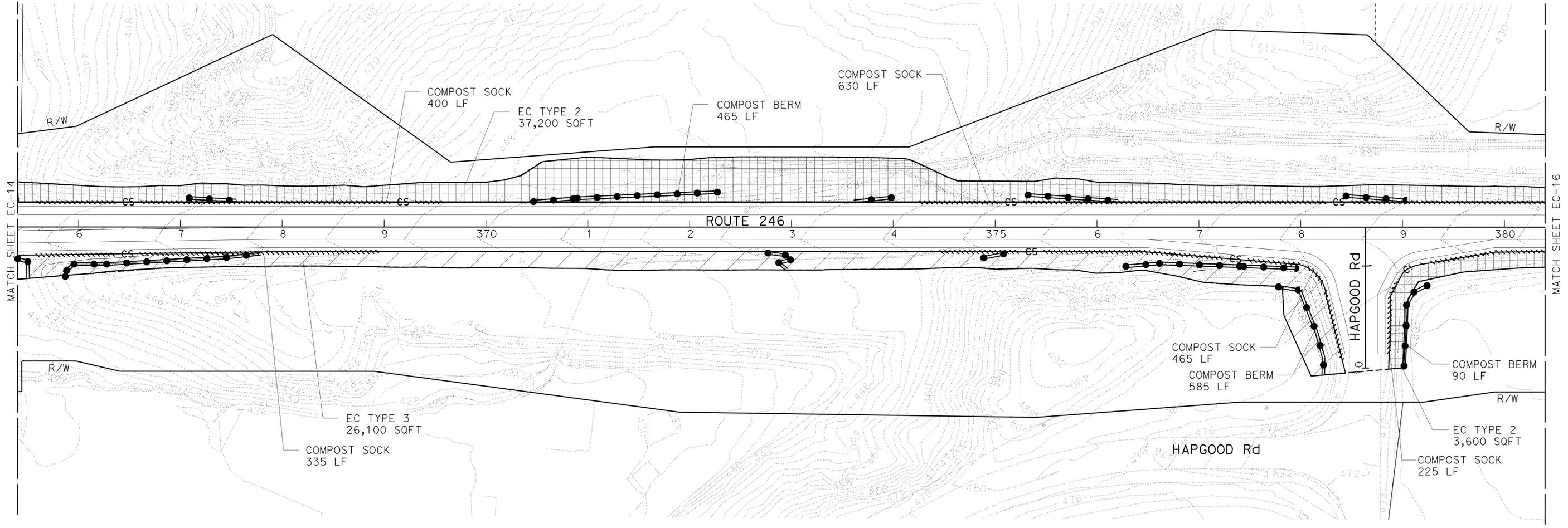
REVISED BY  
 DATE REVISED

**NOTE:**  
 FOR ACCURATE RIGHT OF WAY DATA, CONTACT  
 RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	302	356

[Signature]  
 LICENSED LANDSCAPE ARCHITECT  
 9-29-14  
 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.



APPROVED FOR EROSION CONTROL WORK ONLY

**EROSION CONTROL PLAN**  
**EC-15**

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Et** *Caltrans* LANDSCAPE ARCHITECTURE

SENIOR LANDSCAPE ARCHITECT  
 DENNIS J. REEVES

CALCULATED-DESIGNED BY  
 CHECKED BY

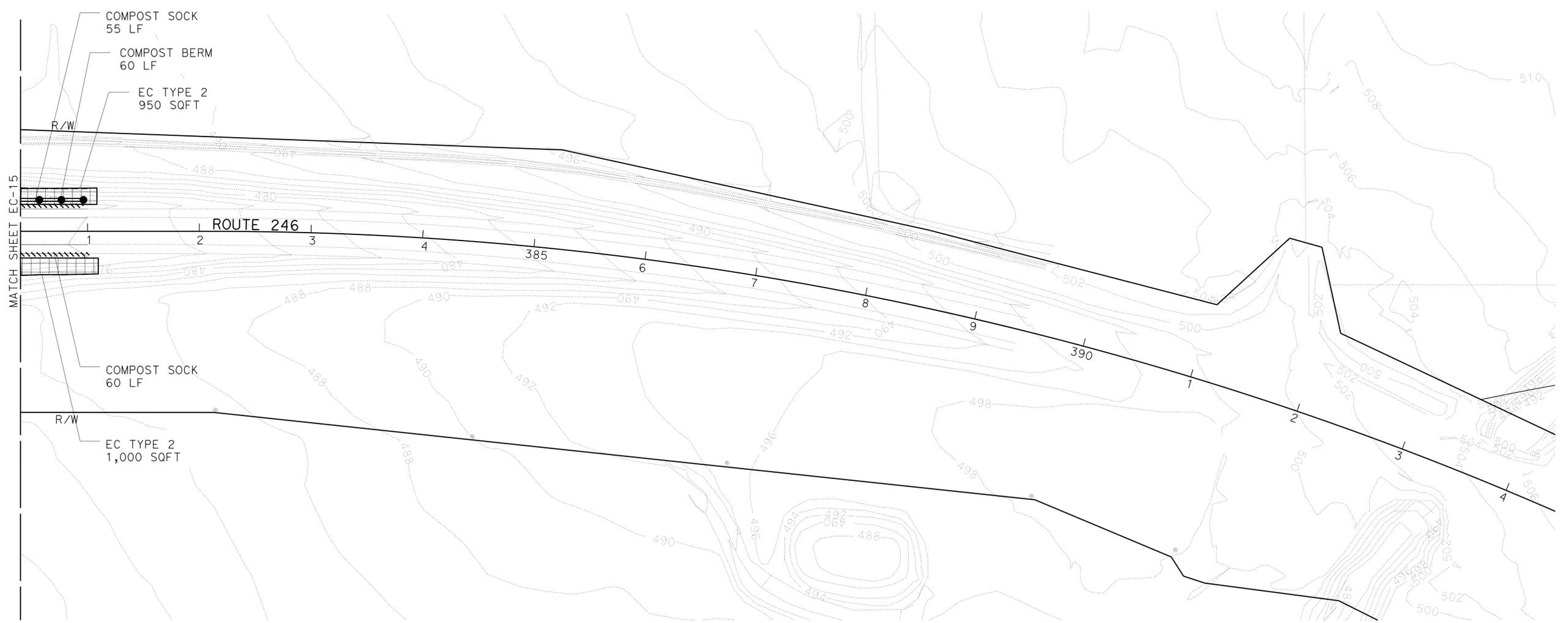
PATRICK BOLGER  
 LINDA BAKER

REVISED BY  
 DATE REVISED

**NOTE:**  
 FOR ACCURATE RIGHT OF WAY DATA, CONTACT  
 RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	303	356

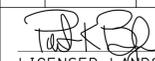
Signature: *PKB*  
 LICENSED LANDSCAPE ARCHITECT  
 9-29-14  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

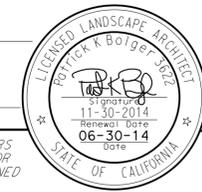


APPROVED FOR EROSION CONTROL WORK ONLY

**EROSION CONTROL PLAN**  
**EC-16**  
 SCALE: 1"=50'

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	304	356

  
 LICENSED LANDSCAPE ARCHITECT  
 9-29-14  
 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.

### EROSION CONTROL

SHEET	DESCRIPTION	COMPOST	STRAW	HYDROSEED	HYDROMULCH	INCORPORATE MATERIAL	COMPOST BERM	COMPOST SOCK
		SQFT	SQFT	SQFT	SQFT	SQFT	LF	LF
EC SHEETS	EROSION CONTROL TYPE 1	202,200				202,200		
	EROSION CONTROL TYPE 2	308,750		308,750				
	EROSION CONTROL TYPE 3	1,550,900	1,550,900	1,550,900	1,550,900			
	COMPOST BERM						41,465	
	COMPOST SOCK							12,505
	TOTAL		2,061,850	1,550,900	1,859,650	1,550,900	202,200	41,465

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Et Gtrans** LANDSCAPE ARCHITECTURE  
 SENIOR LANDSCAPE ARCHITECT  
 DENNIS J. REEVES  
 CALCULATED-DESIGNED BY  
 CHECKED BY  
 PATRICK BOLGER  
 LINDA BAKER  
 REVISED BY  
 DATE REVISED

## EROSION CONTROL QUANTITIES ECQ-1

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

FUNCTIONAL SUPERVISOR  
 ALT BAKHDOD

CALCULATED/DESIGNED BY  
 CHECKED BY

REVISOR BY  
 DATE

REVISOR BY  
 DATE

**NOTES:**

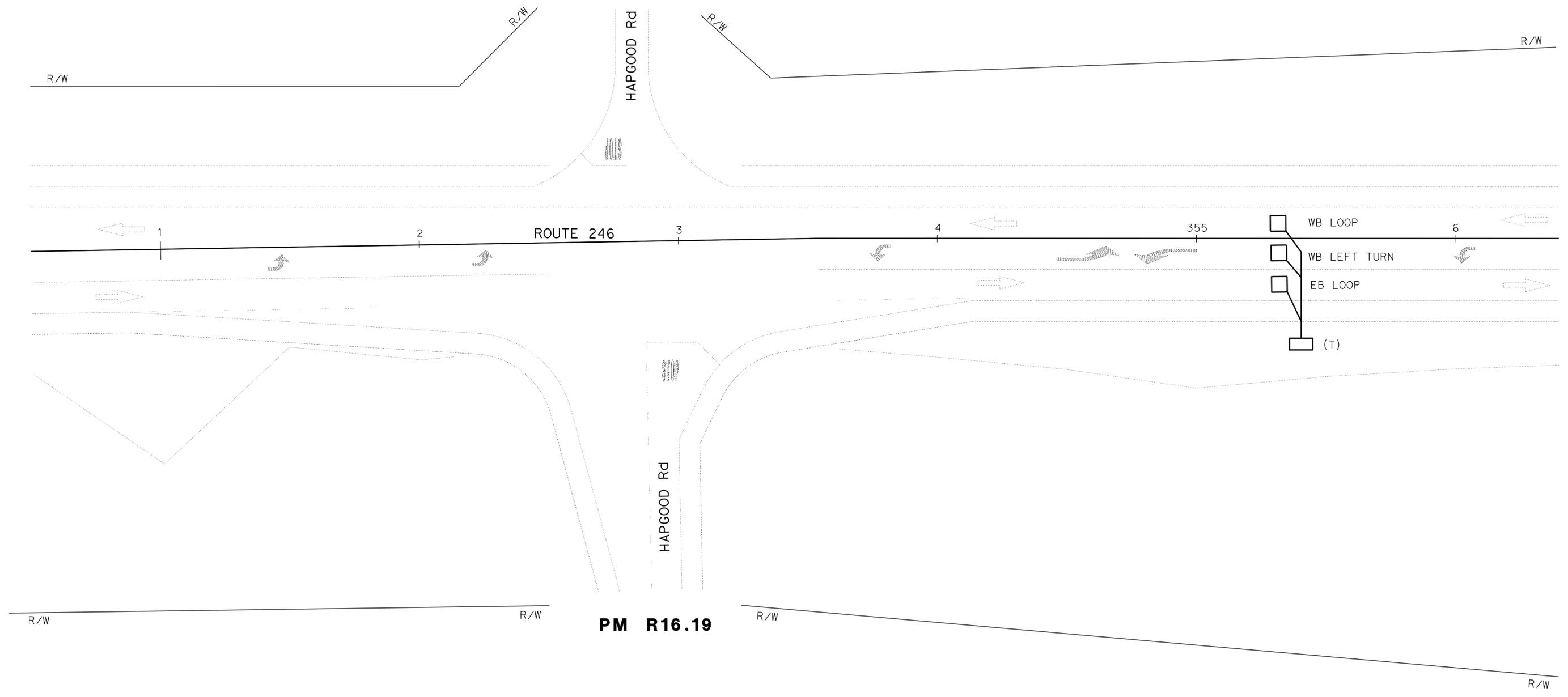
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- LOCATION OF LOOP DETECTORS ARE APPROXIMATE. EXACT LOCATION SHALL BE DETERMINED BY THE ENGINEER.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
05	SB	246	12.3/R16.7	305	356

*Xavier Alfaro* 9-29-14  
 REGISTERED ELECTRICAL ENGINEER

9-29-14  
 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.



APPROVED FOR ELECTRICAL WORK ONLY

**INDUCTIVE LOOP DETECTOR**  
**E-1**

SCALE: 1"=20'

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	306	356

*Grace M. Tsushima*  
REGISTERED CIVIL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

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

TO ACCOMPANY PLANS DATED 9-29-14

**UNIT OF MEASUREMENT SYMBOLS:**

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

**TABLE A**

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

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

**TABLE B**

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

\* For use on a sign panel only

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ABBREVIATIONS  
(SHEET 2 OF 2)**

NO SCALE

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

**M**

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

**P continued**

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

**S**

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

**T continued**

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

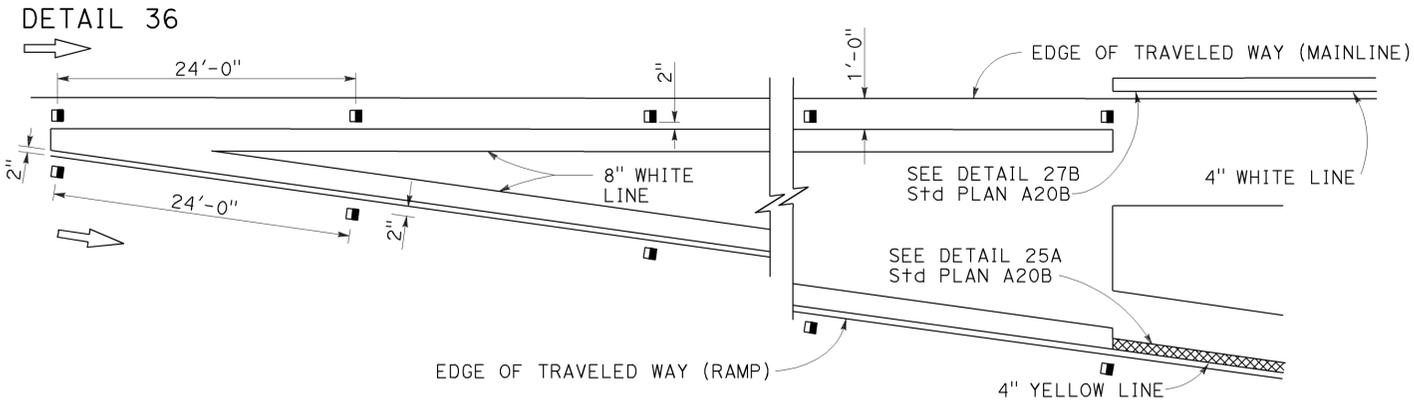
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	307	356

REGISTERED CIVIL ENGINEER  
 Roberta L. McLaughlin  
 No. C40375  
 Exp. 3-31-15  
 CIVIL  
 STATE OF CALIFORNIA

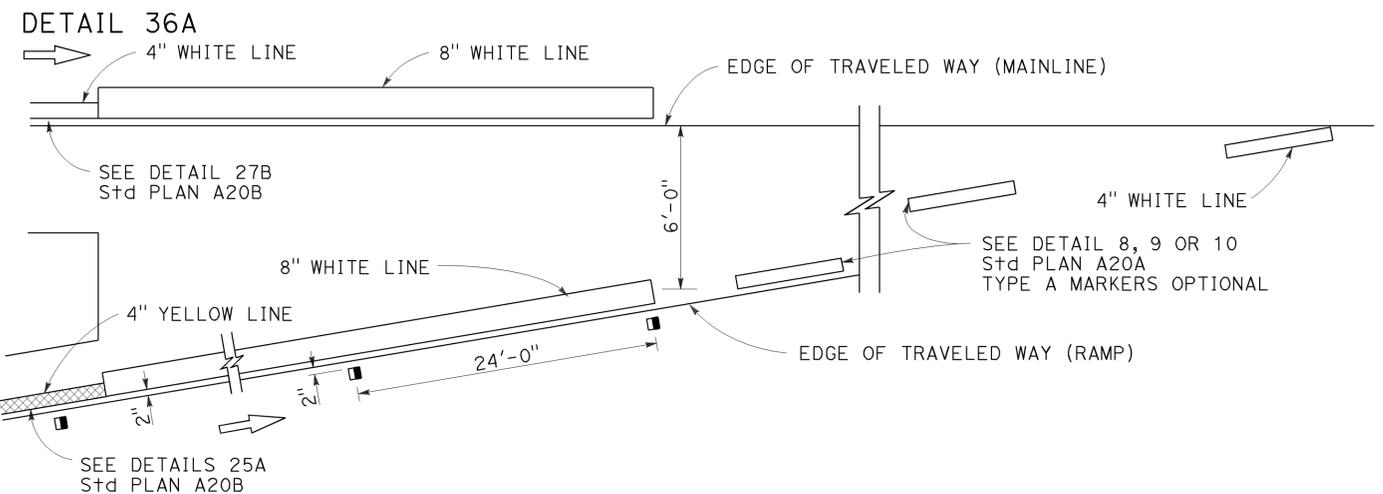
July 19, 2013  
 PLANS APPROVAL DATE

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

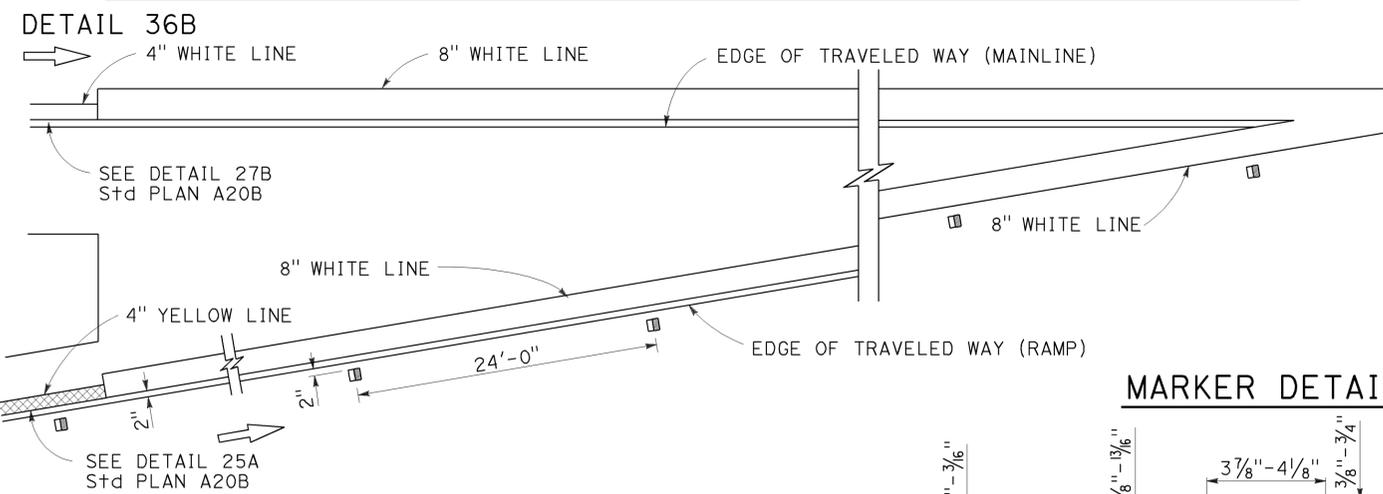
### EXIT RAMP NEUTRAL AREA (GORE) TREATMENT



### ENTRANCE RAMP NEUTRAL AREA (MERGE) TREATMENT

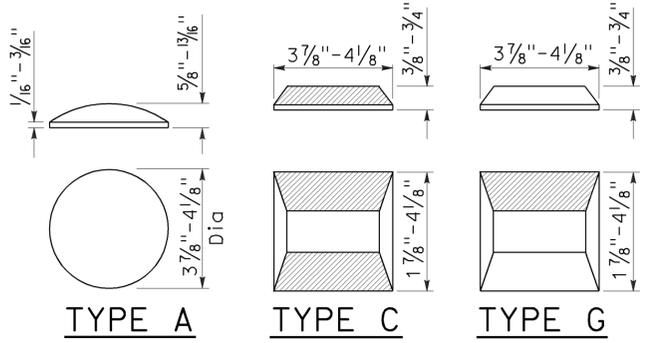


### ENTRANCE RAMP NEUTRAL AREA (ACCELERATION LANE) TREATMENT

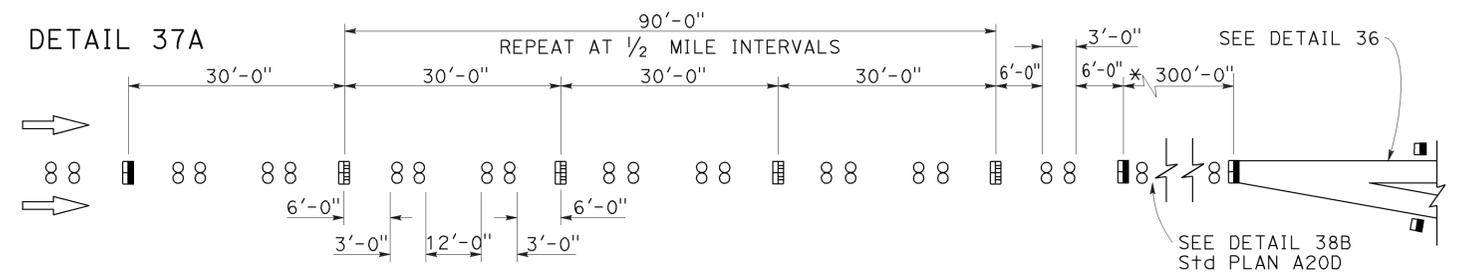
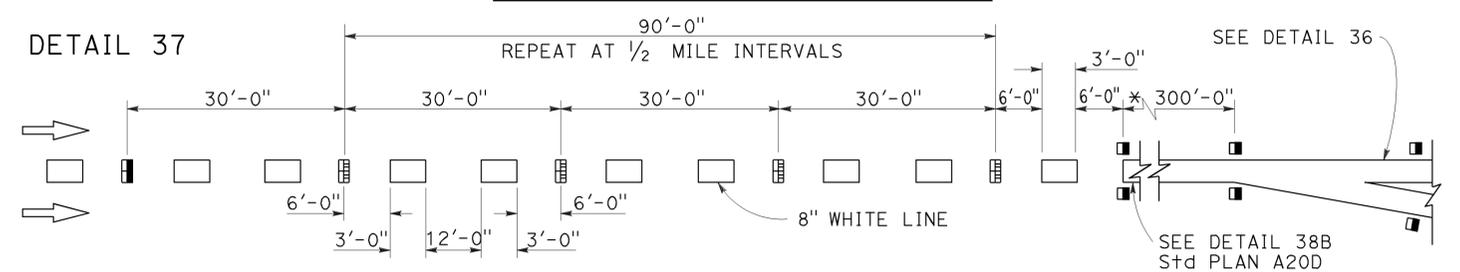


### MARKER DETAILS

- LEGEND:**
- MARKERS
- TYPE A WHITE NON-REFLECTIVE
  - ◻ TYPE C RED-CLEAR RETROREFLECTIVE
  - TYPE G ONE-WAY CLEAR RETROREFLECTIVE

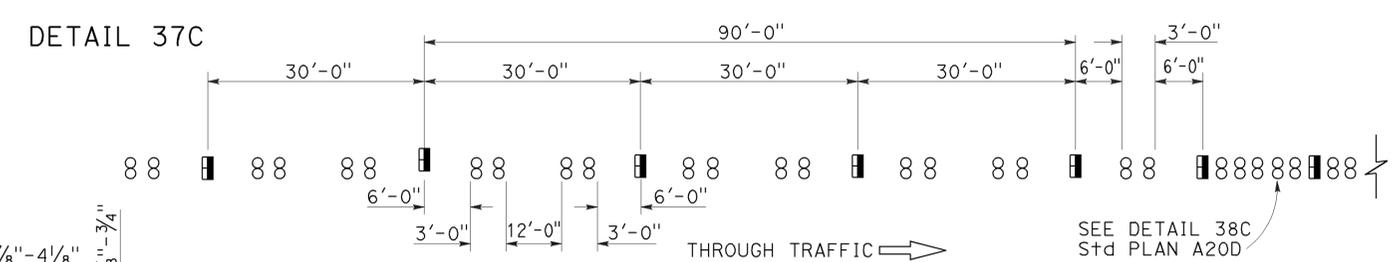
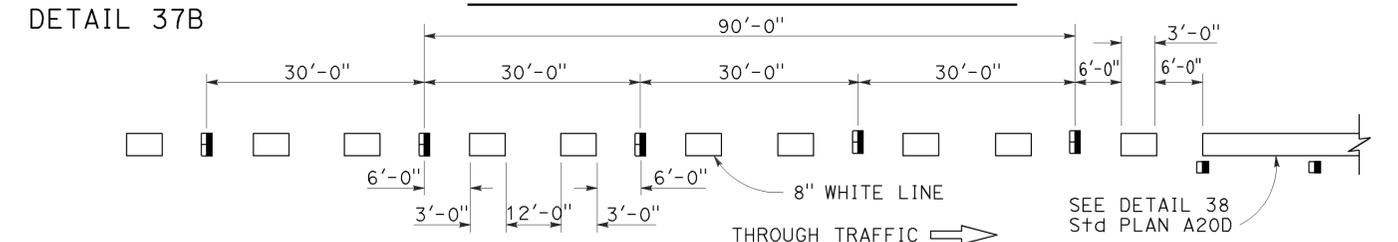


### LANE DROP AT EXIT RAMP



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

### LANE DROP AT INTERSECTIONS



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

## PAVEMENT MARKERS AND TRAFFIC LINE TYPICAL DETAILS

NO SCALE

RSP A20C DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN A20C DATED MAY 20, 2011 - PAGE 11 OF THE STANDARD PLANS BOOK DATED 2010.

## REVISED STANDARD PLAN RSP A20C

2010 REVISED STANDARD PLAN RSP A20C

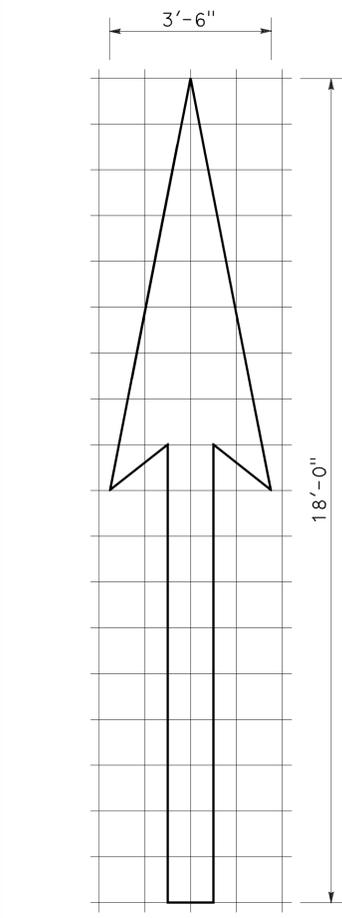
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	308	356

Registered Professional Engineer  
 Roberta L. McLaughlin  
 No. C40375  
 Exp. 3-31-13  
 CIVIL  
 STATE OF CALIFORNIA

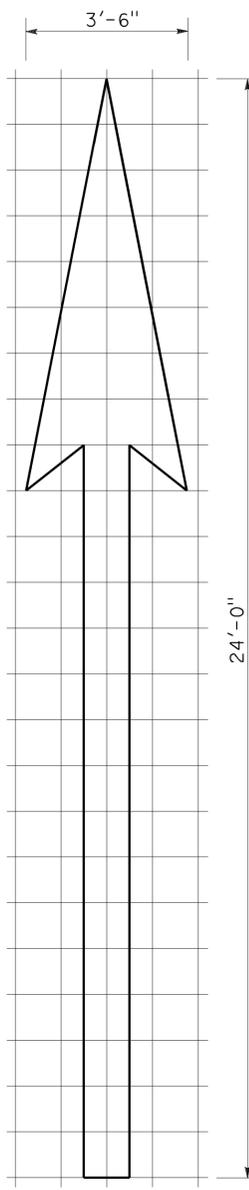
April 20, 2012  
 PLANS APPROVAL DATE

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

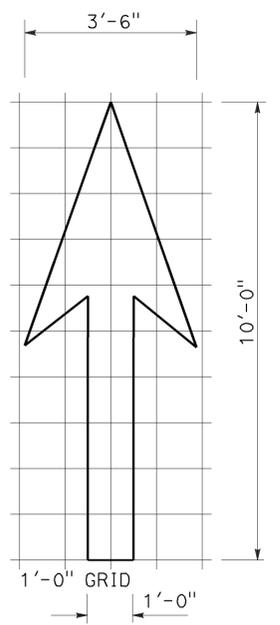
TO ACCOMPANY PLANS DATED 9-29-14



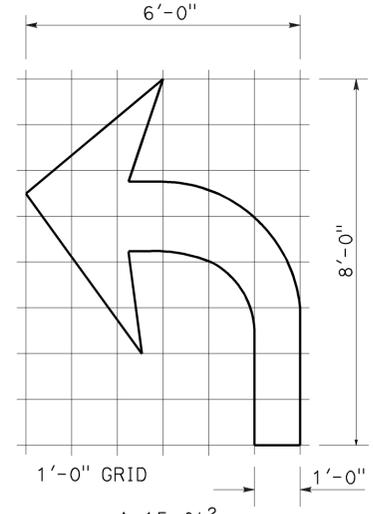
A=25 ft<sup>2</sup>  
**TYPE I 18'-0" ARROW**



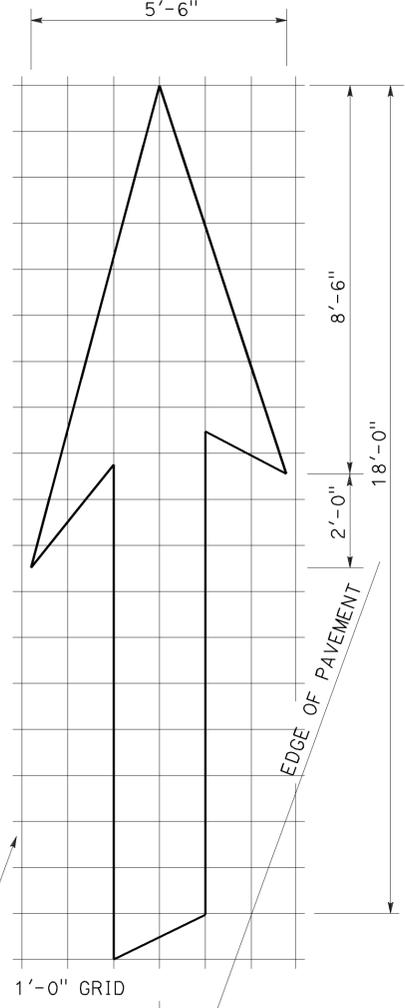
A=31 ft<sup>2</sup>  
**TYPE I 24'-0" ARROW**



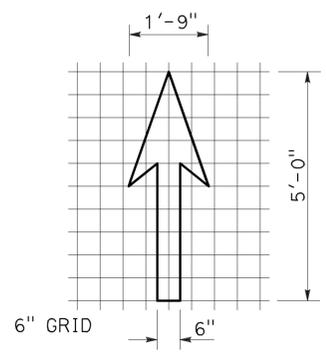
A=14 ft<sup>2</sup>  
**TYPE I 10'-0" ARROW**



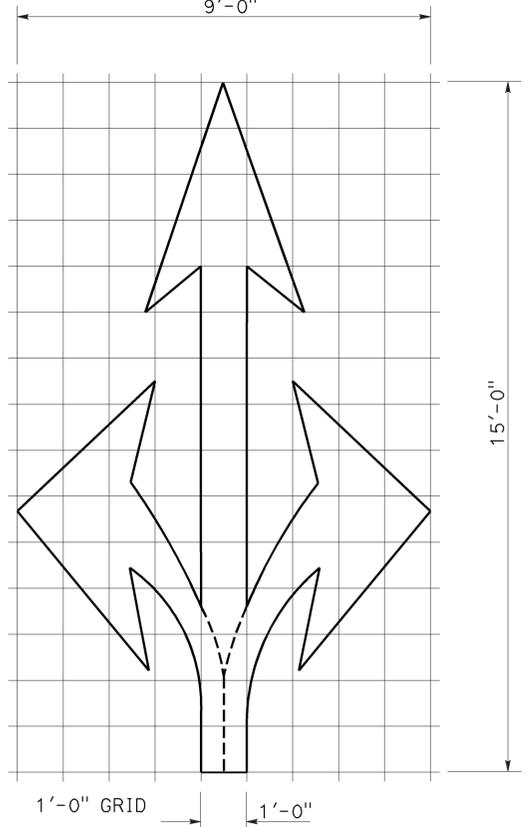
A=15 ft<sup>2</sup>  
**TYPE IV (L) ARROW**  
(For Type IV (R) arrow, use mirror image)



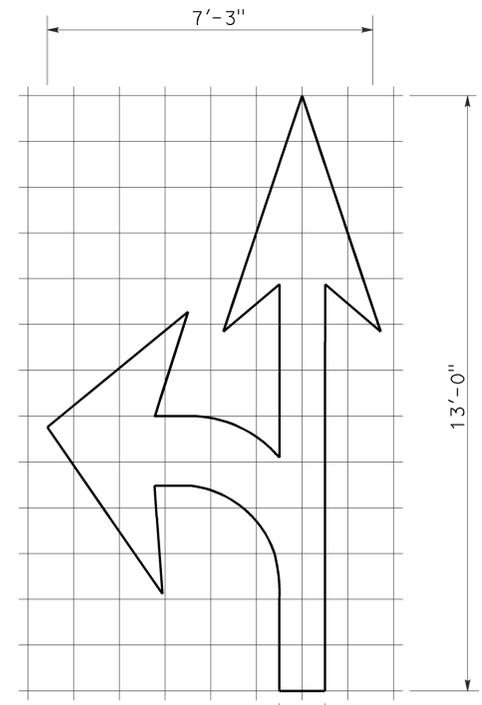
A=42 ft<sup>2</sup>  
**TYPE VI ARROW**  
Right lane drop arrow  
(For left lane, use mirror image)



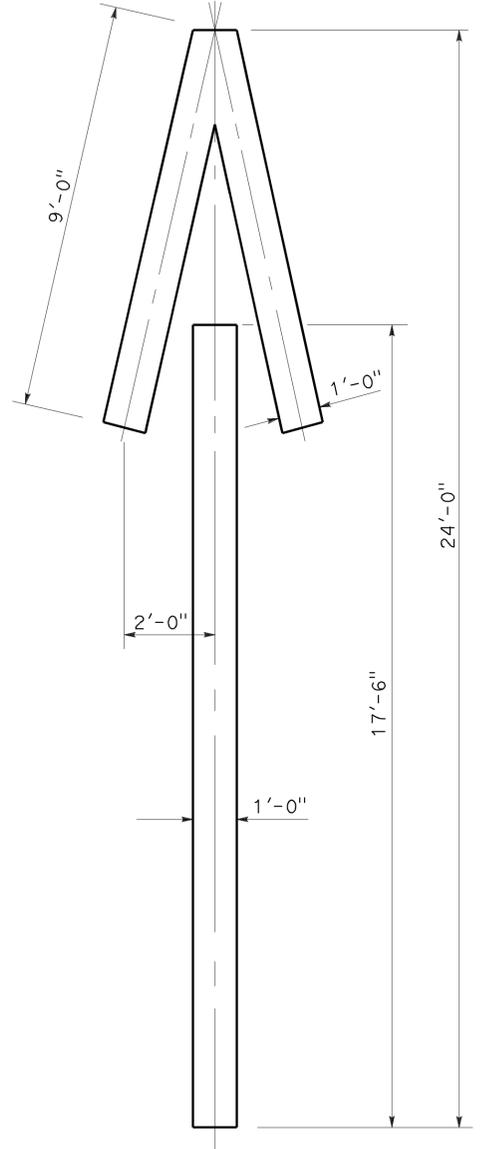
A=3.5 ft<sup>2</sup>  
**BIKE LANE ARROW**



A=36 ft<sup>2</sup>  
**TYPE VIII ARROW**



A=27 ft<sup>2</sup>  
**TYPE VII (L) ARROW**  
(For Type VII (R) arrow, use mirror image)



A=33 ft<sup>2</sup>  
**TYPE V ARROW**

**NOTE:**  
Minor variations in dimensions may be accepted by the Engineer.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**PAVEMENT MARKINGS  
ARROWS**  
NO SCALE

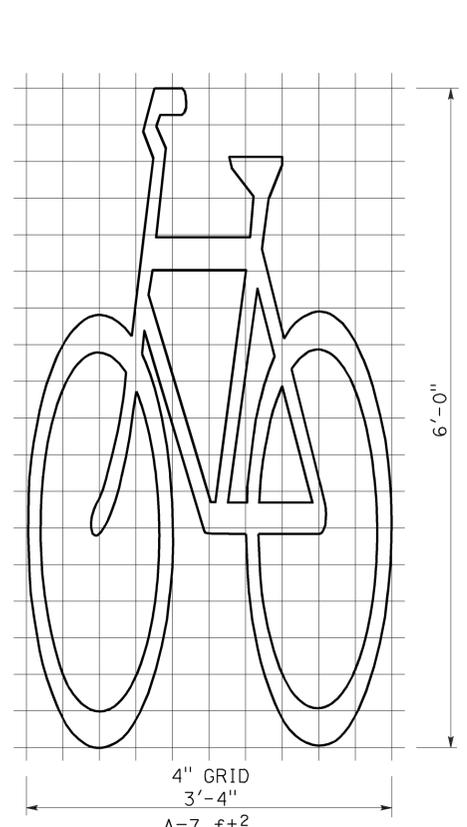
RSP A24A DATED APRIL 20, 2012 SUPERSEDES STANDARD PLAN A24A  
DATED MAY 20, 2011 - PAGE 13 OF THE STANDARD PLANS BOOK DATED 2010.

**2010 REVISED STANDARD PLAN RSP A24A**

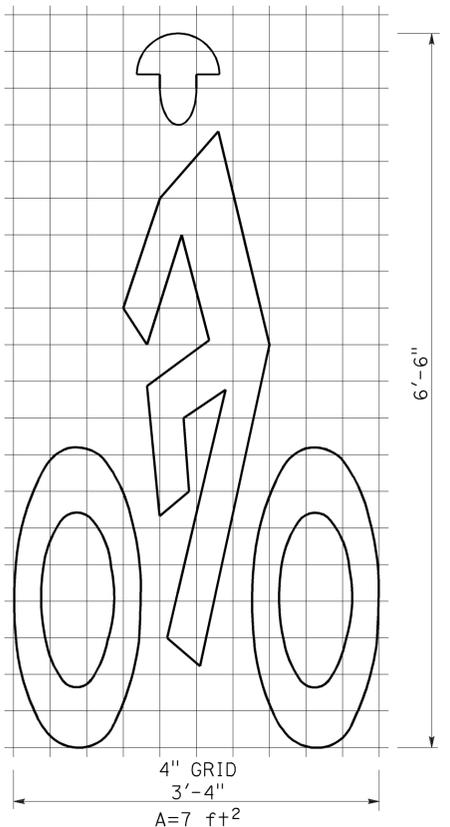
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	309	356

Robert L. McLaughlin  
 REGISTERED CIVIL ENGINEER  
 October 19, 2012  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS  
 OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
 THE ACCURACY OR COMPLETENESS OF SCANNED  
 COPIES OF THIS PLAN SHEET.

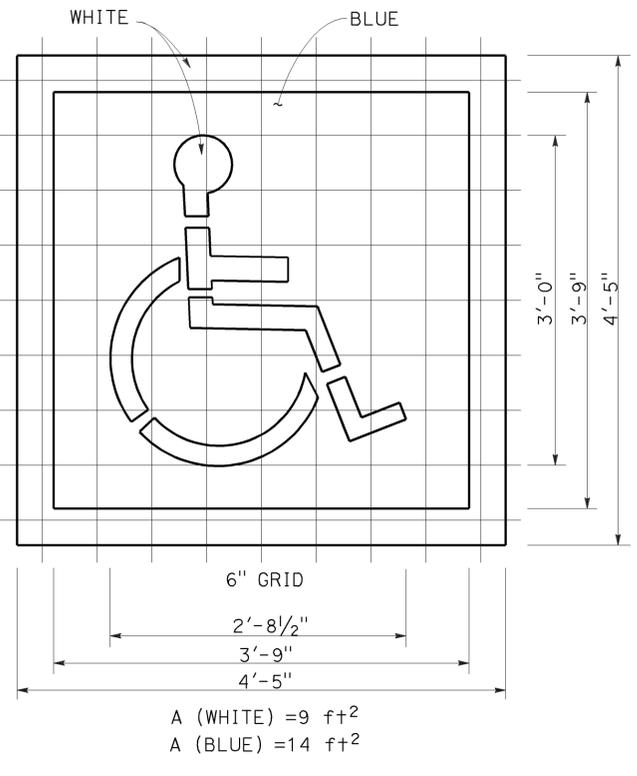
**NOTE:** TO ACCOMPANY PLANS DATED 9-29-14  
 Minor variations in dimensions may be accepted by the Engineer.



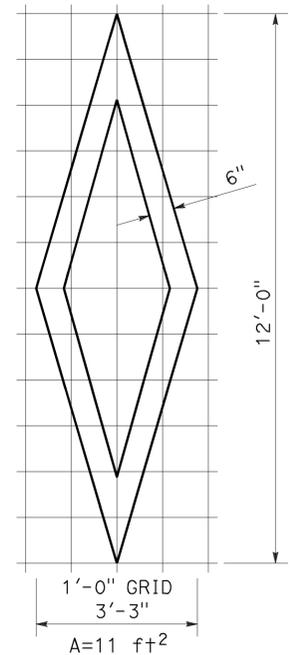
**BIKE LANE SYMBOL  
WITHOUT PERSON**



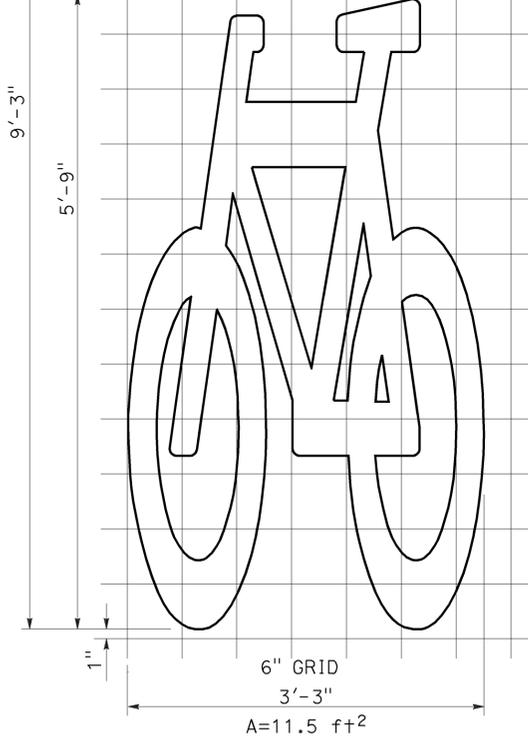
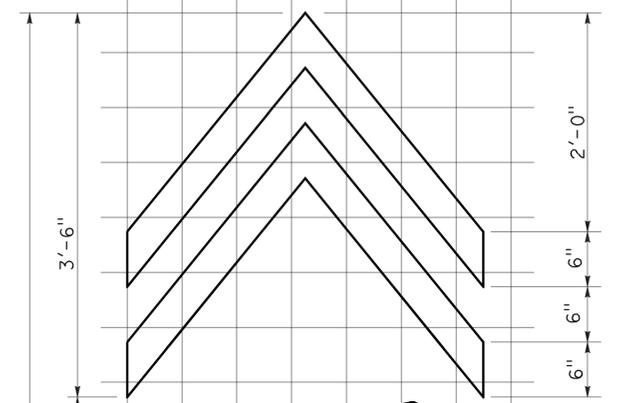
**BIKE LANE SYMBOL  
WITH PERSON**



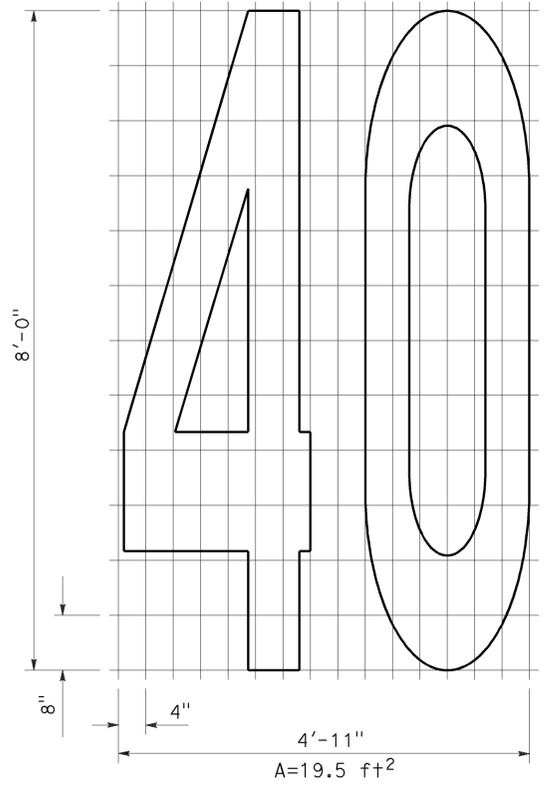
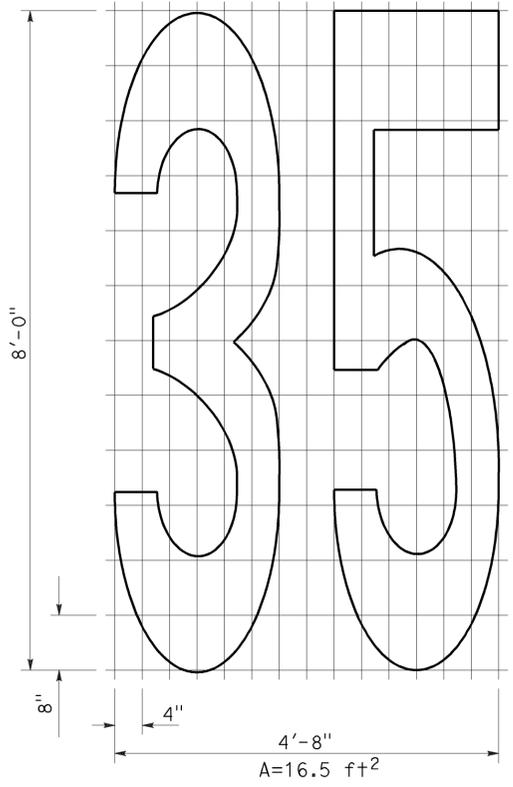
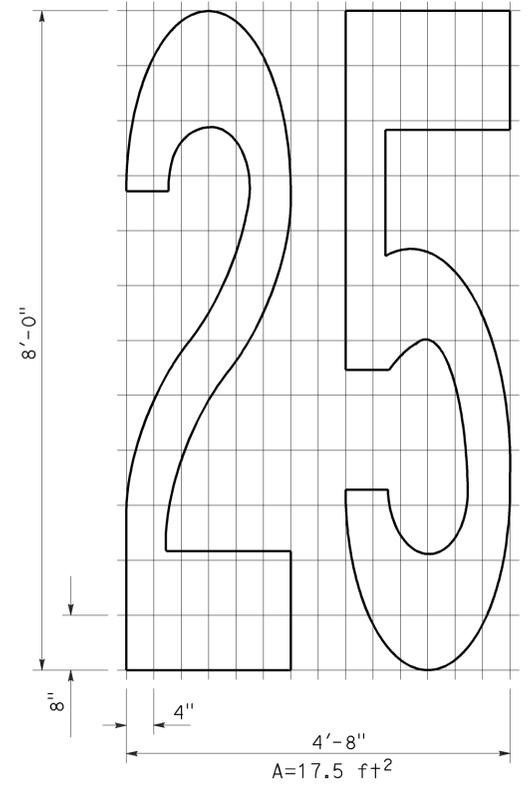
**INTERNATIONAL SYMBOL  
OF ACCESSIBILITY (ISA) MARKING**



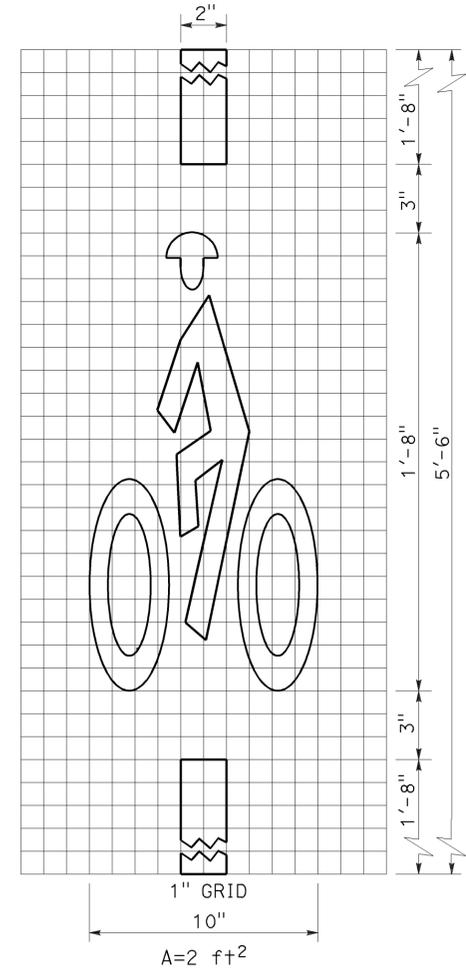
**DIAMOND SYMBOL**



**SHARED ROADWAY BICYCLE MARKING**



**NUMERALS**



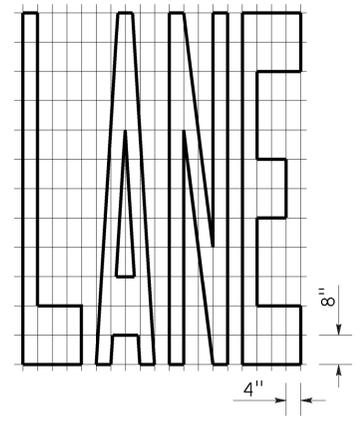
**BICYCLE LOOP  
DETECTOR SYMBOL**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**PAVEMENT MARKINGS  
 SYMBOLS AND NUMERALS**  
 NO SCALE

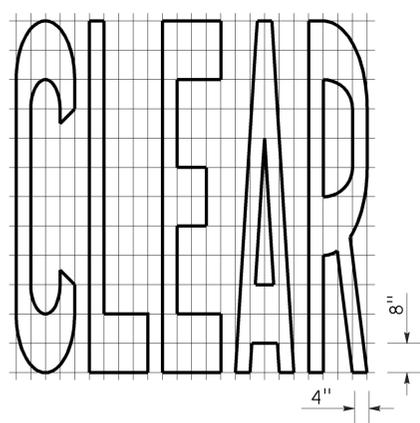
RSP A24C DATED OCTOBER 19, 2012 SUPERSEDES STANDARD PLAN A24C  
 DATED MAY 20, 2011 - PAGE 15 OF THE STANDARD PLANS BOOK DATED 2010.

**2010 REVISED STANDARD PLAN RSP A24C**

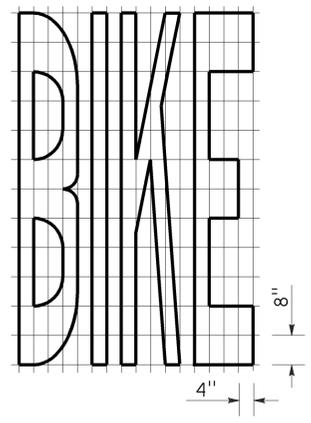
TO ACCOMPANY PLANS DATED 9-29-14



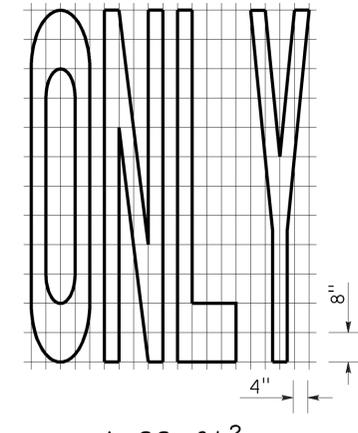
A=24 ft<sup>2</sup>



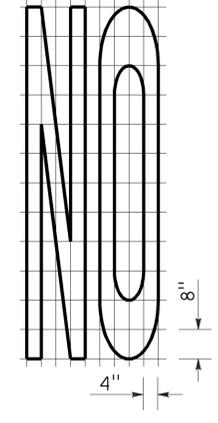
A=27 ft<sup>2</sup>



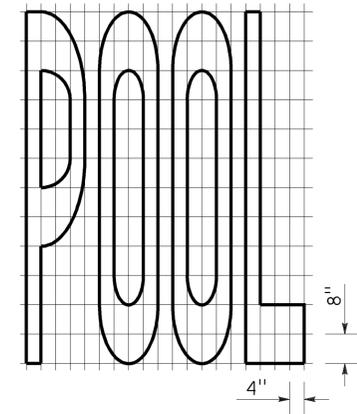
A=21 ft<sup>2</sup>



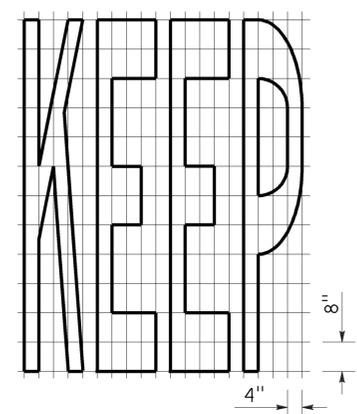
A=22 ft<sup>2</sup>



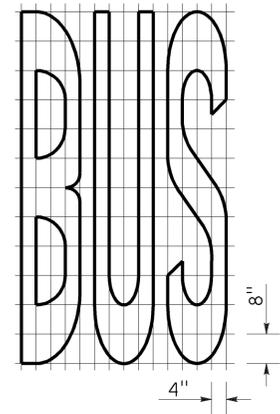
A=14 ft<sup>2</sup>



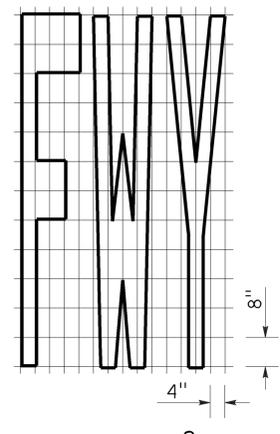
A=23 ft<sup>2</sup>



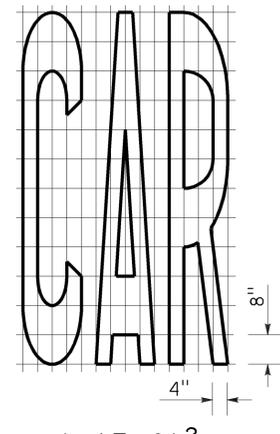
A=24 ft<sup>2</sup>



A=20 ft<sup>2</sup>

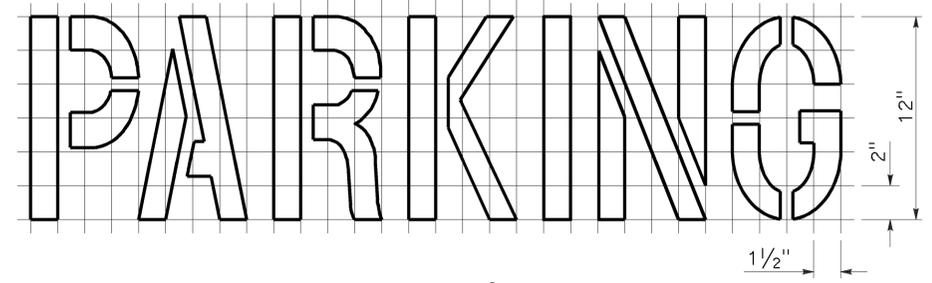
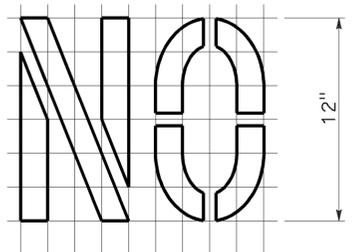


A=16 ft<sup>2</sup>

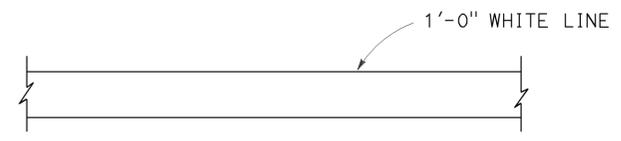


A=17 ft<sup>2</sup>

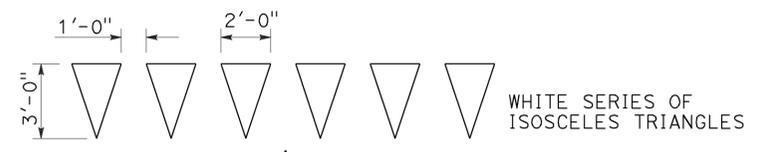
WORD MARKINGS			
ITEM	ft <sup>2</sup>	ITEM	ft <sup>2</sup>
LANE	24	NO	14
POOL	23	BIKE	21
CAR	17	BUS	20
CLEAR	27	ONLY	22
KEEP	24	FWY	16



A=2 ft<sup>2</sup>  
See Notes 6 and 7



LIMIT LINE (STOP LINE)



YIELD LINE

**NOTES:**

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

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

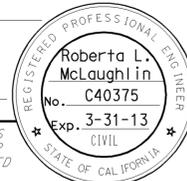
**PAVEMENT MARKINGS  
WORDS, LIMIT AND YIELD LINES**

NO SCALE

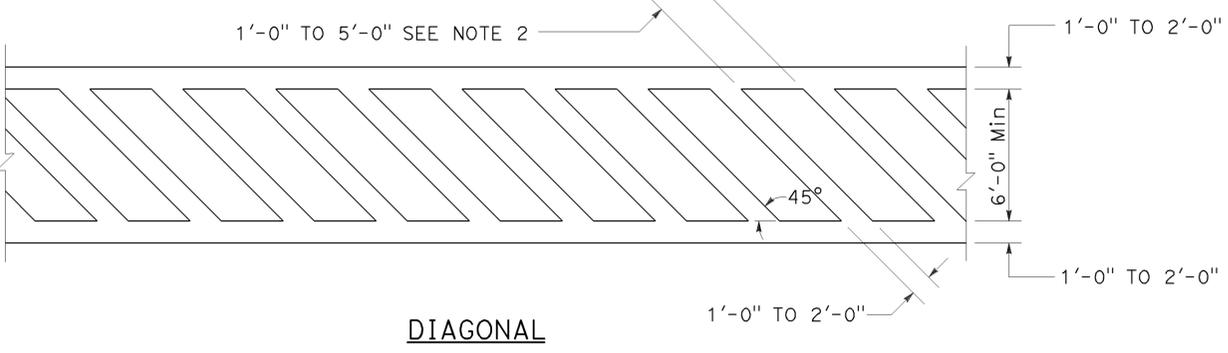
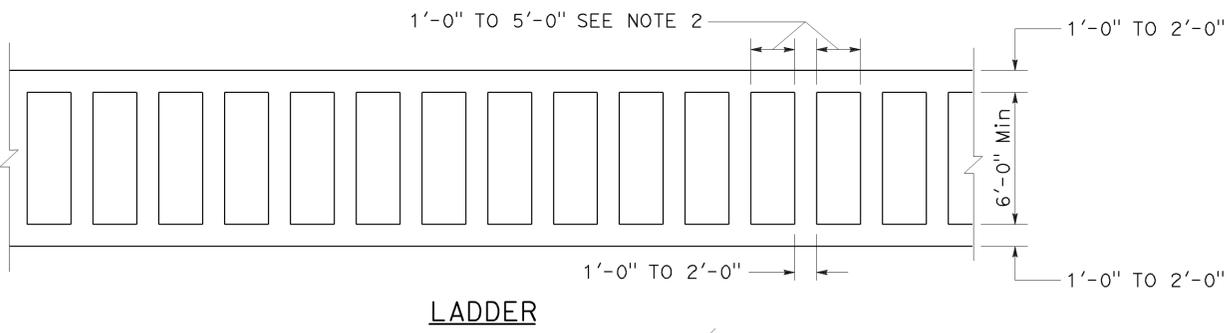
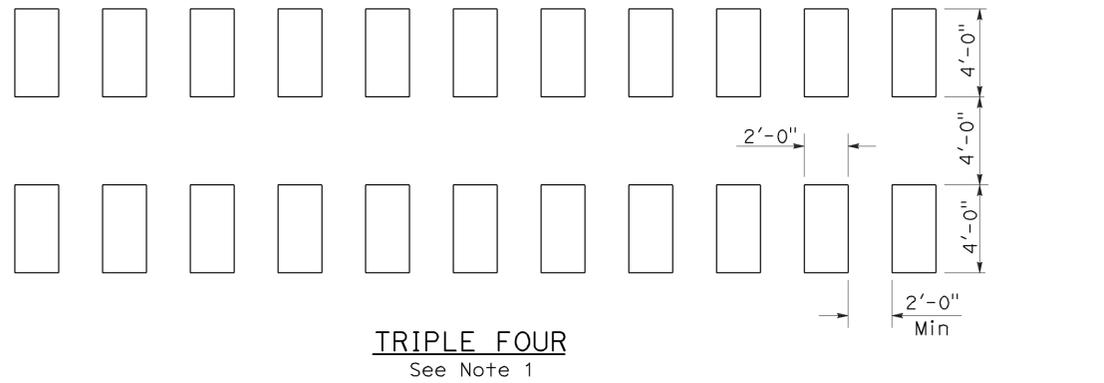
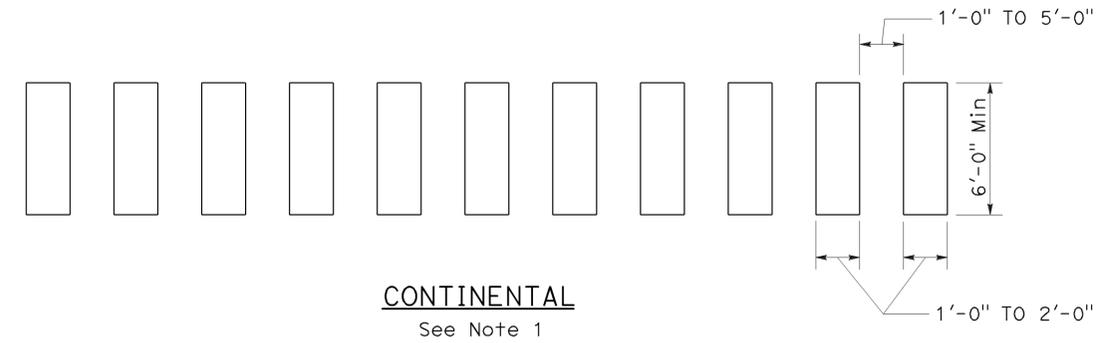
RSP A24E DATED JULY 20, 2012 SUPERSEDES STANDARD PLAN A24E  
DATED MAY 20, 2011 - PAGE 17 OF THE STANDARD PLANS BOOK DATED 2010.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	311	356

 REGISTERED CIVIL ENGINEER		
July 20, 2012 PLANS APPROVAL DATE		
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>		

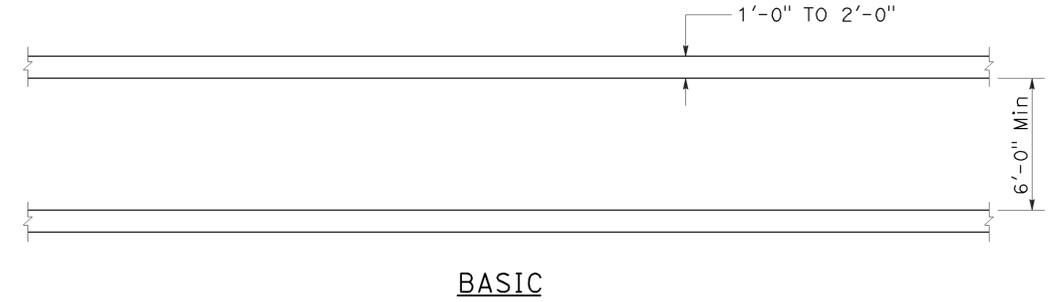
TO ACCOMPANY PLANS DATED 9-29-14



**HIGHER VISIBILITY CROSSWALKS**

**NOTES:**

1. Spaces between markings should be placed in wheel tracks of each lane.
2. Spacings not to exceed 2.5 times width of longitudinal line.
3. All crosswalk markings must be white except for those near schools must be yellow.



**BASIC**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**PAVEMENT MARKINGS**  
**CROSSWALKS**  
NO SCALE

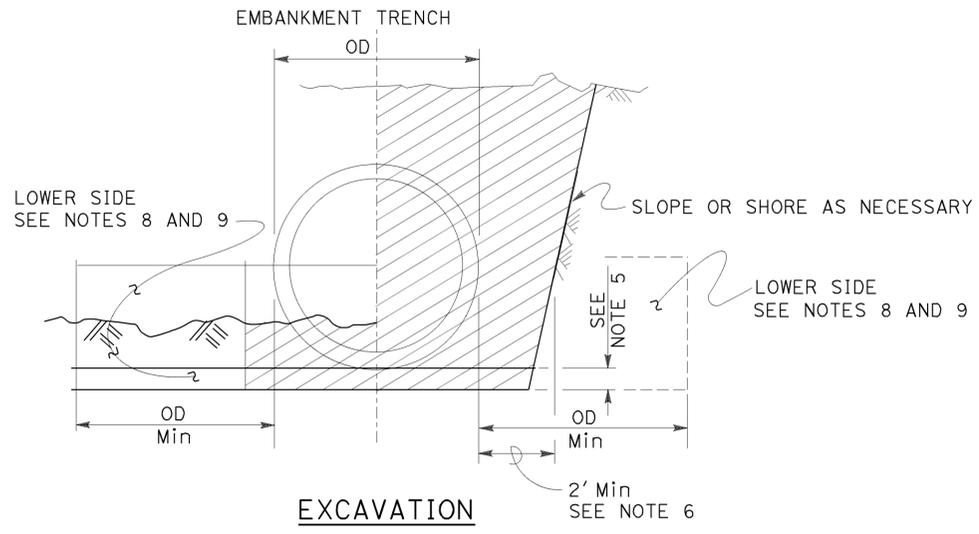
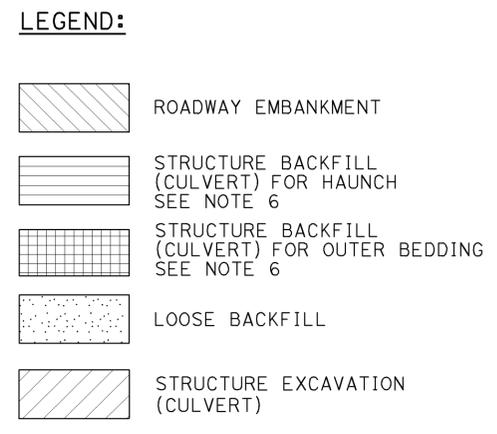
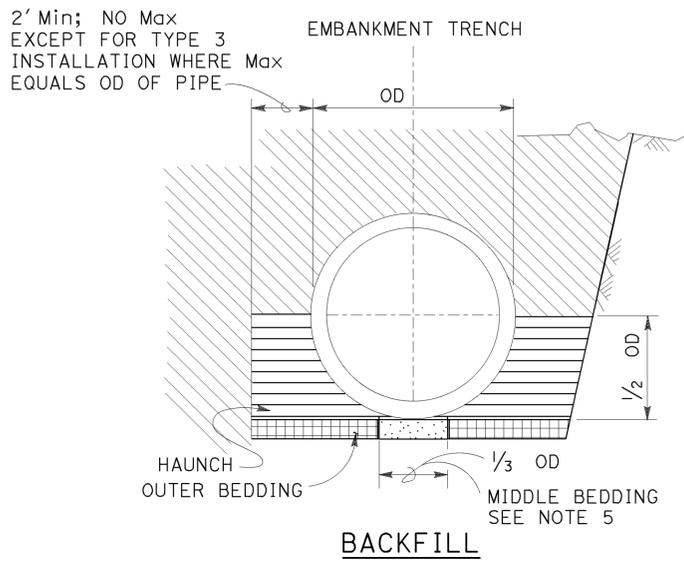
RSP A24F DATED JULY 20, 2012 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

TO ACCOMPANY PLANS DATED 9-29-14

**DESIGN NOTES:**

Design: AASHTO LRFD Bridge Design Specifications, 4th edition with California Amendments. ACPA DESIGN DATA 1, October 2007. INDIRECT DESIGN METHOD

Soil: w Fe = 162 pcf Installation Type 1  
 w Fe = 168 pcf Installation Types 2 & 3  
 w = Unit weight of soil (pcf)  
 Fe = Soil-structure interaction factor



**INSTALLATION TYPE 1:**

The haunch and outer bedding shall be compacted to a minimum 90 percent relative compaction. In addition, the minimum sand equivalent in these areas shall be 30 and the maximum percentage passing the No. 200 sieve size shall be 12.

**INSTALLATION TYPE 2:**

The haunch and outer bedding shall be compacted to a minimum 90 percent relative compaction. In addition, the minimum sand equivalent in these areas shall be 25.

**INSTALLATION TYPE 3:**

The haunch and outer bedding shall be compacted to a minimum 85 percent relative compaction. 90 percent relative compaction will be required where the fill over the pipe is less than 4'-0" or 1/2 OD. In addition, the minimum sand equivalent in these areas shall be 25 and the material shall not contain rocks, broken concrete, or other solid material exceeding 3" in greatest dimension.

**INSTALLATION TYPE 1**

MINIMUM CLASS AND D-LOAD	COVER	
	60" Dia AND SMALLER	OVER 60" Dia TO 120" Dia Max
CLASS II 1000D	14.9'	12.9'
CLASS III 1350D	15.0' - 21.9'	13.0' - 18.9'
CLASS III SPECIAL 1700D	22.0' - 27.9'	19.0' - 24.9'
CLASS IV 2000D	28.0' - 32.9'	25.0' - 29.9'
CLASS IV SPECIAL 2500D	33.0' - 41.9'	30.0' - 38.9'
CLASS I 3000D	42.0' - 49.9'	39.0' - 46.9'
CLASS I SPECIAL 3600D	50.0' - 60.0'	47.0' - 58.0'

**INSTALLATION TYPE 2**

MINIMUM CLASS AND D-LOAD	COVER	
	60" Dia AND SMALLER	OVER 60" Dia TO 120" Dia Max
CLASS II 1000D	11.9'	9.9'
CLASS III 1350D	12.0' - 15.9'	10.0' - 14.9'
CLASS III SPECIAL 1700D	16.0' - 20.9'	15.0' - 19.9'
CLASS IV 2000D	21.0' - 24.9'	20.0' - 23.9'
CLASS IV SPECIAL 2500D	25.0' - 31.9'	24.0' - 30.9'
CLASS I 3000D	32.0' - 37.9'	31.0' - 37.9'
CLASS I SPECIAL 3600D	38.0' - 46.0'	38.0' - 46.0'

**INSTALLATION TYPE 3**

MINIMUM CLASS AND D-LOAD	COVER	
	60" Dia AND SMALLER	OVER 60" Dia TO 120" Dia Max
CLASS II 1000D	8.9'	5.9'
CLASS III 1350D	9.0' - 11.9'	6.0' - 10.9'
CLASS III SPECIAL 1700D	12.0' - 15.9'	11.0' - 13.9'
CLASS IV 2000D	16.0' - 18.9'	14.0' - 17.9'
CLASS IV SPECIAL 2500D	19.0' - 24.9'	18.0' - 22.9'
CLASS I 3000D	25.0' - 29.9'	23.0' - 28.9'
CLASS I SPECIAL 3600D	30.0' - 36.0'	29.0' - 35.0'

**NOTES:**

- Unless otherwise shown on the plans or specified in the special provision, the Contractor shall have the option of selecting the class of RCP and the type of installation to be used, provided the height of cover does not exceed the value shown for the RCP selected.  
 Example: 24" RCP culvert with maximum cover of 24'-0" the options are:  
 a) Class III Special or stronger with Installation Type 1.  
 b) Class IV or stronger with Installation Type 2.  
 c) Class IV Special or stronger with Installation Type 3.  
 Cover is defined as the maximum vertical distance from top of the pipe to finished grade within the length of any given culvert.
- The class of RCP and Installation Type selected shall be the same throughout the length of any given culvert.
- The "length of any culvert" is defined as the culvert between:  
 a) Successive drainage structure (inlets, junction boxes, headwalls, etc.).  
 b) A drainage structure and the inlet or outlet end of the culvert.  
 c) The inlet and outlet end of the culvert when there are no intervening drainage structures.
- Oval and arch shaped RCP shall not be used.
- Bedding depth: 1/25 OD Min, not less than 3".
- Slurry cement backfill may be substituted for backfill in the outer bedding and haunch areas. If slurry is used, the outer and middle beddings shall be omitted. Prior to installation, the soil under the middle 1/3 of the outside diameter of the pipe shall be softened by scarifying or other means to a minimum depth of 1/25 OD, but not less than 3". Where slurry cement backfill is used, clear distance to trench wall may be reduced as set forth in the Standard Specifications.
- Backfill shall be placed full width of excavation except where dimensions are shown for backfill width or thickness. Dimensions shown are minimum.
- Lower side shall be suitable material as determined by the Engineer. Otherwise it shall be considered unsuitable as set forth in of the Standard Specifications. See Note 9.
- Where the pipe is placed in a trench, if the trench walls are sloped at 5 vertical to 1 horizontal or steeper for at least 90 percent of the trench height or up to not less than 12" from the grading plane, the firmness of the soil in the lower side need not be considered.
- Non-reinforced precast concrete pipe sizes 3'-0" or smaller may be placed under installation Types 1, 2 or 3.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**EXCAVATION AND BACKFILL  
 CONCRETE PIPE CULVERTS  
 INDIRECT DESIGN METHOD**  
 NO SCALE

RSP A62DA DATED JULY 18, 2014 SUPERSEDES STANDARD PLAN A62DA DATED MAY 20, 2011 - PAGE 24 OF THE STANDARD PLANS BOOK DATED 2010.

2010 REVISED STANDARD PLAN RSP A62DA

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	313	356

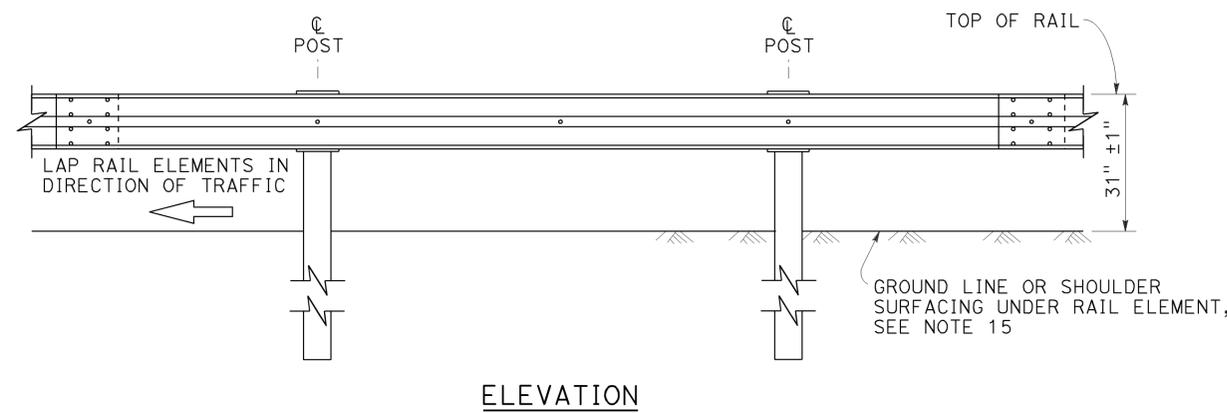
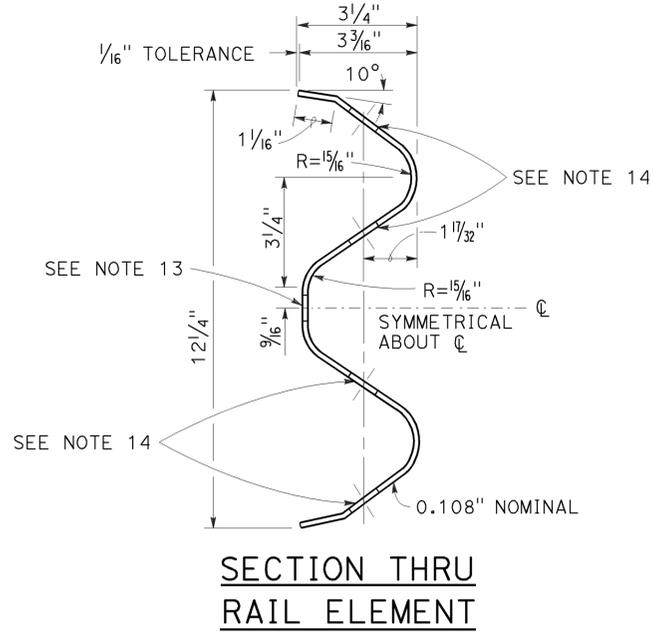
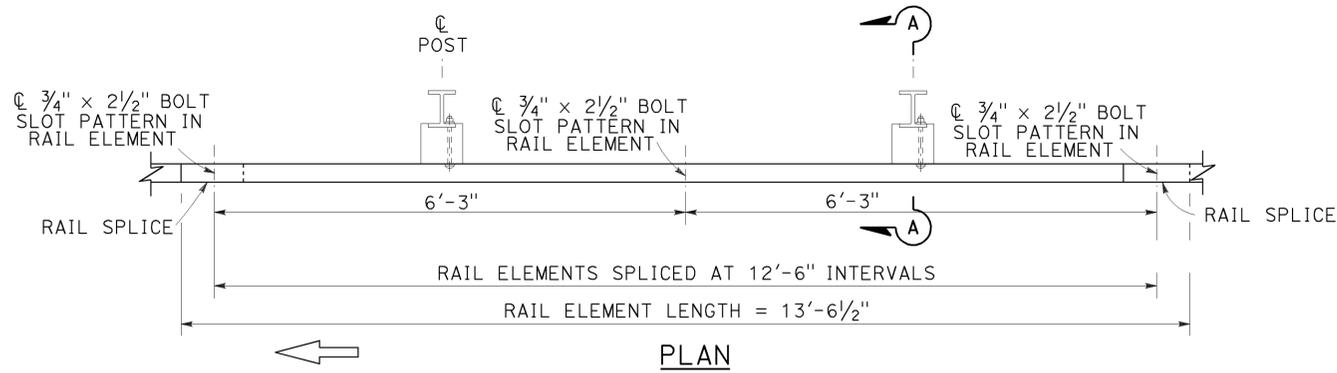
**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

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

TO ACCOMPANY PLANS DATED 9-29-14

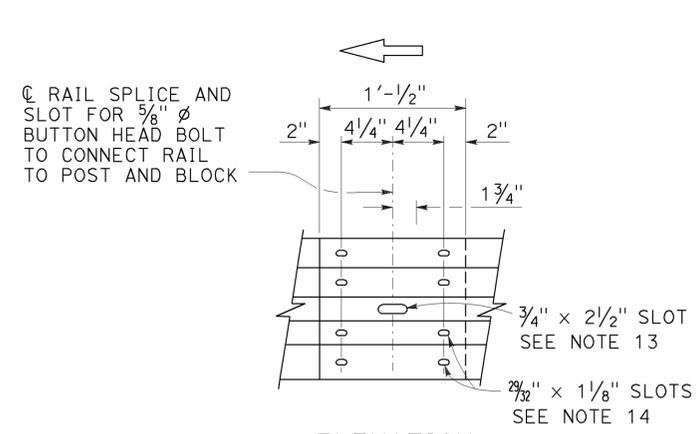
2010 REVISED STANDARD PLAN RSP A77L2



**NOTES:**

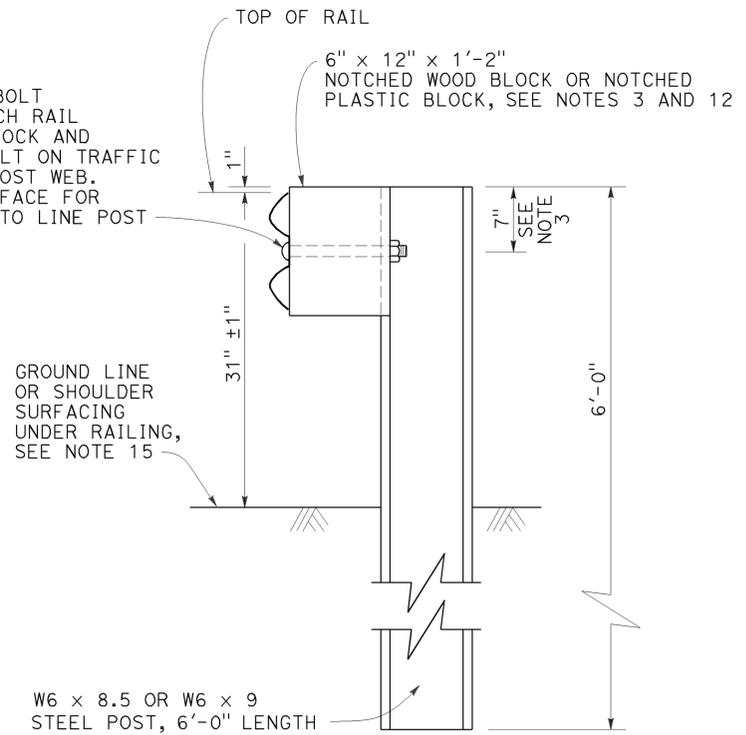
- For details of wood post installations, see Revised Standard Plan RSP A77L1.
- For details of standard hardware used to construct MGS, see Revised Standard Plan RSP A77M1.
- For details of steel posts and notched wood blocks used to construct MGS, see Revised Standard Plan RSP A77N2.
- For additional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

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



**ELEVATION  
RAIL ELEMENT SPLICE DETAIL**

- Connect the overlapped end of the rail elements with  $5/8"$   $\phi$   $\times$   $1 3/8"$  button head oval shoulder splice bolts inserted into the  $7/32"$   $\times$   $1 1/8"$  slots and bolted together with  $5/8"$   $\phi$  recessed hex nuts. Recess of hex nut points toward rail element. A total of 8 bolts and nuts are to be used at each rail splice connection.
- The ends of the rail elements are to be overlapped in the direction of traffic (see details).
- Where end cap is to be attached to the end of a rail element, a total of 4 of the above described splice bolts and nuts are to be used.



**SECTION A-A  
TYPICAL STEEL LINE  
POST INSTALLATION**  
See Note 4

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

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

**REVISED STANDARD PLAN RSP A77L2**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	314	356

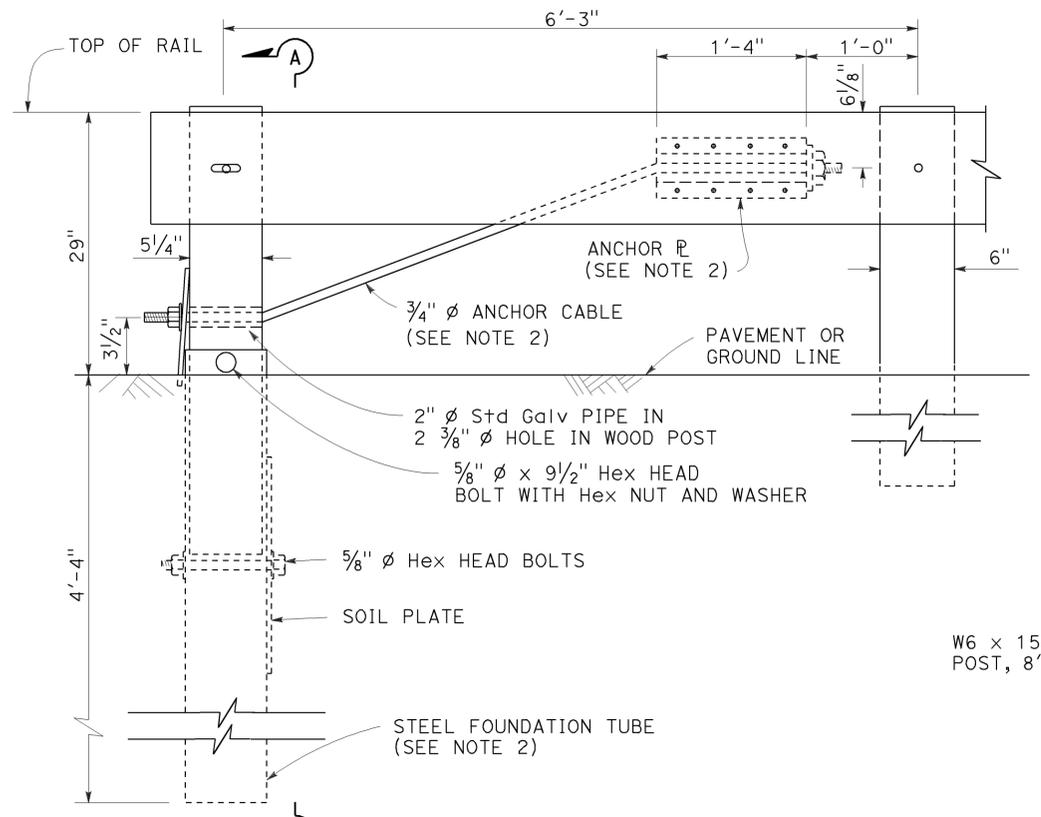
**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

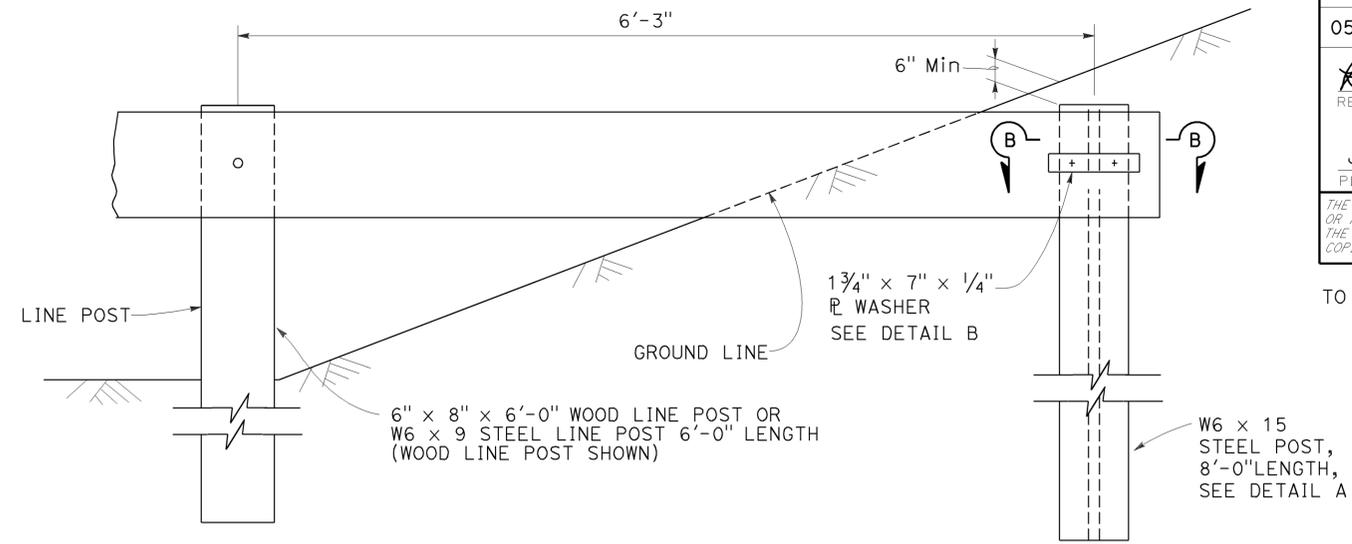
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED 9-29-14

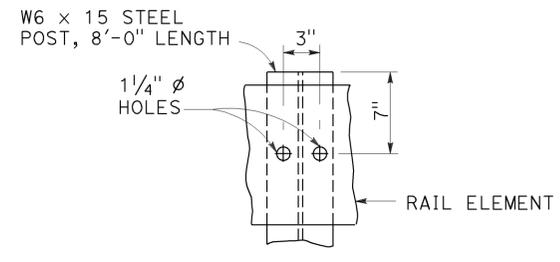
REGISTERED PROFESSIONAL ENGINEER  
No. C50200  
Exp. 6-30-15  
CIVIL  
STATE OF CALIFORNIA



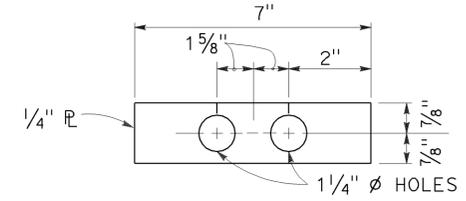
**ELEVATION  
END ANCHOR  
ASSEMBLY (TYPE SFT)**



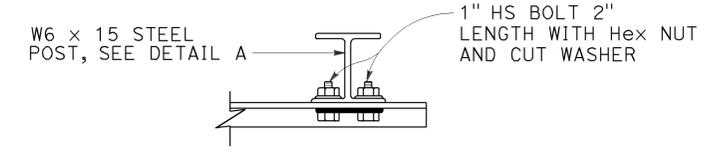
**BURIED POST END ANCHOR**



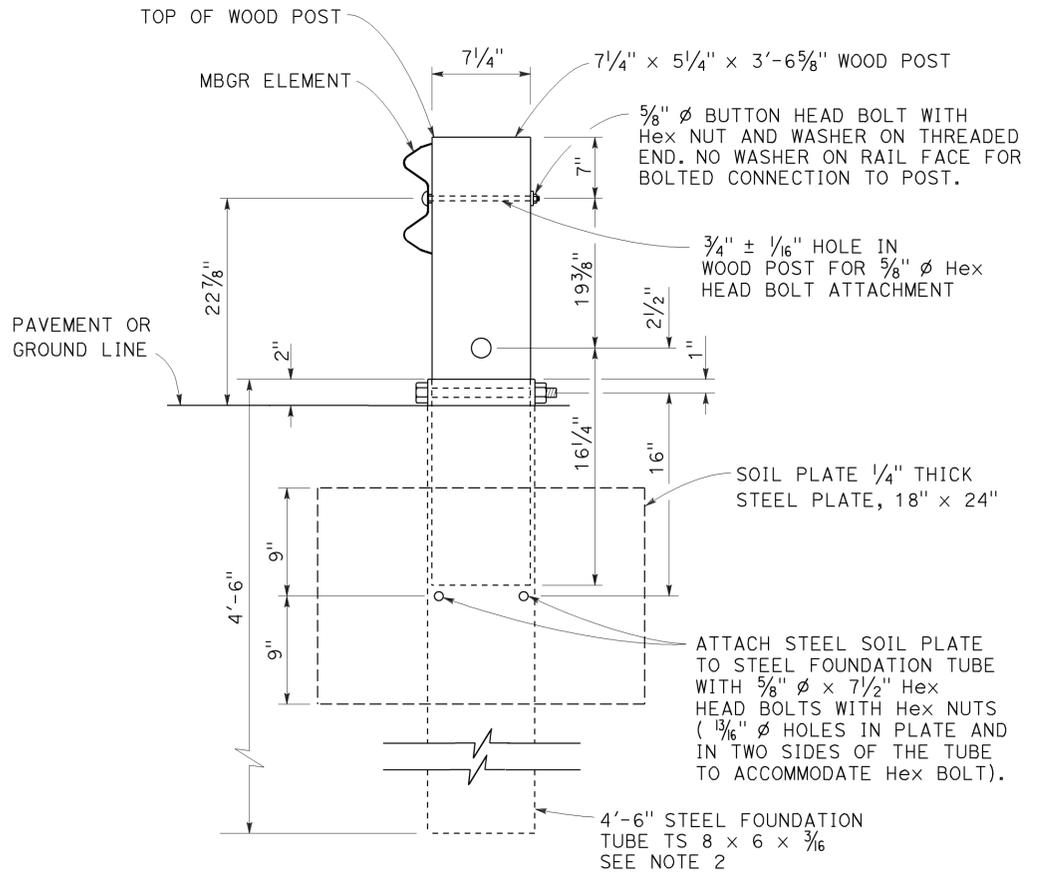
**DETAIL A**



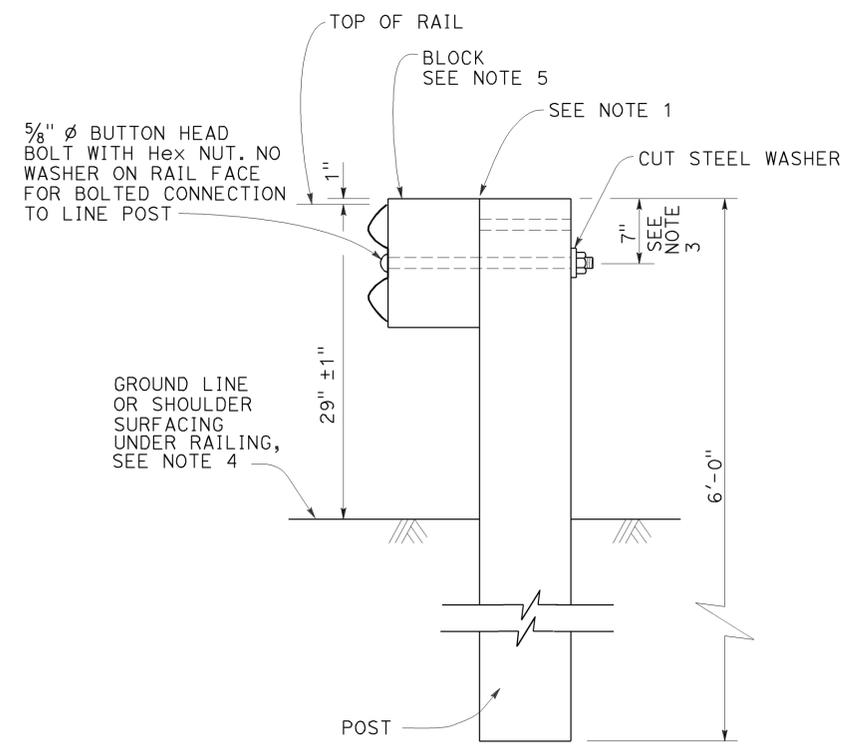
**DETAIL B**



**SECTION B-B**



**SECTION A-A**



**TYPICAL LINE  
POST INSTALLATION**

**NOTES:**

1. For wood post and wood block, toenail with 2-16d Galv nails in top of block. For steel post and notched wood or plastic block, notched face of block faces steel post.
2. A 6'-0" Length steel foundation tube, TS 8 x 6 x 3/16, without a soil plate, may be furnished and installed in place of the 4'-6" length steel foundation tube and soil plate shown. Minimum embedment of the 6'-0" length tube shall be 5'-9". A 5/8" Hex head bolt and nut shall be installed in the hole in the 6'-0" length tube to keep the wood post from dropping into the tube.
3. To connect railing to 27" terminal system end treatment, transition the top of railing height at a ratio of 120:1 to terminal system end treatment height plus one 12'-6" standard railing section at the transitioned height for a horizontal connection to the end treatment.
4. Install posts in soil.
5. See Revised Standard Plans RSP A77N1 and RSP A77N2 for details.
6. Holes excavation in the slope to construct the buried post end anchor shall be backfilled with selected earth, placed in layers approximately 1'-0" thick. Each layer shall be moistened and thoroughly compacted.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL BEAM GUARD RAILING  
RECONSTRUCT INSTALLATION**

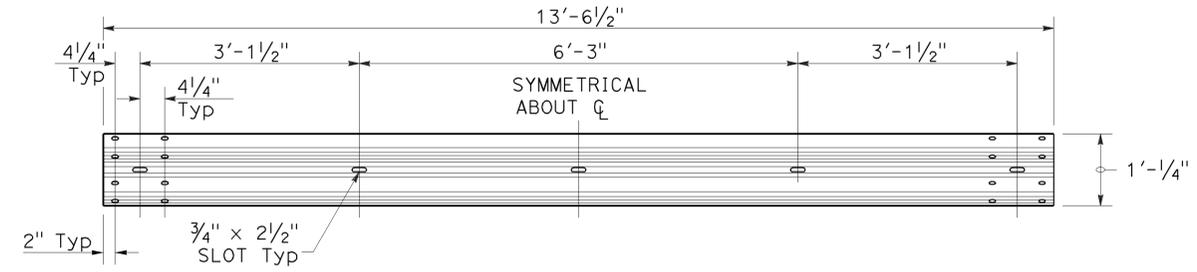
NO SCALE

RSP A77L3 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77L3**

2010 REVISED STANDARD PLAN RSP A77L3

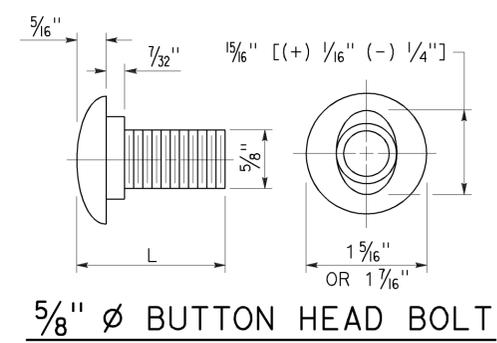
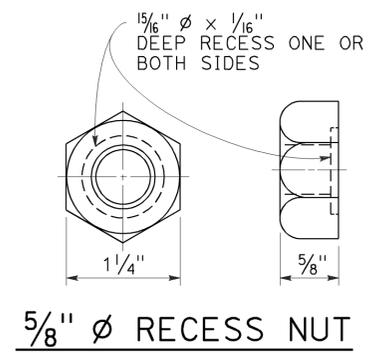
TO ACCOMPANY PLANS DATED 9-29-14



**TYPICAL RAIL ELEMENT**

**NOTE:**

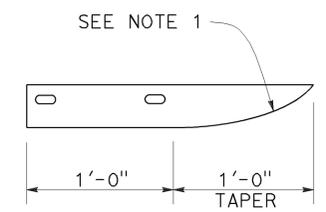
1. Slotted holes for splice bolts to overlap ends of rail element.



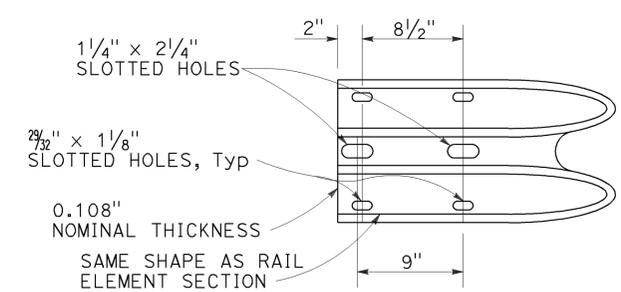
**BUTTON HEAD BOLT**

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

\*\* For nested rail applications.



**PLAN**



**ELEVATION  
END CAP  
(TYPE A)**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
STANDARD HARDWARE**

NO SCALE

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

**REVISED STANDARD PLAN RSP A77M1**

2010 REVISED STANDARD PLAN RSP A77M1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	316	356

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

November 15, 2013  
PLANS APPROVAL DATE

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

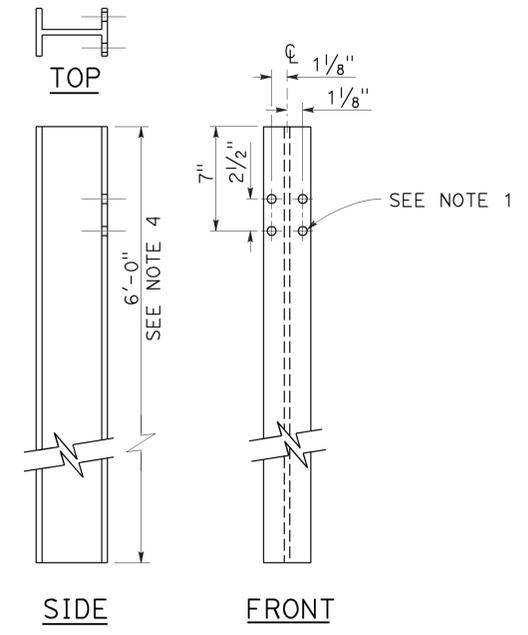
REGISTERED PROFESSIONAL ENGINEER  
Randell D. Hiatt  
No. C50200  
Exp. 6-30-15  
CIVIL  
STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED 9-29-14

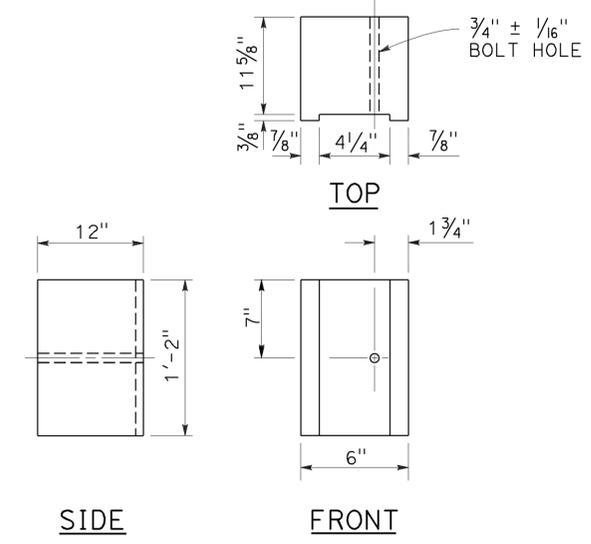
**NOTES:**

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

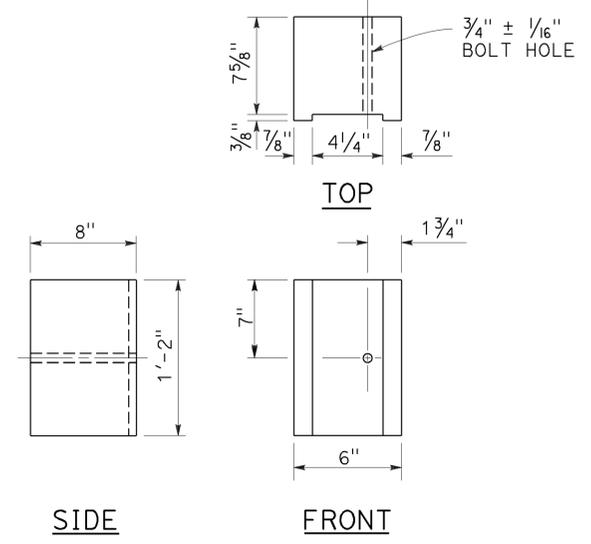
2010 REVISED STANDARD PLAN RSP A77N2



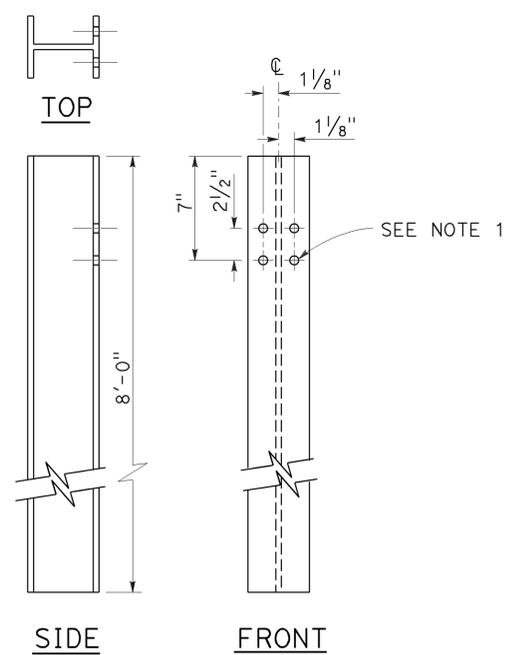
**W6 x 9 OR W6 x 8.5  
STEEL POST**  
See Note 4



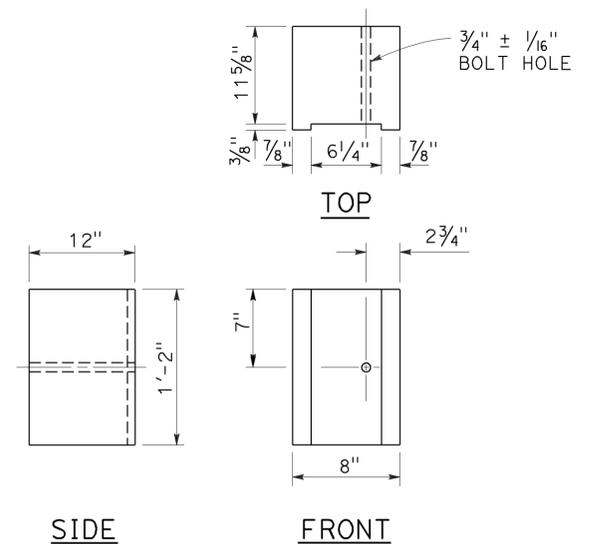
**6" x 12"  
NOTCHED WOOD BLOCK**  
See Notes 2 and 3



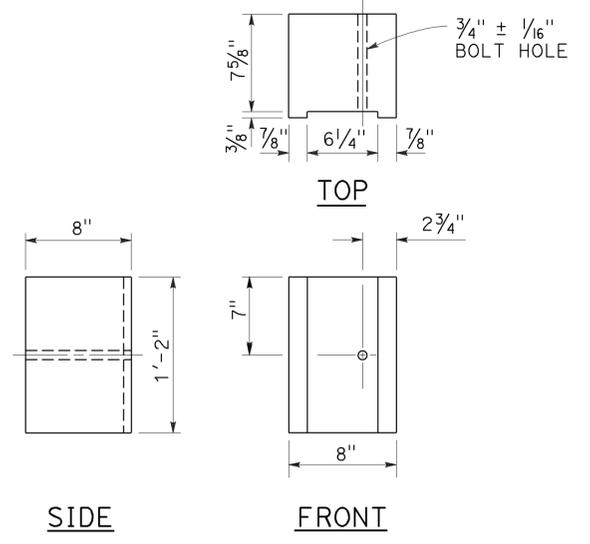
**6" x 8"  
NOTCHED WOOD BLOCK**  
Only for use with metal beam guard railing. See Note 5



**W6 x 15  
STEEL POST**  
See Note 6



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



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

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

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

**REVISED STANDARD PLAN RSP A77N2**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	317	356

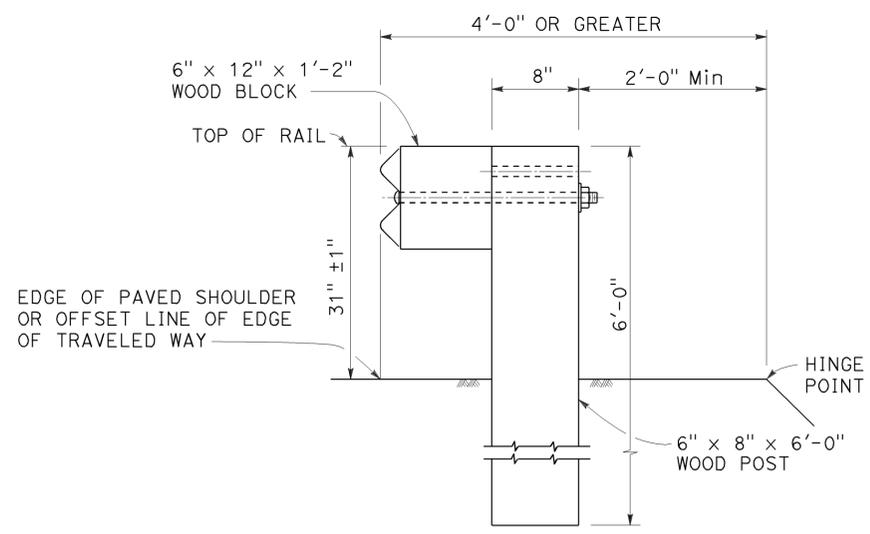
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

November 15, 2013  
PLANS APPROVAL DATE

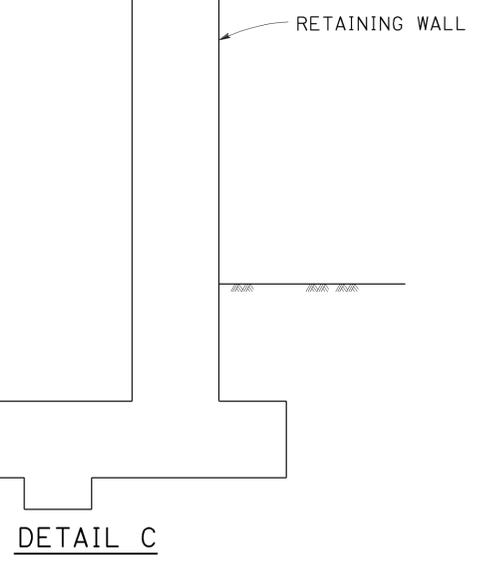
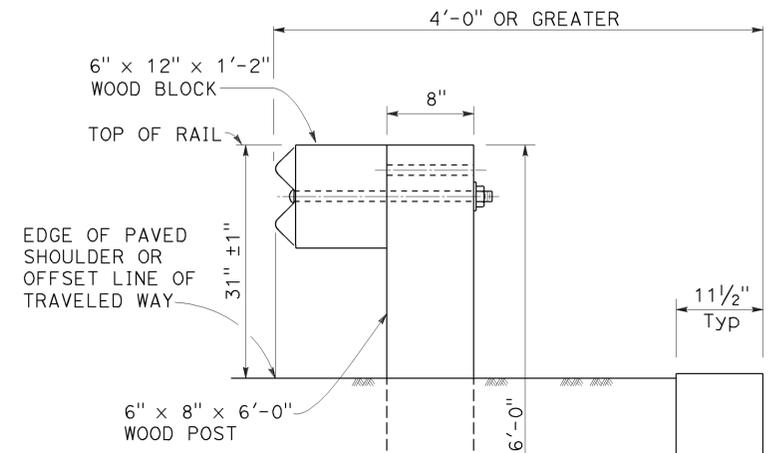
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

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

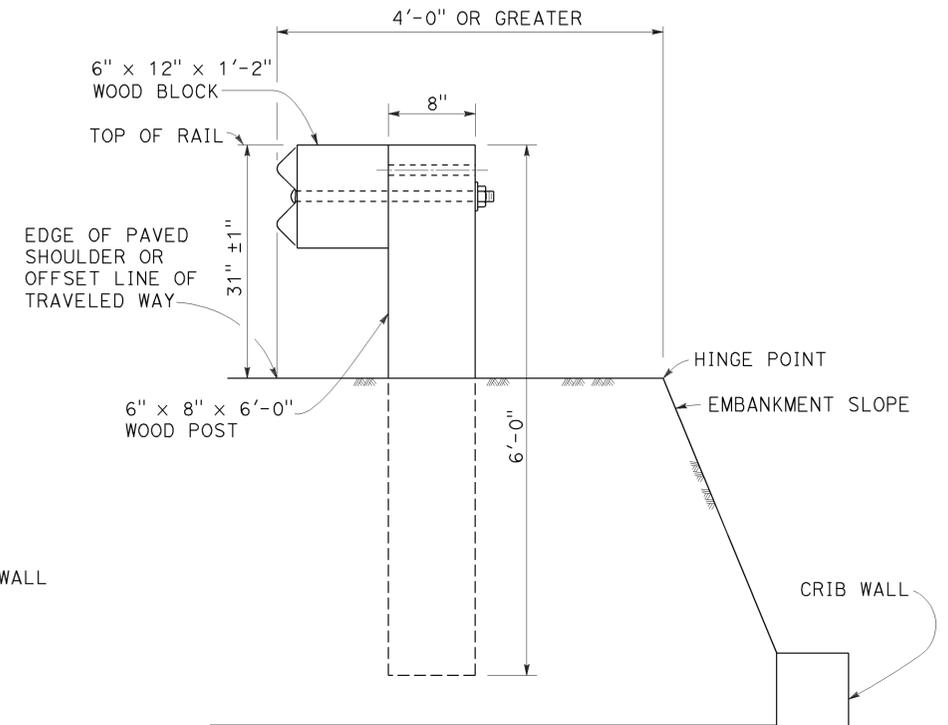
TO ACCOMPANY PLANS DATED 9-29-14



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



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



**DETAIL D**

**INSTALLATION AT EARTH RETAINING WALLS**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

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

**REVISED STANDARD PLAN RSP A77N3**

**NOTES:**

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

**POST EMBEDMENT**

2010 REVISED STANDARD PLAN RSP A77N3

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	318	356

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

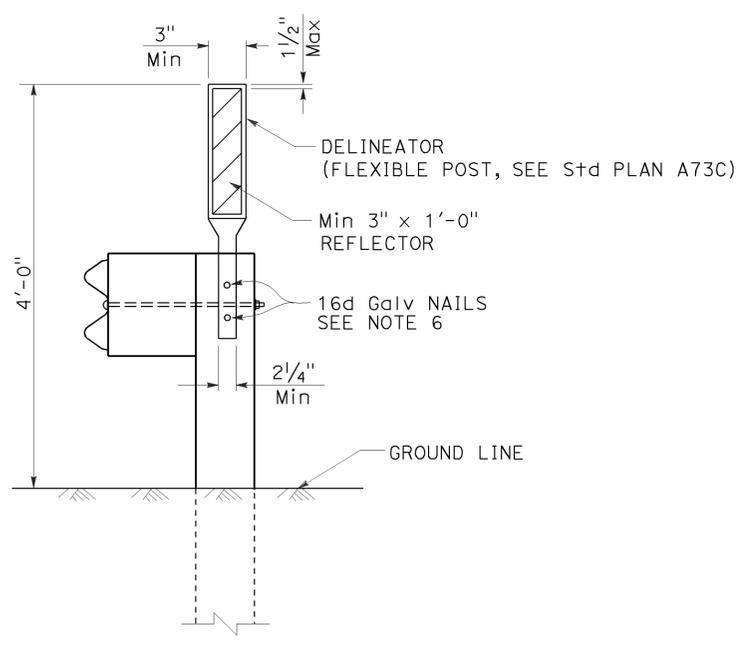
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

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

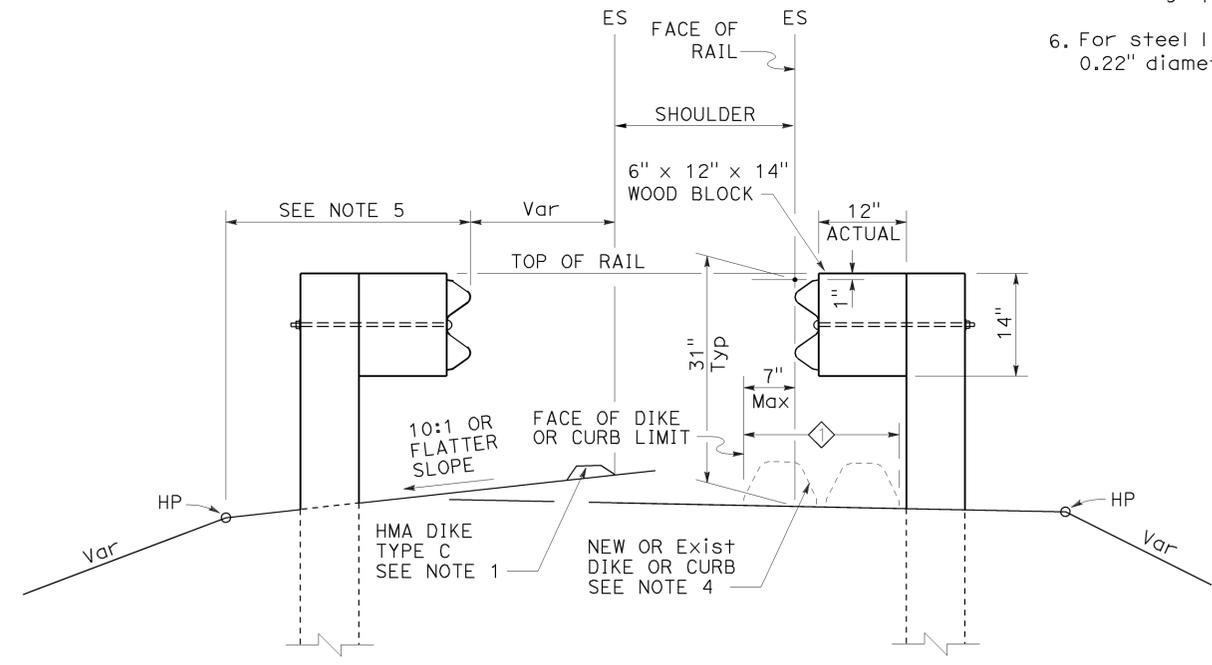
TO ACCOMPANY PLANS DATED 9-29-14

**NOTES:**

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



**MGS DELINEATION**  
See Note 3



**DIKE POSITIONING**  
See Note 1

◇ PERMISSIBLE DIKE OR CURB  
PLACEMENT AREA

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

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

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

**REVISED STANDARD PLAN RSP A77N4**

2010 REVISED STANDARD PLAN RSP A77N4

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	319	356

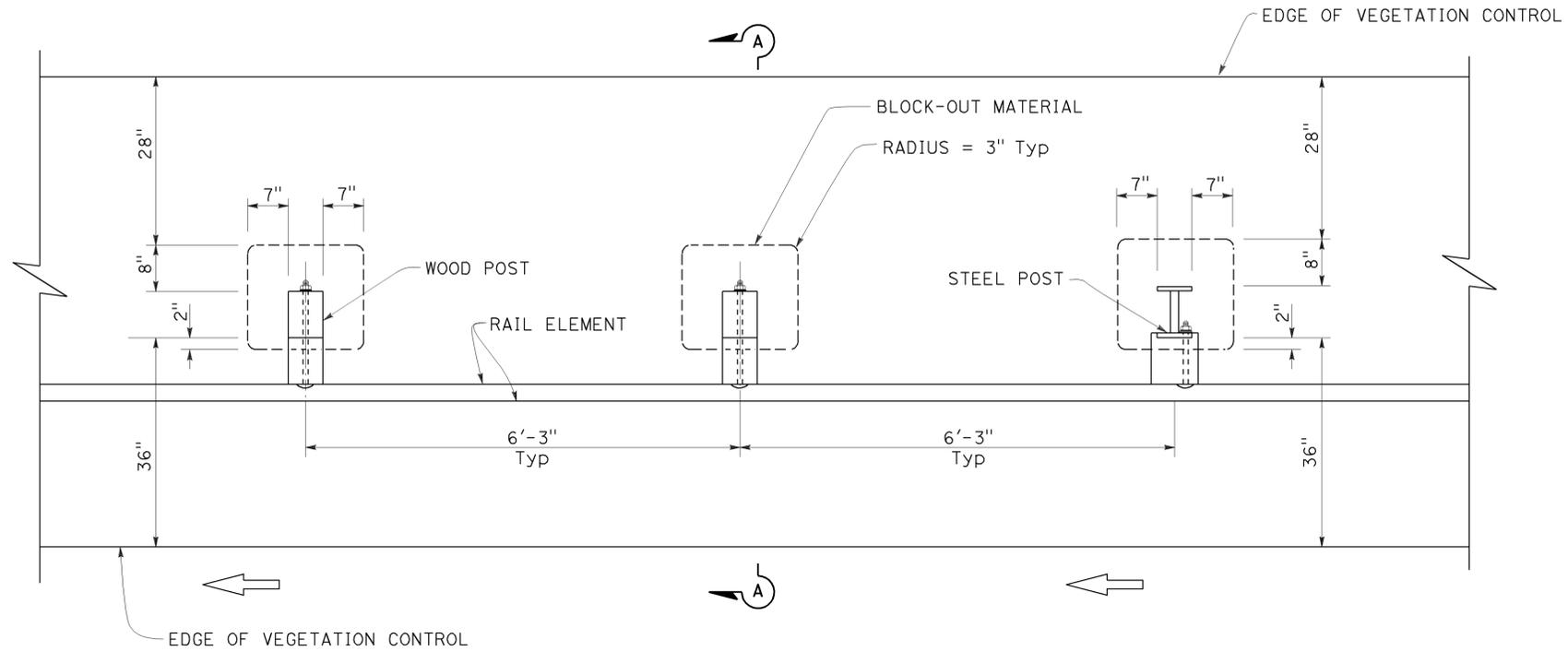
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

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

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

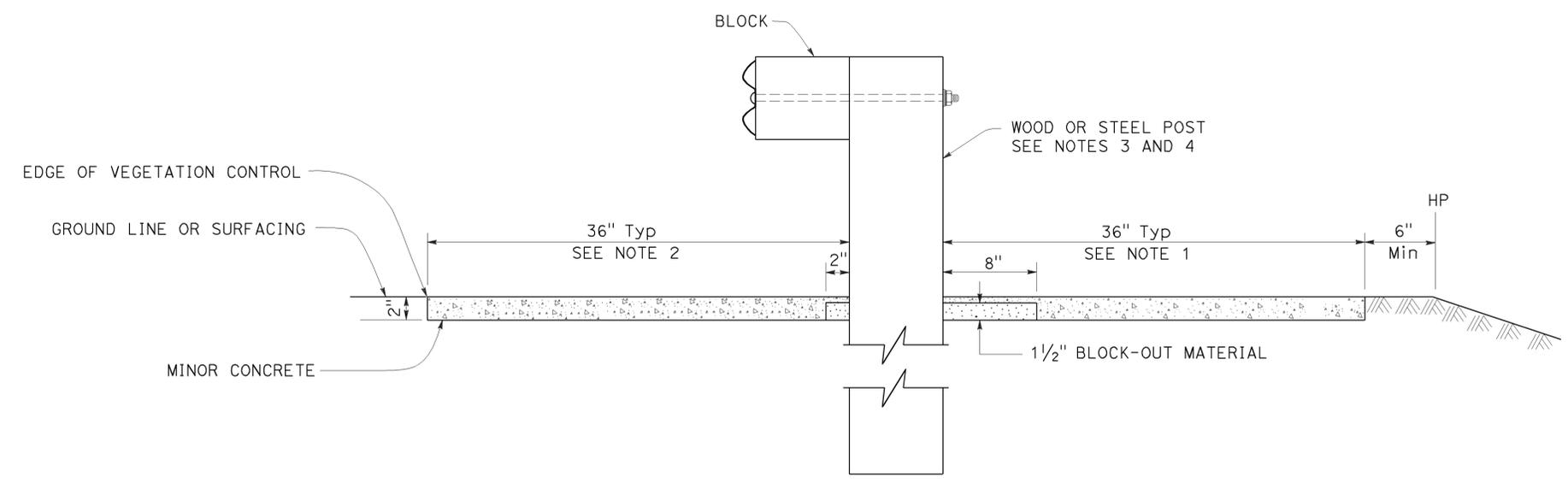
TO ACCOMPANY PLANS DATED 9-29-14



**PLAN**

**NOTES:**

1. Where the distance between back of post and hinge point is less than 42", construct vegetation control to 6" from hinge point while maintaining the 8" block-out at back of post. If the 8" block-out at back of post can not be maintained, construct vegetation control flush with the back edge of post.
2. Where dike is constructed under railing, construct vegetation control to back edge of dike. Where paved shoulder is constructed within 36" in front of the post, construct vegetation control to the edge of paved shoulder.
3. For wood post sizes, see Revised Standard Plan RSP A77N1.
4. For steel post sizes, see Revised Standard Plan RSP A77N2.
5. For details not shown, see Revised Standard Plans RSP A77L1 and RSP A77L2.



**SECTION A-A**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL VEGETATION CONTROL  
STANDARD RAILING SECTION**

NO SCALE

RSP A77N5 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77N5**

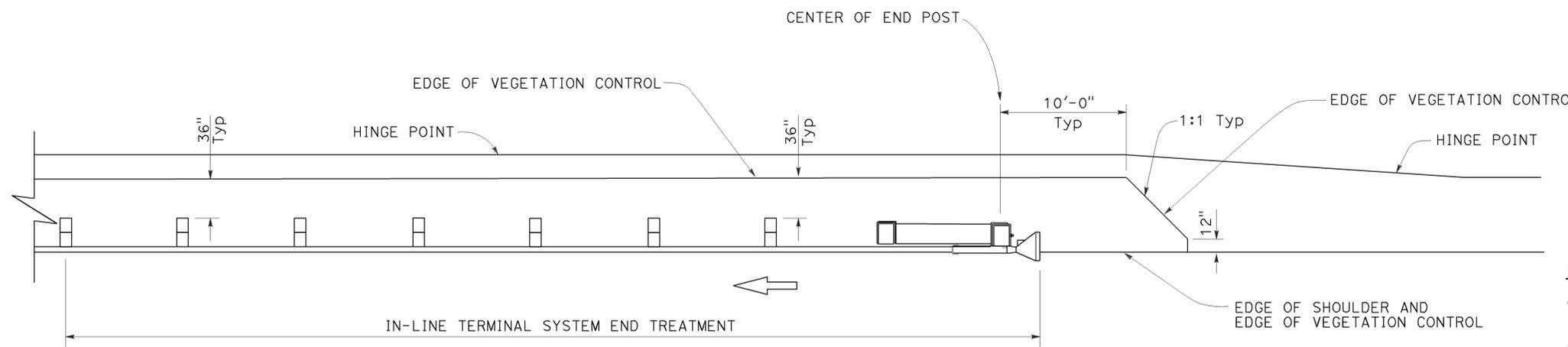
2010 REVISED STANDARD PLAN RSP A77N5

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	320	356

RANDALL D. HIATT  
 REGISTERED CIVIL ENGINEER  
 July 19, 2013  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



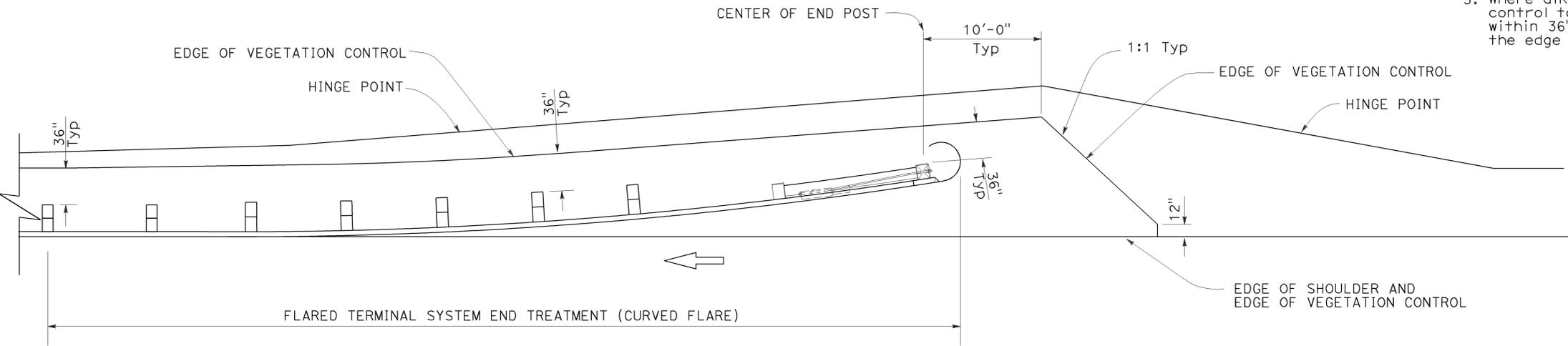
TO ACCOMPANY PLANS DATED 9-29-14



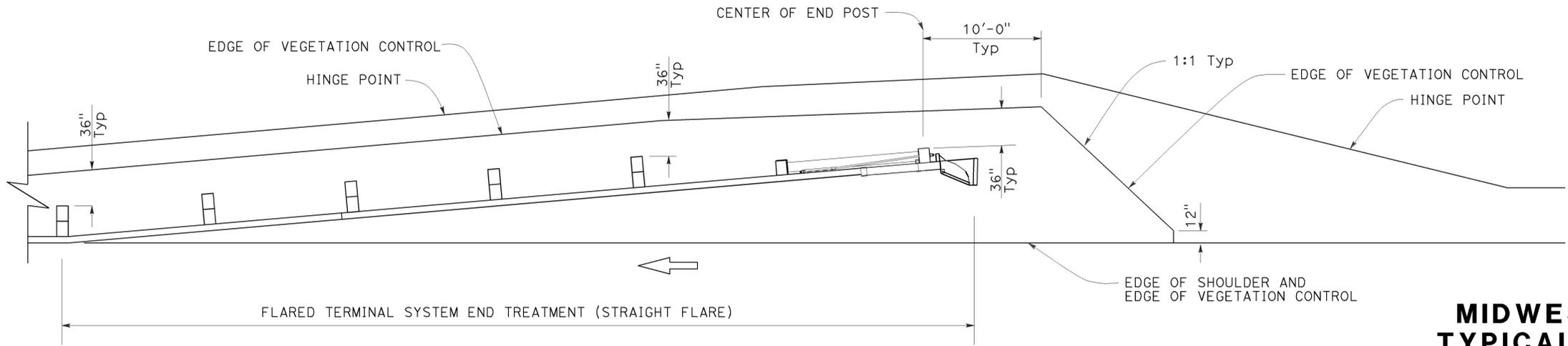
PLAN

**NOTES:**

1. See Revised Standard Plan RSP A77N5 for additional vegetation control details.
2. Where the distance between back of post and hinge point is less than 42", construct vegetation control to 6" from hinge point while maintaining the 8" block-out at back of post. If the 8" block-out at back of post can not be maintained, construct vegetation control flush with the back edge of post.
3. Where dike is constructed under railing, construct vegetation control to back edge of dike. Where paved shoulder is constructed within 36" in front of the post, construct vegetation control to the edge of paved shoulder.



PLAN



PLAN

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL VEGETATION CONTROL  
FOR TERMINAL SYSTEM END TREATMENTS**

NO SCALE

RSP A77N6 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77N6**

2010 REVISED STANDARD PLAN RSP A77N6

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	321	356

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

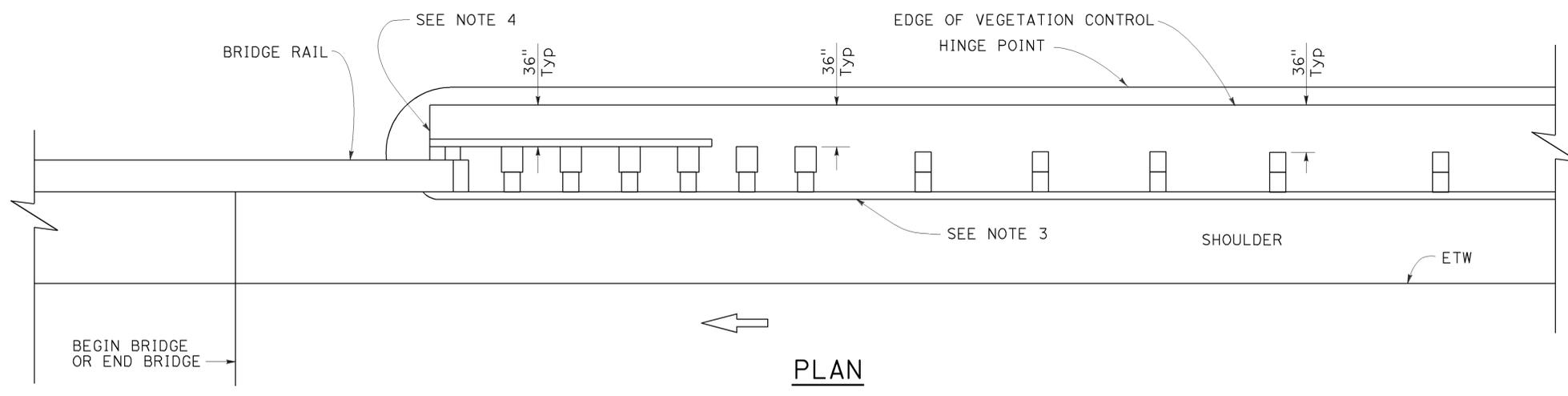
July 19, 2013  
PLANS APPROVAL DATE

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

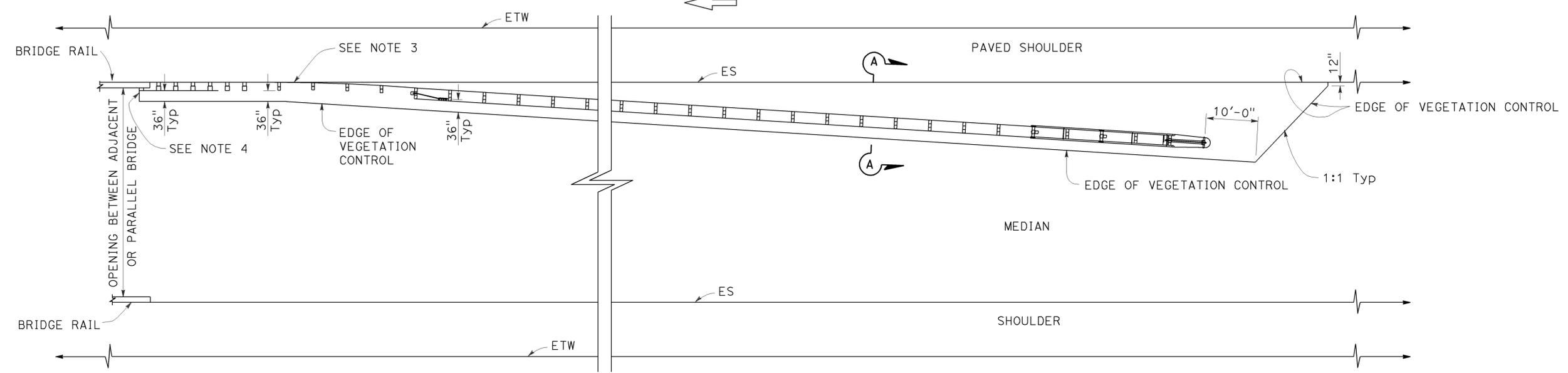
REGISTERED PROFESSIONAL ENGINEER  
No. C50200  
Exp. 6-30-15  
CIVIL  
STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED 9-29-14

2010 REVISED STANDARD PLAN RSP A77N7



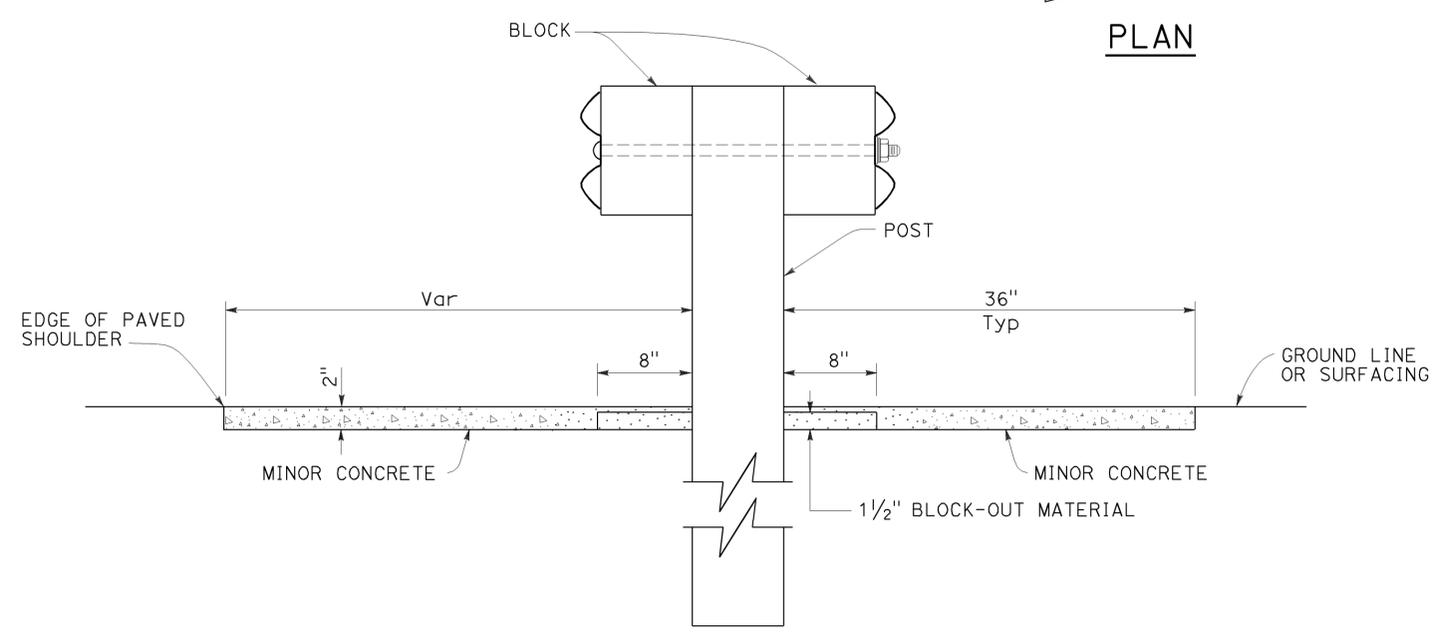
PLAN



PLAN

**NOTES:**

1. See Revised Standard Plan RSP A77N5 for additional vegetation control details.
2. Where the distance between back of post and hinge point is less than 42", construct vegetation control to 6" from hinge point while maintaining the 8" block-out at back of post. If the 8" block-out at back of post can not be maintained, construct vegetation control flush with the back edge of post.
3. Where dike is constructed under railing, construct vegetation control to back edge of dike. Where paved shoulder is constructed within 36" in front of the post, construct vegetation control to the edge of paved shoulder.
4. End vegetation control at end of backside rail element.



SECTION A-A

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
TYPICAL VEGETATION CONTROL  
AT STRUCTURE APPROACH**

NO SCALE

RSP A77N7 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77N7**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	322	356

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

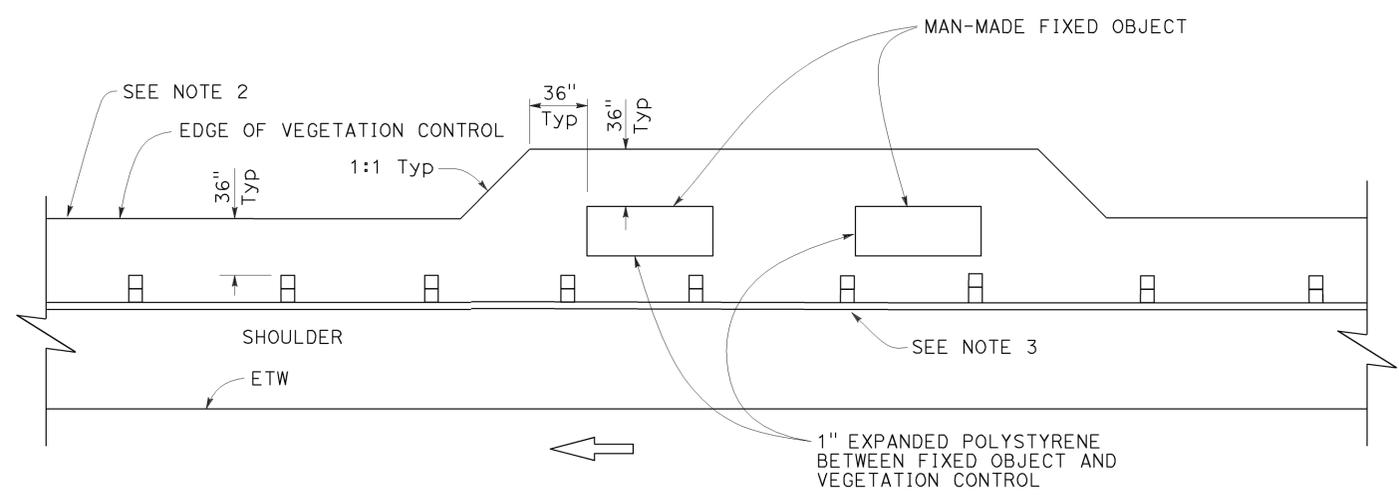
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TO ACCOMPANY PLANS DATED 9-29-14

**NOTES:**

1. See Revised Standard Plan RSP A77N5 for additional vegetation control details.
2. Where the distance between back of post and hinge point is less than 42", construct vegetation control to 6" from hinge point while maintaining the 8" block-out at back of post. If the 8" block-out at back of post can not be maintained, construct vegetation control flush with the back edge of post.
3. Where dike is constructed under railing, construct vegetation control to back edge of dike. Where paved shoulder is constructed within 36" in front of the post, construct vegetation control to the edge of paved shoulder.



**PLAN**  
Fixed object(s) on shoulder

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
TYPICAL VEGETATION CONTROL  
AT FIXED OBJECT**

NO SCALE

RSP A77N8 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77N8**

2010 REVISED STANDARD PLAN RSP A77N8

**NOTES:**

1. See Revised Standard Plan RSP A77N5 for additional vegetation control details.
2. Where dike is constructed under railing, construct vegetation control to back edge of dike. Where paved shoulder is constructed within 36" in front of the post, construct vegetation control to the edge of paved shoulder.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	323	356

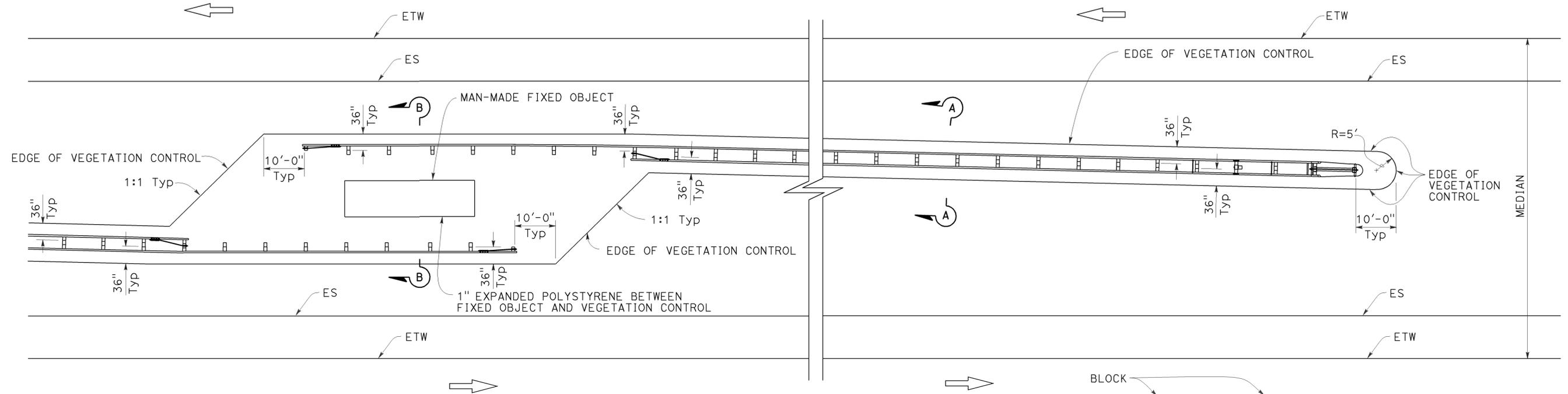
**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

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

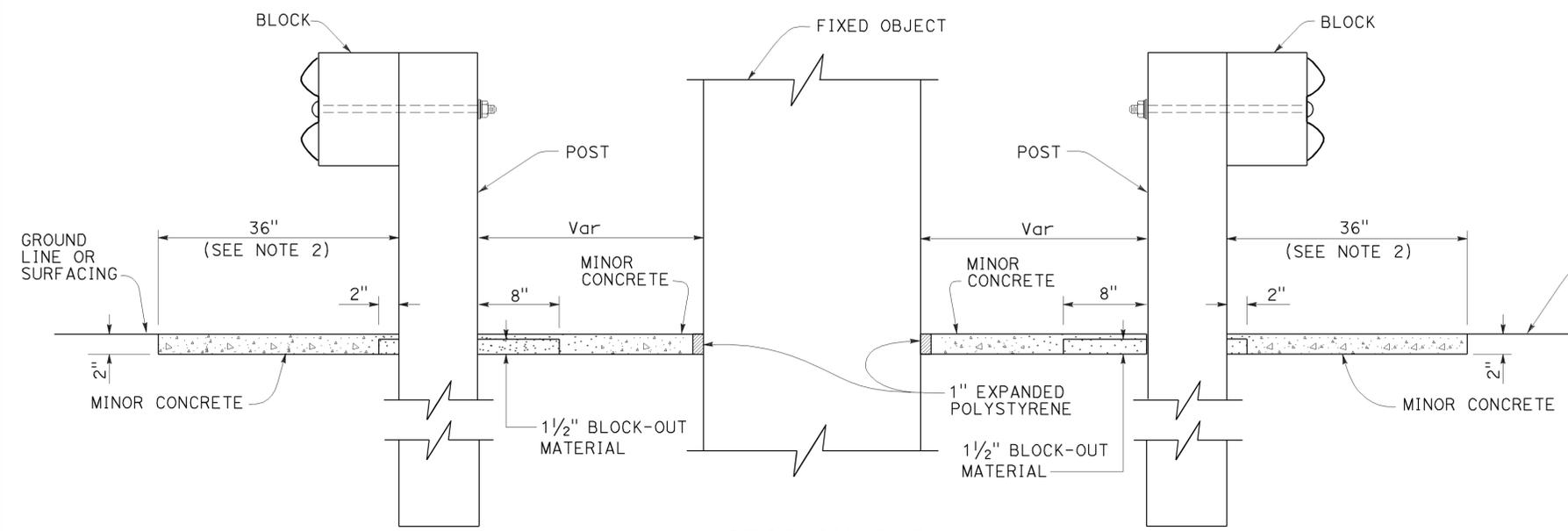


TO ACCOMPANY PLANS DATED 9-29-14

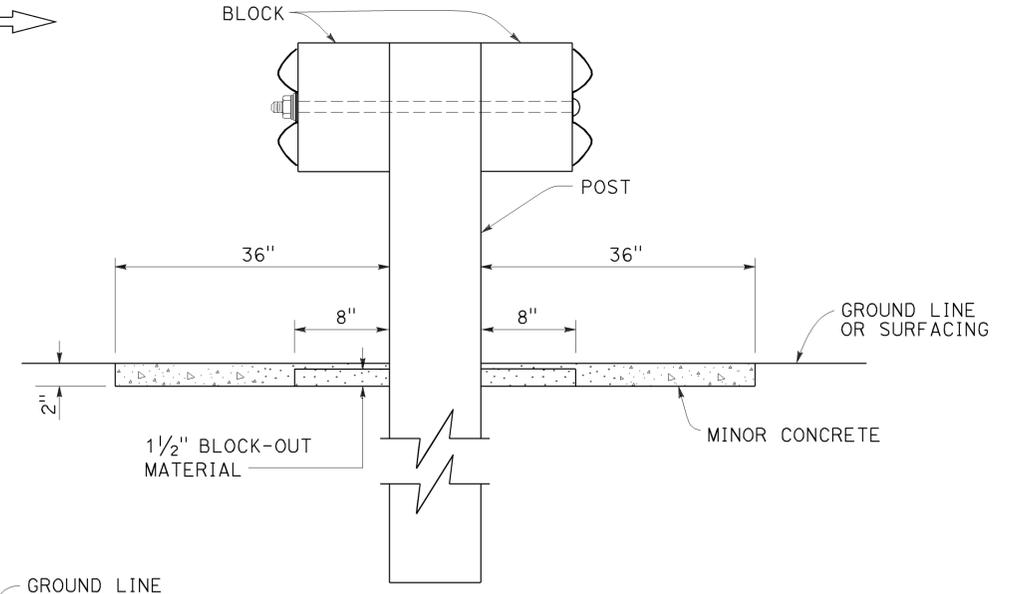


**PLAN**

Fixed object(s) in median



**SECTION B-B**



**SECTION A-A**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL VEGETATION CONTROL  
AT FIXED OBJECT**

NO SCALE

RSP A77N9 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77N9**

2010 REVISED STANDARD PLAN RSP A77N9

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	324	356

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

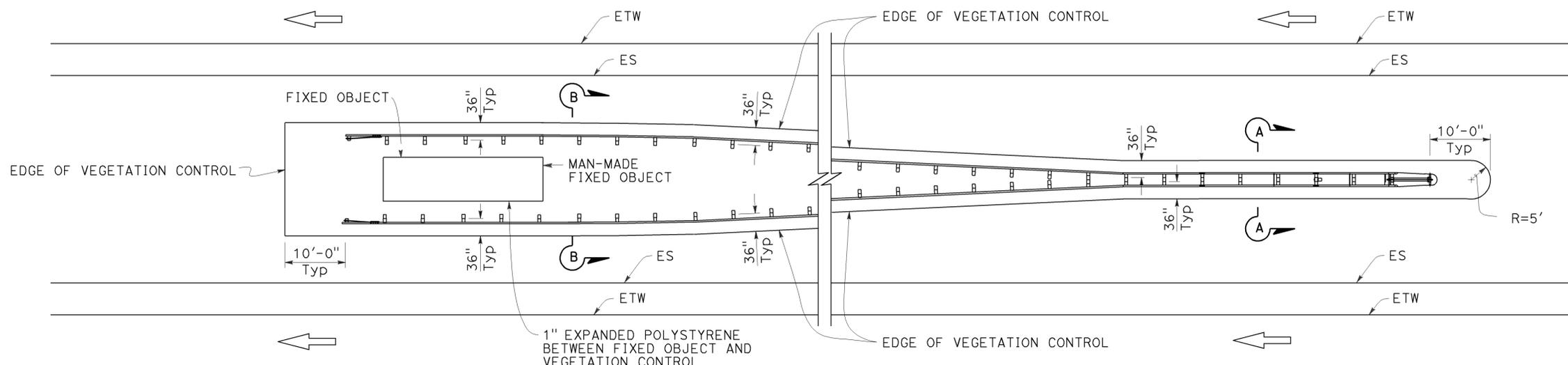
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

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

TO ACCOMPANY PLANS DATED 9-29-14

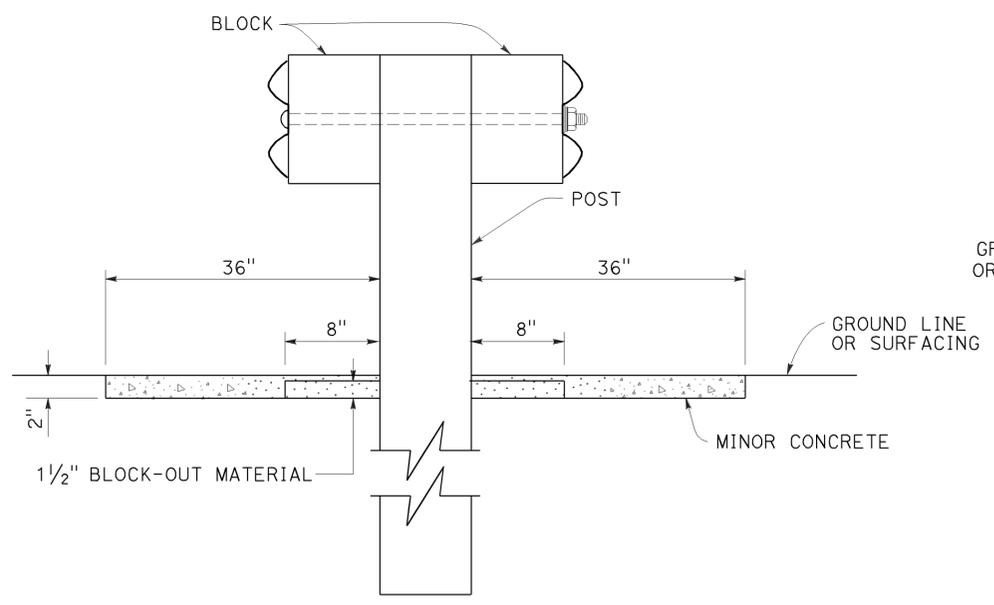
**NOTES:**

1. See Revised Standard Plan RSP A77N5 for additional vegetation control details.
2. Where dike is constructed under railing, construct vegetation control to back edge of dike. Where paved shoulder is constructed within 36" in front of the post, construct vegetation control to the edge of paved shoulder.

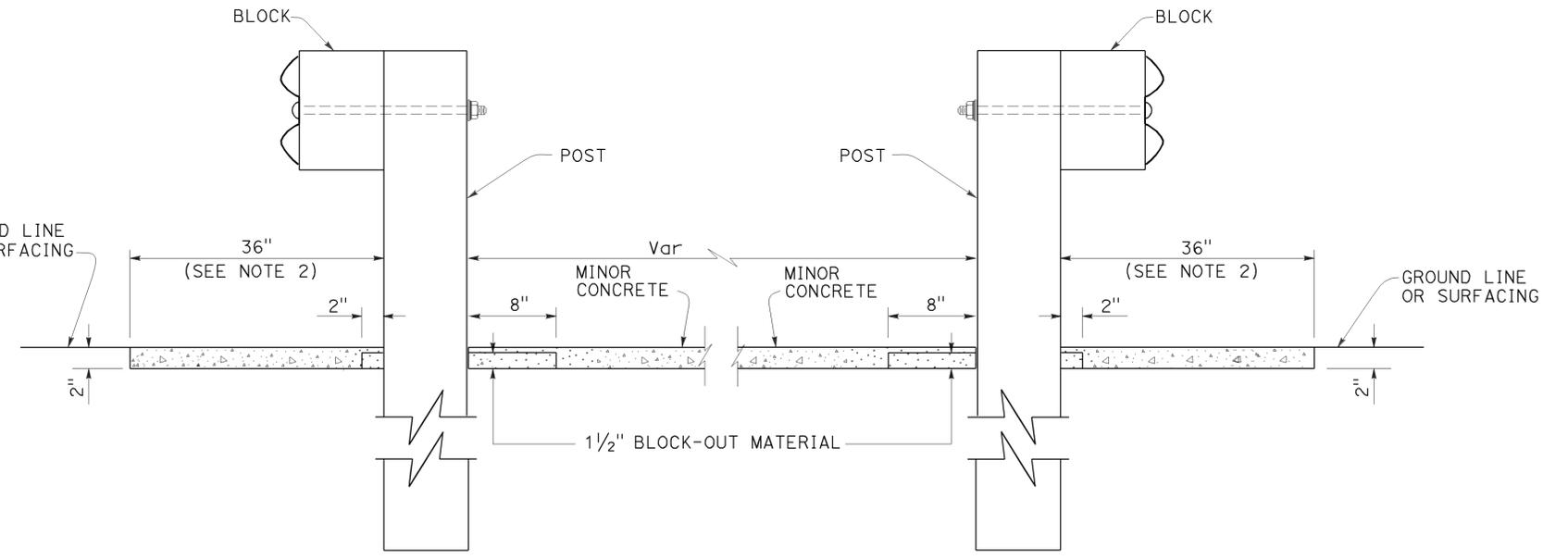


**PLAN**

Fixed object(s) between separate roadbeds  
(One-Way Traffic)



**SECTION A-A**



**SECTION B-B**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL VEGETATION CONTROL  
AT FIXED OBJECT**

NO SCALE

RSP A77N10 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77N10**

2010 REVISED STANDARD PLAN RSP A77N10

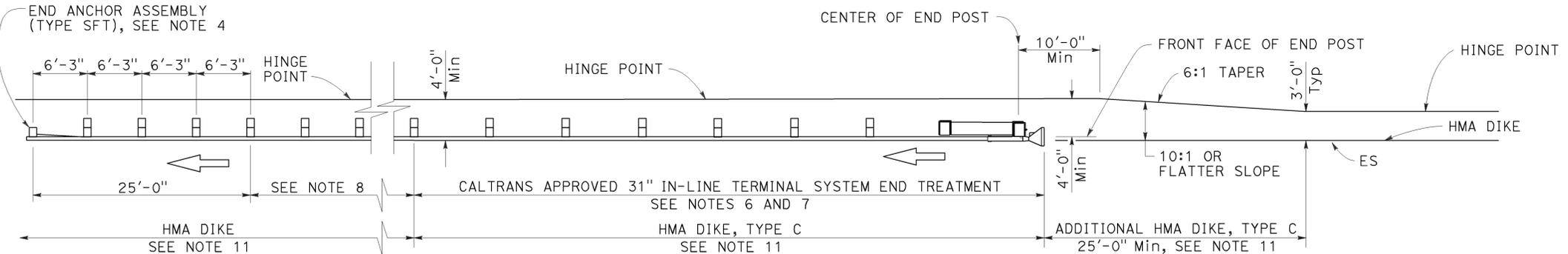
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	325	356

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

November 15, 2013  
PLANS APPROVAL DATE

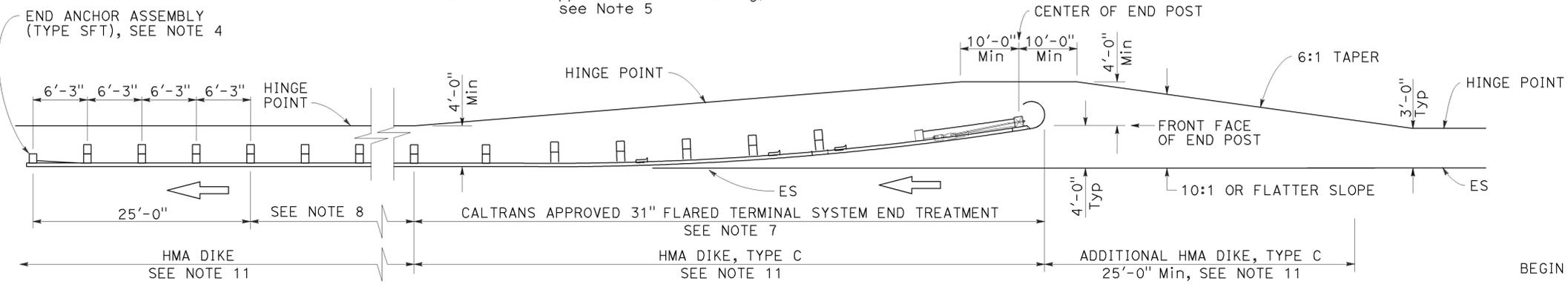
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED 9-29-14



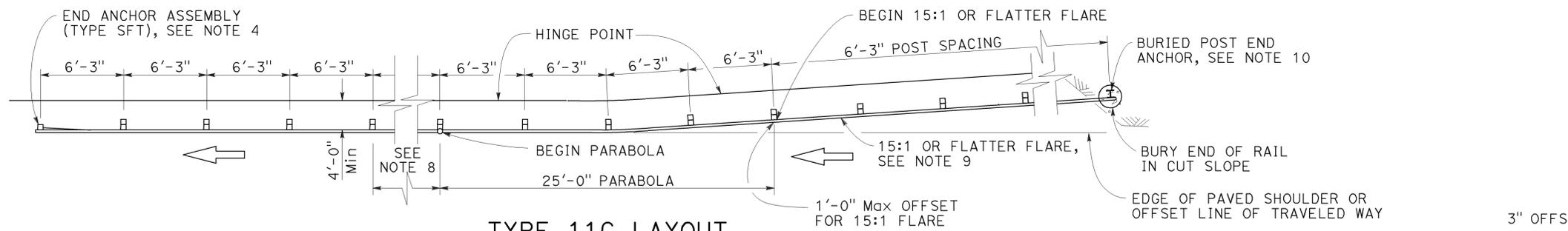
**TYPE 11A LAYOUT**

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



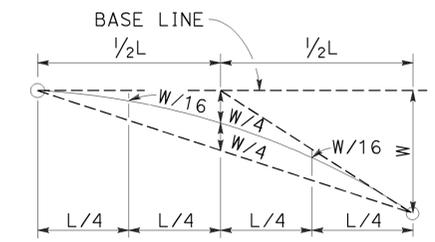
**TYPE 11B LAYOUT**

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

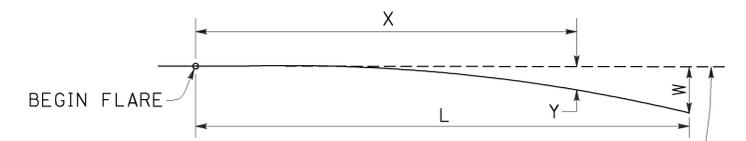


**TYPE 11C LAYOUT**

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



**TYPICAL PARABOLIC LAYOUT**

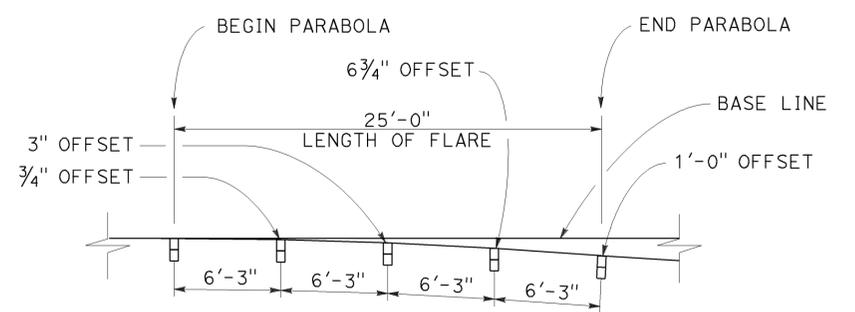


BASE LINE (EDGE OF PAVED SHOULDER OR OFFSET LINE OF EDGE OF TRAVELED WAY)

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

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

**PARABOLIC FLARE OFFSETS**



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

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR EMBANKMENTS**

NO SCALE

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

**REVISED STANDARD PLAN RSP A77P1**

**NOTES:**

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

2010 REVISED STANDARD PLAN RSP A77P1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	326	356

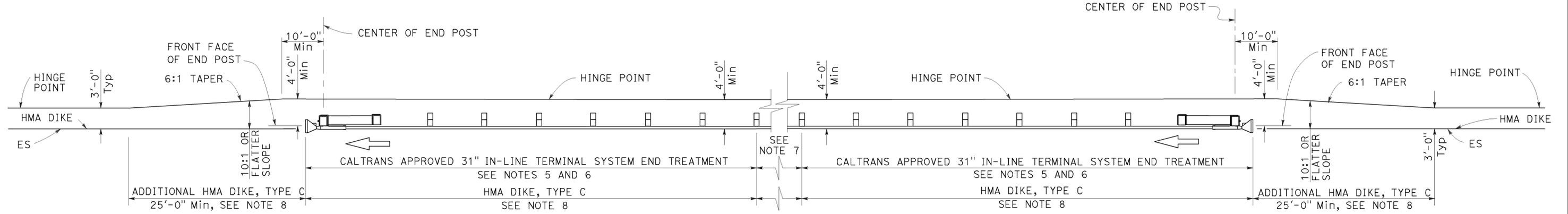
Randell D. Hiatt  
REGISTERED CIVIL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

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

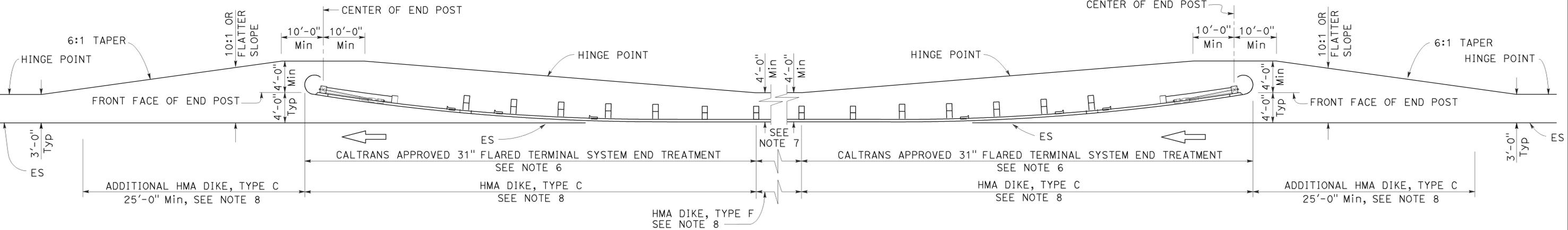
REGISTERED PROFESSIONAL ENGINEER  
Randell D. Hiatt  
No. C50200  
Exp. 6-30-15  
CIVIL  
STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED 9-29-14



**TYPE 11D LAYOUT**

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



**TYPE 11E LAYOUT**

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

**NOTES:**

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

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**

NO SCALE

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

**REVISED STANDARD PLAN RSP A77P2**

2010 REVISED STANDARD PLAN RSP A77P2

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	327	356

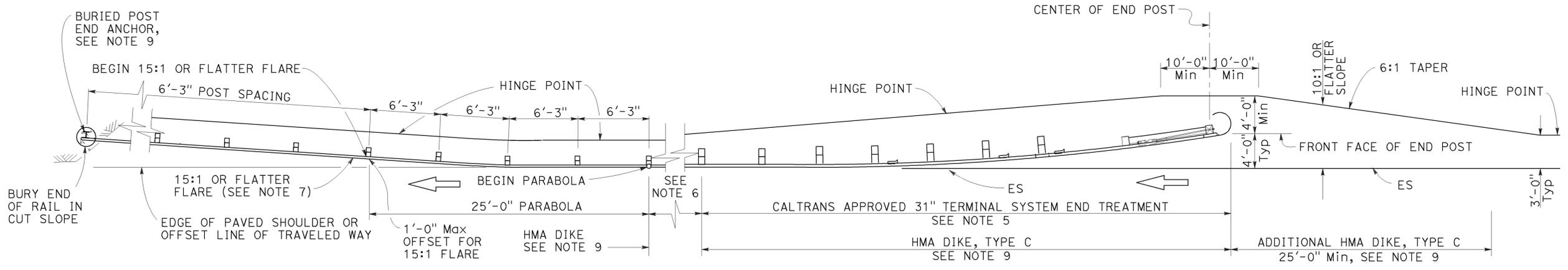
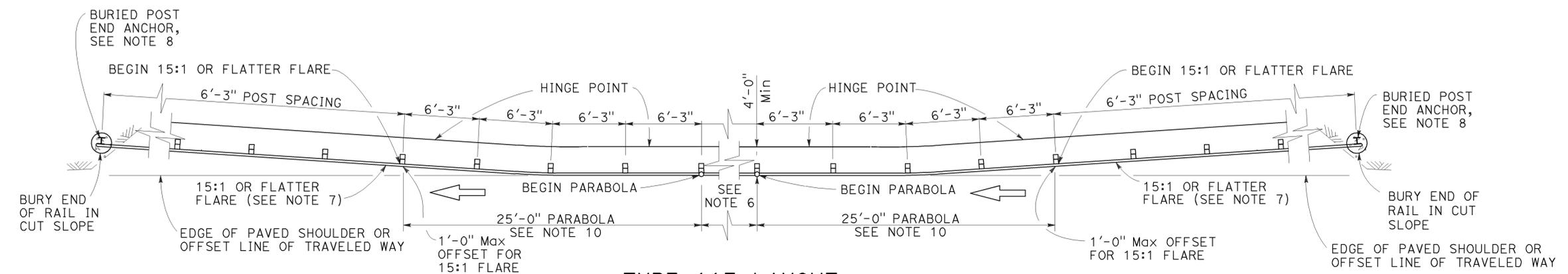
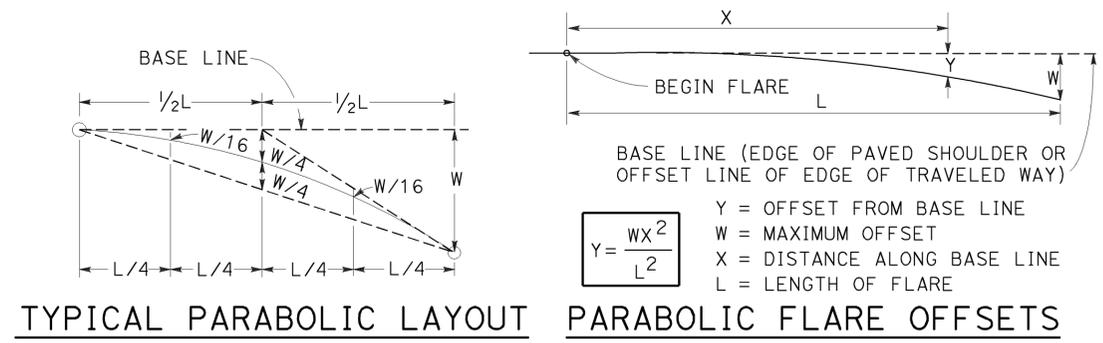
Randell D. Hiatt  
REGISTERED CIVIL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

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

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

TO ACCOMPANY PLANS DATED 9-29-14



**NOTES:**

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

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**

NO SCALE

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

**REVISED STANDARD PLAN RSP A77P3**

2010 REVISED STANDARD PLAN RSP A77P3

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	328	356

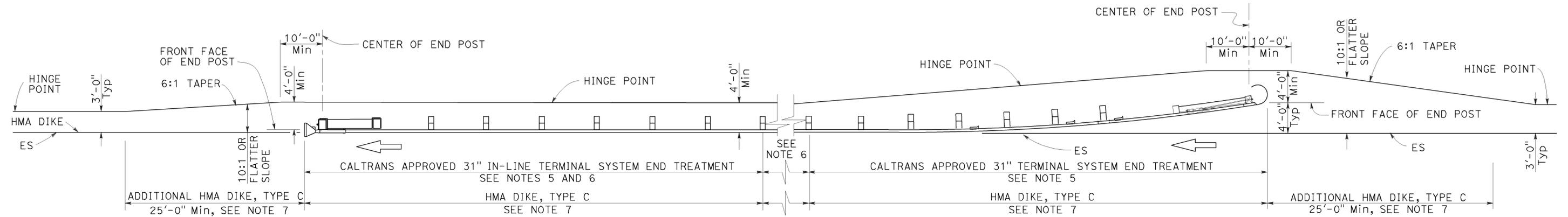
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

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

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

TO ACCOMPANY PLANS DATED 9-29-14



**TYPE 11H LAYOUT**

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

**NOTES:**

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

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

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

**REVISED STANDARD PLAN RSP A77P4**

2010 REVISED STANDARD PLAN RSP A77P4

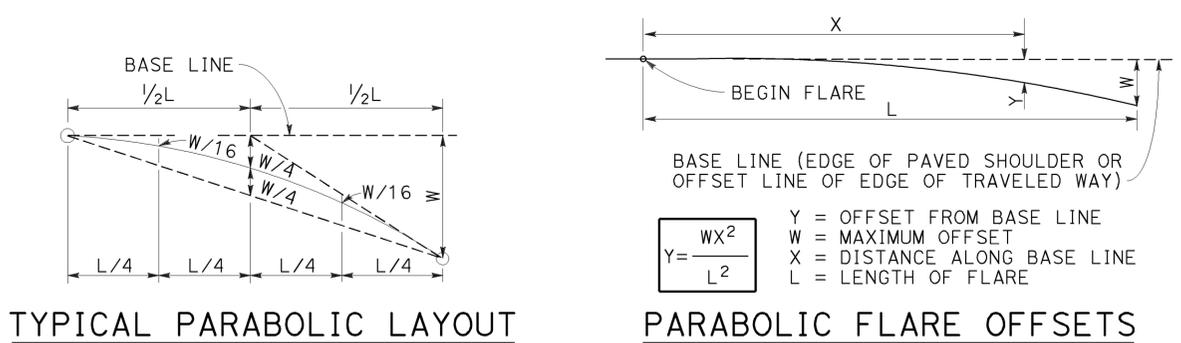
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	329	356

Randell D. Hiatt  
REGISTERED CIVIL ENGINEER

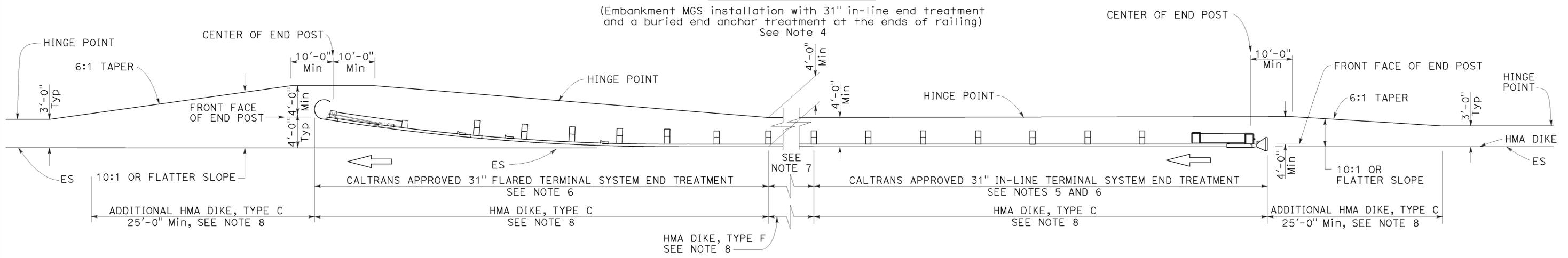
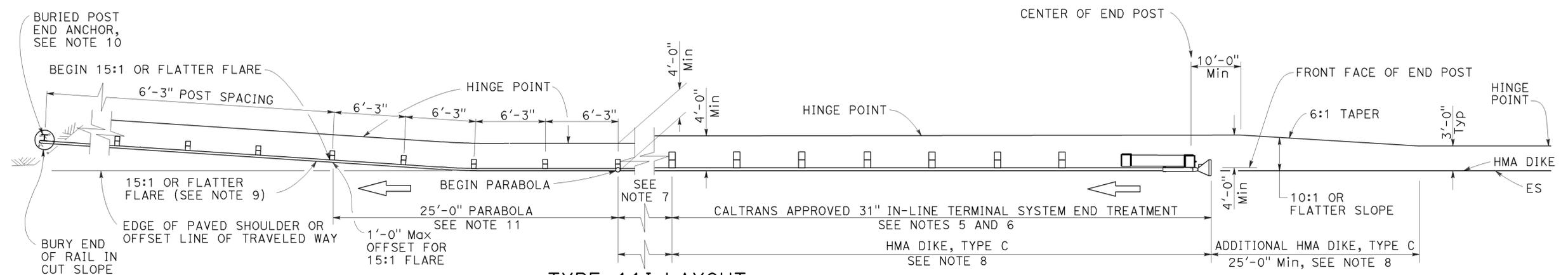
July 19, 2013  
PLANS APPROVAL DATE

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

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



TO ACCOMPANY PLANS DATED 9-29-14



**NOTES:**

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

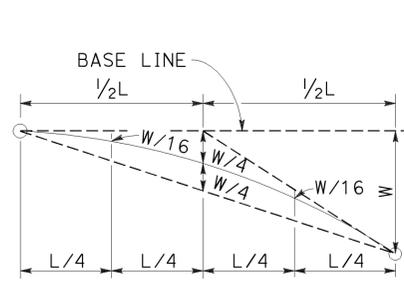
RSP A77P5 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77P5**

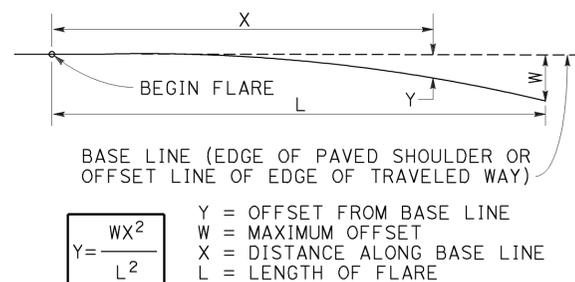
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**  
NO SCALE

2010 REVISED STANDARD PLAN RSP A77P5

TO ACCOMPANY PLANS DATED 9-29-14



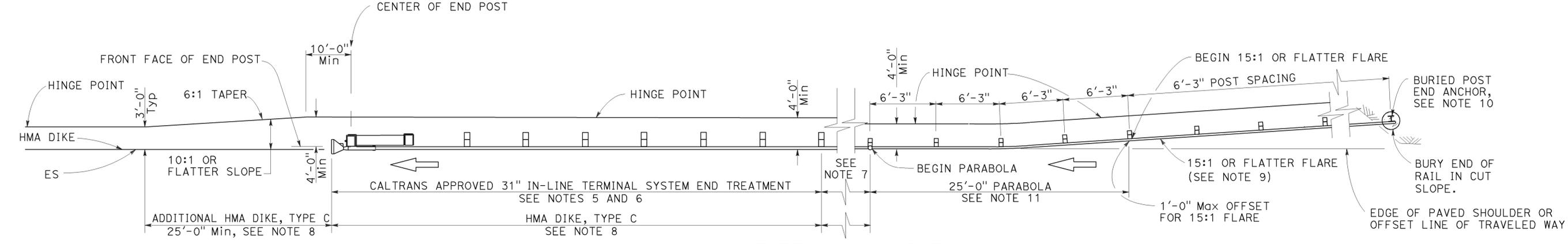
TYPICAL PARABOLIC LAYOUT



PARABOLIC FLARE OFFSETS

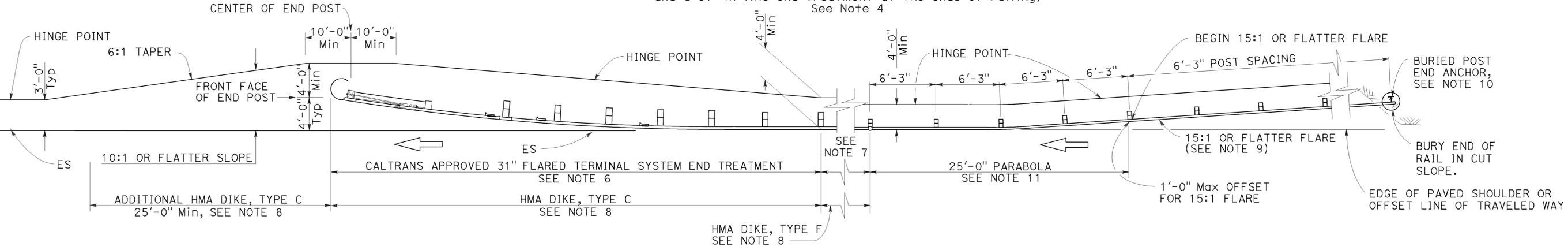
$$Y = \frac{WX^2}{L^2}$$

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



TYPE 11K LAYOUT

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



TYPE 11L LAYOUT

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

NOTES:

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

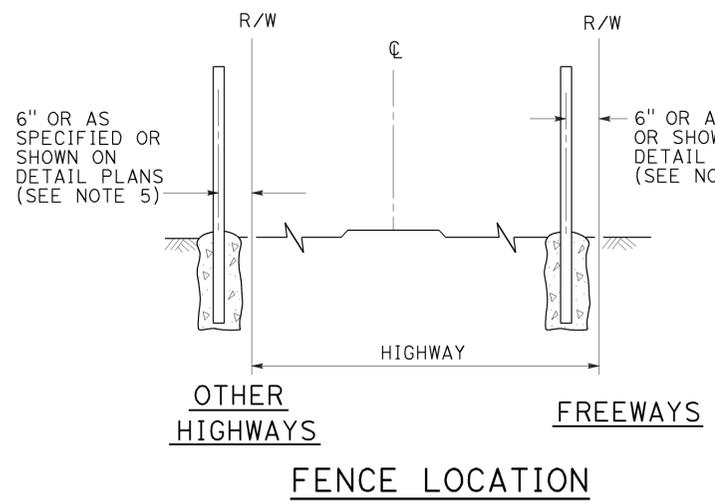
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**

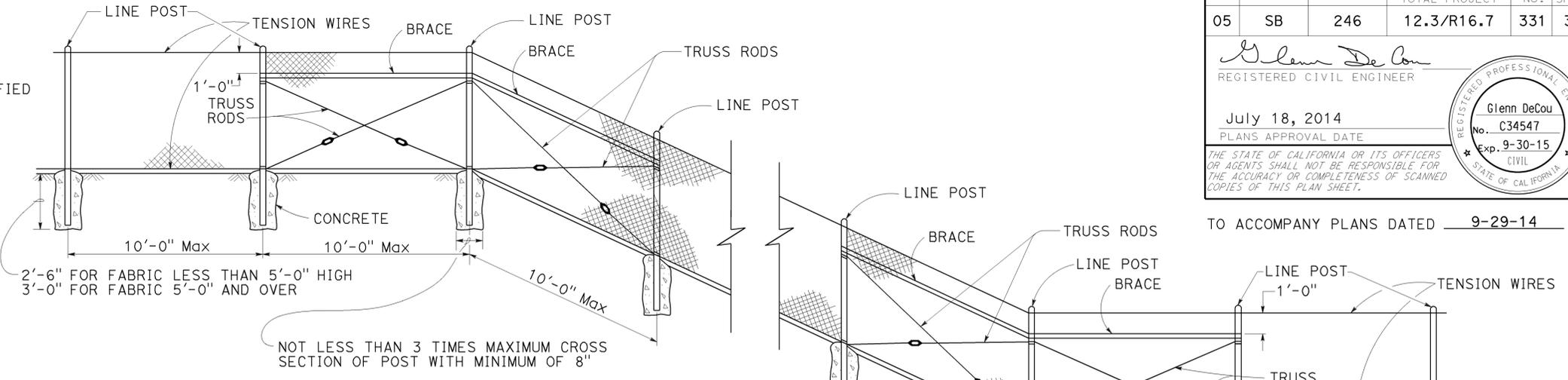
NO SCALE

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

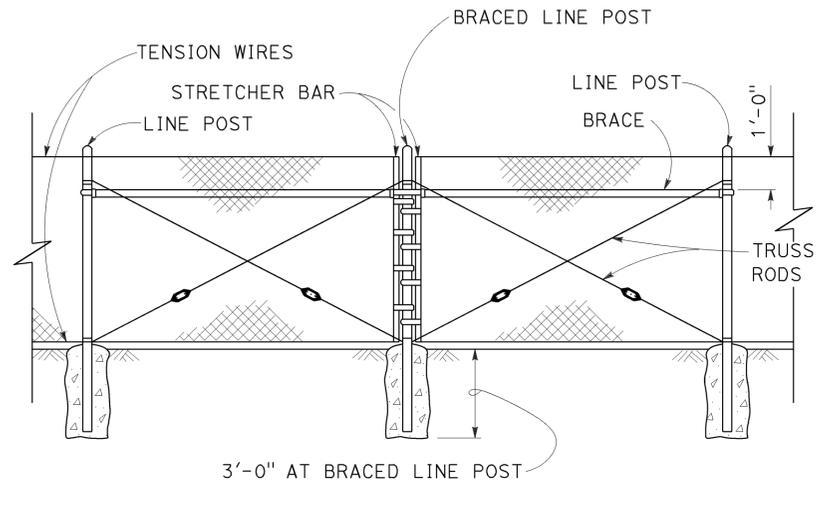
2010 REVISED STANDARD PLAN RSP A77P6



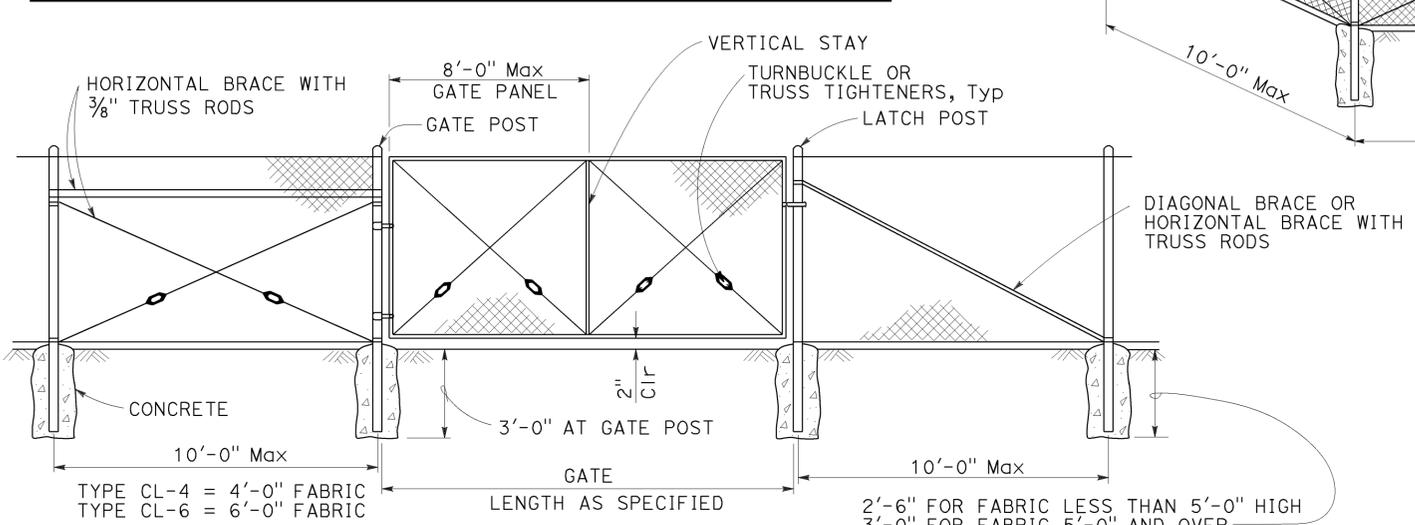
**FENCE LOCATION**



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



**BRACED LINE POST INSTALLATION**  
Braced line post at intervals not exceeding 1000'

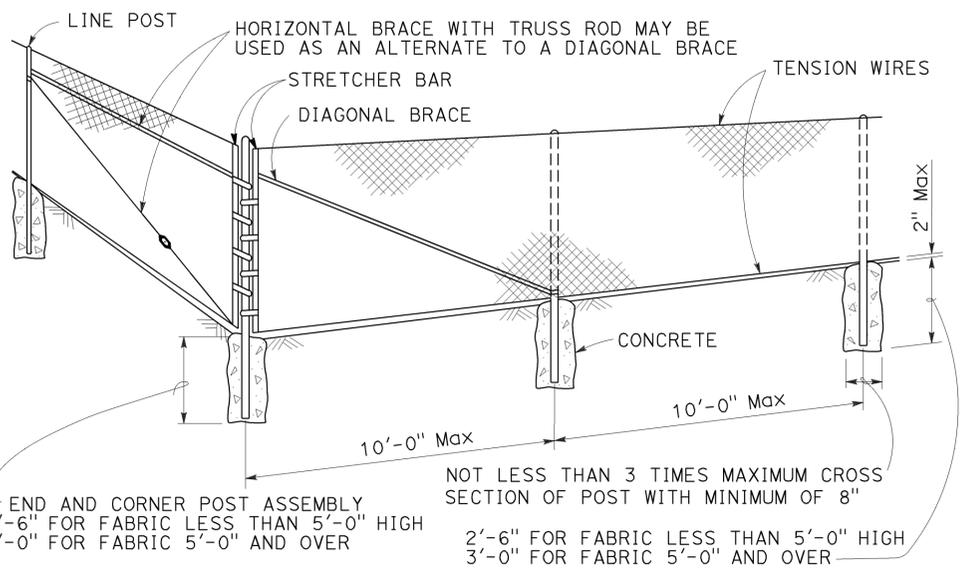


**CHAIN LINK GATE INSTALLATION**

GATE POST			
FENCE HEIGHT	GATE WIDTHS	ROUND OD PIPE	WEIGHT (lb/ft)
6'-0" AND LESS	UP THRU 6'-0"	2.875"	5.80
	OVER 6'-0" THRU 12'-0"	4.500"	10.80
	OVER 12'-0" THRU 18'-0"	5.563"	14.63
OVER 6'-0" TO 8'-0" Max	OVER 18'-0" TO 24'-0" Max	6.625"	18.99
	UP THRU 6'-0"	3.500"	7.58
	OVER 6'-0" THRU 12'-0"	5.563"	14.63
	OVER 12'-0" THRU 18'-0"	6.625"	18.99
	OVER 18'-0" TO 24'-0" Max	8.625"	28.58

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

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



**CORNER POST**

FENCE HEIGHT	TYPICAL MEMBER DIMENSIONS (See Notes)									
	LINE POSTS				END, LATCH AND CORNER POSTS		BRACES			
	ROUND OD PIPE	WEIGHT (lb/ft)	ROLL FORMED		ROUND OD PIPE	WEIGHT (lb/ft)	ROUND OD PIPE	WEIGHT (lb/ft)	ROLL FORMED	
			SECTION	WEIGHT (lb/ft)					SECTION	WEIGHT (lb/ft)
6'-0" AND LESS	1.900"	2.72	1.875" x 1.625"	1.85	2.375"	3.65	1.66"	2.27	1.625" x 1.25"	1.35
OVER 6'-0" TO 8'-0" Max	2.375"	3.65	2.25" x 1.70"	2.78	2.875"	5.80	1.66"	2.27	1.625" x 1.25"	1.35

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

RSP A85 DATED JULY 18, 2014 SUPERSEDES STANDARD PLAN A85  
DATED MAY 20, 2011 - PAGE 112 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A85**

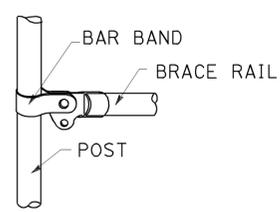
2010 REVISED STANDARD PLAN RSP A85

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	332	356

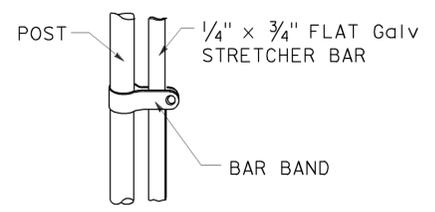
Glenn DeCou  
 REGISTERED CIVIL ENGINEER  
 No. C34547  
 Exp. 9-30-13  
 STATE OF CALIFORNIA  
 CIVIL ENGINEER

October 19, 2012  
 PLANS APPROVAL DATE

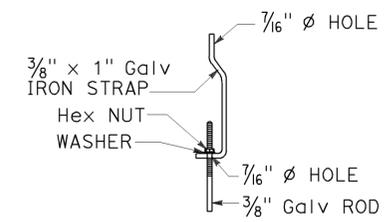
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



**BRACE RAIL**



**STRETCHER BAR**

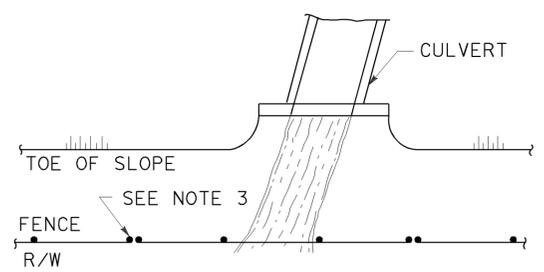


**TRUSS TIGHTENER**

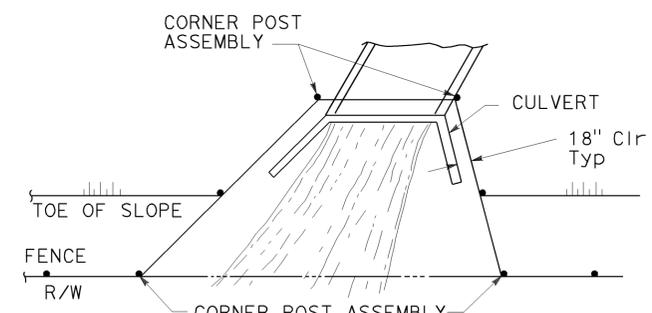
**NOTES:**

1. All material for abutment connection to be galvanized.
2. The chain link fabric shall be replaced by barbed wire strands at 12" maximum centers between the double posts.
3. When the width of the culvert makes it necessary to anchor a post to the top of the culvert, a cast iron shoe or other device approved by the Engineer shall be used.
4. Fencing over stream and around headwall may also use Barbed Wire or Wire Mesh fencing with either wood post or steel post installation.
5. See Standard Plan A85 for Chain Link fence dimensions. See Standard Plan A86 for Barbed Wire and Wire Mesh fence dimensions and for wood post and steel post installation.

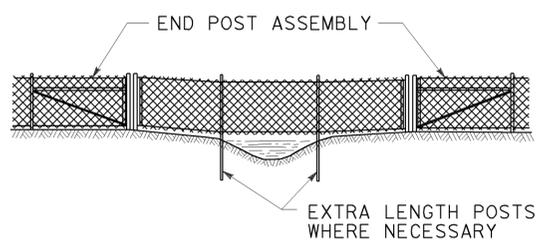
TO ACCOMPANY PLANS DATED 9-29-14



**PLAN**

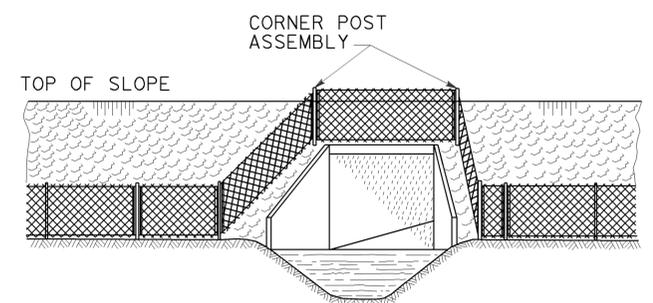


**PLAN**



**ELEVATION**

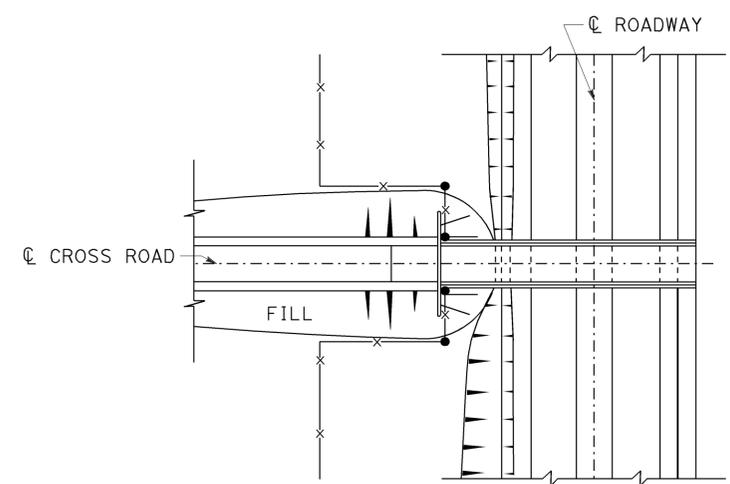
**INSTALLATION OVER STREAM**



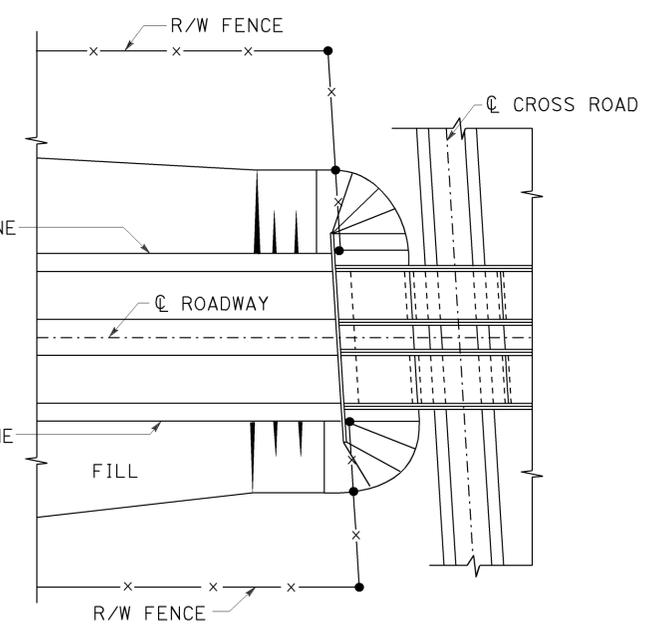
**ELEVATION**

**INSTALLATION AROUND HEADWALL**

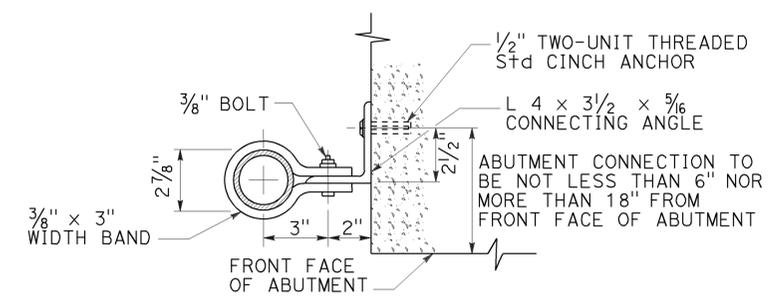
See Note 4



**PLAN OF ROADWAY - OVERCROSSING**



**PLAN OF ROADWAY - UNDERCROSSING**



**ABUTMENT CONNECTION**

**TYPICAL INSTALLATION AT BRIDGES**

ABUTMENT CONNECTION TO BE NOT LESS THAN 6" NOR MORE THAN 18" FROM FRONT FACE OF ABUTMENT

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**CHAIN LINK FENCE DETAILS**

NO SCALE

RSP A85B DATED OCTOBER 19, 2012 SUPERSEDES STANDARD PLAN A85B DATED MAY 20, 2011 - PAGE 114 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A85B**

2010 REVISED STANDARD PLAN RSP A85B

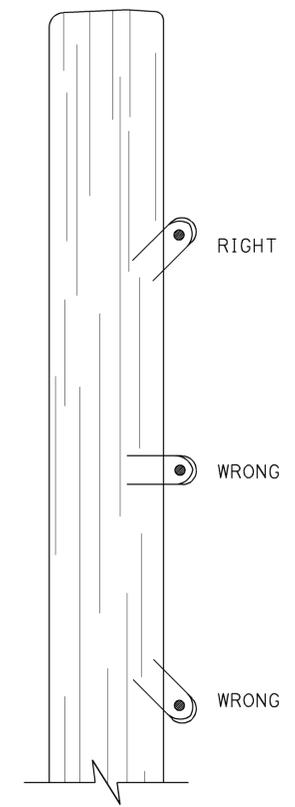
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	333	356

Raymond Don Tsztou  
 REGISTERED CIVIL ENGINEER  
 October 19, 2012  
 PLANS APPROVAL DATE

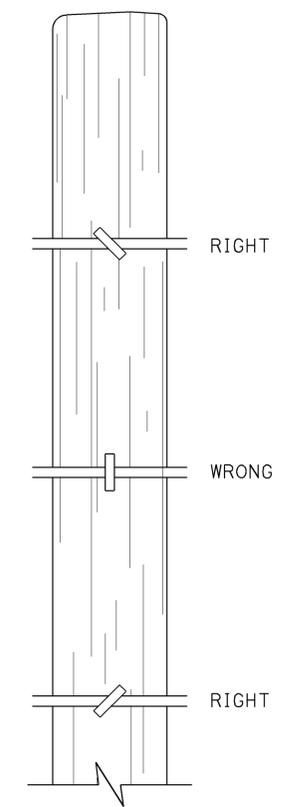
REGISTERED PROFESSIONAL ENGINEER  
 Raymond  
 Don Tsztou  
 No. C37332  
 Exp. 6-30-14  
 CIVIL  
 STATE OF CALIFORNIA

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.

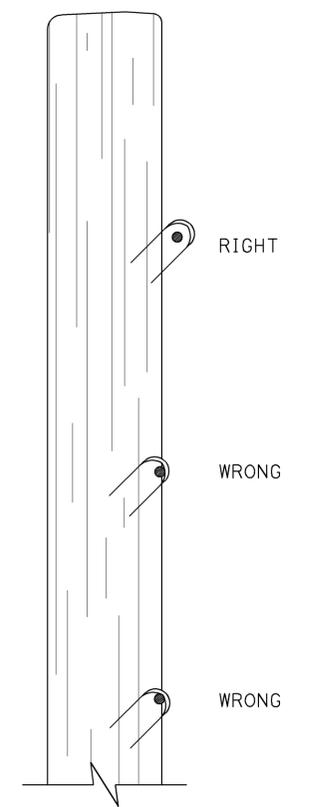
TO ACCOMPANY PLANS DATED 9-29-14



DRIVE STAPLES AT ANGLE

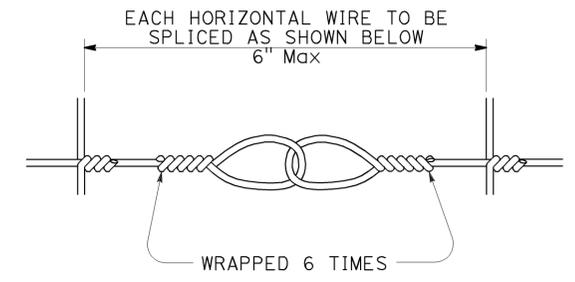


DO NOT DRIVE STAPLES PARALLEL TO SIDE OF POST

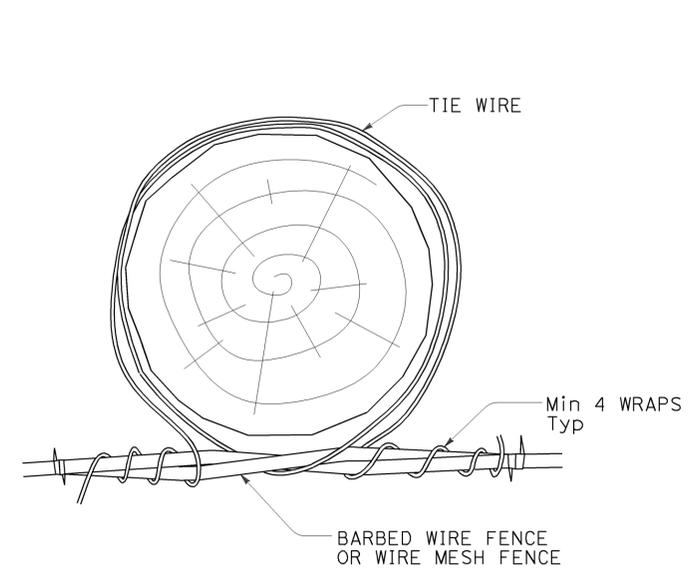


LEAVE WIRE LOOSE IN STAPLE

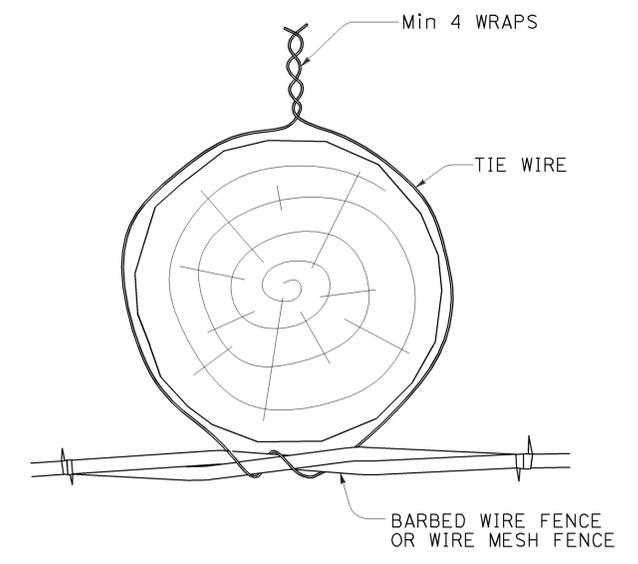
LINE POST STAPLING DETAILS  
 (Apply to rectangular/square and round posts)  
 Do not staple vertical wire in wire mesh.



SPLICE DETAIL FOR BARBED WIRE/WIRE MESH FENCE

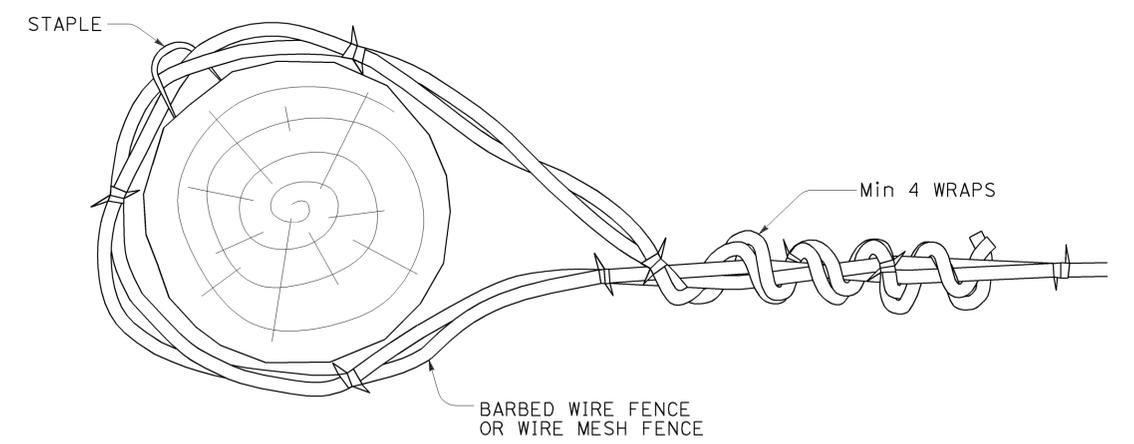


OPTION A



OPTION B

LINE POST WIRE TIE OPTION DETAILS  
 (Option details also apply to rectangular/square posts)



END, LATCH, PULL, AND CORNER POST DETAIL  
 (Also applies to rectangular/square posts)

**BARBED WIRE AND WIRE MESH FENCE - MISCELLANEOUS DETAILS**

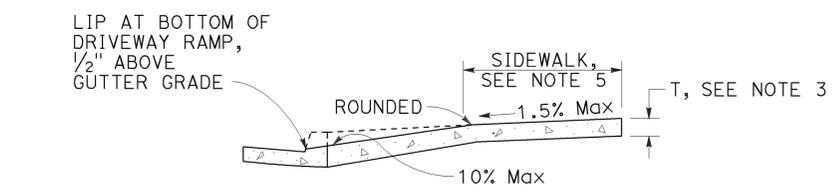
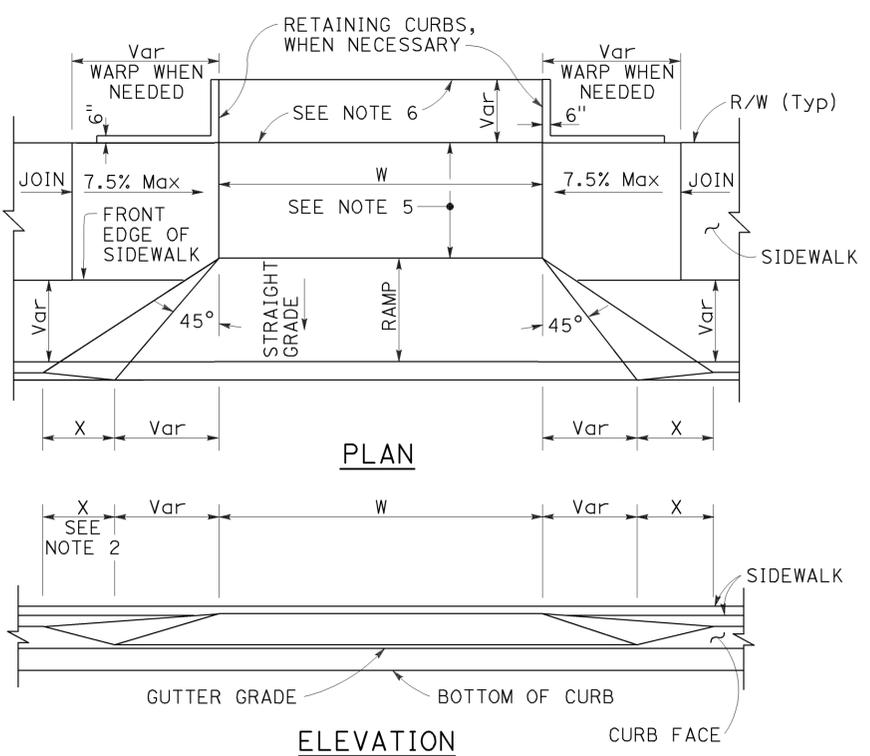
NO SCALE

RSP A86D DATED OCTOBER 19, 2012 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

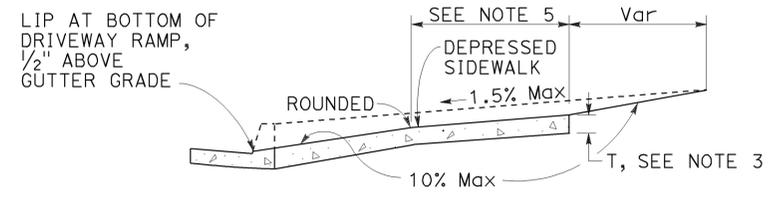
TO ACCOMPANY PLANS DATED 9-29-14

**CURB QUANTITIES**

TYPE	CUBIC YARDS PER LINEAR FOOT
A1-6	0.02585
A1-8	0.03084
A2-6	0.05903
A2-8	0.06379
A3-6	0.01036
A3-8	0.01435
B1-4	0.02185
B1-6	0.02930
B2-4	0.05515
B2-6	0.06171
B3-4	0.00641
B3-6	0.01074
B4	0.05709
D-4	0.04083
D-6	0.06804
E	0.06661



**CASE A**  
Typical driveway, sidewalk not depressed



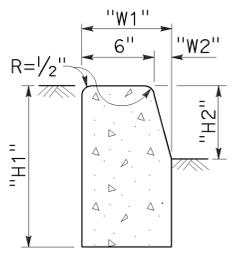
**CASE B**  
Driveway with depressed sidewalk

**SECTIONS**

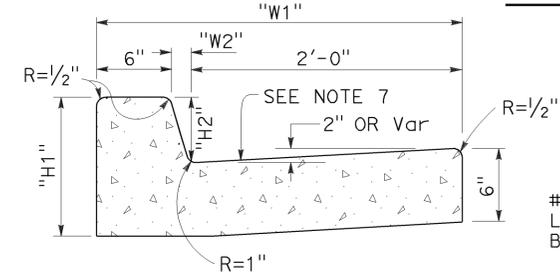
**TABLE A**

CURB TYPE	DIMENSIONS			
	"H1"	"H2"	"W1"	"W2"
A1-6	1'-2"	6"	7 1/2"	1 1/2"
A1-8	1'-4"	8"	8"	2"
A2-6	1'-0"	6"	2'-7 1/2"	1 1/2"
A2-8	1'-2"	8"	2'-8"	2"
A3-6	6"	5"	7 1/4"	1 1/4"
A3-8	8"	7"	7 3/4"	1 3/4"
B1-4	1'-0"	4"	7 1/2"	2 1/2"
B1-6	1'-2"	6"	9"	4"
B2-4	10"	4"	2'-7 1/2"	2 1/2"
B2-6	1'-0"	6"	2'-9"	4"
B3-4	4"	3"	7"	2"
B3-6	6"	5"	8 1/2"	3 1/2"
D-4	10"	4"	1'-6"	1'-1"
D-6	1'-0"	6"	2'-2"	1'-9"

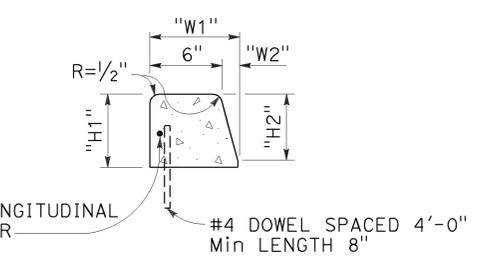
**DRIVEWAYS**



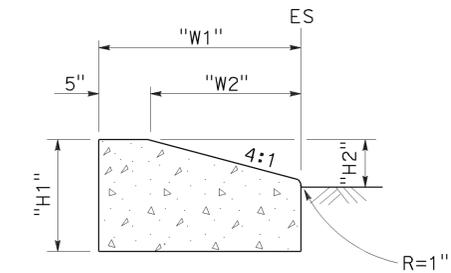
**TYPE A1 CURBS**  
See Table A



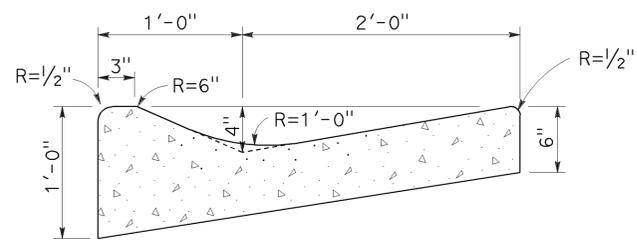
**TYPE A2 CURBS**  
See Table A



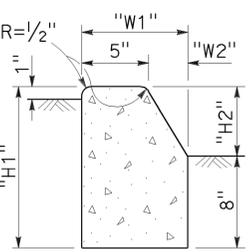
**TYPE A3 CURBS**  
Superimposed on existing pavement  
See Table A



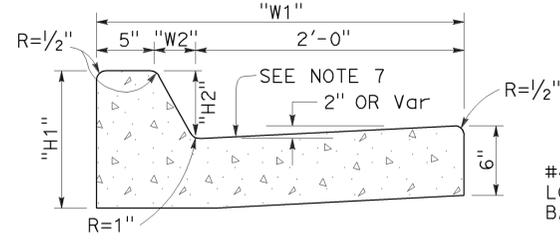
**TYPE D CURBS**  
See Table A



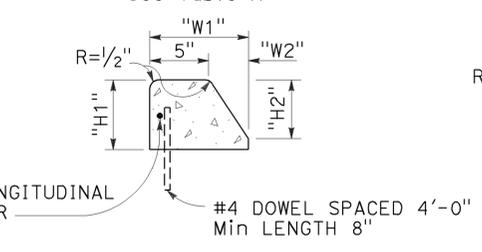
**TYPE E CURB**



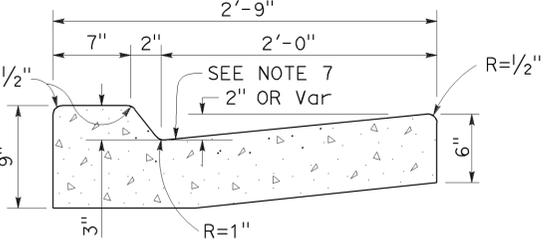
**TYPE B1 CURBS**  
See Table A



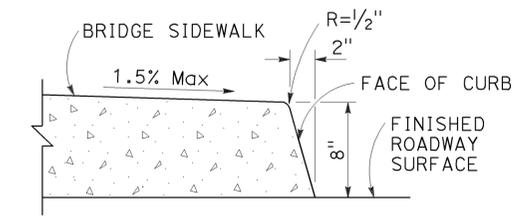
**TYPE B2 CURBS**  
See Table A



**TYPE B3 CURBS**  
Superimposed on existing pavement  
See Table A



**TYPE B4 CURBS**



**TYPE H CURB**  
On Bridges

**CURBS**

- NOTES:**
- Case A driveway section typically applies.
  - X=3'-0" except for curb heights over 10" where 4:1 slopes shall be used on curb slope.
  - Sidewalk and ramp thickness "T" at driveway shall be 4" for residential and 6" for commercial.
  - Difference in slope of the driveway ramp and the slope of a line between the gutter and a point on the roadway 5'-0" from gutter line shall not exceed 15%. Reduce driveway ramp slope, not gutter slope, where required.
  - Minimum width of clear passageway for sidewalk shall be 4'-2".
  - Retaining curbs and acquisition of construction easement may be necessary for narrow sidewalks or curb heights in excess of 6".
  - Across the pedestrian route at curb ramp locations, the gutter pan slope shall not exceed 1" of depth for each 2'-0" of width.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**CURBS AND DRIVEWAYS**  
 NO SCALE

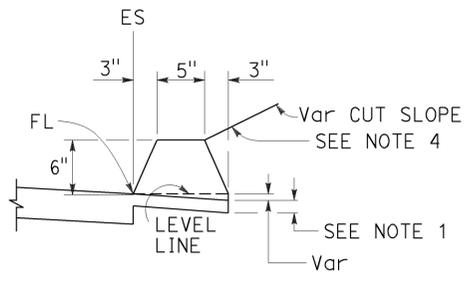
RSP A87A DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN A87A  
 DATED MAY 20, 2011 - PAGE 119 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A87A**

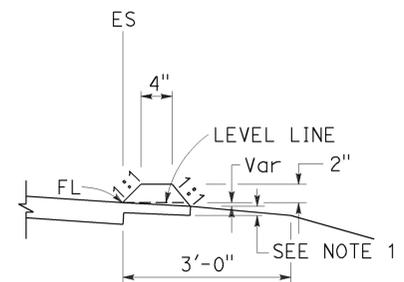
2010 REVISED STANDARD PLAN RSP A87A



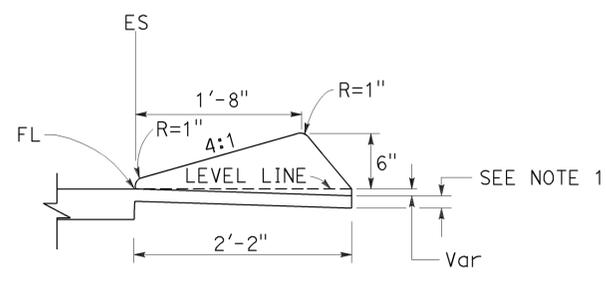
TO ACCOMPANY PLANS DATED 9-29-14



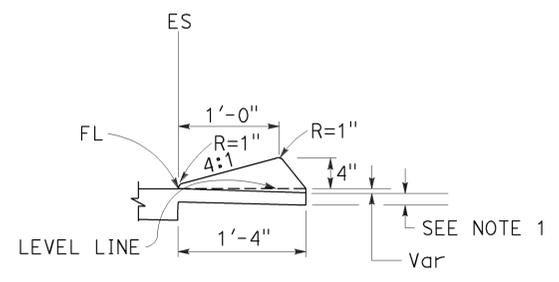
**TYPE A**  
See Note 3



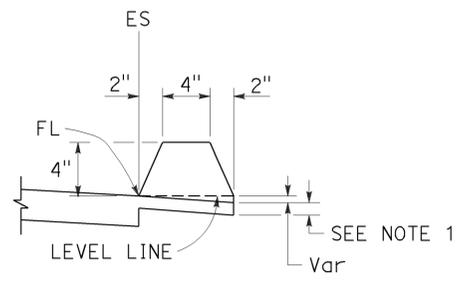
**TYPE C**



**TYPE D**

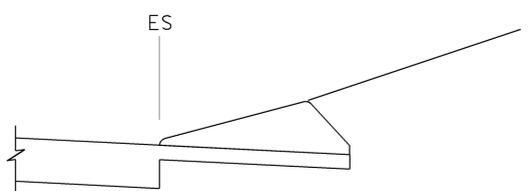


**TYPE E**

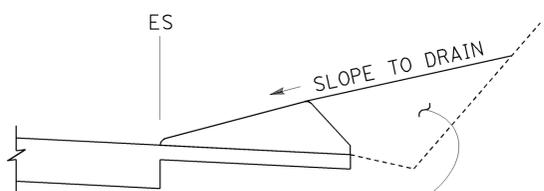


**TYPE F**  
See Note 5

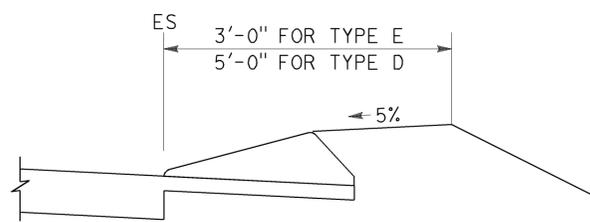
**DIKES**



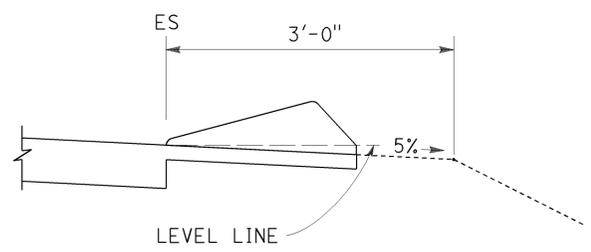
**CASE C-1**  
Cut Slope



**CASE C-2**  
Cut Slope



**CASE F**



**CASE R**  
See Note 2

**TYPE D AND E BACKFILL DETAILS**

**NOTES:**

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

**DIKE QUANTITIES**

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

Quantities based on 5% cross slope.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**HOT MIX ASPHALT DIKES**

NO SCALE

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

**REVISED STANDARD PLAN RSP A87B**

2010 REVISED STANDARD PLAN RSP A87B

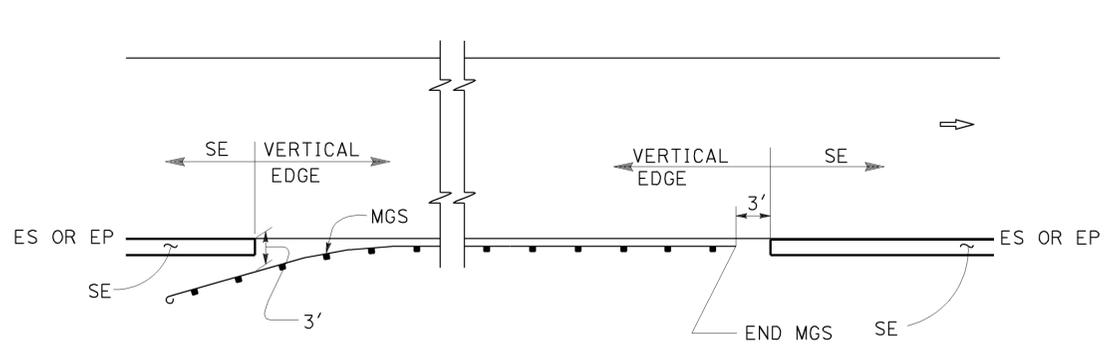
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	336	356

REGISTERED CIVIL ENGINEER  
 November 15, 2013  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

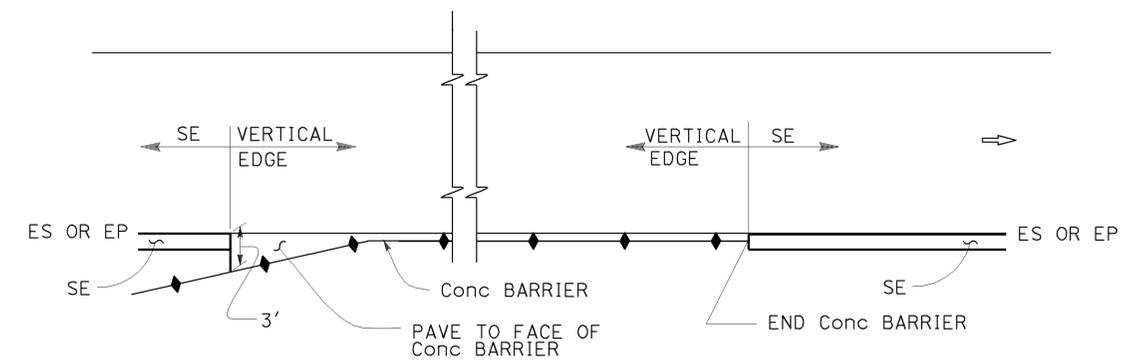
REGISTERED PROFESSIONAL ENGINEER  
 Cornelis M. Hakim  
 No. C55610  
 Exp. 12-31-14  
 CIVIL  
 STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED 9-29-14

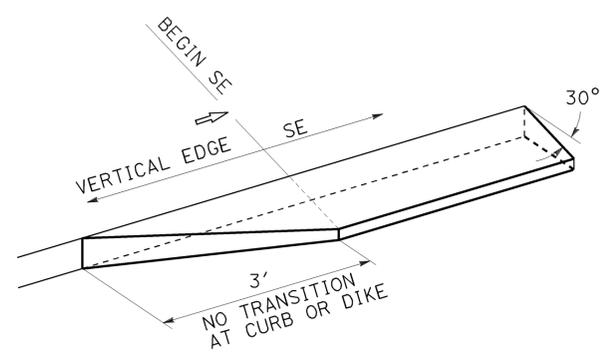
**ABBREVIATIONS:**  
SE SAFETY EDGE



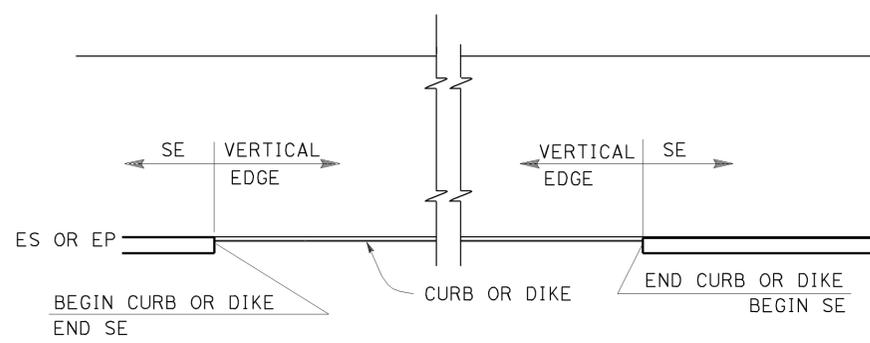
**MGS**



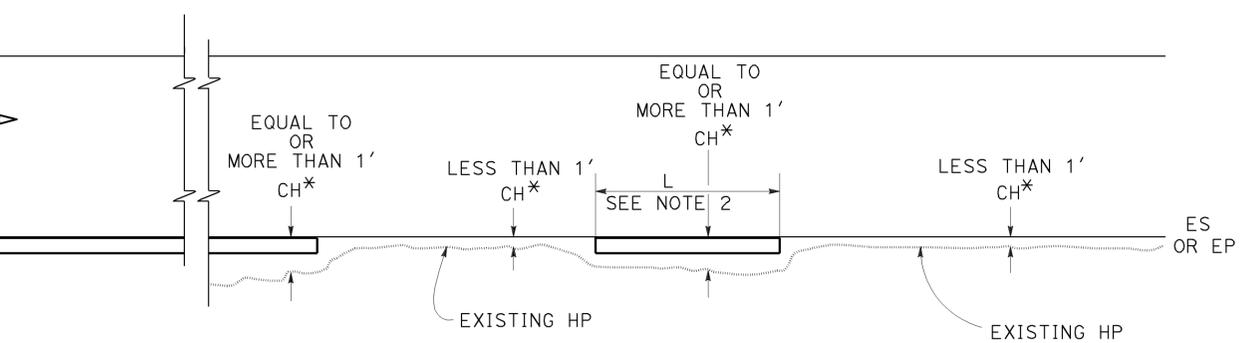
**CONCRETE BARRIER**



**TRANSITION DETAIL FOR CONCRETE ONLY**

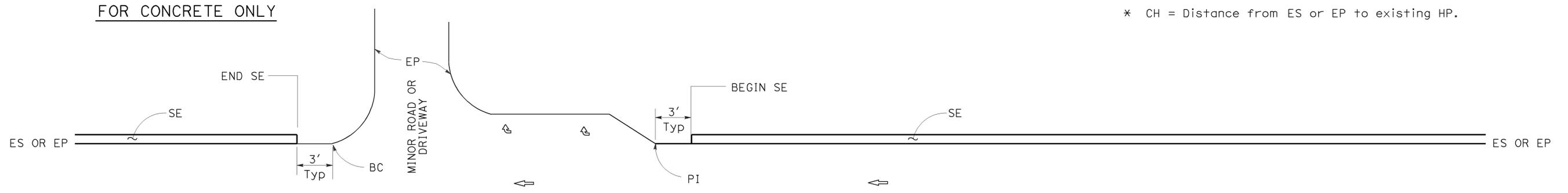


**CURB OR DIKE**



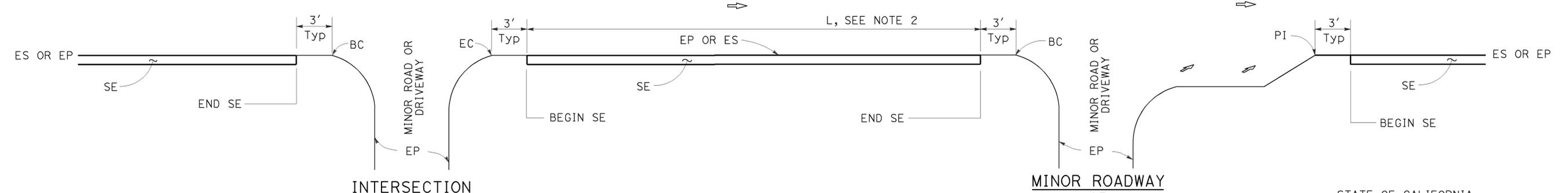
**NARROW SIDE SLOPE**

\* CH = Distance from ES or EP to existing HP.



**STATE ROUTE**

**STATE ROUTE**



**INTERSECTION**

**DRIVEWAY AND INTERSECTION**

**MINOR ROADWAY OR DRIVEWAY**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**PAVEMENT EDGE TREATMENTS**

NO SCALE

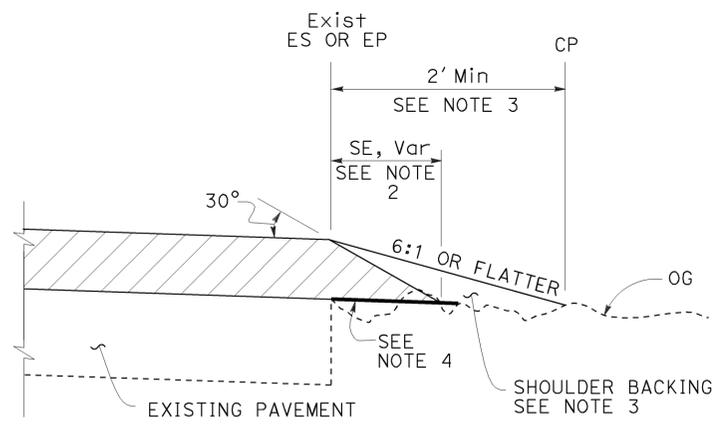
- NOTES:**
1. For details not shown, see Revised Standard Plans RSP P75 and RSP P76.
  2. Safety edge is optional when L is less than 30'.

RSP P74 DATED NOVEMBER 15, 2013 SUPERSEDES RSP P74 DATED JANUARY 20, 2012 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

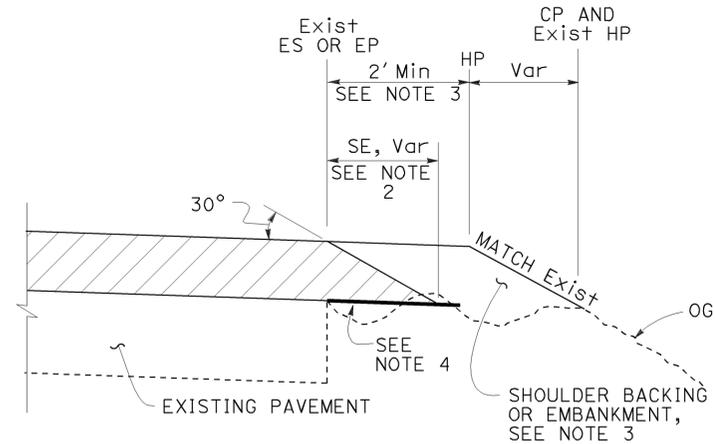
**REVISED STANDARD PLAN RSP P74**

2010 REVISED STANDARD PLAN RSP P74

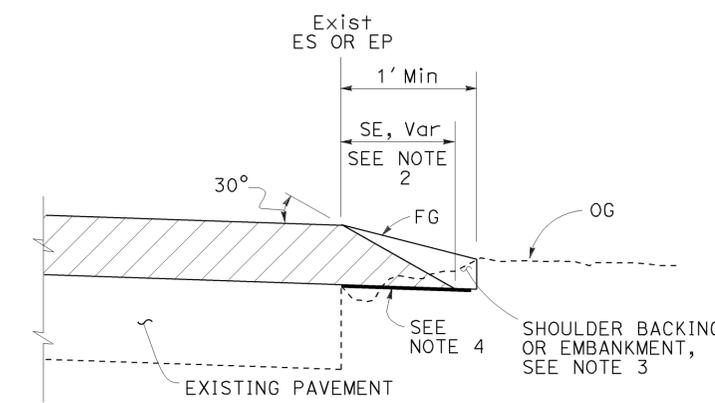
2010 REVISED STANDARD PLAN RSP P75



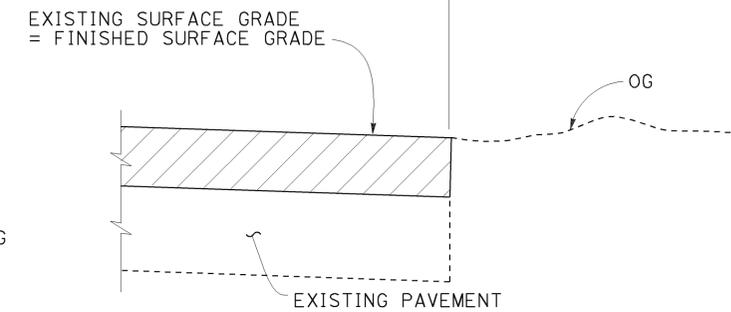
**CASE A**  
Safety Edge



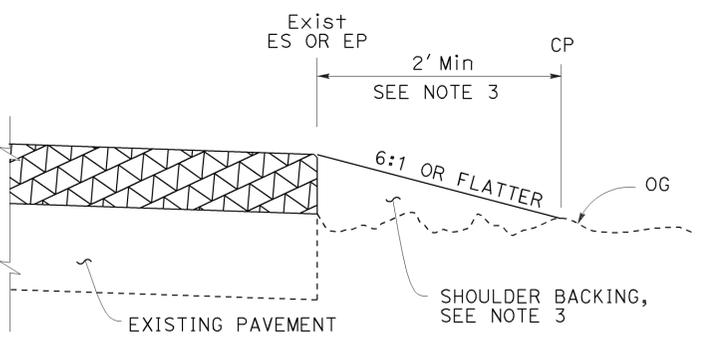
**CASE B**  
Safety Edge



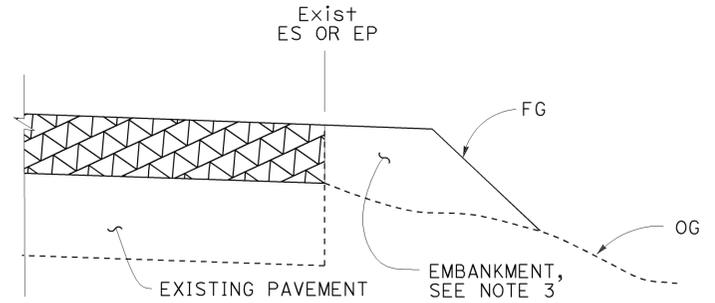
**CASE C**  
Safety Edge



**CASE D**  
Vertical Edge



**CASE E**  
Vertical Edge



**CASE F**  
Vertical Edge

\* See Table A and Revised Std Plan RSP P74

- NOTES:**
- For limits of safety edge and vertical edge treatments, see Revised Standard Plan RSP P74.
  - Details shown for HMA overlay thickness less than 0.43'. See Detail "A" for HMA overlay thickness more than 0.43' or concrete overlay.
  - For locations and limits of shoulder backing or embankment see project plans.
  - Grade existing ground to place safety edge. 1' minimum width
  - Safety edge transverse joint must match overlay transverse joint. End of #6 longitudinal bar must be 2" ± 1/2" clear from transverse joint.
  - Safety edge is not needed in the area of MGS, barrier, right turn lane and acceleration lane. See Revised Standard Plan RSP P74.

**LEGEND:**

- HMA OVERLAY
- HMA OR CONCRETE OVERLAY
- CONCRETE OVERLAY

**ABBREVIATIONS:**

- SE SAFETY EDGE
- TT TOTAL THICKNESS OF SE

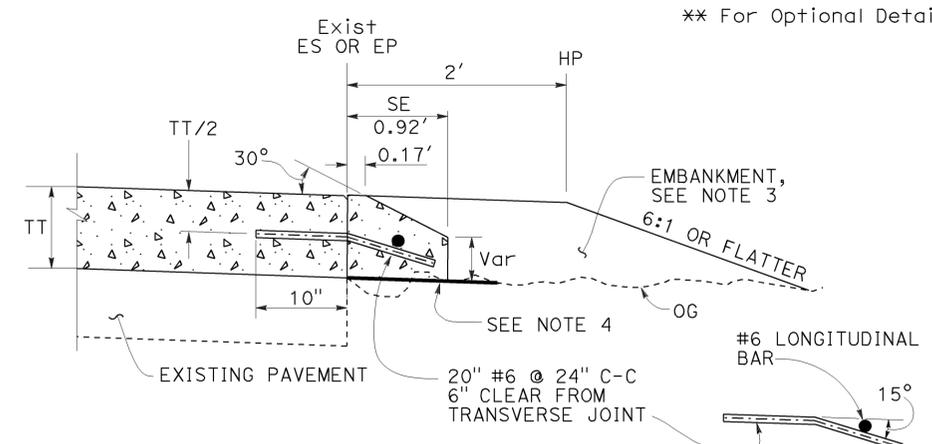
**TABLE A**  
EDGE TREATMENT FOR VARIOUS OVERLAY THICKNESS AND CONDITIONS

FIELD CONDITION	OVERLAY THICKNESS	
	LESS THAN 0.15'	0.15' OR MORE
Exist SLOPE 6:1 OR FLATTER	CASE E	CASE A
Exist SLOPE 3:1 TO 6:1	CASE E	CASE B
Exist SLOPE STEEPER THAN 3:1	CASE F	CASE F
CUT SECTION (REPLACE, COLD PLANE, MILL PAVEMENT)	CASE D	CASE C

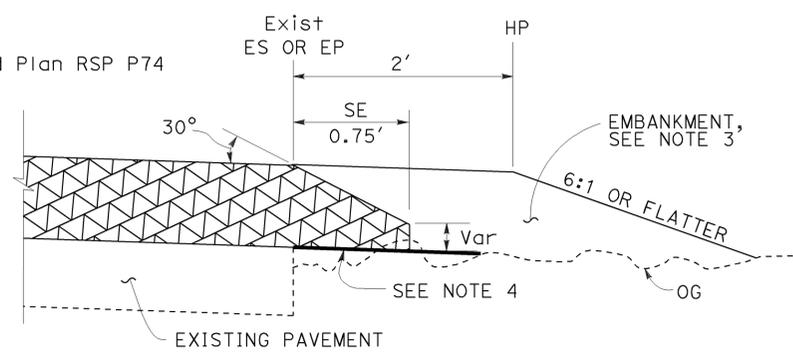
TO ACCOMPANY PLANS DATED 9-29-14  
**ADDITIONAL HMA OR CONCRETE QUANTITIES FOR SE/SIDE/MILE**

TYPICAL CROSS SECTION	TT	TOTAL ADDITIONAL MATERIAL FOR SE/SIDE/MILE		
		HMA (TON)	CONCRETE (CY)*	CONCRETE (CY)**
	0.15'	NA	NA	NA
	0.20'	13.7	NA	NA
	0.30'	30.9	NA	NA
	0.40'	54.9	NA	NA
	0.45'	69.4	NA	NA
	0.50'	84.2	NA	NA
	0.60'	113.9	NA	NA
	0.70'	143.6	70.9	94.2
	0.80'	173.3	85.6	112.2
	0.90'	203.0	100.3	130.2
	1.00'	232.7	114.9	148.2
	1.10'	262.4	129.6	166.2
1.20'	292.1	144.3	184.2	

\* For Detail "A"  
 \*\* For Optional Detail "A"



**OPTIONAL DETAIL "A"**  
 For concrete overlay  
 See Note 5



**DETAIL "A"**

For HMA overlay thickness more than 0.43' or concrete overlay

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**PAVEMENT EDGE TREATMENTS - OVERLAYS**  
 NO SCALE

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	338	356

 REGISTERED CIVIL ENGINEER		
November 15, 2013 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>		

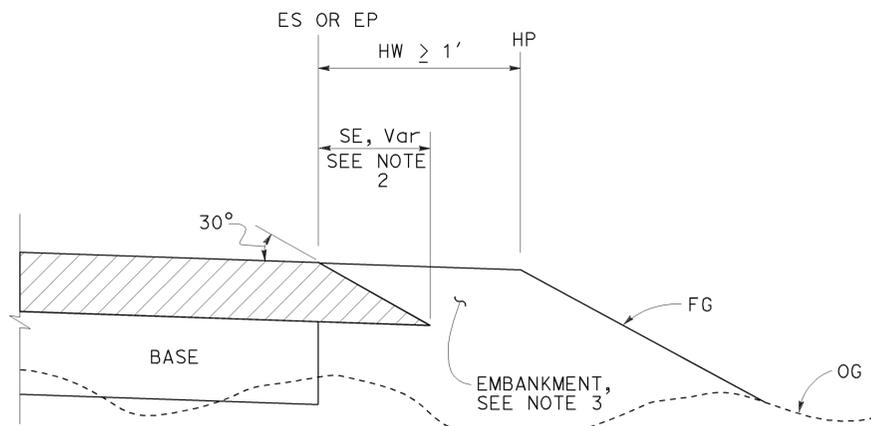
**LEGEND:**

-  HMA PAVEMENT
-  HMA OR CONCRETE PAVEMENT
-  CONCRETE PAVEMENT

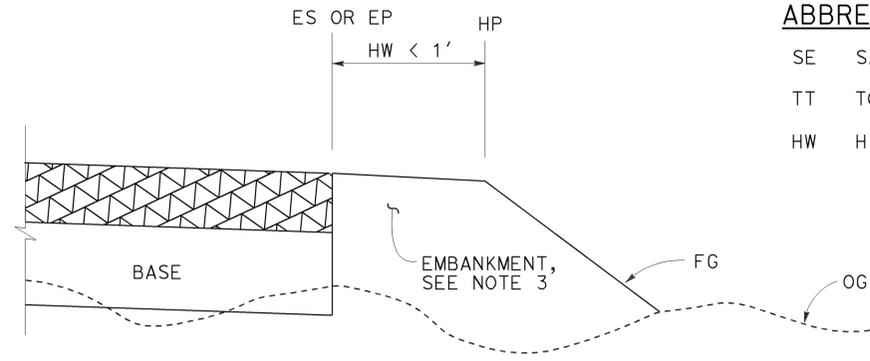
**ABBREVIATIONS:**

- SE SAFETY EDGE
- TT TOTAL THICKNESS OF SE
- HW HINGE WIDTH, DISTANCE FROM ES OR EP TO HP

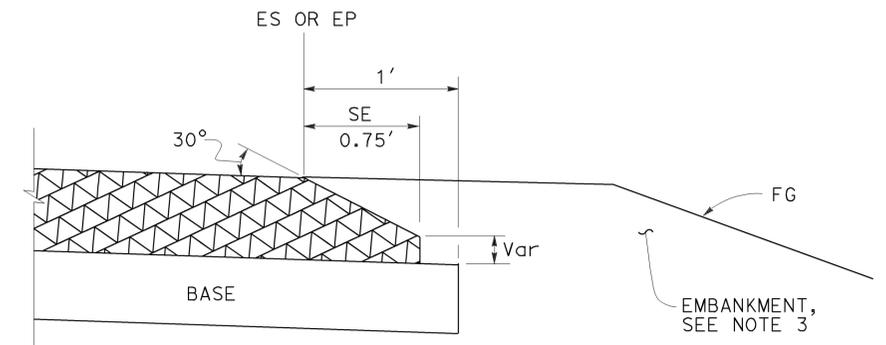
TO ACCOMPANY PLANS DATED 9-29-14



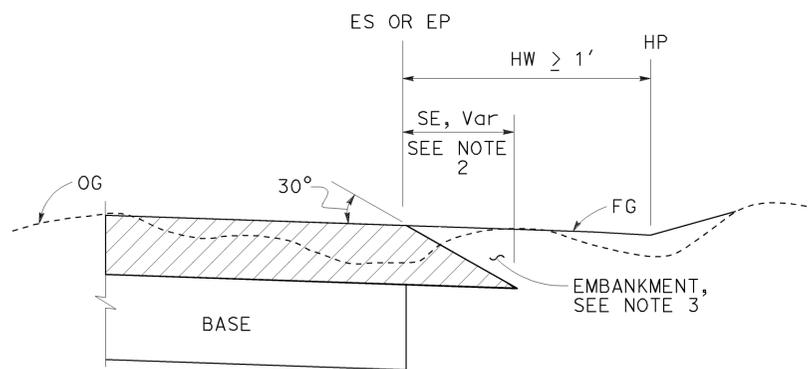
**CASE K**  
Safety Edge - Fill Section, HW  $\geq 1'$



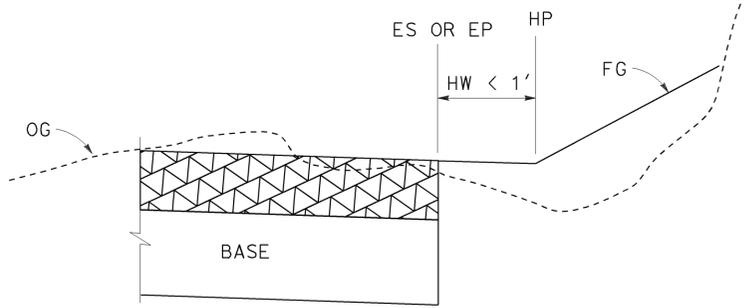
**CASE L**  
Vertical Edge - Fill Section, HW  $< 1'$



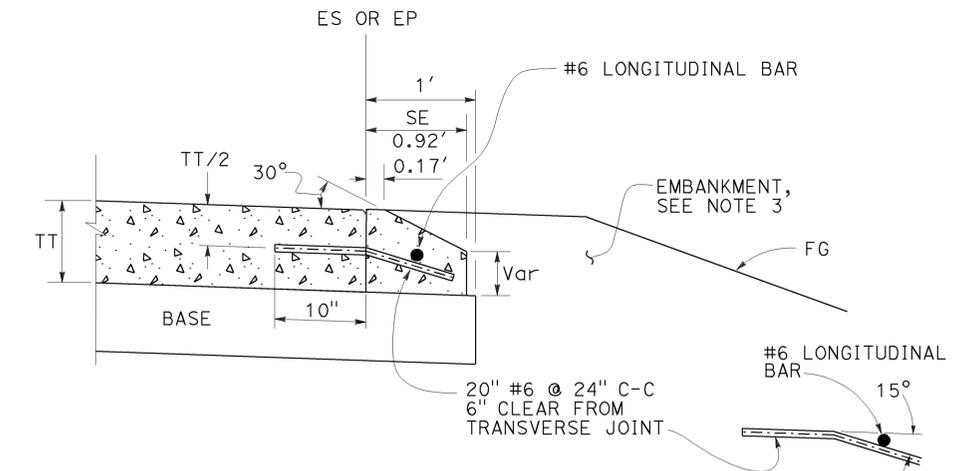
**DETAIL "B"**  
For HMA pavement thickness more than 0.43' or concrete pavement



**CASE M**  
Safety Edge - Cut Section, HW  $\geq 1'$



**CASE N**  
Vertical Edge - Cut Section, HW  $< 1'$



**OPTIONAL DETAIL "B"**  
For concrete pavement  
See Note 4

**FILL SECTION**

**CUT SECTION**

**NOTES:**

- For limits of safety edge and vertical edge treatments, see Revised Standard Plan RSP P74
- Details shown for HMA pavement thickness less than 0.43'. See Detail "B" for HMA pavement thickness more than 0.43' or concrete pavement.
- For locations and limits of embankment see project plans.
- Safety edge transverse joint must match pavement transverse joint. End of #6 longitudinal bar must be 2"  $\pm 1/2$ " clear from transverse joint.
- Safety edge is not needed in the area of MGS, barrier, right turn lane and acceleration lane. See Revised Standard Plan RSP P74.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**PAVEMENT EDGE TREATMENTS-  
NEW CONSTRUCTION**  
NO SCALE

RSP P76 DATED NOVEMBER 15, 2013 SUPERSEDES RSP P76 DATED JANUARY 20, 2012 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.  
**REVISED STANDARD PLAN RSP P76**

2010 REVISED STANDARD PLAN RSP P76

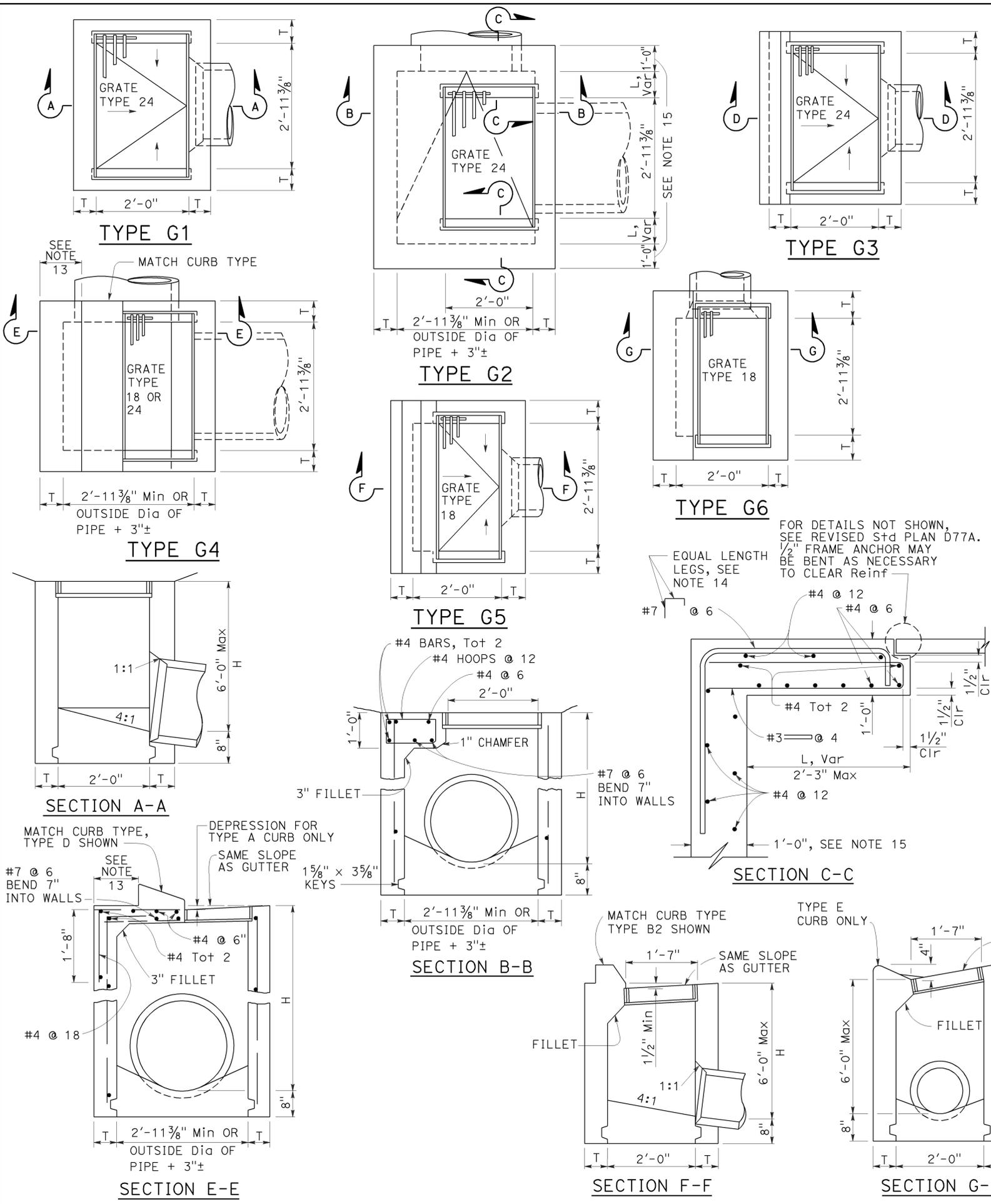
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	339	356

Glenn DeCou  
REGISTERED CIVIL ENGINEER

October 19, 2012  
PLANS APPROVAL DATE

Glenn DeCou  
No. C34547  
Exp. 9-30-13  
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.



- NOTES:**
- "H" is the difference in elevation between the outlet pipe flow line and the normal gutter grade line undepressed.
  - For "T" wall thickness, see Table A below.
  - Wall reinforcing not required when "H" is 8'-0" or less and the unsupported width or length is 7'-0" or less. Walls exceeding these limits shall be reinforced with #4 bars @ 1'-6" ± centers placed 1/2" clear to inside of box unless otherwise shown.
  - Inlet bottom reinforcing not required. See Standard Plan D74C for alternative reinforced bottom and alternative half round bottom.
  - Steps-None required where "H" is less than 2'-6". Where "H" is 2'-6" or more, install steps with lowest rung 1'-0" above the floor and highest rung not more than 6" below top of inlet. The distance between steps shall not exceed 1'-0" and shall be uniform throughout the length of the wall. Place steps in the wall without an opening. Steps inserts may be substituted for the bar steps. Step inserts shall comply with State Industrial Safety requirements. See Standard Plan D74C for step details.
  - Details shown apply to both metal and concrete pipe.
  - Pipe(s) can be placed in any wall.
  - Curb section shall match adjacent curb.
  - Basin floors shall have wood trowel finish and a minimum slope of 12:3 from all directions toward outlet pipe.
  - Set inlet so that grate bars are parallel to direction of principal surface flow.
  - See Revised Standard Plans D77A and D77B for grate and frame details and weights of miscellaneous iron and steel.
  - See Standard Plan D78A for gutter depression details.
  - This dimension will vary with different grates, curbs types, box width and wall thickness.
  - Bar may be rotated as necessary to clear opening. Where "L" is 6" or less, bar may be omitted.
  - Where "L" is 6" or less, wall thickness shall be as shown in Table A.
  - Cast-in-place inlets to be formed around all pipes/stubs intersecting the inlet, and concrete poured in one continuous operation. Precast inlets shall have mortared connections conforming to details for Type GCP Inlet shown on Standard Plan D75B. See Standard Specifications for mortar composition.

**TABLE A**

**CONCRETE QUANTITIES**

TYPE	H=3'-0" TO 8'-0" (T=6")		H=8'-1" TO 20'-0" (T=8")	
	H=3'-0" (CY)	ADDITIONAL PCC PER FOOT (CY)	H=8'-1" (CY)	ADDITIONAL PCC PER FOOT (CY)
G-1	0.95	0.220	See Note A	SEE NOTE A
G-2*	1.31	0.255	3.50	0.357
G-3	1.03	0.220	See Note A	SEE NOTE A
G-4* (TYPE 24)	1.27	0.255	3.48	0.357
G-4* (TYPE 18)	1.30	0.255	3.50	0.357
G-5	1.02	0.220	SEE NOTE A	SEE NOTE A
G-6	1.04	0.220	SEE NOTE A	SEE NOTE A

TABLE BASED ON 8" FLOOR SLAB. NO DEDUCTIONS ARE TO BE MADE TO THESE QUANTITIES BECAUSE OF PIPE OPENINGS, DIFFERENT FLOOR ALTERNATIVES OR DIFFERENT CURB TYPES. \* QUANTITIES FOR TYPE G-2 AND G-4 INLETS BASED ON THE MINIMUM INTERIOR DIMENSIONS.

**NOTE A:**  
Maximum allowable height 6'-0".

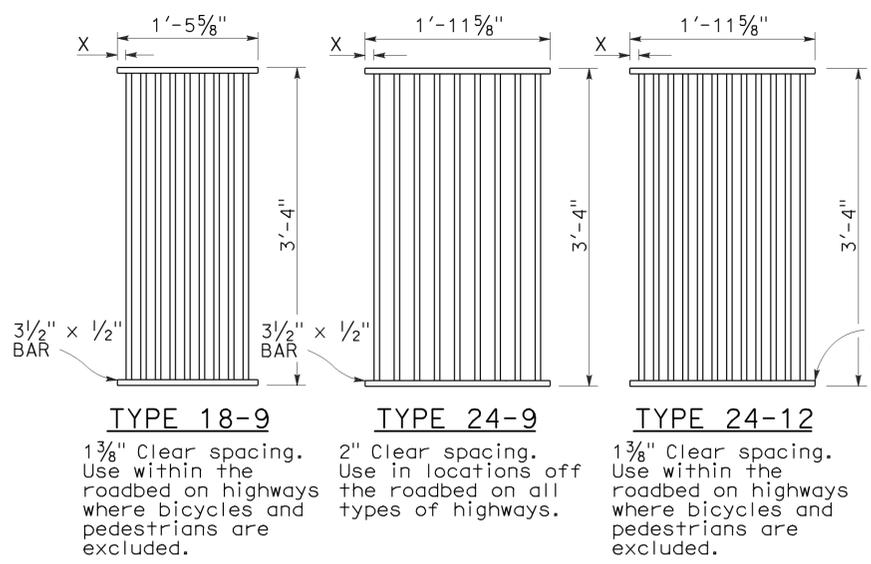
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**DRAINAGE INLETS**  
NO SCALE

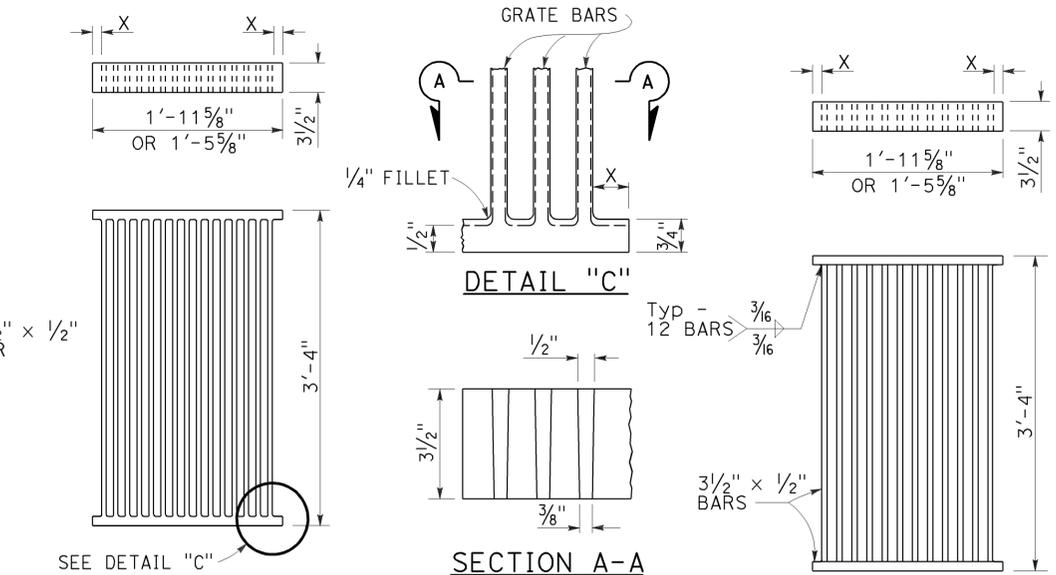
RSP D73 DATED OCTOBER 19, 2012 SUPERSEDES STANDARD PLAN D73 DATED MAY 20, 2011 - PAGE 156 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP D73**

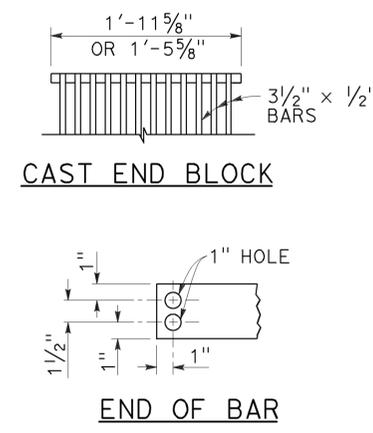
2010 REVISED STANDARD PLAN RSP D73



**RECTANGULAR GRATE DETAILS**  
(See table below)

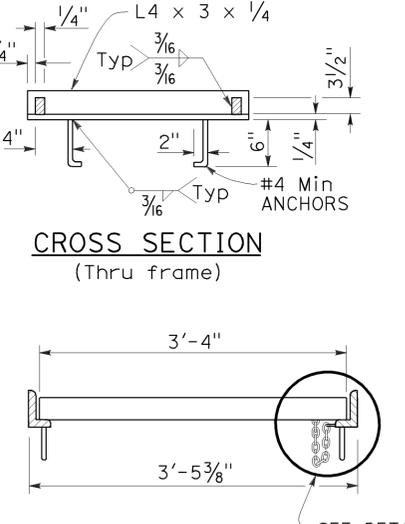
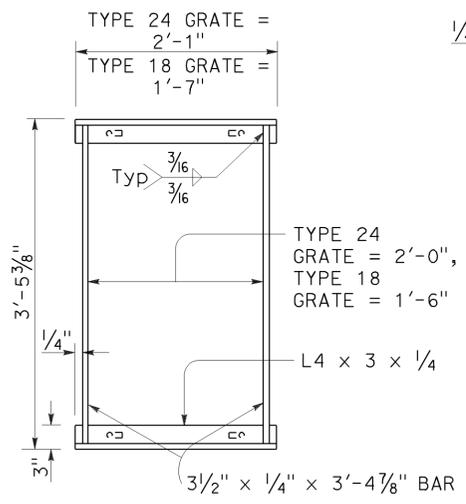


**ALTERNATIVE CAST DUCTILE IRON GRATE OR CAST CARBON STEEL GRATE**  
**ALTERNATIVE WELDED GRATE**



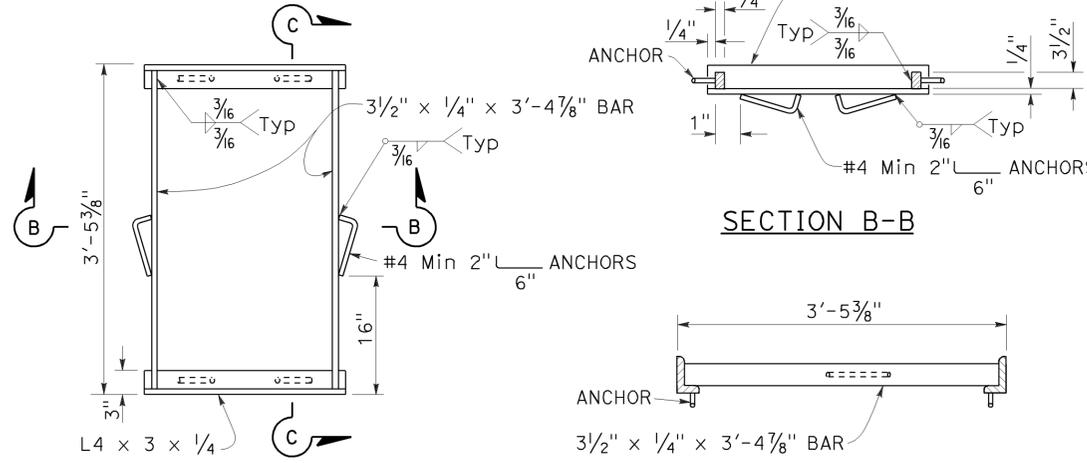
**CAST END BLOCK**  
**END OF BAR**

- NOTES:**
- Grate type numbers refer to approximate width of grate in inches and number of bars, respectively.
  - Contractor has the option of using cast ductile iron, cast carbon steel, welded, bolted, or cast end block grate.
  - Rounded top of bars optional on all grates.
  - Pipe inlets with a grate shall be placed so that bars parallel direction of principle surface flow.
  - Complete joint penetration butt welds may be substituted for the fillet welds on all anchors.
  - Standard square, hexagon, round or equivalent headed anchors may be substituted for the right angle hooks on the anchors shown on this plan.
  - Grate and frame weights are based on welded grates (weights of face angles, steps, protection bars, etc. are not included).
  - Connect chain to grate and frame only at locations shown on the plans. When chain is required, do not use cast ductile iron grates.

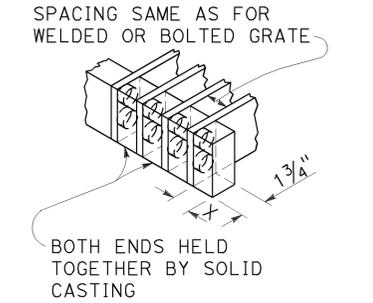


**TYPICAL FRAME**

**LONGITUDINAL SECTION**  
(Thru frame and grate)



**TYPICAL FRAME**  
**SECTION B-B**



**ALTERNATIVE CAST DUCTILE IRON OR CAST CARBON STEEL END BLOCK GRATE**

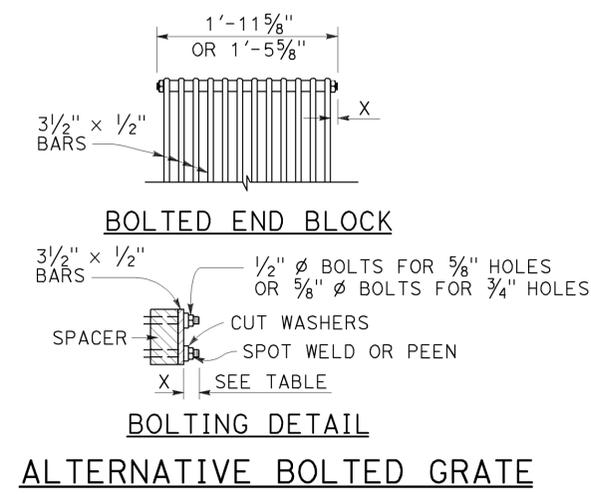
**RECTANGULAR FRAME DETAILS**  
(For all rectangular grates)

**GRATE BAR SPACING TABLE**

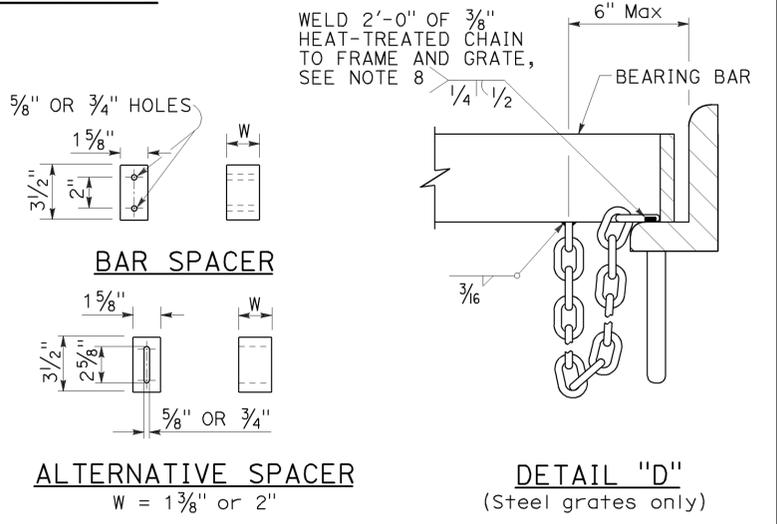
TYPE	NO. OF BARS	CLEAR BAR SPACING	X
18-9	9	1 3/8"	1 1/16"
24-9	9	2"	1 9/16"
24-12	12	1 3/8"	1 1/4"

INLET TYPE	COVER TYPE	WEIGHT LB
OS	PLATE	174
OL-7	PLATE	170
OL-10	PLATE	170
OL-14	PLATE	170
OL-21	PLATE	170
OCPI	PLATE	112
OCPI	PLATE	112
OCPI	REDWOOD	42
OMP	PLATE	177
OMPI	PLATE	177

INLET TYPE	GRATE TYPE	NO. OF GRATES	WEIGHT LB
GDO	24-12	2	634
GOL-7	24-12	1	326
GOL-10	24-12	1	326
G0,G1,G2,G3,G4 (TYPE 24)	24-9	1	263
	24-12	1	326
G4 (TYPE 18),G5,G6	18-9	1	249
GT1	18-9	2	498
GT2	18-9	2	498
GT3	24-12	2	652
GT4	24-12	2	652
TRASH RACK			22
GRATE CHAIN			3



**BOLTED END BLOCK**  
**BOLTING DETAIL**  
**ALTERNATIVE BOLTED GRATE**



**BAR SPACER**  
**ALTERNATIVE SPACER**  
**DETAIL "D"**  
(Steel grates only)

**BASIS FOR MISC IRON & STEEL FINAL PAY WEIGHTS FOR DRAINAGE INLETS**  
(See Note 7)

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**GRATE DETAILS No. 1**  
NO SCALE

RSP D77A DATED APRIL 19, 2013 SUPERSEDES RSP D77A DATED JULY 20, 2012 AND STANDARD PLAN D77A DATED MAY 20, 2011 - PAGE 164 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP D77A**

2010 REVISED STANDARD PLAN RSP D77A



**DESIGN NOTES:**

Design Specifications:  
AASHTO LRFD Bridge Design Specifications, 4th Edition with California Amendments.

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

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

Earth load:  
Earth pressure for two conditions:  
140 pcf vertical, 42 pcf horizontal  
140 pcf vertical, 140 pcf horizontal

Load Factors:  
AASHTO LRFD Table 3.4.1.1 & Table 3.4.1.2

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

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

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

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

**CONSTRUCTION NOTES:**

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

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

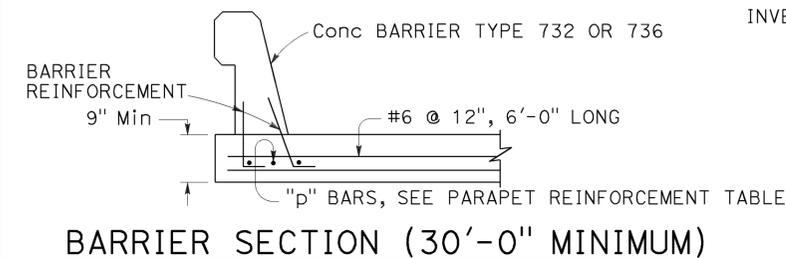
Roof and Walls:  
When cover is less than span length-  
Place 1/2" premolded expansion joint filler at 30'-0" ± centers outside the paved roadway lanes and place Bridge Detail 3-2, Standard Plan B0-3, at 30'-0" centers under paved roadway lanes.  
When cover is more than span length-  
Place 1/2" premolded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

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

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

Earthwork:  
See Standard Plan A62E.

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



**GENERAL NOTES:**

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

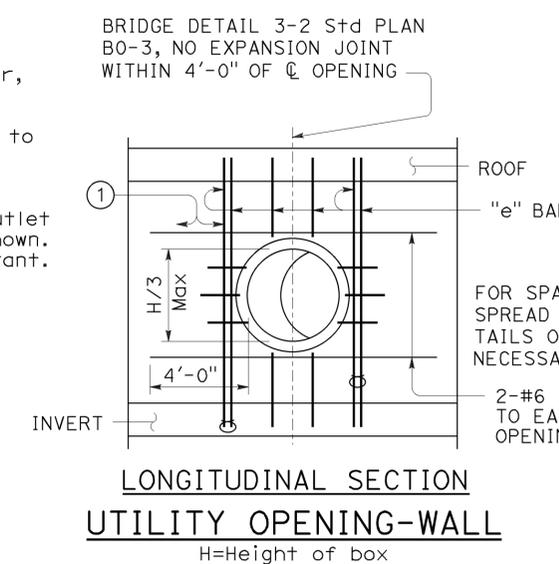
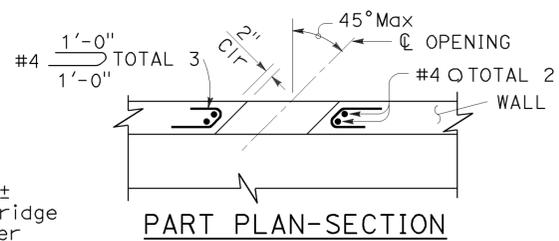
Alternatives:  
Single cell: Invert will be sloped unless "trapezoidal invert", "flat invert" or "V invert" is included in designation.  
Multiple cell: Invert will be vee unless "flat invert" is specified. Ends of culvert will be rounded unless "square ends" are designated. Parapets will be as shown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

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

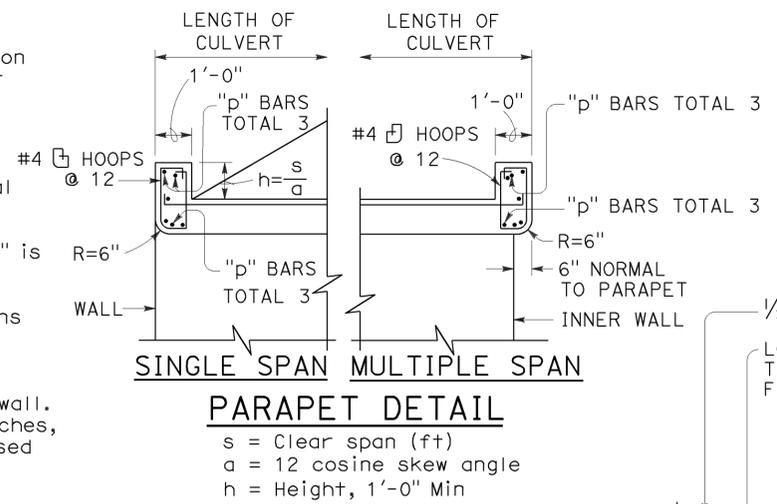
Reinforcement placement:  
Main reinforcement is to be placed transversely or, for curved culverts, radially. When radial, reinforcing spacing of the "a", "f" and "g" bars is measured along the centerline. Stagger splices not shown. Hooks may be rotated or tilted, as necessary, for clearance.

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

Special design:  
Required for culverts with conditions, loads, design bearing pressures or sizes greater than those given on this plan or Standard Plans D80 & D81. Also required for multiple cell culverts with unequal spans. For culverts with railroad loading, see the current AREMA design specification.  
3 or more cells:  
For culverts with more than two cells, use dimensions and reinforcement for the standard "double box culvert" and adjust quantities accordingly.

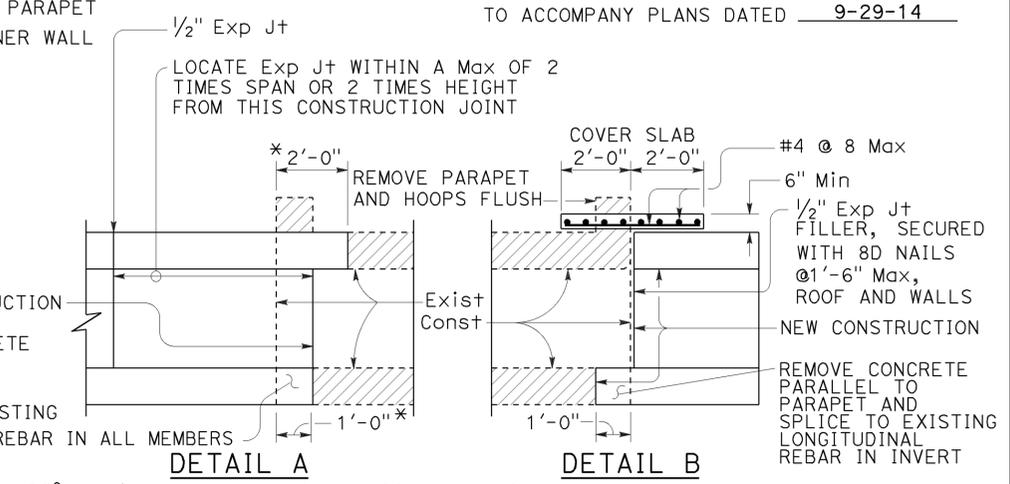
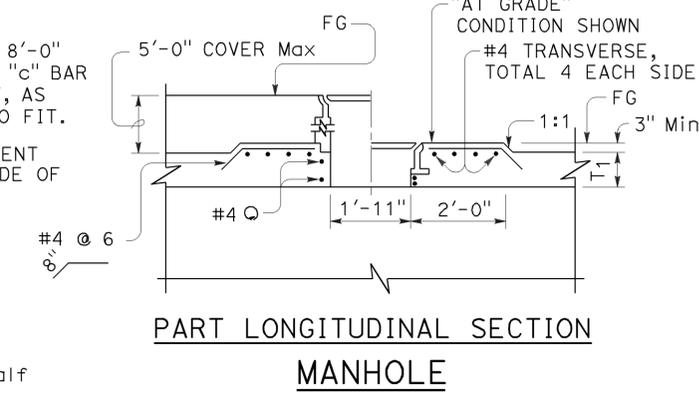
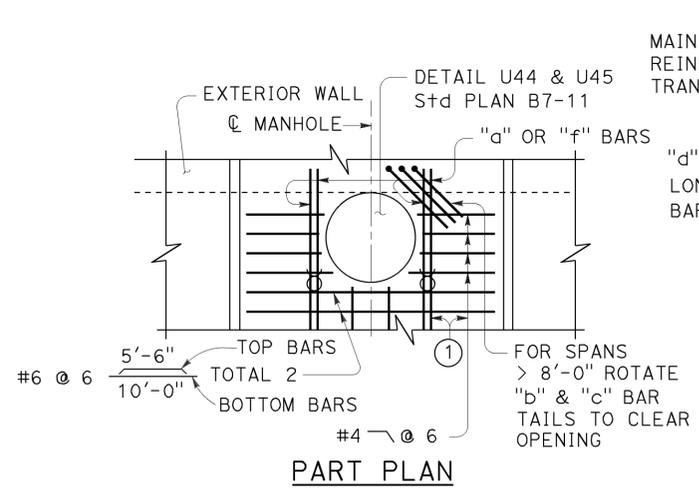


① Adjacent to each side of the opening, place additional bars equivalent to half the interrupted main reinforcement.



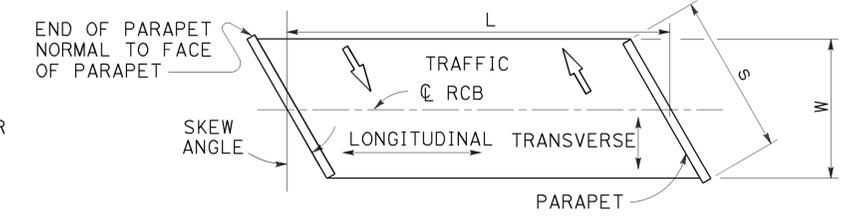
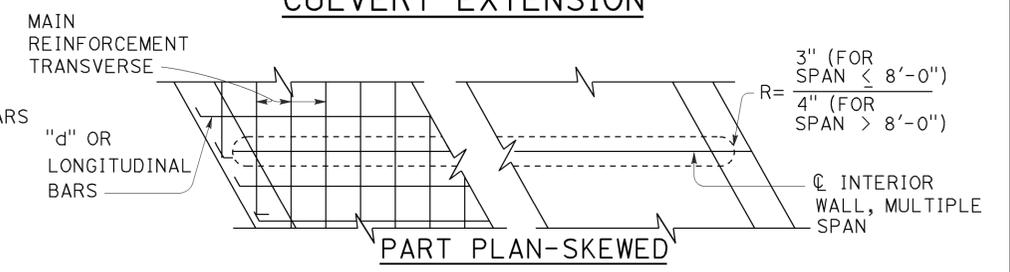
PARAPET "p" BARS		0° TO 15°	16° TO 30°	31° TO 45°
SPAN	SKIEW ANGLE			
4'		#4	#4	#4
6'		#4	#4	#5
8'		#4	#5	#6
10'		#5	#6	#7
12'		#6	#7	#8
14'		#7	#8	#9

**PARAPET REINFORCEMENT**



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

**CULVERT EXTENSION**



**RCB TERMINOLOGY**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

RSP D82 DATED JULY 18, 2014 SUPERSEDES STANDARD PLAN D82 DATED MAY 20, 2011 - PAGE 174 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP D82**

2010 REVISED STANDARD PLAN RSP D82

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	342	355

REGISTERED CIVIL ENGINEER  
July 18, 2014  
PLANS APPROVAL DATE

Carl M. Duan  
No. C59976  
Exp. 6-30-16  
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.

TO ACCOMPANY PLANS DATED 9-29-14



**DESIGN NOTES:**

Specifications:  
AASHTO LRFD Bridge Design Specifications, 4th Edition with California Amendments.

Earth load:  
Earth pressures for two conditions:  
140 pcf Vert, 42 pcf Horiz  
140 pcf Vert, 140 pcf Horiz

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

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

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

**GENERAL NOTES:**

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

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

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

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

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

**CONSTRUCTION NOTES:**

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

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

Earthwork:  
See Standard Plan A62G.

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

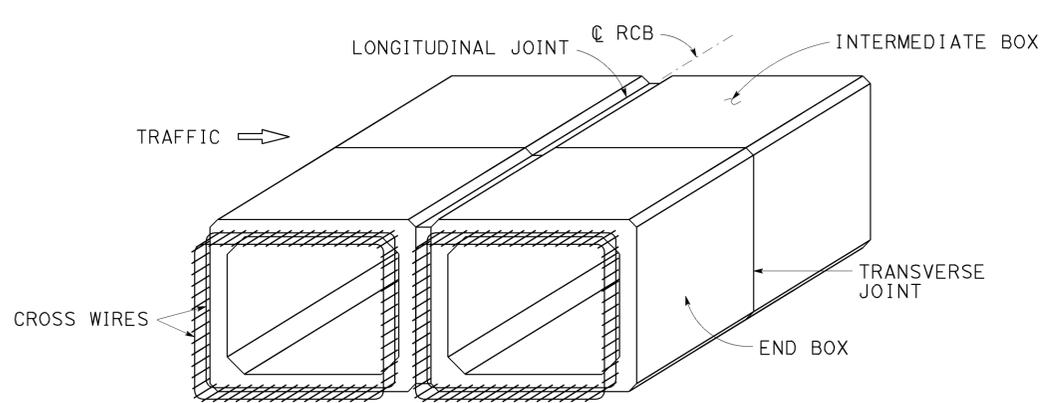
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	344	356

REGISTERED CIVIL ENGINEER  
Carl M. Duan  
No. C59976  
Exp. 6-30-16  
CIVIL  
STATE OF CALIFORNIA

July 18, 2014  
PLANS APPROVAL DATE

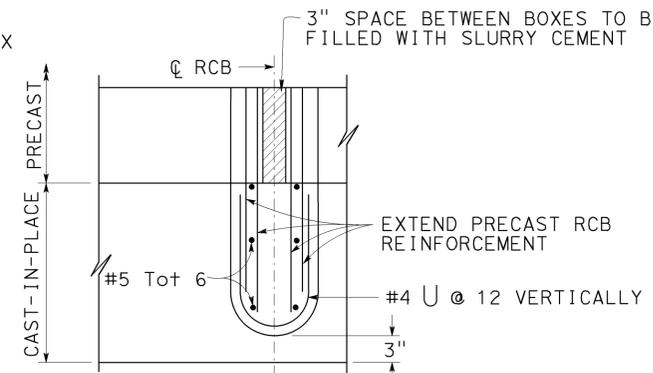
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED 9-29-14



**PRECAST RCB TERMINOLOGY**

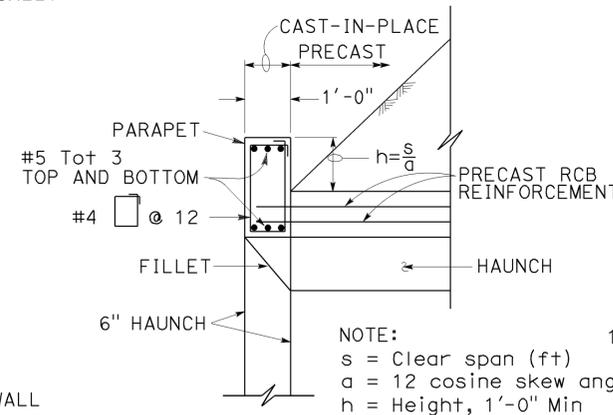
NOTE: Inner and outer reinforcement to be exposed as required to tie to cast-in-place construction. A minimum of two cross wires shall be exposed on all sides.



**PARTIAL PLAN INTERIOR WALL MULTICELL CULVERT**

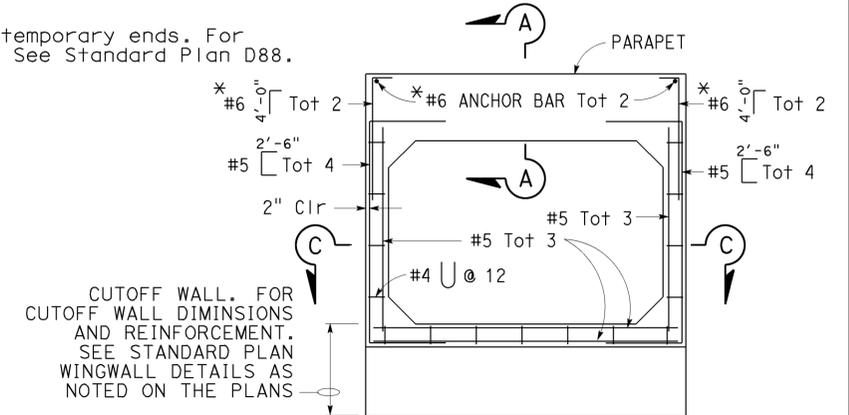
SPAN	PARAPET "P" BARS		
	SKEW ANGLE 0° TO 15°	16° TO 30°	31° TO 45°
4'-0"	#5	#5	#5
5'-0"	#5	#5	#6
6'-0"	#6	#6	#6
7'-0"	#7	#7	#7
8'-0"	#7	#7	#8
10'-0"	#8	#8	#9
12'-0"	#9	#9	#10

**BARRIER PARAPET REINFORCEMENT**



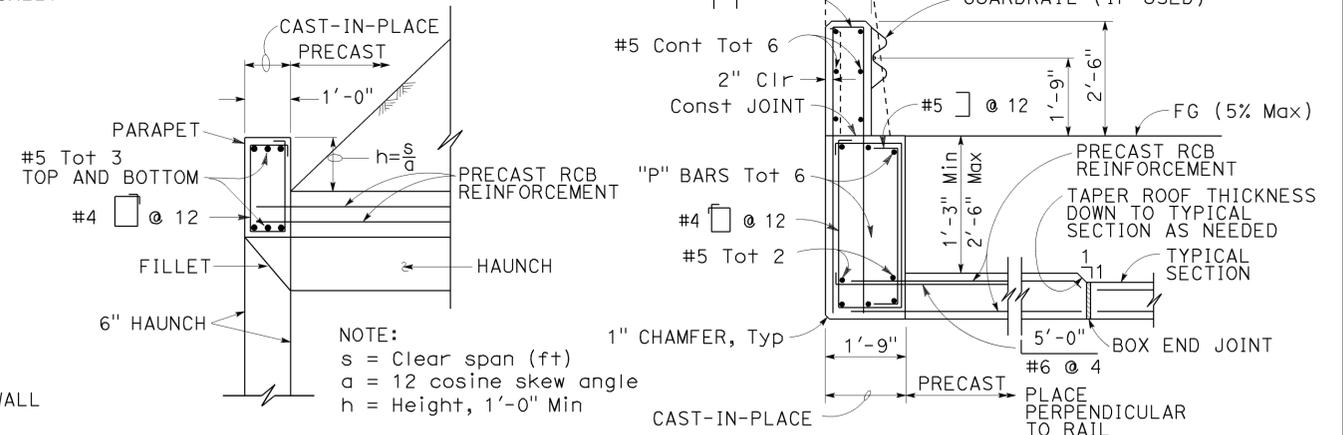
**SECTION A-A (Standard Height Parapet)**

CUTOFF WALL. FOR CUTOFF WALL DIMENSIONS AND REINFORCEMENT. SEE STANDARD PLAN WINGWALL DETAILS AS NOTED ON THE PLANS



**CAST-IN-PLACE END ELEVATION**

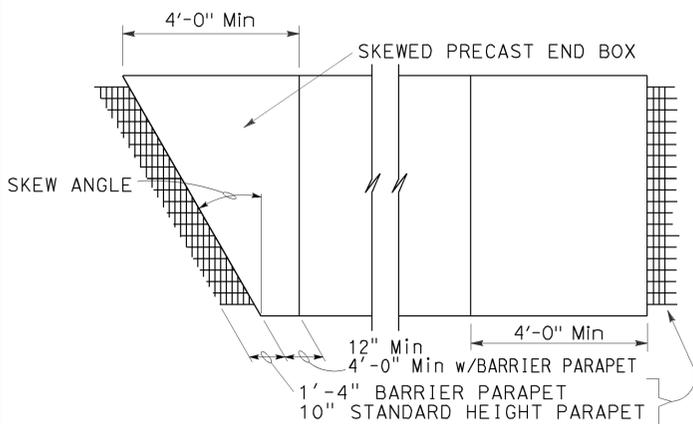
\* Reinforcing required for barrier parapet application only.



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

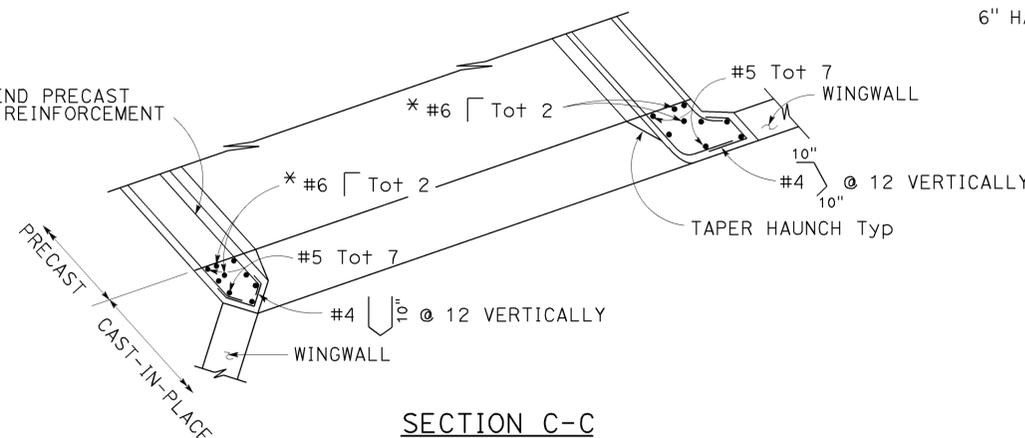
**TYPICAL CULVERT END DETAILS**

For wall and invert reinforcement not shown, See "End Elevation" detail.



**PARTIAL PLAN VIEW**

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



**SECTION C-C**

\* Reinforcing required for barrier parapet application only.

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

RSP D83B DATED JULY 18, 2014 SUPERSEDES STANDARD PLAN D83B DATED MAY 20, 2011 - PAGE 176 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP D83B**

2010 REVISED STANDARD PLAN RSP D83B

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	345	356

*Gregory A. Balzer*  
LICENSED LANDSCAPE ARCHITECT

July 19, 2013  
PLANS APPROVAL DATE

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

TO ACCOMPANY PLANS DATED 9-29-14

**A**

AB AGGREGATE BASE  
 ABS ACRYLONITRILE-BUTADIENE-STYRENE  
 AC ASPHALT CONCRETE  
 ACC ARMOR-CLAD CONDUCTORS  
 Adj ADJACENT/ADJUSTABLE  
 AIC AUXILIARY IRRIGATION CONTROLLER  
 Alt ALTERNATIVE  
 AMEND AMENDMENT  
 ARV AIR RELEASE VALVE  
 AUTO AUTOMATIC  
 AUX AUXILIARY  
 AVB ATMOSPHERIC VACUUM BREAKER

**B**

B&B BALLED AND BURLAPPED  
 B/B BRASS/BRONZE  
 B/B/PL BRASS/BRONZE/PLASTIC  
 B/PL BRASS/PLASTIC  
 BFM BONDED FIBER MATRIX  
 Bit Ctd BITUMINOUS COATED  
 BP BOOSTER PUMP  
 BPA BACKFLOW PREVENTER ASSEMBLY  
 BPE BACKFLOW PREVENTER ENCLOSURE  
 BV BALL VALVE

**C**

C CONDUIT  
 CAP CORRUGATED ALUMINUM PIPE  
 CARV COMBINATION AIR RELEASE VALVE  
 CB COUPLING BAND  
 CCA CAM COUPLER ASSEMBLY  
 CEC CONTROLLER ENCLOSURE CABINET  
 CHDPE CORRUGATED HIGH DENSITY POLYETHYLENE  
 CL CHAIN LINK  
 CNC CONTROL AND NEUTRAL CONDUCTORS  
 Conc CONCRETE  
 CP COPPER PIPE  
 CS COMPOST SOCK  
 CSP CORRUGATED STEEL PIPE  
 CST CENTER STRIP  
 CV CHECK VALVE

**D**

Dia DIAMETER  
 DIP DUCTILE IRON PIPE  
 DIT DRIP IRRIGATION TUBING  
 DG DECOMPOSED GRANITE  
 DN DIAMETER NOMINAL  
 DVA DRIP VALVE ASSEMBLY

**E**

EC EROSION CONTROL  
 ECTC EROSION CONTROL TECHNOLOGY COUNCIL  
 Elect ELECTRIC/ELECTRICAL  
 Elev ELEVATION  
 ELL ELBOW  
 ENCL ENCLOSURE  
 EP EDGE OF PAVEMENT  
 ES EDGE OF SHOULDER  
 EST END STRIP  
 ESTB ESTABLISHMENT  
 ETW EDGE OF TRAVELED WAY

**F**

F FULL CIRCLE  
 F/P FULL/PART CIRCLE  
 FCV FLOW CONTROL VALVE  
 FERT FERTILIZER  
 FG FINISHED GRADE  
 FH FLEXIBLE HOSE  
 FIPT FEMALE IRON PIPE THREAD  
 FIS FERTILIZER INJECTOR SYSTEM  
 FL FLOW LINE  
 FR FIBER ROLL  
 FS FLOW SENSOR  
 FSC FLOW SENSOR CABLE  
 FV FLUSH VALVE

**G**

Galv GALVANIZED  
 GARV GARDEN VALVE  
 GARVA GARDEN VALVE ASSEMBLY  
 GM GRAVEL MULCH  
 GPH GALLONS PER HOUR  
 GPM GALLONS PER MINUTE  
 GSP GALVANIZED STEEL PIPE  
 GV GATE VALVE

**H**

H HALF CIRCLE  
 HDPE HIGH DENSITY POLYETHYLENE  
 HP HORSEPOWER/HINGE POINT  
 HPL HIGH PRESSURE LINE  
 Hwy HIGHWAY

**I**

IC IRRIGATION CONTROLLER  
 ICC IRRIGATION CONTROLLER(S)  
 IN CONTROLLER ENCLOSURE CABINET  
 ID INSIDE DIAMETER  
 IFS IRRIGATION FILTRATION SYSTEM  
 IPS IRON PIPE SIZE  
 IPT IRON PIPE THREAD  
 Irr IRRIGATION

**L**

L LENGTH

**M**

Max MAXIMUM  
 MBGR METAL BEAM GUARD RAILING  
 MCV MANUAL CONTROL VALVE  
 MIC MASTER IRRIGATION CONTROLLER  
 Min MINIMUM  
 MIPT MALE IRON PIPE THREAD  
 Misc MISCELLANEOUS  
 MtI MATERIAL  
 MVP MAINTENANCE VEHICLE PULLOUT

**N**

NCN NO COMMON NAME  
 NL NOZZLE LINE  
 No. NUMBER  
 NPT NATIONAL PIPE THREAD

**O**

O/C ON CENTER  
 OD OUTSIDE DIAMETER  
 OL OVERLAP

**P**

P PART CIRCLE  
 PB PULL BOX  
 PCC PORTLAND CEMENT CONCRETE  
 PE POLYETHYLENE  
 Pkt+ PACKET  
 PL PLASTIC  
 PLS PURE LIVE SEED  
 PLT PLANT/PLANTING  
 PLT ESTB PLANT ESTABLISHMENT  
 PM POST MILE  
 PR PRESSURE RATED  
 PRLV PRESSURE RELIEF VALVE  
 PRV PRESSURE REGULATING VALVE  
 PVC POLYVINYL CHLORIDE  
 Pvm+ PAVEMENT

**Q**

Q QUARTER CIRCLE  
 QCV QUICK COUPLING VALVE

**R**

R RADIUS  
 RCP REINFORCED CONCRETE PIPE  
 RCV REMOTE CONTROL VALVE  
 RCVM REMOTE CONTROL VALVE (MASTER)  
 RCVMF REMOTE CONTROL VALVE (MASTER) W/FLOW  
 SENSOR  
 RCVP REMOTE CONTROL VALVE W/PRESSURE  
 REGULATOR  
 RCW RECYCLED WATER  
 RECP ROLLED EROSION CONTROL PRODUCT  
 REQ REQUIRED  
 RICS REMOTE IRRIGATION CONTROL SYSTEM  
 R/W RIGHT OF WAY

**S**

S SLIP  
 SCH SCHEDULE  
 SF STATE-FURNISHED  
 Shld SHOULDER  
 Sq SQUARE  
 SST SIDE STRIP  
 Sta STATION  
 Std STANDARD  
 SW SIDEWALK/SOUND WALL

**T**

T THIRD CIRCLE/THREAD  
 TLS TRUCK LOADING STANDPIPE  
 TQ THREE QUARTER CIRCLE  
 TRM TURF REINFORCEMENT MAT  
 TT TWO-THIRDS CIRCLE  
 TWSA TREE WELL SPRINKLER ASSEMBLY  
 Typ TYPICAL

**U**

UG UNDERGROUND

**W**

W WIDTH  
 W/ WITH  
 WM WATER METER  
 WS WYE STRAINER  
 WSA WYE STRAINER ASSEMBLY  
 WSP WELDED STEEL PIPE  
 WWM WELDED WIRE MESH

**NOTE:**  
 For additional abbreviations,  
 see Standard Plans A10A and A10B.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**LANDSCAPE AND  
 EROSION CONTROL ABBREVIATIONS**  
 NO SCALE

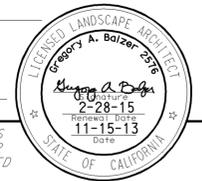
RSP H1 DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN H1  
 DATED MAY 20, 2011 - PAGE 218 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP H1**

2010 REVISED STANDARD PLAN RSP H1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	346	356

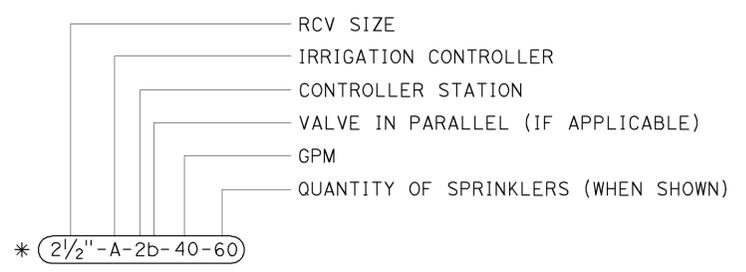
  
 LICENSED LANDSCAPE ARCHITECT  
 November 15, 2013  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TO ACCOMPANY PLANS DATED 9-29-14

EXISTING	NEW	ITEM DESCRIPTION
		WATER METER (WM)
		BACKFLOW PREVENTER ASSEMBLY (BPA)
		BACKFLOW PREVENTER ENCLOSURE (BPE)
		BOOSTER PUMP (BP)
		TRUCK LOADING STANDPIPE (TLS)
		FLOW SENSOR (FS)
		MASTER IRRIGATION CONTROLLER (MIC)
		AUXILIARY IRRIGATION CONTROLLER (AIC)
		IRRIGATION CONTROLLER (IC)
		IRRIGATION CONTROLLER (IC) (BATTERY)
		IRRIGATION CONTROLLER (IC) (SOLAR)
		IRRIGATION CONTROLLER (IC) (TWO WIRE)
		IRRIGATION CONTROLLER(S) IN CONTROLLER ENCLOSURE CABINET (ICC)
		ARMOR-CLAD CONDUCTORS (ACC)
		CONTROL AND NEUTRAL CONDUCTORS (CNC)
		IRRIGATION CONDUIT
		EXTEND IRRIGATION CONDUIT
		DUCTILE IRON PIPE (SUPPLY LINE) (MAIN) (DIP)
		GALVANIZED STEEL PIPE (SUPPLY LINE) (MAIN) (GSP)
		GALVANIZED STEEL PIPE (SUPPLY LINE) (LATERAL) (GSP)
		PLASTIC PIPE (SUPPLY LINE) (MAIN)
		PLASTIC PIPE (SUPPLY LINE) (LATERAL)
		COPPER PIPE (SUPPLY LINE)
		DRIP IRRIGATION TUBING
		REMOTE CONTROL VALVE (RCV)
		REMOTE CONTROL VALVE (MASTER) (RCVM)
		REMOTE CONTROL VALVE (MASTER) W/FLOW METER (RCVMF)
		REMOTE CONTROL VALVE W/PRESSURE REGULATOR (RCVP)
		EXISTING MANUAL CONTROL VALVE (MCV)
		DRIP VALVE ASSEMBLY (DVA)
		WYE STRAINER ASSEMBLY (WSA)

EXISTING	NEW	ITEM DESCRIPTION
		GATE VALVE (GV)
		BALL VALVE (BV)
		QUICK COUPLING VALVE (QCV)
		CAM COUPLER ASSEMBLY (CCA)
		GARDEN VALVE ASSEMBLY (GARVA)
		PRESSURE REGULATING VALVE (PRV)
		PRESSURE RELIEF VALVE (PRLV)
		FLOW CONTROL VALVE (FCV)
		COMBINATION AIR RELEASE VALVE (CARV)
		CHECK VALVE (CV)
		FLUSH VALVE (FV)
		EXISTING NOZZLE LINE W/TURNING UNION
		EXISTING IRRIGATION SYSTEM
		EXISTING IRRIGATION SYSTEM TO BE REMOVED
		CHAIN LINK GATE
		QUICK COUPLING VALVE W/SPRINKLER PROTECTOR
		SPRINKLER W/SPRINKLER PROTECTOR
		CONNECT TO EXISTING SYSTEM
		CAP
		CAP EXISTING
		FIBER ROLL
		COMPOST SOCK



VALVE CODE

\* VALVE CODES FOR EXISTING VALVES ARE SHOWN IN A DASHED ENCLOSURE.

RSP H2 DATED NOVEMBER 15, 2013 SUPERSEDES RSP H2 DATED JULY 19, 2013 AND STANDARD PLAN H2 DATED MAY 20, 2011 - PAGE 219 OF THE STANDARD PLANS BOOK DATED 2010.

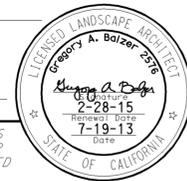
**REVISED STANDARD PLAN RSP H2**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**LANDSCAPE AND EROSION  
 CONTROL SYMBOLS**  
 NO SCALE

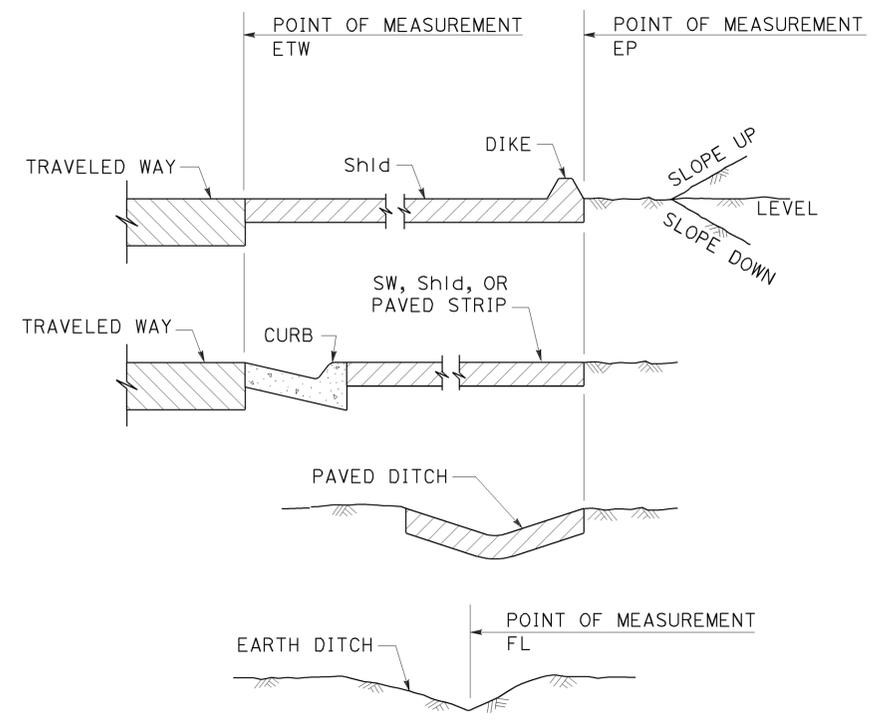
2010 REVISED STANDARD PLAN RSP H2

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	347	356

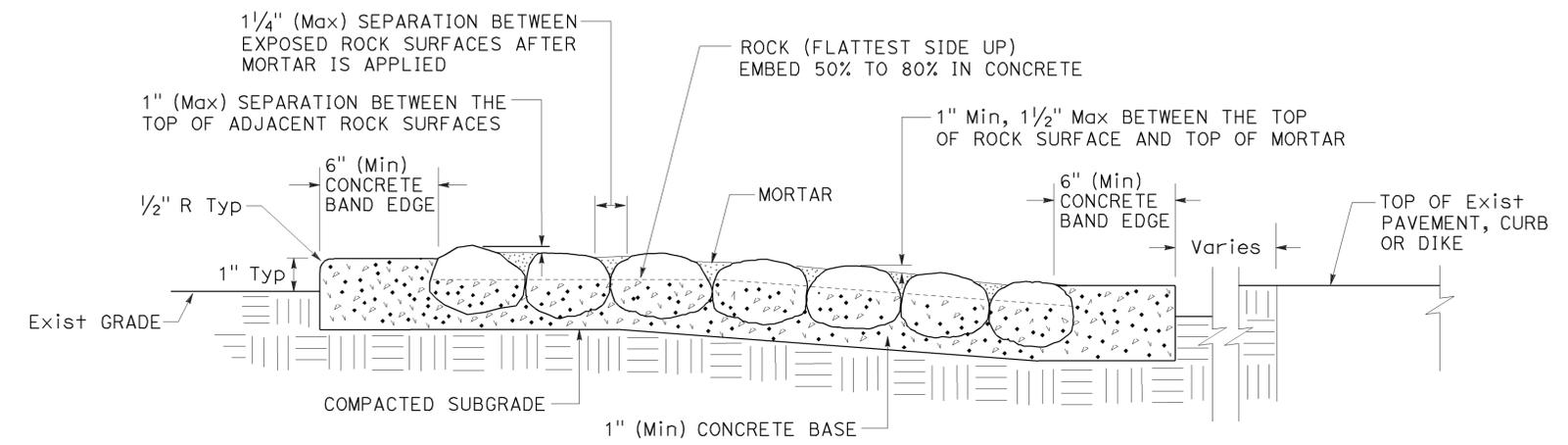
*Gregory A. Balzer*  
 LICENSED LANDSCAPE ARCHITECT  
 July 19, 2013  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



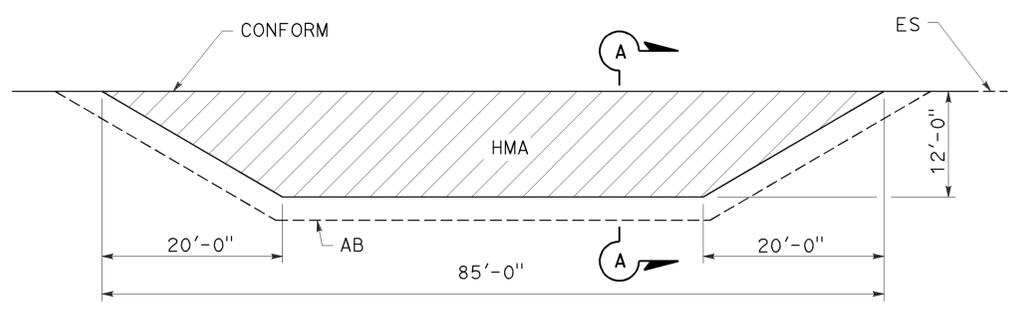
TO ACCOMPANY PLANS DATED 9-29-14



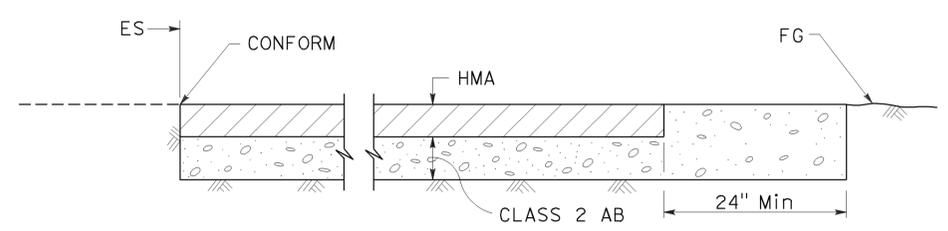
**SECTION  
POINTS OF MEASUREMENT**



**SECTION  
ROCK BLANKET**



**PLAN**



**SECTION A-A  
MAINTENANCE VEHICLE PULLOUT**

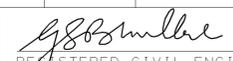
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**LANDSCAPE DETAILS**  
 NO SCALE

RSP H9A DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP H9A**

2010 REVISED STANDARD PLAN RSP H9A

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	348	356

  
 REGISTERED CIVIL ENGINEER  
 July 19, 2013  
 PLANS APPROVAL DATE



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

TO ACCOMPANY PLANS DATED 9-29-14

TABLE 1

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

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

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

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

TABLE 2

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

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

TABLE 3

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

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

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

## TRAFFIC CONTROL SYSTEM TABLES FOR LANE AND RAMP CLOSURES

NO SCALE

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

**REVISED STANDARD PLAN RSP T9**

2010 REVISED STANDARD PLAN RSP T9

**NOTES:**

See Revised Standard Plan RSP T9 for tables.

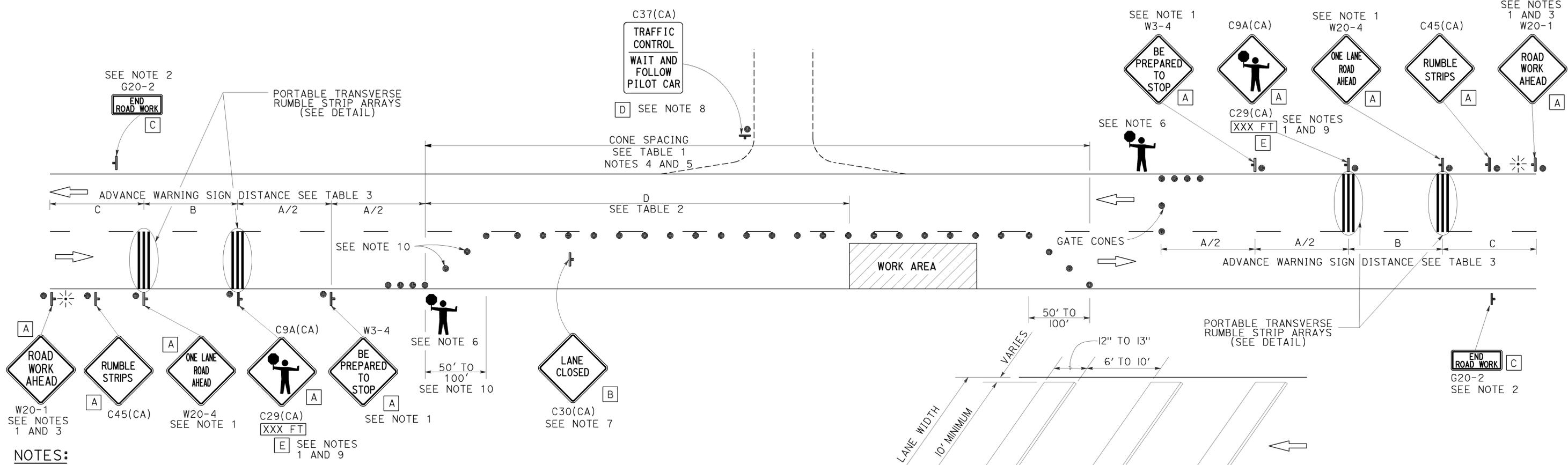
Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

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

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

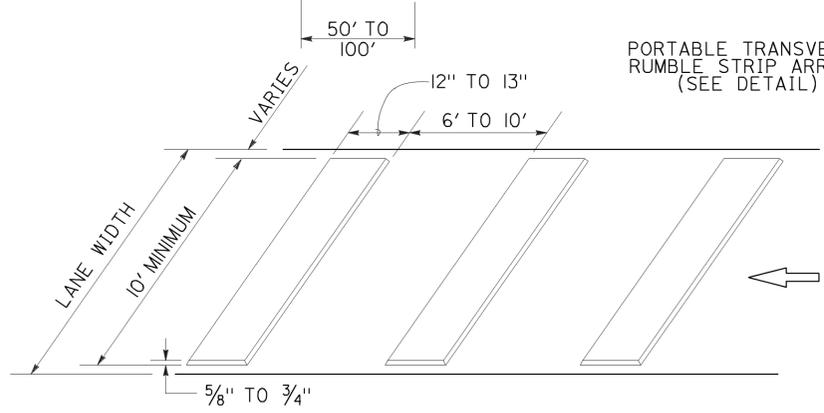
**TYPICAL LANE CLOSURE WITH REVERSIBLE CONTROL**

TO ACCOMPANY PLANS DATED 9-29-14



- NOTES:**
- Each advance warning sign in each direction of travel shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
  - A G20-2 "END ROAD WORK" sign, as appropriate, shall be placed at the end of the lane control unless the end of work area is obvious, or ends within a larger project's limits.
  - If the W20-1 sign would follow within 2000' of a stationary W20-1 or G20-1 "ROAD WORK NEXT \_\_\_\_\_ MILES", use a W20-4 sign for the first advance warning sign.
  - All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
  - Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.
  - Additional advance flaggers may be required. Flagger should stand in a conspicuous place, be visible to approaching traffic as well as approaching vehicles after the first vehicle has stopped. During the hours of darkness, the flagging-station and flagger shall be illuminated and clearly visible to approaching traffic. The illumination footprint of the lighting on the ground shall be at least 20' in diameter. Place a minimum of four cones at 50' intervals in advance of flagger station as shown.

- Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work areas. They are optional if the work area is visible from the flagger station.
- When a pilot car is used, place a C37(CA) "TRAFFIC CONTROL-WAIT AND FOLLOW PILOT CAR" sign with black legend on white background at all intersections, driveways and alleys without a flagger within traffic control area. Signs shall be clean and visible at all times. Where traffic can not be effectively self-regulated, at least one flagger shall be used at each intersection within traffic control area.
- An optional C29(CA) sign may be placed below the C9A(CA) sign.
- Either traffic cones or barricades shall be placed on the taper. Barricades shall be Type I, II, or III.
- The color of the portable transverse rumble strips shall be black or orange. Use 2 arrays, each array shall consist of 3 rumble strips.
- Portable transverse rumble strips shall not be placed on sharp horizontal or vertical curves nor shall they be placed through pedestrian crossings.
- If the portable transverse rumble strips become out of alignment (skewed) by more than 6 inches, measured from one end to the other, they shall be readjusted to bring the placement back to the original location.



**SIGN PANEL SIZE (Min)**

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

- LEGEND**
- TRAFFIC CONE
  - ⊥ TEMPORARY TRAFFIC CONTROL SIGN
  - ⚡ PORTABLE FLASHING BEACON
  - 🚧 FLAGGER

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

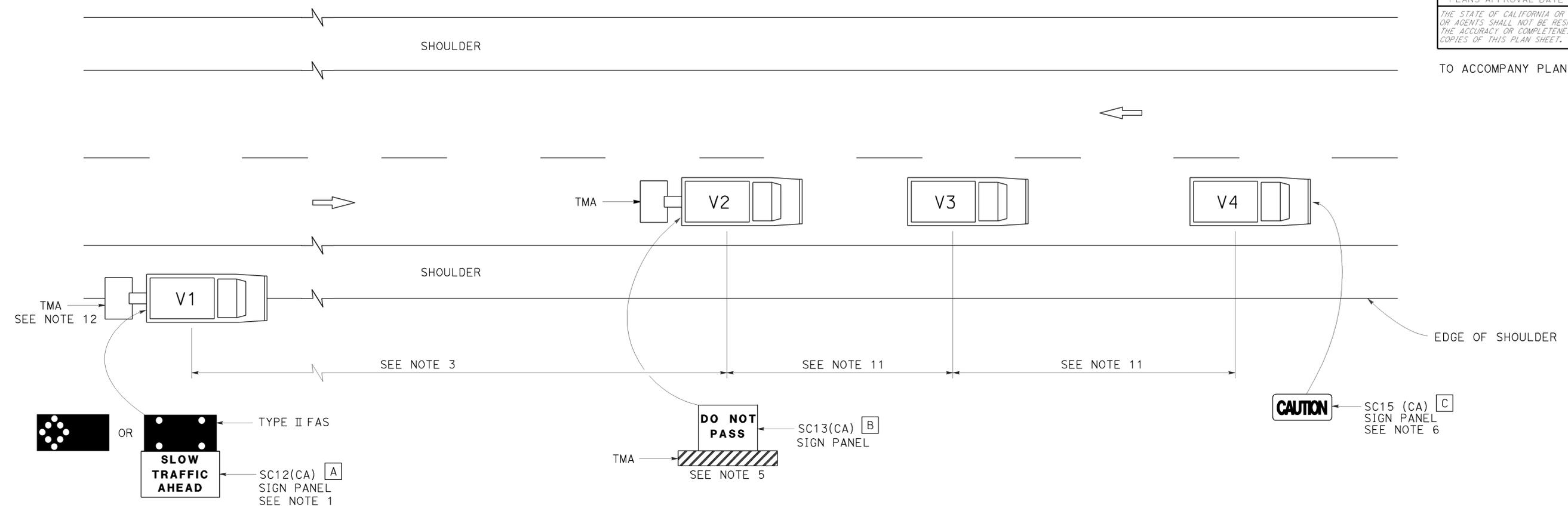
**TRAFFIC CONTROL SYSTEM  
FOR LANE CLOSURE ON  
TWO LANE CONVENTIONAL  
HIGHWAYS**

NO SCALE

RSP T13 DATED JULY 18, 2014 SUPERSEDES RSP T13 DATED APRIL 19, 2013 AND STANDARD PLAN T13 DATED MAY 20, 2011 - PAGE 241 OF THE STANDARD PLANS BOOK DATED 2010.

2010 REVISED STANDARD PLAN RSP T13

TO ACCOMPANY PLANS DATED 9-29-14



**NOTES:**

1. Either a changeable message sign or a SC12(CA) "SLOW TRAFFIC AHEAD" sign shall be mounted on the rear of sign vehicle V1. The changeable message sign shall be sequenced to show the "CAUTION" message first, follow by the "SLOW TRAFFIC AHEAD" message. A Type II flashing arrow sign may be used with the SC12(CA) sign panel.
2. Sign vehicle V1 should be positioned where highly visible when shoulders are not available.
3. If traffic queues develop, sign vehicle V1 should be positioned upstream from the end of queue.
4. Vehicle-mounted sign panels shall have Type III or above retroreflective sheeting, black on white, or black on fluorescent orange, with 6" minimum series D letters per Caltrans sign specifications.
5. Shadow vehicle shall be equipped with a truck-mounted attenuator. The sign panel shown shall be mounted on the rear of shadow vehicle V2. The message "LANE CLOSED" may be used in place of the "DO NOT PASS" message.
6. The sign panel shown shall be mounted on the front of sign vehicle V4, facing opposing traffic.

7. All vehicles shall be equipped with flashing or rotating amber lights.
8. Sign vehicle V4 will not be required when the work and vehicles V2 and V3 are 2' or more from the centerline of the highway during the work or application operations.
9. All vehicles used for lane closures shall be equipped with two-way radios and the vehicle operators shall maintain communication during the work or application operation.
10. This plan shall not be used where workers would be on foot in the work area. Use a stationary type lane closure (Revised Standard Plan T13) for this condition.
11. Minimize spacing between vehicles V2 and V3 and vehicles V3 and V4 to deter road users from driving in between them.
12. If sign vehicle V1 encroaches into the traffic lane due to insufficient shoulder width, sign vehicle V1 shall be equipped with a truck-mounted attenuator. Sign vehicle V1 shall stay as close to the edge of shoulder as practicable.

**LEGEND**

- V1 SIGN VEHICLE
- V2 SHADOW VEHICLE
- V3 WORK/APPLICATION VEHICLE
- V4 SIGN VEHICLE
- TMA TRUCK-MOUNTED ATTENUATOR
-  FLASHING ARROW SIGN (FAS) IN FLASHING CAUTION MODE
-  FLASHING ARROW SIGN (FAS) IN ALTERNATING DIAMOND CAUTION

**SIGN PANEL SIZE (Min)**

- A 72" x 42"
- B 54" x 42"
- C 54" x 24"

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
 FOR MOVING LANE CLOSURE  
 ON TWO LANE HIGHWAYS**

NO SCALE

RSP T17 DATED APRIL 19, 2013 SUPERSEDES STANDARD PLAN T17  
 DATED MAY 20, 2011 - PAGE 245 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP T17**

2010 REVISED STANDARD PLAN RSP T17

**LEGEND:**

<b>AB</b>	ABANDON. IF APPLIED TO CONDUIT, REMOVE CONDUCTORS
<b>BC</b>	INSTALL PULL BOX IN EXISTING CONDUIT RUN
<b>BP</b>	PEDESTRIAN BARRICADE, TYPE AS INDICATED ON PLAN
<b>CB</b>	INSTALL CONDUIT INTO EXISTING PULL BOX
<b>CC</b>	CONNECT NEW AND EXISTING CONDUIT. REMOVE EXISTING CONDUCTORS AND INSTALL CONDUCTORS AS INDICATED
<b>CF</b>	CONDUIT TO REMAIN FOR FUTURE USE. REMOVE CONDUCTORS. INSTALL PULL TAPE
<b>DH</b>	DETECTOR HANDHOLE
<b>FA</b>	FOUNDATION TO BE ABANDONED
<b>IS</b>	INSTALL SIGN ON SIGNAL MAST ARM
<b>NS</b>	NO SLIP BASE ON STANDARD
<b>PEC</b>	PHOTOELECTRIC CONTROL
<b>PEU</b>	PHOTOELECTRIC UNIT
<b>RC</b>	EQUIPMENT OR MATERIAL TO BE REMOVED AND BECOME THE PROPERTY OF THE CONTRACTOR
<b>RE</b>	REMOVE ELECTROLIER, FUSES AND BALLAST. TAPE ENDS OF CONDUCTORS
<b>RL</b>	RELOCATE EQUIPMENT
<b>RR</b>	REMOVE AND REUSE EQUIPMENT
<b>RS</b>	REMOVE AND SALVAGE EQUIPMENT
<b>SC</b>	SPLICE NEW TO EXISTING CONDUCTORS
<b>SD</b>	SERVICE DISCONNECT
<b>TSP</b>	TELEPHONE SERVICE POINT

**ABBREVIATIONS**

APS	ACCESSIBLE PEDESTRIAN SIGNAL	M/M	MULTIPLE TO MULTIPLE TRANSFORMER
BBS	BATTERY BACKUP SYSTEM	Mtg	MOUNTING
BC	BOLT CIRCLE	MV	MERCURY VAPOR LIGHTING FIXTURE
BPB	BICYCLE PUSH BUTTON	MVDS	MICROWAVE VEHICLE DETECTION SYSTEM
C	CONDUIT	N	NEUTRAL (GROUNDED CONDUCTOR)
CB	CIRCUIT BREAKER	NB	NEUTRAL BUS
CCTV	CLOSED CIRCUIT TELEVISION	NC	NORMALLY CLOSE
Ck+	CIRCUIT	NO	NORMALLY OPEN
CMS	CHANGEABLE MESSAGE SIGN	P	CIRCUIT BREAKER'S POLE
Ctid	CALTRANS IDENTIFICATION	PB	PULL BOX
Comm	COMMUNICATION	PBA	PUSH BUTTON ASSEMBLY
DLC	LOOP DETECTOR LEAD-IN CABLE	PEC	PHOTOELECTRIC CONTROL
EMS	EXTINGUISHABLE MESSAGE SIGN	Ped	PEDESTRIAN
EVUC	EMERGENCY VEHICLE UNIT CABLE	PEU	PHOTOELECTRIC UNIT
EVUD	EMERGENCY VEHICLE UNIT DETECTOR	PT	CONDUIT WITH PULL TAPE
FB	FLASHING BEACON	RE	RELOCATED EQUIPMENT
FBCA	FLASHING BEACON CONTROL ASSEMBLY	RM	RAMP METERING
FBS	FLASHING BEACON WITH SLIP BASE	RWIS	ROADSIDE WEATHER INFORMATION SYSTEM
FO	FIBER OPTIC	SB	SLIP BASE
G	EQUIPMENT GROUNDING CONDUCTOR	SIC	SIGNAL INTERCONNECT CABLE
GB	GROUND BUS	Sig	SIGNAL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	SMA	SIGNAL MAST ARM
HAR	HIGHWAY ADVISORY RADIO	SNS	STREET NAME SIGN
Hex	HEXAGONAL	SP	SERVICE POINT
HPS	HIGH PRESSURE SODIUM	TDC	TELEPHONE DEMARCATION CABINET
IISNS	INTERNALLY ILLUMINATED STREET NAME SIGN	TMS	TRAFFIC MONITORING STATION
ISL	INDUCTION SIGN LIGHTING	TOS	TRAFFIC OPERATIONS SYSTEM
LED	LIGHT EMITTING DIODE	Veh	VEHICLE
LMA	LUMINAIRE MAST ARM	VIVDS	VIDEO IMAGE VEHICLE DETECTION SYSTEM
LPS	LOW PRESSURE SODIUM	WIM	WEIGH-IN-MOTION
Ltg	LIGHTING	Xfmr	TRANSFORMER
Lum	LUMINAIRE		
M	METERED		
MAT	MAST ARM MOUNTING TOP ATTACHMENT		
MAS	MAST ARM MOUNTING SIDE ATTACHMENT		

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	351	356

*Theresa Gabriel*  
REGISTERED ELECTRICAL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

Theresa Aziz Gabriel  
No. E15129  
Exp. 6-30-14  
ELECTRICAL  
STATE OF CALIFORNIA

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

TO ACCOMPANY PLANS DATED 9-29-14

**SOFFIT AND WALL MOUNTED LUMINAIRES**

- PENDANT, 70 W HPS UNLESS OTHERWISE SPECIFIED
- FLUSH, 70 W HPS UNLESS OTHERWISE SPECIFIED
- WALL SURFACE, 70 W HPS UNLESS OTHERWISE SPECIFIED
- EXISTING SOFFIT OR WALL LUMINAIRE TO REMAIN UNMODIFIED
- EXISTING SOFFIT OR WALL LUMINAIRE TO BE MODIFIED AS SPECIFIED

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

COMMONLY USED SYMBOLS FOR UNITED STATES CUSTOMARY UNITS OF MEASUREMENT:

SYMBOL USED	DEFINITIONS
$\Omega$	OHMS
min	MINUTE
s	SECOND
bps	BITS PER SECOND
Bps	BYTES PER SECOND
A	AMPERE
V	VOLT
V(dc)	VOLT (DIRECT CURRENT)
V(ac)	VOLT (ALTERNATING CURRENT)
FC	FOOT - CANDLE
W	WATTS
VA	VOLT-AMPERE
M	MEGA
k	KILO
m	MILLI
$\mu$	MICRO
P	PICO
Hz	HERTZ

**MISCELLANEOUS ELECTROLIERS**

NEW	EXISTING	
		LUMINAIRE ON WOOD POLE
		NON-STANDARD ELECTROLIER (SEE PROJECT NOTES OR PROJECT PLANS)
		CITY ELECTROLIER
		ELECTROLIER FOUNDATION (FUTURE INSTALLATION)

**NOTES:**

- HPS luminaires shall be 310 W HPS when installed on Type 21, 21D, 30, 31 and 32 Standards, unless otherwise specified. HPS luminaires shall be 200 W when installed on other type standards or poles, unless otherwise specified.
- LED luminaires shall be 235 W when installed on Type 21, 21D, 30, 31 and 32 Standards, unless otherwise specified. LED luminaires shall be 165 W when installed on other type standards or poles, unless otherwise specified.
- Luminaires shall be the cutoff type, ANSI Type III medium cutoff lighting distribution, unless otherwise specified.

**STANDARD ELECTROLIER**

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

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS (LEGEND AND ABBREVIATIONS)**

NO SCALE

RSP ES-1A DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-1A DATED MAY 20, 2011 - PAGE 425 OF THE STANDARD PLANS BOOK DATED 2010.

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

2010 REVISED STANDARD PLAN RSP ES-1A

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	352	356

*Theresa Gabriel*  
REGISTERED ELECTRICAL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

Theresa Aziz Gabriel  
No. E15129  
Exp. 6-30-14  
ELECTRICAL  
STATE OF CALIFORNIA

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

TO ACCOMPANY PLANS DATED 9-29-14

**CONDUIT**

NEW	EXISTING	
---	---	LIGHTING CONDUIT, UNLESS OTHERWISE INDICATED OR NOTED
---	---	TRAFFIC SIGNAL CONDUIT
---C---	---c---	COMMUNICATION CONDUIT
---T---	---t---	TELEPHONE CONDUIT
---F---	---f---	FIRE ALARM CONDUIT
---FO---	---fo---	FIBER OPTIC CONDUIT
---	---	CONDUIT TERMINATION
		CONDUIT RISER ATTACHED TO THE STRUCTURE OR SERVICE POLE

**SIGNAL EQUIPMENT**

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

**SERVICE EQUIPMENT**

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

**POLE-MOUNTED SERVICE DESIGNATION**

	TYPE H SERVICE, 28'-10"	TYPE OF INSTALLATION AND POLE HEIGHT ABOVE GRADE
--	-------------------------	--

**FLASHING BEACON**

NEW	EXISTING	
		FLASHING BEACON (ONE VEHICLE SIGNAL HEAD WITH BACKPLATE AND VISOR) "R" INDICATES RED INDICATION, "Y" INDICATES YELLOW INDICATION
		FLASHING BEACON WITH TYPE 15-FBS STANDARD AND A SIGN.
		FLASHING BEACON WITH TYPES 9, 9A OR 9B SIGN UNLESS OTHERWISE SPECIFIED OR INDICATED

**SIGNAL EQUIPMENT Cont**

NEW	EXISTING	
		GUARD POST
		TYPE 1 STANDARD WITH RAMP METERING SIGN
		OPTICAL DETECTOR FOR THE EMERGENCY VEHICLE DETECTION SYSTEM

**NOTES:**

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

**ILLUMINATED OVERHEAD SIGN**

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

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(LEGEND AND ABBREVIATIONS)**

NO SCALE

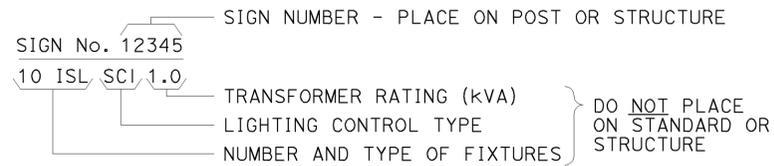
RSP ES-1B DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-1B DATED MAY 20, 2011 - PAGE 426 OF THE STANDARD PLANS BOOK DATED 2010.

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

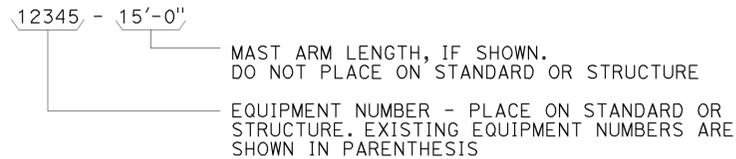
2010 REVISED STANDARD PLAN RSP ES-1B

### EQUIPMENT IDENTIFICATION

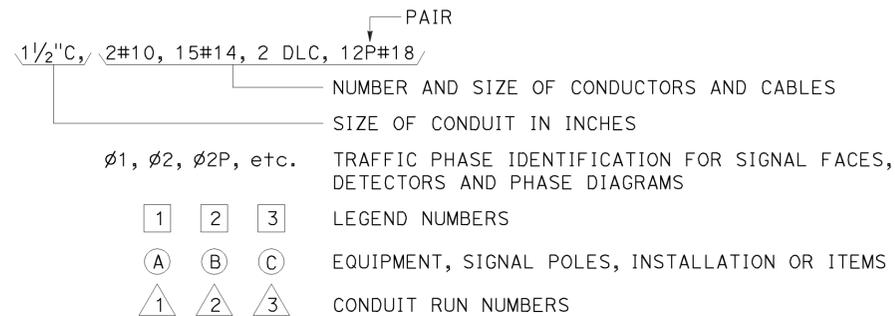
#### ILLUMINATED SIGN IDENTIFICATION NUMBER:



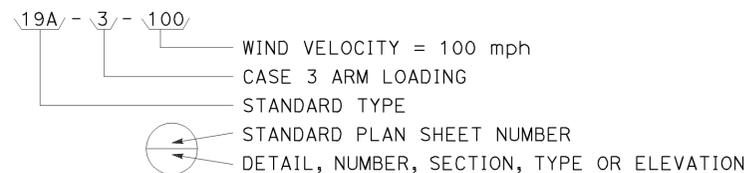
#### ELECTROLIER OR EQUIPMENT IDENTIFICATION NUMBER:



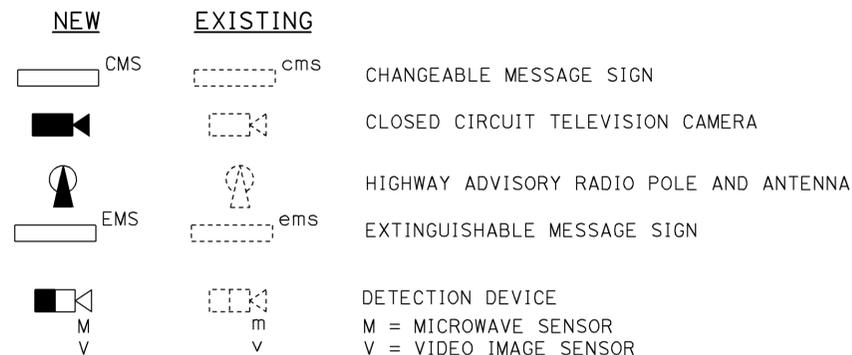
#### CONDUIT AND CONDUCTOR IDENTIFICATION:



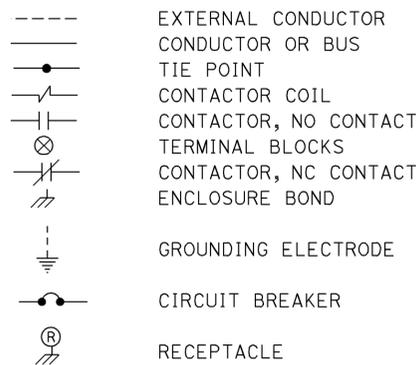
#### SIGNAL AND LIGHTING STANDARD (TYPICAL DESIGNATION):



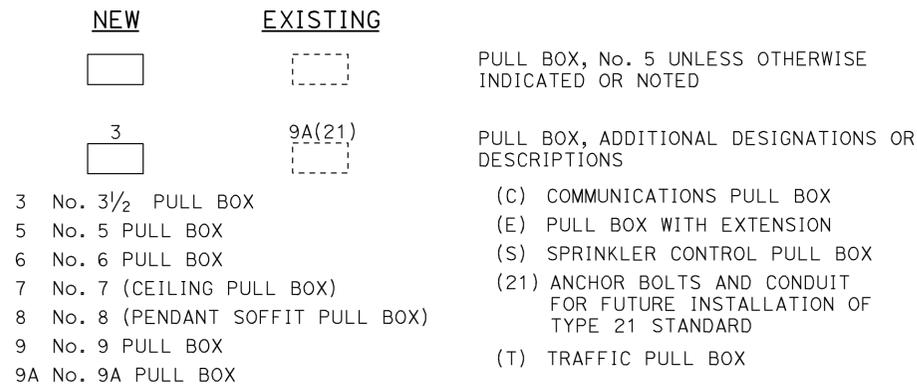
### MISCELLANEOUS EQUIPMENT



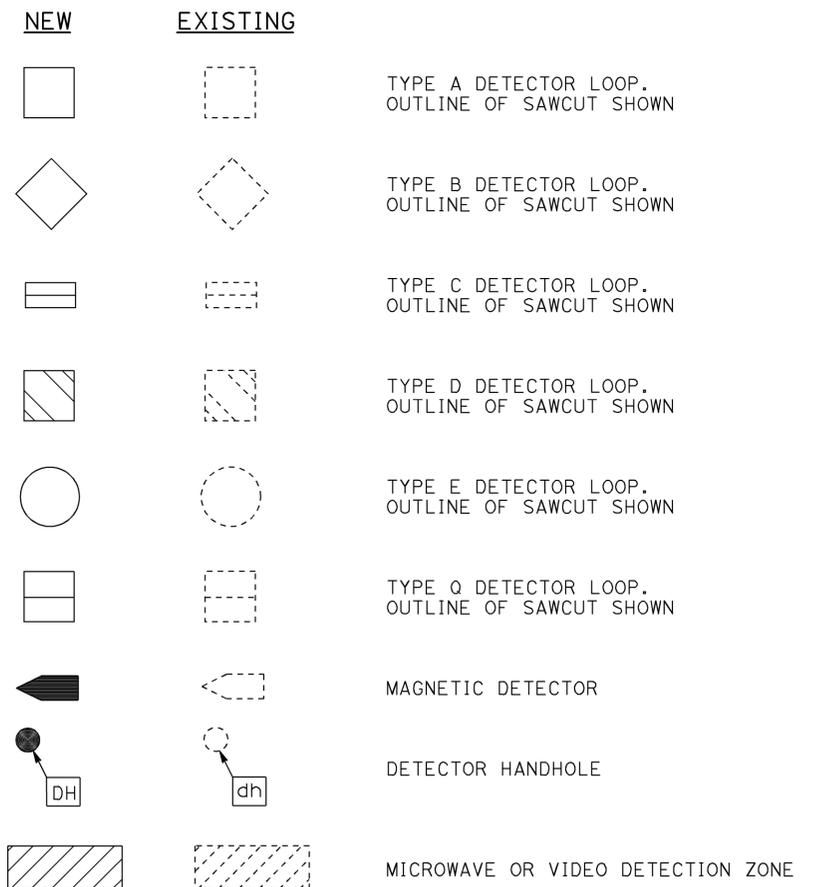
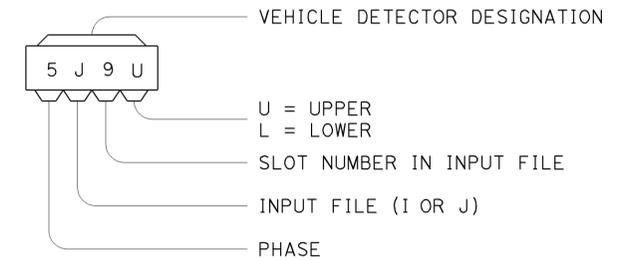
### WIRING DIAGRAM LEGEND



### PULL BOXES



### VEHICLE DETECTORS



STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

## ELECTRICAL SYSTEMS (LEGEND AND ABBREVIATIONS)

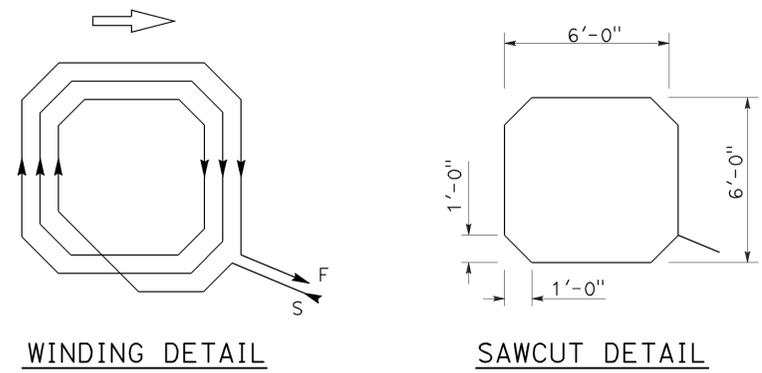
NO SCALE

RSP ES-1C DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-1C DATED MAY 20, 2011 - PAGE 427 OF THE STANDARD PLANS BOOK DATED 2010.

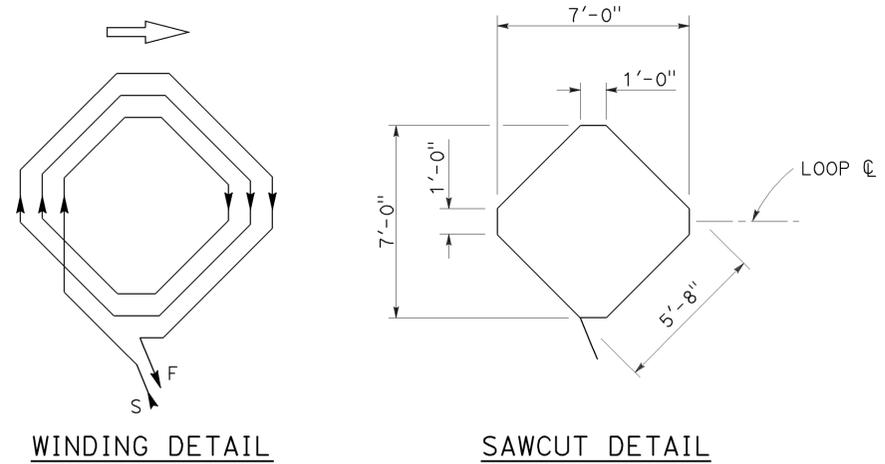
2010 REVISED STANDARD PLAN RSP ES-1C

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	354	356
<i>Theresa Gabriel</i> REGISTERED ELECTRICAL ENGINEER July 19, 2013 PLANS APPROVAL DATE <small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

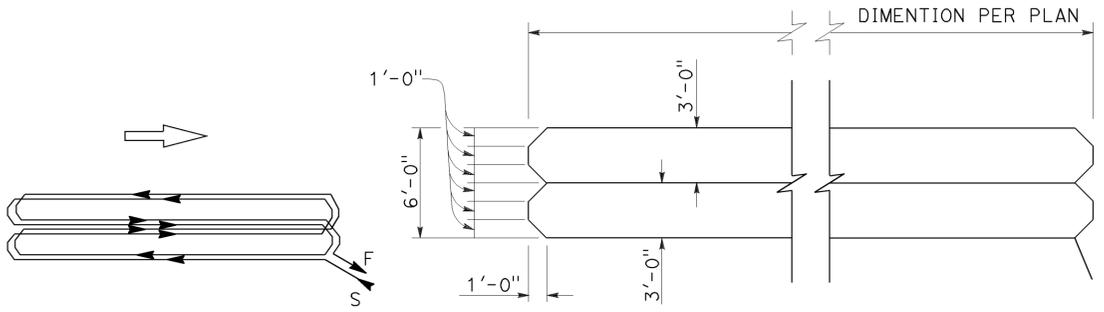
TO ACCOMPANY PLANS DATED 9-29-14



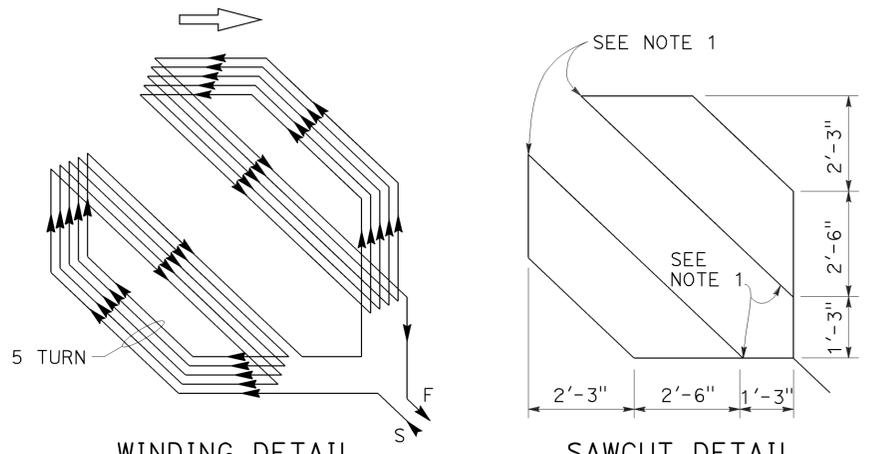
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE A LOOP DETECTOR CONFIGURATION**



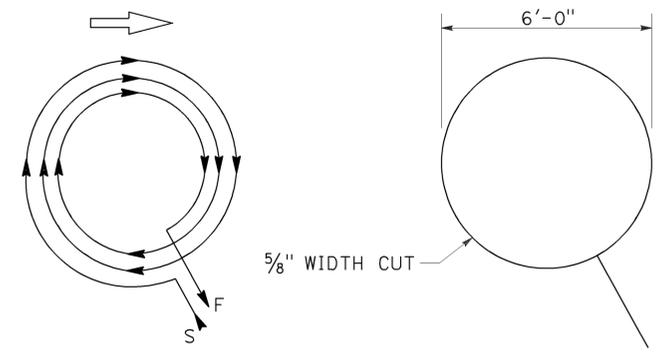
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE B LOOP DETECTOR CONFIGURATION**



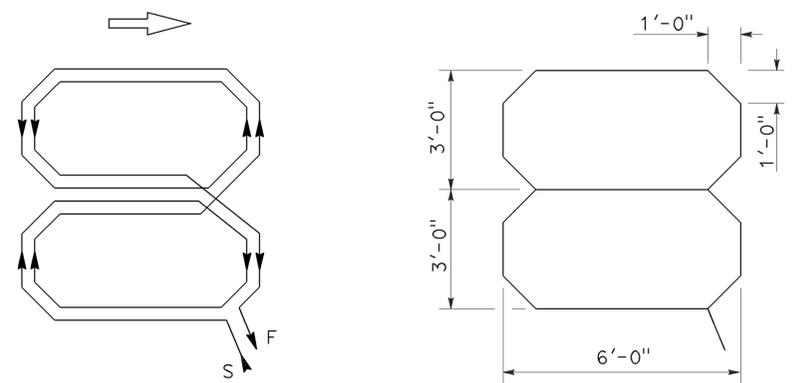
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE C LOOP DETECTOR CONFIGURATION**



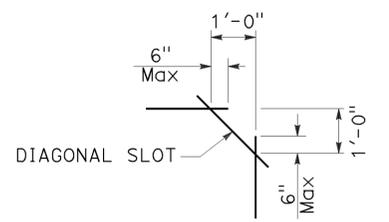
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE D LOOP DETECTOR CONFIGURATION**



WINDING DETAIL  
SAWCUT DETAIL  
**TYPE E LOOP DETECTOR CONFIGURATION**



WINDING DETAIL  
SAWCUT DETAIL  
**TYPE Q LOOP DETECTOR CONFIGURATION**



**PLAN VIEW OF  
DIAGONAL SLOT  
AT CORNERS**

- NOTES:**
1. Round corners of acute angle sawcuts to prevent damage to conductors.
  2. Typical distance separating loops from edge to edge is 10' for Type A, B, D and E installation in single lane.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(DETECTORS)**

NO SCALE

RSP ES-5B DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-5B  
DATED MAY 20, 2011 - PAGE 449 OF THE STANDARD PLANS BOOK DATED 2010.

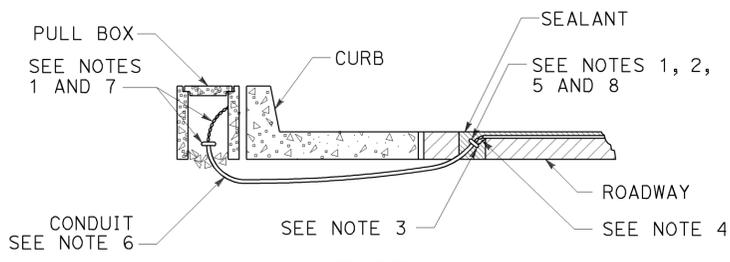
2010 REVISED STANDARD PLAN RSP ES-5B

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SB	246	12.3/R16.7	355	356

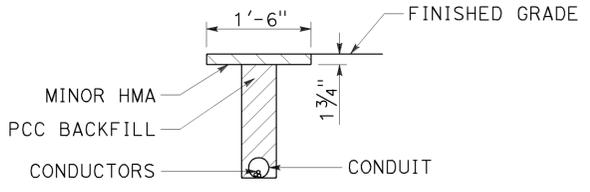
Theresa Gabriel  
 REGISTERED ELECTRICAL ENGINEER  
 July 19, 2013  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



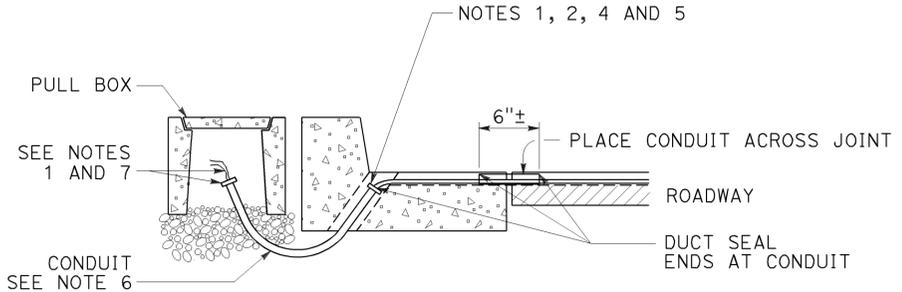
TO ACCOMPANY PLANS DATED 9-29-14



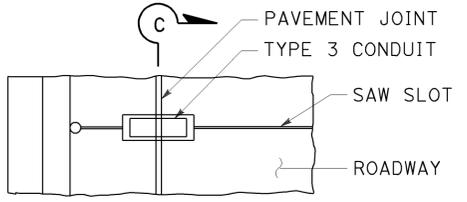
**TYPE A**  
**CURB TERMINATION DETAIL**



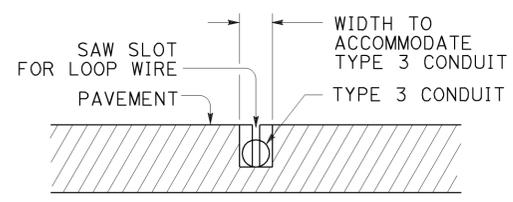
**"T" TRENCH**  
**DETAIL I**



**CROSS SECTION**

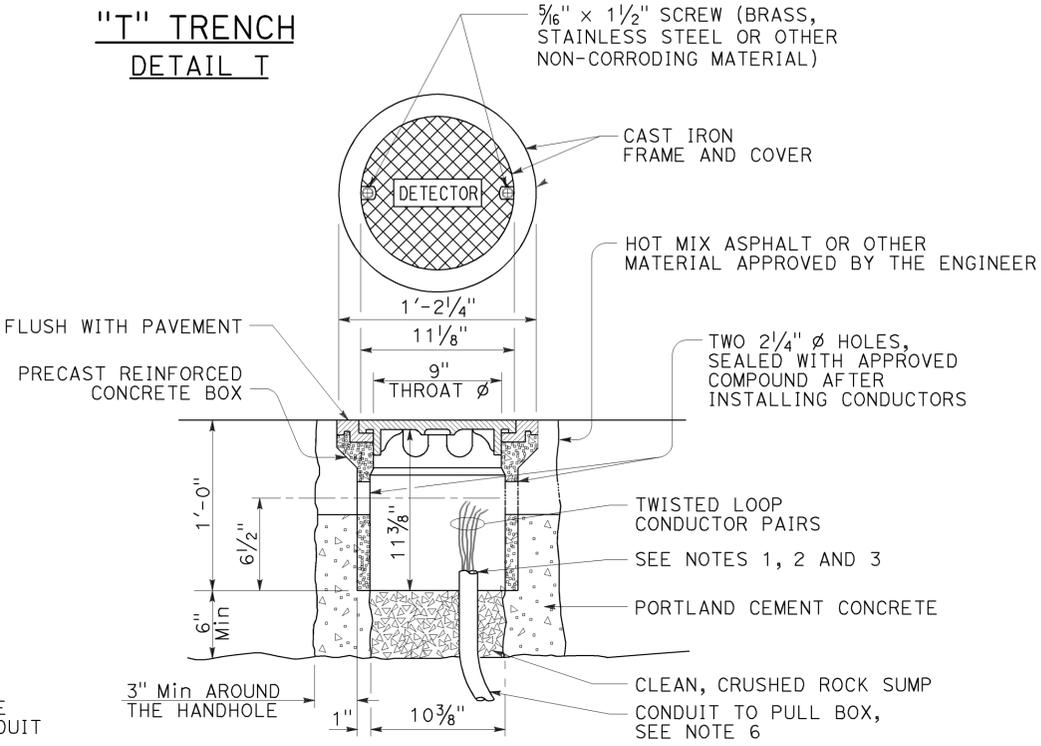


**PLAN VIEW**

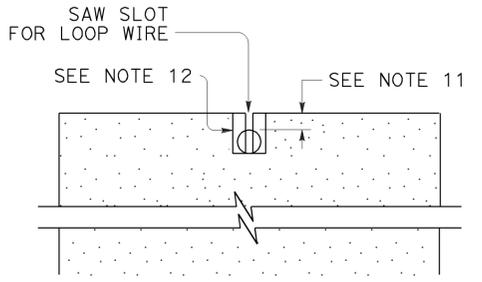


**SECTION C-C**

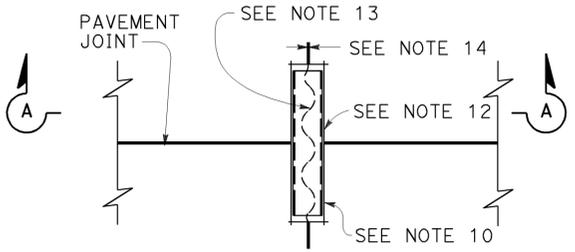
**TYPE B**  
**CURB TERMINATION DETAIL**



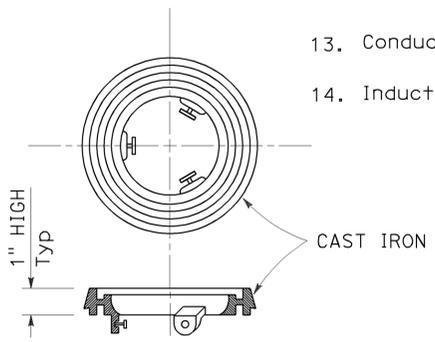
**DETECTOR HANDHOLE DETAIL**



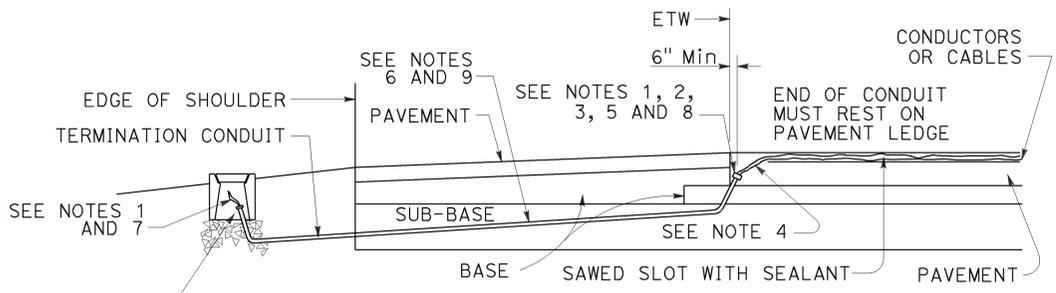
**SECTION A-A**



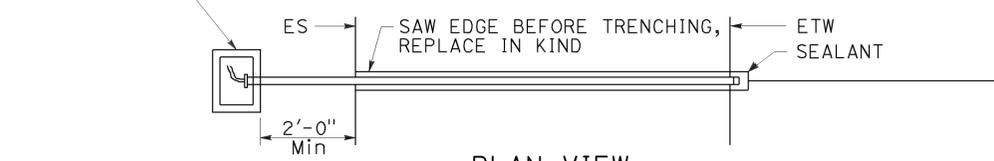
**PLAN VIEW**  
**TYPICAL LOOP LEAD-IN DETAIL**  
**AT PAVEMENT JOINT**



**LOCKING GRADE RING**



**CROSS SECTION**



**PLAN VIEW**  
**SHOULDER TERMINATION DETAILS**

**NOTES:**

- Bushing shall be used at end of conduit.
- Tape detector conductors or cables 3" each side of bushings.
- Install duct seal compound to each end of termination conduit before installing sealant.
- Round all sharp edges where detector conductors or cables have to pass.
- End of conduit shall be 3/8" below roadway surface.
- |                 |                 |
|-----------------|-----------------|
| Conduit size    | Loop conductors |
| 1"C minimum     | 1 to 2 pairs    |
| 1 1/2"C minimum | 3 to 4 pairs    |
| 2"C minimum     | 5 or more pairs |
- Splice detector conductors or cables to detector lead-in-cable.
- Location of detector handhole when shown on plans.
- When the shoulder and traveled way are paved with the same material and there is no joint between them, the conduit shall extend only 2'-0" into the shoulder pavement.
- 3/4"C, Type 3 conduit 6" long minimum, plug both ends with duct compound to keep out sealant.
- 1/2" Minimum between top of conduit and pavement surface.
- Sawcut shall not exceed 1" in width and 1/8" longer than conduit to be installed.
- Conductors with 1/2" minimum slack inside conduit.
- Inductive loop detector saw slot.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(CURB TERMINATION**  
**AND HANDHOLE)**  
NO SCALE

RSP ES-5D DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-5D  
DATED MAY 20, 2011 - PAGE 451 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP ES-5D**

2010 REVISED STANDARD PLAN RSP ES-5D

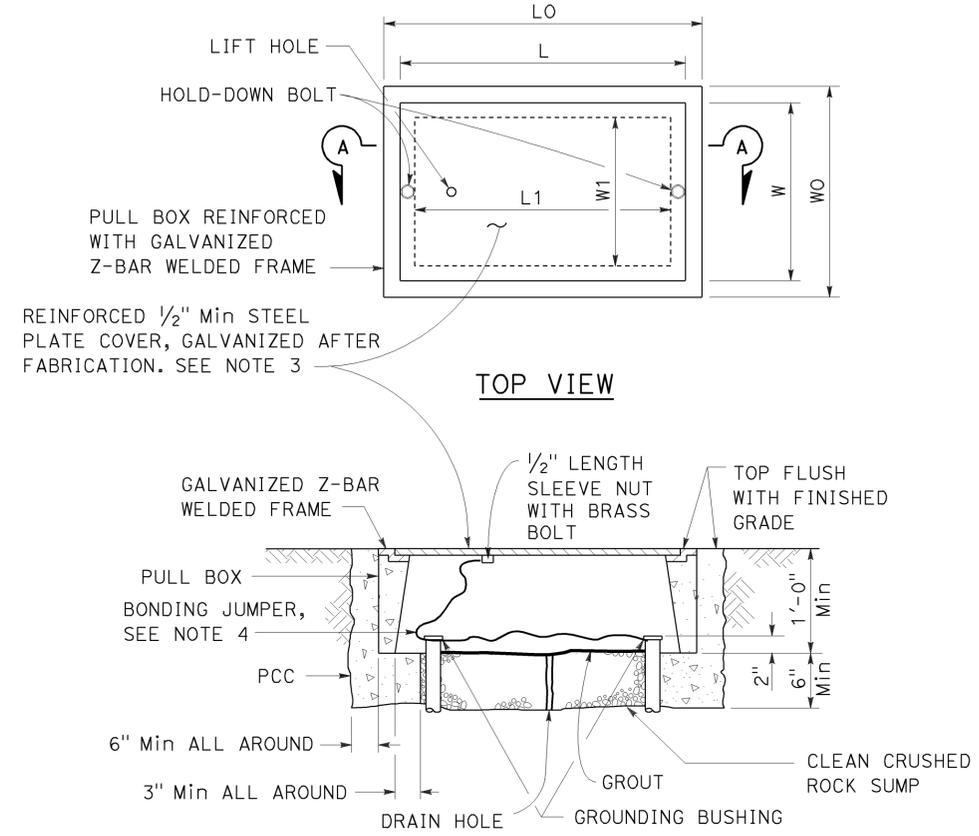
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
05	SB	246	12.3/R16.7	356	356

*Theresa Gabriel*  
 REGISTERED ELECTRICAL ENGINEER  
 July 19, 2013  
 PLANS APPROVAL DATE

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

REGISTERED PROFESSIONAL ENGINEER  
 Theresa Aziz Gabriel  
 No. E15129  
 Exp. 6-30-14  
 ELECTRICAL  
 STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED 9-29-14



**SECTION A-A**  
**No. 3 1/2(T), No. 5(T) AND**  
**No. 6(T) TRAFFIC PULL BOX**

**NOTES:**

- Traffic pull box shall be provided with steel cover and special concrete footing. Steel cover shall have embossed non-skid pattern.
- Steel reinforcing shall be as regularly used in the standard products of the respective manufacturer.
- Pull box covers shall be marked as follows: "SERVICE" Service circuits between service point and service disconnect; "SPRINKLER-CONTROL" Sprinkler control circuits, 50 V or less; "CALTRANS" On all pull boxes, except pull boxes marked "SPRINKLER-CONTROL"; and "TELEPHONE" Telephone service.
  - No. 3 1/2(T) pull box.
    - "SIGNAL" - Traffic signal circuits with or without lighting or sign lighting circuits.
    - "LIGHTING" - Lighting or sign lighting circuits where voltage is under 600 V.
  - No. 5(T) or 6(T) pull box.
    - "TRAFFIC SIGNAL" - Traffic signal circuits with or without lighting or sign lighting circuits.
    - "LIGHTING" - Lighting or sign lighting circuits where voltage is under 600 V.
    - "LIGHTING-HIGH VOLTAGE" - Lighting or sign lighting circuits where voltage is above 600 V.
    - "IRRIGATION" - Circuits to irrigation controller 120 V or more.
    - "RAMP METER" - Ramp meter circuits.
    - "COUNT STATION" - Count or speed monitor circuits.
    - "COMMUNICATION" - Communication circuits.
    - "TOS COMMUNICATIONS" - TOS communications line.
    - "TOS POWER" - TOS power.
    - "TDC POWER" - Telephone demarcation cabinet power.
    - "CCTV" - Closed circuit television circuits.
    - "TMS" - Traffic monitoring station circuits.
    - "CMS" - Changeable message sign circuits.
    - "HAR" - Highway advisory radio circuits.
    - "BOOSTER PUMP" - Booster pump circuit.
- Bonding jumper for metal covers shall be 3' long, minimum.
- The nominal dimensions of the opening in which the cover sets shall be the same as the cover dimensions except the length and width dimensions shall be 1/8" greater.
- Covers and boxes shall be interchangeable with California standard male and female gages. When interchanged with a standard male or female gage, the top surfaces shall be flush within 1/8".

PULL BOX	PULL BOX						COVER				
	MINIMUM * THICKNESS	MINIMUM DEPTH BOX AND EXTENSION	W0	L0	L1	W1	L **	W **	R	EDGE THICKNESS	EDGE TAPER
No. 3 1/2(T)	1 1/2"	1'-0"	1'-5"± 1"	1'-8 3/8"±	1'-2 1/2"±	10 5/8"± 1"	1'-8"±	1'-1 3/4"±	0"	1/2"	NONE
No. 5(T)	1 3/4"	1'-0"	1'-11 1/2"± 1"	2'-5 1/2"±	1'-7"±	1'-1"± 1"	2'-3"±	1'-4"±	0"	1/2"	NONE
No. 6(T)	2"	1'-0"	2'-6"± 1"	2'-11 1/2"±	1'-11 1/2"±	1'-5"± 1"	2'-9"±	1'-8"±	0"	1/2"	NONE

\* EXCLUDING CONDUIT WEB      \*\* TOP DIMENSION

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(TRAFFIC PULL BOX)**  
 NO SCALE

RSP ES-8B DATED JULY 19, 2013 SUPERSEDES RSP ES-8B DATED JANUARY 20, 2012 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP ES-8B**

2010 REVISED STANDARD PLAN RSP ES-8B