INDEX OF PLANS

| SHEET No. | DESCRIPTION |
|---|---|
| 1 | TITLE AND LOCATION MAP |
| 2-8 | CONSTRUCTION DETAILS |
| 9 | TRAFFIC HANDLING DETAILS |
| 10 | SUMMARY OF QUANTITIES |
| 11-26 | REVISED STANDARD PLANS |

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

STATE OF CALIFORNIA

# DEPARTMENT OF TRANSPORTATION

## PROJECT PLANS FOR CONSTRUCTION ON

# STATE HIGHWAY

## IN SACRAMENTO COUNTY NEAR GALT AT VARIOUS LOCATIONS FROM HERALD ROAD TO 0.2 MILE WEST OF CLAY STATION ROAD

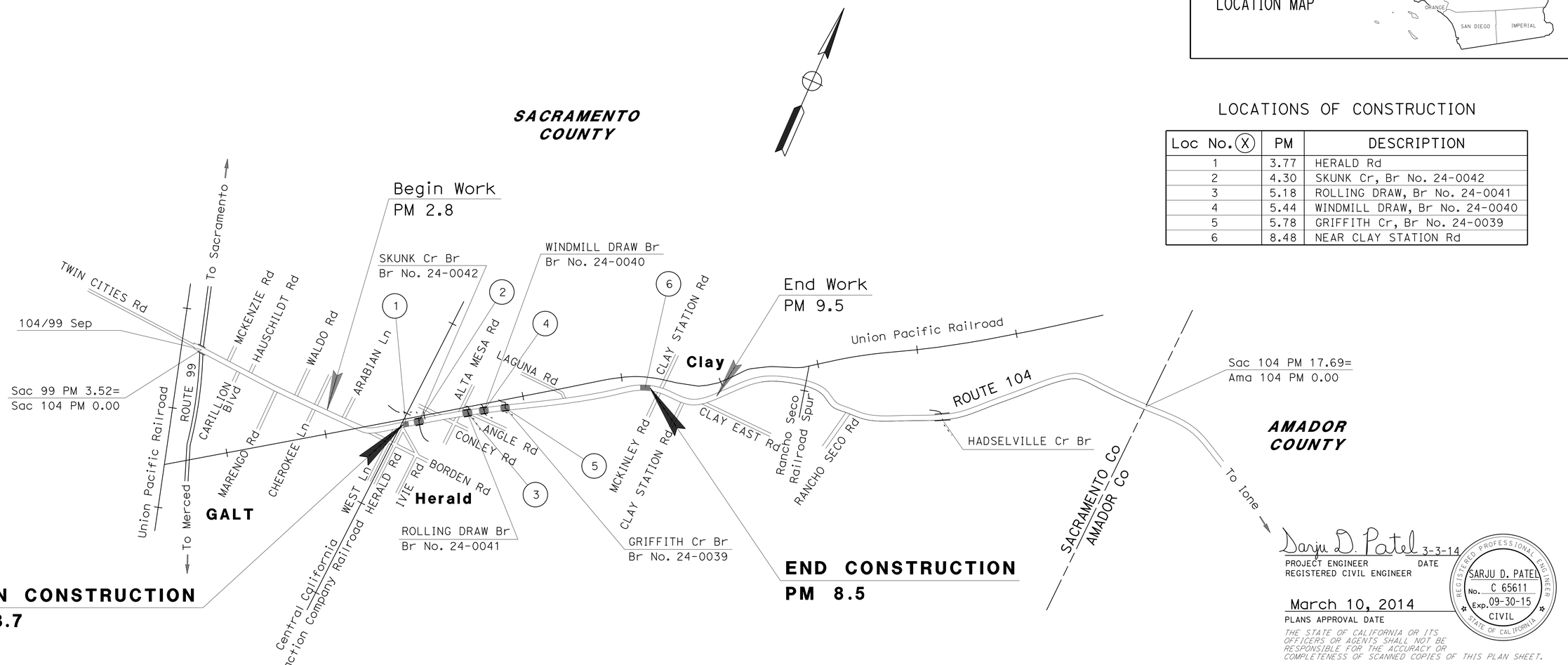
TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 1 | 26 |

LOCATION MAP

LOCATIONS OF CONSTRUCTION

| Loc No. (X) | PM | DESCRIPTION |
|---|---|---|
| 1 | 3.77 | HERALD Rd |
| 2 | 4.30 | SKUNK Cr, Br No. 24-0042 |
| 3 | 5.18 | ROLLING DRAW, Br No. 24-0041 |
| 4 | 5.44 | WINDMILL DRAW, Br No. 24-0040 |
| 5 | 5.78 | GRIFFITH Cr, Br No. 24-0039 |
| 6 | 8.48 | NEAR CLAY STATION Rd |




NO SCALE

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

PROJECT MANAGER: RONALD S. SYKES

DESIGN ENGINEER: RONALD S. SYKES

Darju D. Patel 3-3-14
PROJECT ENGINEER DATE
REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — SARJU D. PATEL — No. C 65611 — Exp. 09-30-15 — CIVIL — STATE OF CALIFORNIA

March 10, 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.

| CONTRACT No. | 03-4M6604 |
|---|---|
| PROJECT ID | 0312000303 |

LAST REVISION 05-14-13

DATE PLOTTED => 12-MAR-2014
TIME PLOTTED => 14:42

BORDER LAST REVISED 9/30/2012 | CALTRANS WEB SITE IS: HTTP//WWW.DOT.CA.GOV/ | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s119538 DGN FILE => 0312000303ab001.dgn | UNIT 0484 | PROJECT NUMBER & PHASE 03120003031

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 2 | 26 |

Darju D. Patel 3-3-14
REGISTERED CIVIL ENGINEER DATE

3-10-14
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — SARJU D. PATEL No. C 65611 Exp 09-30-15 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:

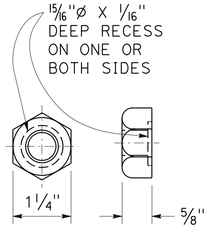
1. EXISTING UTILITY FACILITIES ARE NOT SHOWN ON THESE PLANS.
2. EXACT LOCATION OF DELINEATORS AND OBJECT MARKER TO BE DETERMINED BY THE ENGINEER. INSTALL DELINEATORS AT 100′ SPACING.
3. SEE CONSTRUCTION DETAILS FOR VEGETATION CONTROL (ASPHALT COMPOSITE) DETAILS.

## ABBREVIATIONS:

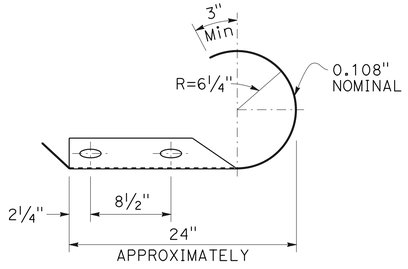
AILTS ALTERNATIVE IN-LINE TERMINAL SYSTEM
VC(AC) VEGETATION CONTROL (ASPHALT COMPOSITE)

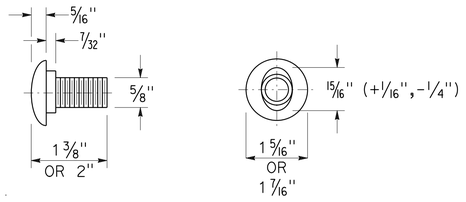
## LEGEND:

E DELINEATOR (CLASS 1) TYPE E
F DELINEATOR (CLASS 1) TYPE F
L-1 OBJECT MARKER (TYPE L-1)

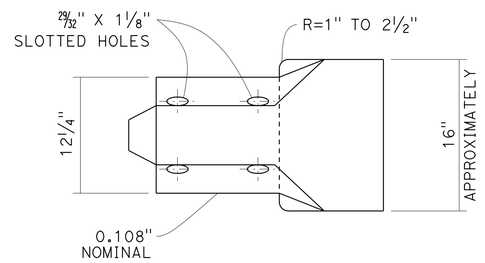


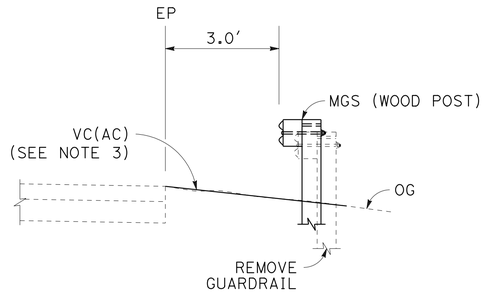

5/8" RECESS NUT



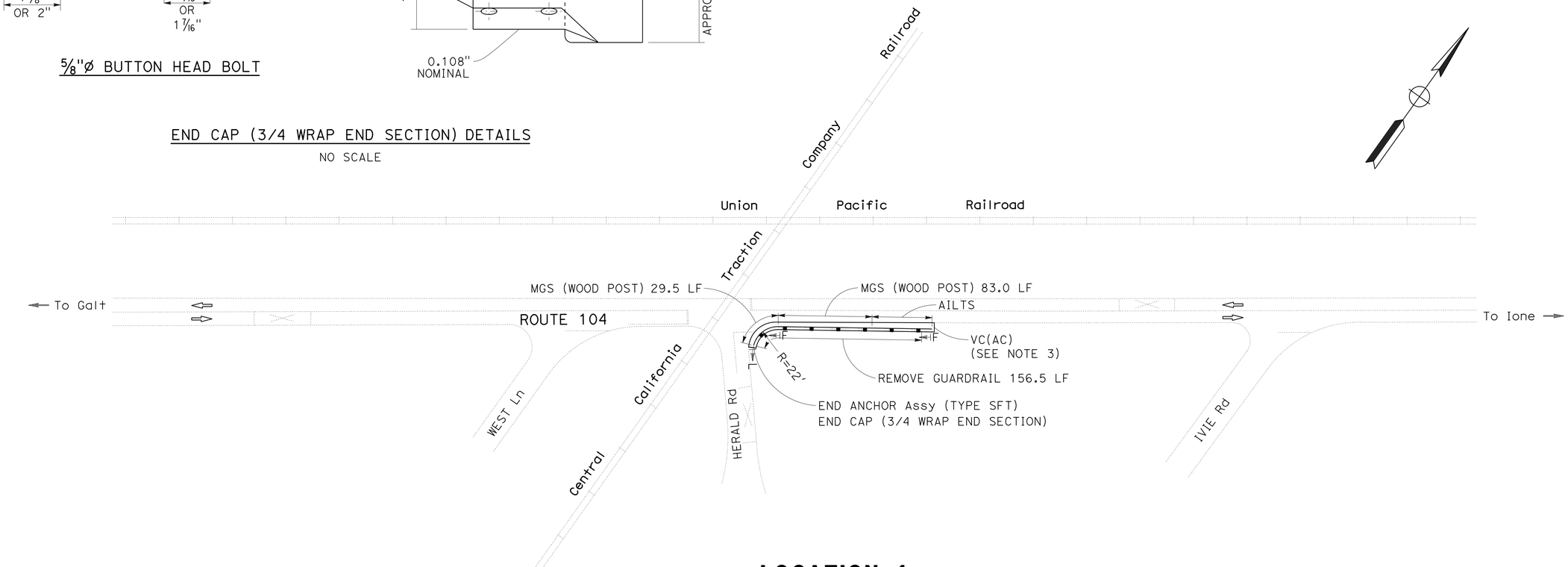

5/8"ø BUTTON HEAD BOLT




TYPICAL GUARDRAIL DETAILS
NO SCALE

END CAP (3/4 WRAP END SECTION) DETAILS
NO SCALE




**LOCATION 1**
PM 3.77

# CONSTRUCTION DETAILS
SCALE: 1" = 50′

C-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® MAINTENANCE DESIGN

| | REVISED BY | DATE REVISED |
|---|---|---|
| CALCULATED-DESIGNED BY | SARJU D. PATEL | |
| CHECKED BY | RONALD S. SYKES | |
| FUNCTIONAL SUPERVISOR | RONALD S. SYKES | |

LAST REVISION DATE PLOTTED => 12-MAR-2014
05-14-13 TIME PLOTTED => 14:01

BORDER LAST REVISED 7/2/2010 | USERNAME => s119538 | DGN FILE => 03120003031ga001.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0484 | PROJECT NUMBER & PHASE 03120003031

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 3 | 26 |

Sarju D. Patel 3-3-14
REGISTERED CIVIL ENGINEER DATE

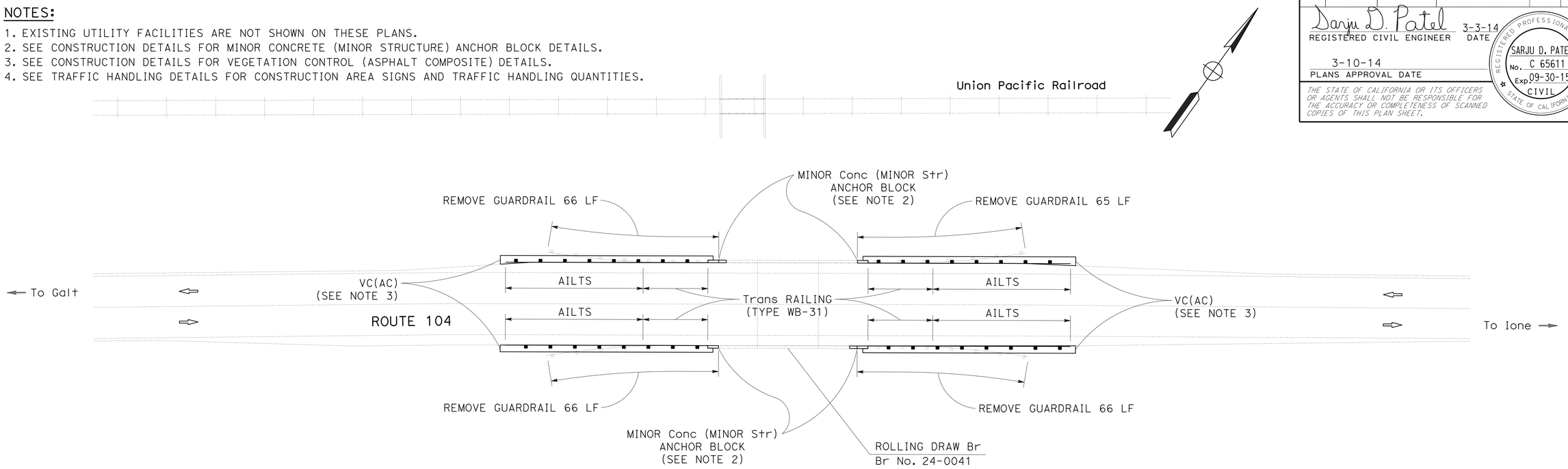
3-10-14
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — SARJU D. PATEL No. C 65611 Exp 09-30-15 CIVIL — STATE OF CALIFORNIA

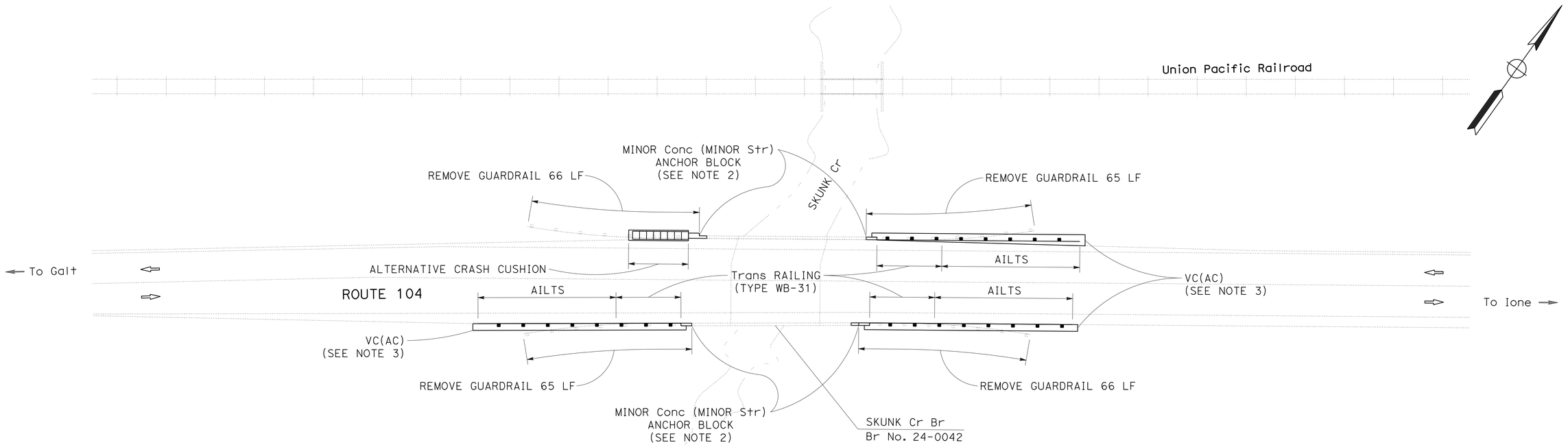
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

## NOTES:

1. EXISTING UTILITY FACILITIES ARE NOT SHOWN ON THESE PLANS.
2. SEE CONSTRUCTION DETAILS FOR MINOR CONCRETE (MINOR STRUCTURE) ANCHOR BLOCK DETAILS.
3. SEE CONSTRUCTION DETAILS FOR VEGETATION CONTROL (ASPHALT COMPOSITE) DETAILS.
4. SEE TRAFFIC HANDLING DETAILS FOR CONSTRUCTION AREA SIGNS AND TRAFFIC HANDLING QUANTITIES.




## LOCATION 3
PM 5.18




## LOCATION 2
PM 4.30

# CONSTRUCTION DETAILS
SCALE: 1" = 20'

C-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® MAINTENANCE DESIGN
FUNCTIONAL SUPERVISOR: RONALD S. SYKES
CALCULATED-DESIGNED BY: SARJU D. PATEL
CHECKED BY: RONALD S. SYKES
REVISED BY / DATE REVISED

LAST REVISION | DATE PLOTTED => 12-MAR-2014 | TIME PLOTTED => 14:01
05-14-13

BORDER LAST REVISED 7/2/2010 | USERNAME => s119538 | DGN FILE => 0312000303ga002.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0484 | PROJECT NUMBER & PHASE 03120003031

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 4 | 26 |

Darju D. Patel 3-3-14
REGISTERED CIVIL ENGINEER DATE

3-10-14
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
SARJU D. PATEL
No. C 65611
Exp 09-30-15
CIVIL
STATE OF CALIFORNIA

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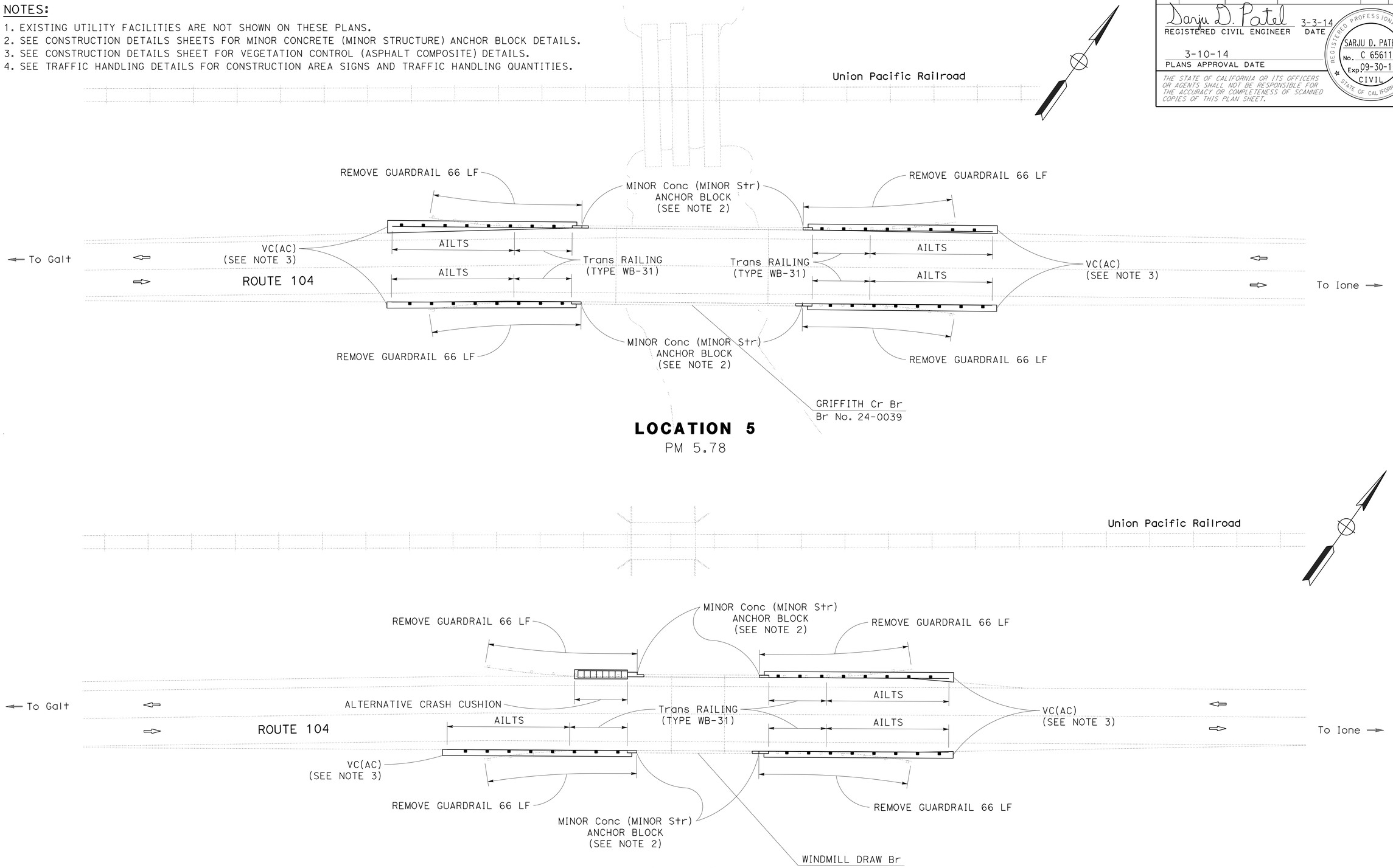
## NOTES:

1. EXISTING UTILITY FACILITIES ARE NOT SHOWN ON THESE PLANS.
2. SEE CONSTRUCTION DETAILS SHEETS FOR MINOR CONCRETE (MINOR STRUCTURE) ANCHOR BLOCK DETAILS.
3. SEE CONSTRUCTION DETAILS SHEET FOR VEGETATION CONTROL (ASPHALT COMPOSITE) DETAILS.
4. SEE TRAFFIC HANDLING DETAILS FOR CONSTRUCTION AREA SIGNS AND TRAFFIC HANDLING QUANTITIES.




**LOCATION 5**
PM 5.78




**LOCATION 4**
PM 5.44

# CONSTRUCTION DETAILS

SCALE: 1" = 20'

C-3

REVISED BY | DATE REVISED
SARJU D. PATEL | RONALD S. SYKES
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR | RONALD S. SYKES
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® MAINTENANCE DESIGN

LAST REVISION | DATE PLOTTED => 12-MAR-2014
05-14-13 | TIME PLOTTED => 14:01

BORDER LAST REVISED 7/2/2010 | USERNAME => s119538 | DGN FILE => 03120000303ga003.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0484 | PROJECT NUMBER & PHASE 03120003031

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 5 | 26 |

Darju D. Patel 3-3-14
REGISTERED CIVIL ENGINEER DATE

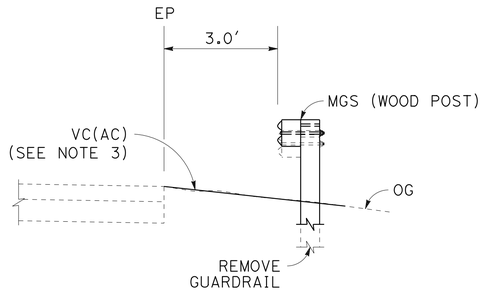
3-10-14
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
SARJU D. PATEL
No. C 65611
Exp. 09-30-15
CIVIL
STATE OF CALIFORNIA

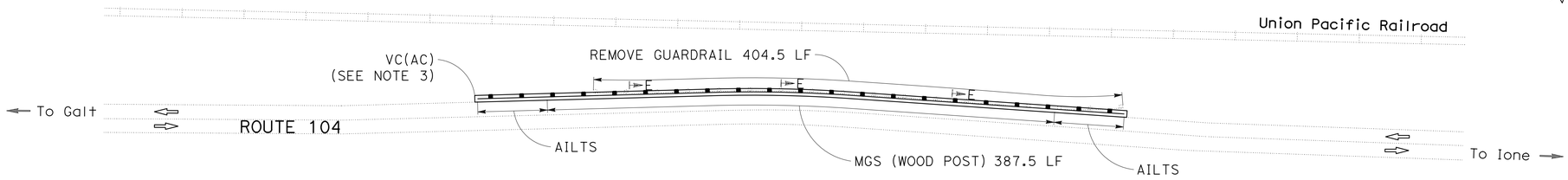
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

## NOTES:

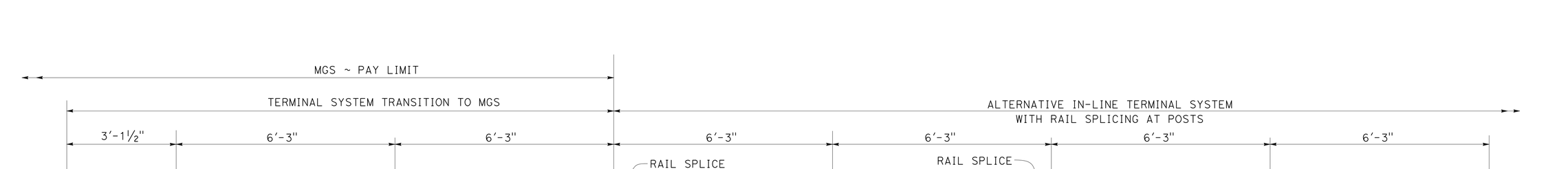
1. EXISTING UTILITY FACILITIES ARE NOT SHOWN ON THESE PLANS.
2. EXACT LOCATION OF DELINEATORS TO BE DETERMINED BY THE ENGINEER. INSTALL DELINEATORS AT 100′ SPACING.
3. SEE CONSTRUCTION DETAILS FOR VEGETATION CONTROL (ASPHALT COMPOSITE) DETAILS.
4. USE 15′-7 ½" LENGTH RAIL.




TYPICAL GUARDRAIL DETAILS
NO SCALE




## LOCATION 6
PM 8.48




## TRANSITION DETAIL FOR 31" TERMINAL SYSTEM END TREATMENT WITH RAIL SPLICING AT POSTS TO MIDWEST GUARDRAIL SYSTEM

LOCATION 1 AND 6
NO SCALE

## CONSTRUCTION DETAILS
SCALE: 1" = 50′

C-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® MAINTENANCE DESIGN
FUNCTIONAL SUPERVISOR: RONALD S. SYKES
CALCULATED-DESIGNED BY: SARJU D. PATEL
CHECKED BY: RONALD S. SYKES
REVISED BY / DATE REVISED

LAST REVISION 05-14-13
DATE PLOTTED => 19-MAR-2014
TIME PLOTTED => 13:21

BORDER LAST REVISED 7/2/2010
USERNAME => s119538
DGN FILE => 0312000303ga004.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0484
PROJECT NUMBER & PHASE 03120003031

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 6 | 26 |

Darju D. Patel 3-3-14
REGISTERED CIVIL ENGINEER DATE

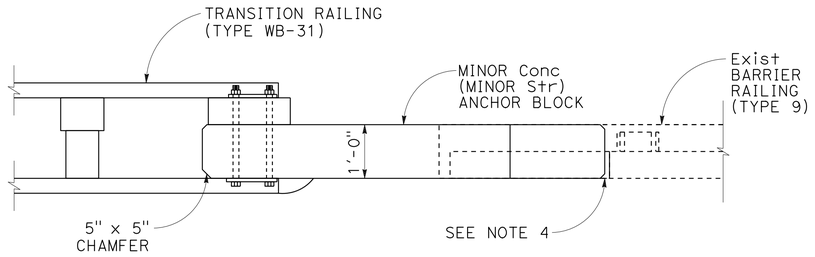
3-10-14
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
SARJU D. PATEL
No. C 65611
Exp 09-30-15
CIVIL
STATE OF CALIFORNIA

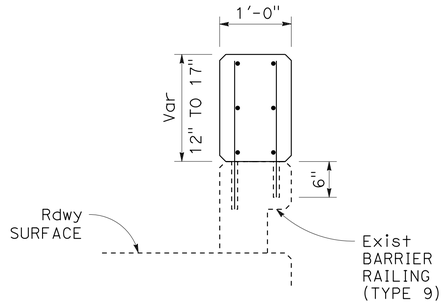
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

## NOTES:

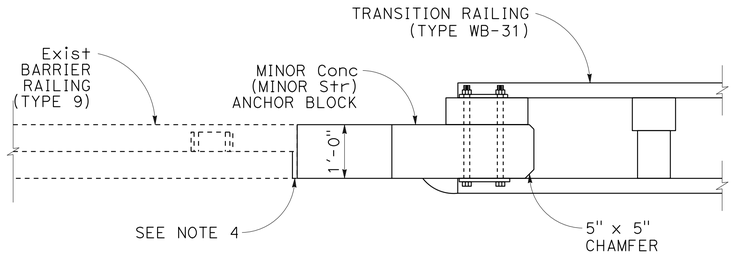
1. EXISTING UTILITY FACILITIES ARE NOT SHOWN ON THESE PLANS.
2. FOR TRANSITION RAILING (TYPE WB-31) CONNECTION DETAILS NOT SHOWN, SEE REVISED STANDARD PLAN RSP A77U4.
3. CONTRACTOR SHALL VERIFY DIMENSIONS IN THE FIELD BEFORE FABRICATION OF ANY END CONNECTION TO CONFORM WITH EXISTING PAVED CONDITIONS.
4. CUT AND REMOVE TUBING OF EXISTING BARRIER RAILING (TYPE 9) AS REQUIRED.



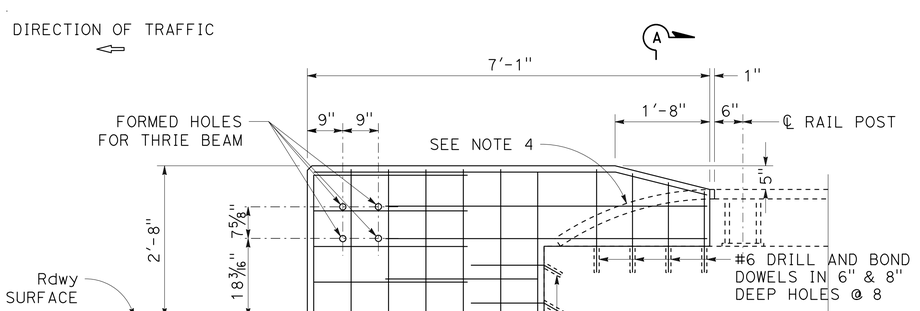

PLAN



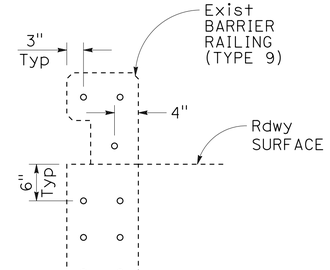

SECTION A-A



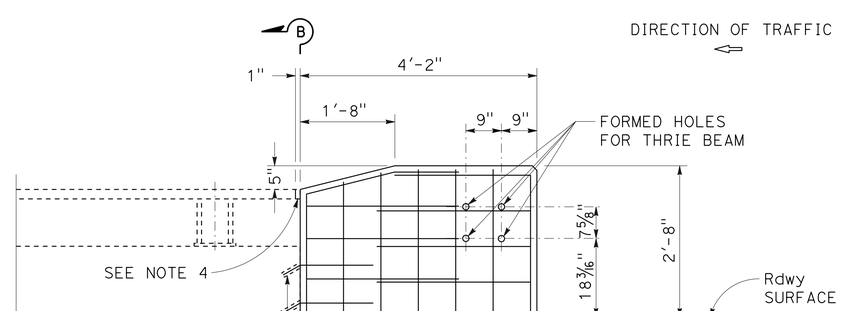

PLAN




ELEVATION




SECTION B-B




ELEVATION

# MIDWEST GUARDRAIL SYSTEM
# TRANSITION RAILING (TYPE WB-31)
# CONNECTION TO EXISTING APPROACH
# AND TRAILING BARRIER RAILING (TYPE 9)

## CONSTRUCTION DETAILS

NO SCALE

C-5

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® MAINTENANCE DESIGN
FUNCTIONAL SUPERVISOR: RONALD S. SYKES
CALCULATED-DESIGNED BY: SARJU D. PATEL
CHECKED BY: RONALD S. SYKES
REVISED BY
DATE REVISED

LAST REVISION: DATE PLOTTED => 12-MAR-2014
05-14-13 TIME PLOTTED => 14:01

BORDER LAST REVISED 7/2/2010
USERNAME => s119538
DGN FILE => 0312000303ga005.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0484
PROJECT NUMBER & PHASE 03120003031

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 7 | 26 |

Darju D. Patel 3-3-14
REGISTERED CIVIL ENGINEER DATE

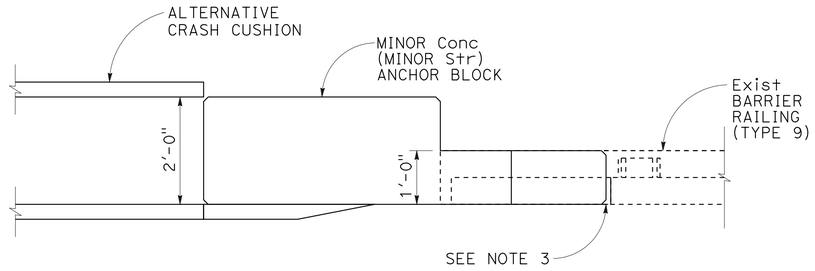
3-10-14
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
SARJU D. PATEL
No. C 65611
Exp 09-30-15
CIVIL
STATE OF CALIFORNIA

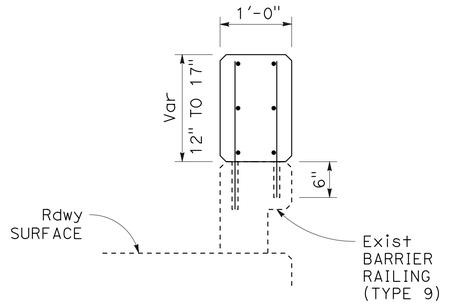
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

## NOTES:

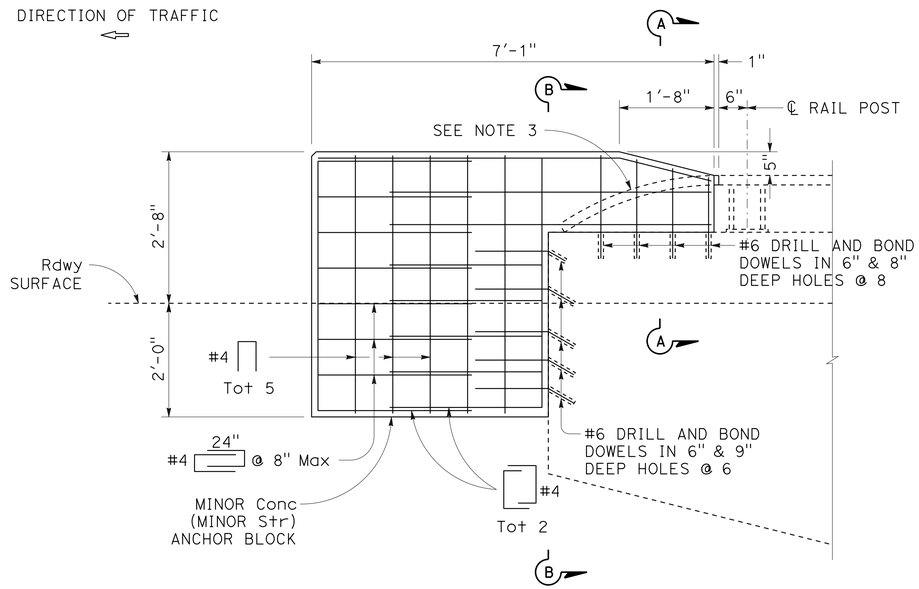
1. EXISTING UTILITY FACILITIES ARE NOT SHOWN ON THESE PLANS.
2. CONTRACTOR SHALL VERIFY DIMENSIONS IN THE FIELD BEFORE FABRICATION OF ANY END CONNECTION TO CONFORM WITH EXISTING PAVED CONDITIONS.
3. CUT AND REMOVE TUBING OF EXISTING BARRIER RAILING (TYPE 9) AS REQUIRED.



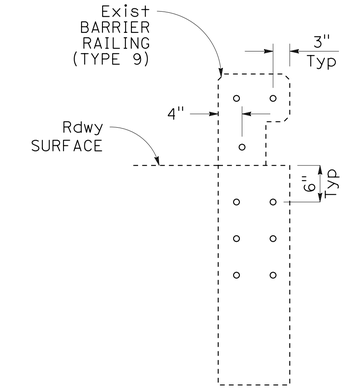

PLAN




SECTION A-A




ELEVATION




SECTION B-B

# ALTERNATIVE CRASH CUSHION CONNECTION TO EXISTING TRAILING BARRIER RAILING (TYPE 9)

# CONSTRUCTION DETAILS

NO SCALE

C-6

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® MAINTENANCE DESIGN
FUNCTIONAL SUPERVISOR: RONALD S. SYKES
CALCULATED-DESIGNED BY: SARJU D. PATEL
CHECKED BY: RONALD S. SYKES
REVISED BY
DATE REVISED

LAST REVISION DATE PLOTTED => 12-MAR-2014
05-14-13 TIME PLOTTED => 14:01

BORDER LAST REVISED 7/2/2010
USERNAME => s119538
DGN FILE => 0312000303ga006.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0484
PROJECT NUMBER & PHASE 03120003031

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 8 | 26 |

Sarju D. Patel 3-3-14
REGISTERED CIVIL ENGINEER DATE

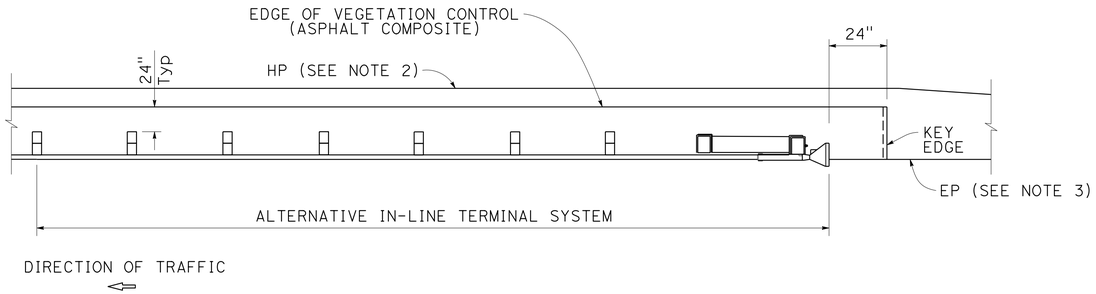
3-10-14
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
SARJU D. PATEL
No. C 65611
Exp 09-30-15
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.

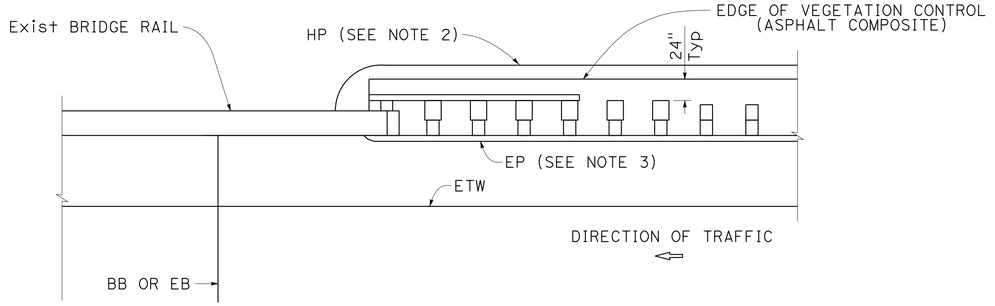
NOTES:

1. EXISTING UTILITY FACILITIES ARE NOT SHOWN ON THESE PLANS.
2. WHERE THE DISTANCE BETWEEN BACK OF POST AND HINGE POINT IS LESS THAN 24", CONSTRUCT VEGETATION CONTROL TO 12" BEYOND THE BACK EDGE OF POST WITH THE EDGE KEYED IN.
3. WHERE PAVED SHOULDER IS WITHIN 36" IN OF THE FACE OF RAIL ELEMENT, CONSTRUCT VEGETATION CONTROL TO EDGE OF PAVED SHOULDER.
4. FEATHER EDGE OF ASPHALT COMPOSITE TRANSITION UP POSTS. TRANSITION LINE SHALL FORM A REASONABLY STRAIGHT LINE, HORIZONTALLY FROM POST TO POST.



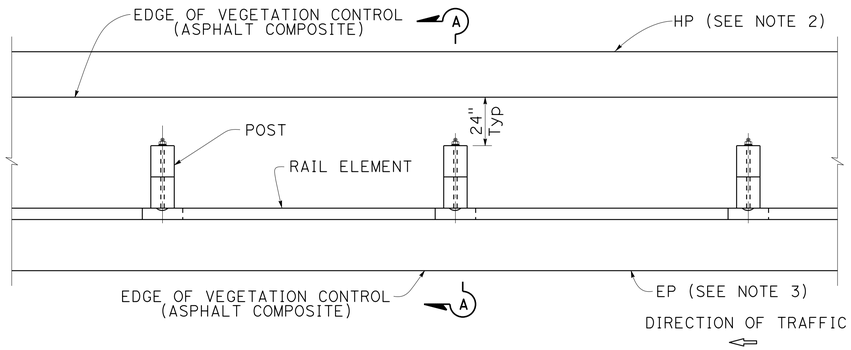

PLAN

AT ALTERNATIVE IN-LINE TERMINAL SYSTEMS



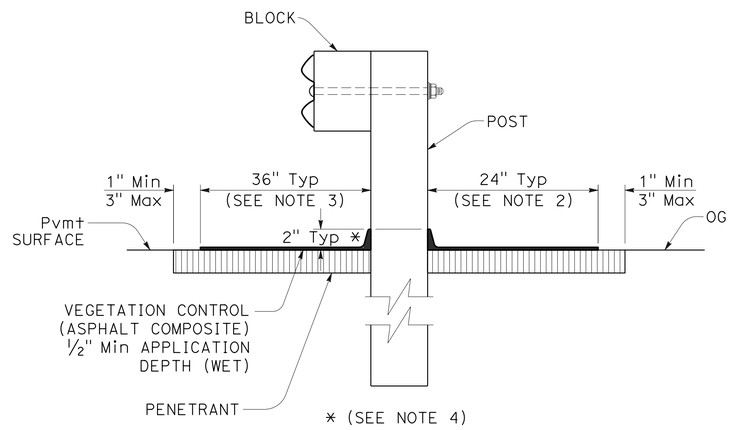

PLAN

NEAR BRIDGES

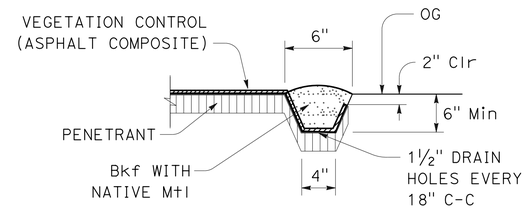



PLAN

ALONG MIDWEST GUARDRAIL SYSTEM




SECTION A-A




KEY EDGE

# VEGETATION CONTROL (ASPHALT COMPOSITE)

## CONSTRUCTION DETAILS

NO SCALE

C-7

REVISED BY | DATE REVISED
SARJU D. PATEL | RONALD S. SYKES
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR | RONALD S. SYKES
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® MAINTENANCE DESIGN

LAST REVISION DATE PLOTTED => 12-MAR-2014
05-14-13 TIME PLOTTED => 14:01

BORDER LAST REVISED 7/2/2010 | USERNAME => s119538 | DGN FILE => 0312000303ga007.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0484 | PROJECT NUMBER & PHASE 03120003031

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 9 | 26 |

Sarju D. Patel 3-3-14
REGISTERED CIVIL ENGINEER DATE

3-10-14
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
SARJU D. PATEL
No. C 65611
Exp 09-30-15
CIVIL
STATE OF CALIFORNIA

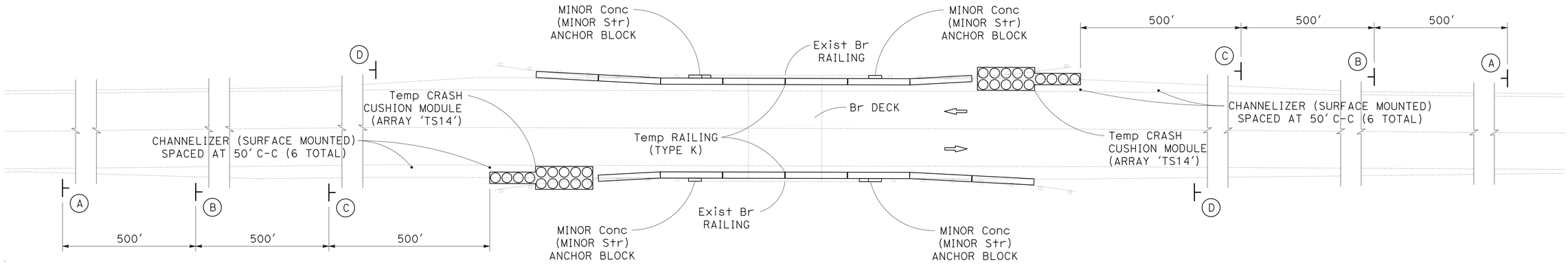
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

**NOTE:**

1. EXACT LOCATION OF TEMPORARY RAILING (TYPE K), TEMPORARY CRASH CUSHION MODULE, CHANNELIZERS, AND SIGNS TO BE DETERMINED BY THE ENGINEER.

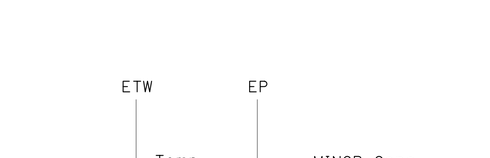
**LEGEND:**

- • CHANNELIZER (SURFACE MOUNTED)
- ┤ CONSTRUCTION AREA SIGN




## TRAFFIC HANDLING QUANTITIES

| LOCATION | PM | TEMPORARY RAILING (TYPE K) | CHANNELIZER (SURFACE MOUNTED) | TEMPORARY CRASH CUSHION MODULE | DESCRIPTION |
|---|---|---|---|---|---|
| | | LF | EA | EA | |
| 2 | 4.30 | 280 | 12 | 28 | SKUNK Cr, Br No. 24-0042 |
| 3 | 5.18 | 280 | 12 | 28 | ROLLING DRAW, Br No. 24-0041 |
| 4 | 5.44 | 280 | 12 | 28 | WINDMILL DRAW, Br No. 24-0040 |
| 5 | 5.78 | 360 | 12 | 28 | GRIFFITH Cr, Br No. 24-0039 |
| | | | | | |
| | TOTAL | 1200 | 48 | 112 | |




TYPICAL PLACEMENT DETAIL

## STATIONARY MOUNTED CONSTRUCTION AREA SIGNS

| SIGN LETTER | SIGN CODE | SIGN MESSAGE | PANEL SIZE | No. OF POSTS AND SIZE | No. OF SIGNS |
|---|---|---|---|---|---|
| (A) | C24(CA) | SHOULDER WORK AHEAD | 48" x 48" | 1 - 6" x 6" | 8 |
| (B) | W21-5bR (1000) | RIGHT SHOULDER CLOSED 1000 FT | 48" x 48" | 1 - 6" x 6" | 8 |
| (C) | C30A(CA) | SHOULDER CLOSED | 48" x 48" | 1 - 6" x 6" | 8 |
| (D) | G20-2 | END ROAD WORK | 36" x 18" | 1 - 4" x 4" | 8 |

**AT BRIDGE LOCATIONS**

# TRAFFIC HANDLING DETAILS

NO SCALE

**THD-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
MAINTENANCE DESIGN
FUNCTIONAL SUPERVISOR: RONALD S. SYKES
CALCULATED-DESIGNED BY: SARJU D. PATEL
CHECKED BY: RONALD S. SYKES
REVISED BY / DATE REVISED

LAST REVISION | DATE PLOTTED => 12-MAR-2014
05-14-13 | TIME PLOTTED => 14:01

BORDER LAST REVISED 7/2/2010
USERNAME => s119538
DGN FILE => 0312000303me001.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0484
PROJECT NUMBER & PHASE 03120003031

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 10 | 26 |

Sarju D. Patel 3-3-14
REGISTERED CIVIL ENGINEER DATE

3-10-14
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
SARJU D. PATEL
No. C 65611
Exp 09-30-15
CIVIL
STATE OF CALIFORNIA

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# MIDWEST GUARDRAIL SYSTEM

| LOCATION | PM | REMOVE GUARDRAIL | TREATED WOOD WASTE | (N) REMOVE CONCRETE ANCHORS | MINOR CONCRETE (MINOR STRUCTURE) | TRANSITION RAILING (TYPW WB-31) | MIDWEST GUARDRAIL SYSTEM (WOOD POST) | END ANCHOR ASSEMBLY (TYPE SFT) | ALTERNATIVE IN-LINE TERMINAL SYSTEM | END CAP (3/4 WRAP END SECTION) | ALTERNATIVE CRASH CUSHION | VEGETATION CONTROL (ASPHALT COMPOSITE) | (N) MIDWEST GUARDRAIL SYSTEM LAYOUT TYPE | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LF | LB | EA | CY | EA | LF | EA | | | | SQYD | | |
| 1 | 3.77 | 156.5 | 2161 | 3 | | | 112.5 | 1 | 1 | 1 | | 139.3 | 11D | HERALD Rd |
| 2 | 4.30 | 262.0 | 615 | 12 | 3.88 | 3 | | | 3 | | 1 | 78.5 | 12A, 12AA | SKUNK Cr, Br No. 24-0042 |
| 3 | 5.18 | 263.0 | 615 | 12 | 3.16 | 4 | | | 4 | | | 95.8 | 12A, 12AA | ROLLING DRAW, Br No. 24-0041 |
| 4 | 5.44 | 264.0 | 615 | 12 | 3.88 | 3 | | | 3 | | 1 | 72.5 | 12A, 12AA | WINDMILL DRAW, Br No. 24-0040 |
| 5 | 5.78 | 264.0 | 615 | 12 | 3.16 | 4 | | | 4 | | | 112.6 | 12A, 12AA | GRIFFITH Cr, Br No. 24-0039 |
| 6 | 8.48 | 404.5 | 301 | 2 | | | 387.5 | | 2 | | | 282.3 | 11D | NEAR CLAY STATION Rd |
| | | | | | | | | | | | | | | |
| SUBTOTAL | | 1614.0 | 4922 | 53 | 14.08 | 14 | 500.0 | 1 | 17 | 1 | 2 | 781.0 | | |
| TOTAL | | 1614.0 | 4922 | | 14.08 | 14 | 500.0 | 1 | 17 | 1 | 2 | 781.0 | | |

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

# MARKERS AND DELINEATORS

| LOCATION | PM | (N) REMOVE MARKER | (N) REMOVE DELINEATOR | RESET HIGHWAY POST MARKER | DELINEATOR (CLASS 1) TYPE E | DELINEATOR (CLASS 1) TYPE F | OBJECT MARKER (TYPE L-1) | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|
| | | EA | | | | | | |
| 1 | 3.77 | 2 | 3 | | | 2 | 1 | HERALD Rd |
| 2 | 4.30 | 2 | 2 | | | | | SKUNK Cr, Br No. 24-0042 |
| 3 | 5.18 | 2 | 2 | | | | | ROLLING DRAW, Br No. 24-0041 |
| 4 | 5.44 | 2 | 2 | | | | | WINDMILL DRAW, Br No. 24-0040 |
| 5 | 5.78 | 2 | 2 | | | | | GRIFFITH Cr, Br No. 24-0039 |
| 6 | 8.48 | 1 | 3 | 1 | 3 | | | NEAR CLAY STATION Rd |
| | | | | | | | | |
| SUBTOTAL | | 11 | 14 | 1 | 3 | 2 | 1 | |
| TOTAL | | | | 1 | 5 | | 1 | |

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

## SUMMARY OF QUANTITIES

Q-1

| REVISED BY | DATE REVISED |
|---|---|
| | |

CALCULATED-DESIGNED BY: SARJU D. PATEL
CHECKED BY: RONALD S. SYKES
FUNCTIONAL SUPERVISOR: RONALD S. SYKES

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® MAINTENANCE DESIGN

LAST REVISION 05-14-13 | DATE PLOTTED => 12-MAR-2014 | TIME PLOTTED => 14:01

BORDER LAST REVISED 7/2/2010

USERNAME => s119538
DGN FILE => 0312000303pa001.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0484 | PROJECT NUMBER & PHASE 03120003031

## 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,<br>MODIFY |
| Mon | MONUMENT |
| MP | METAL PLATE |
| MPGR | METAL PLATE GUARD RAILING |
| MR | MOVEMENT RATING |
| MSE | MECHANICALLY STABILIZED EMBANKMENT |
| Mt | MOUNTAIN, MOUNT |
| Mtl | MATERIAL |
| MVP | MAINTENANCE VEHICLE PULLOUT |

## N

| | |
|---|---|
| N | NORTH |
| NB | NORTHBOUND |
| No. | NUMBER (MUST HAVE PERIOD) |
| Nos. | NUMBERS (MUST HAVE PERIOD) |
| NPS | NOMINAL PIPE SIZE |
| NS | NEAR SIDE |
| NSP | NEW STANDARD PLAN |
| NTS | NOT TO SCALE |

## O

| | |
|---|---|
| Oblr | OBLITERATE |
| OC | OVERCROSSING |
| OD | OUTSIDE DIAMETER |
| OF | OUTSIDE FACE |
| OG | ORIGINAL GROUND |
| OGAC | OPEN GRADED ASPHALT CONCRETE |
| OGFC | OPEN GRADED FRICTION COURSE |
| OH | OVERHEAD |
| OHWM | ORDINARY HIGH WATER MARK |
| O-O | OUT TO OUT |
| Opp | OPPOSITE |
| OSD | OVERSIDE DRAIN |

## P

| | |
|---|---|
| p | PAGE |
| PAP | PERFORATED ALUMINUM PIPE |
| PB | PULL BOX |
| PC | POINT OF CURVATURE,<br>PRECAST |
| PCC | POINT OF COMPOUND CURVE,<br>PORTLAND CEMENT CONCRETE |
| PCMS | PORTABLE CHANGEABLE MESSAGE SIGN |
| PCP | PERFORATED CONCRETE PIPE,<br>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 Mtl | PERMEABLE MATERIAL |

## P continued

| | |
|---|---|
| PG | PROFILE GRADE |
| PI | POINT OF INTERSECTION |
| PJP | PARTIAL JOINT PENETRATION |
| Pkwy | PARKWAY |
| ℙ,PL | PLATE |
| P/L | PROPERTY LINE |
| PM | POST MILE,<br>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,<br>PLASTIC PIPE,<br>POWER POLE |
| PPL | PREFORMED PERMEABLE LINER |
| PPP | PERFORATED PLASTIC PIPE |
| PRC | POINT OF REVERSE CURVE |
| PRF | PAVEMENT REINFORCING FABRIC |
| PRVC | POINT OF REVERSE VERTICAL CURVE |
| PS&E | PLANS, SPECIFICATIONS AND ESTIMATES |
| PS, P/S | PRESTRESSED |
| PSP | PERFORATED STEEL PIPE |
| PT | POINT OF TANGENCY |
| PVC | POLYVINYL CHLORIDE |
| Pvmt | PAVEMENT |

## Q

| | |
|---|---|
| Qty | QUANTITY |

## R

| | |
|---|---|
| R | RADIUS |
| R & D | REMOVE AND DISPOSE |
| R & S | REMOVE AND SALVAGE |
| R/C | RATE OF CHANGE |
| RCA | REINFORCED CONCRETE ARCH |
| RCB | REINFORCED CONCRETE BOX |
| RCP | REINFORCED CONCRETE PIPE |
| RCPA | REINFORCED CONCRETE PIPE ARCH |
| Rd | ROAD |
| Reinf | REINFORCED,<br>REINFORCEMENT,<br>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,<br>REFERENCE POINT |
| RR | RAILROAD |
| RSP | ROCK SLOPE PROTECTION,<br>REVISED STANDARD PLAN |
| Rt | RIGHT |
| Rte | ROUTE |
| RW | REDWOOD,<br>RETAINING WALL |
| R/W | RIGHT OF WAY |
| Rwy | RAILWAY |

## S

| | |
|---|---|
| S | SOUTH,<br>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,<br>SECTION |
| Sep | SEPARATION |
| SG | SUBGRADE |
| Shld | SHOULDER |
| Sht | SHEET |
| Sim | SIMILAR |
| ℄ | STATION LINE |
| SM | SELECTED MATERIAL |
| Spec | SPECIAL,<br>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,<br>SOUND WALL |
| Swr | SEWER |
| Sym | SYMMETRICAL |
| S4S | SURFACE 4 SIDES |

## T

| | |
|---|---|
| T | SEMI-TANGENT |
| Tan | TANGENT |
| TBB | THRIE BEAM BARRIER |
| Tbr | TIMBER |
| TC | TOP OF CURB |
| TCB | TRAFFIC CONTROL BOX |
| TCE | TEMPORARY CONSTRUCTION EASEMENT |
| 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,<br>TRAFFIC SIGNAL,<br>TUBULAR STEEL |
| Typ | TYPICAL |

## U

| | |
|---|---|
| UC | UNDERCROSSING |
| UD | UNDERDRAIN |
| UG | UNDERGROUND |
| UON | UNLESS OTHERWISE NOTED |
| UP | UNDERPASS |

## V

| | |
|---|---|
| V | VALVE,<br>DESIGN SPEED |
| Var | VARIABLE,<br>VARIES |
| VC | VERTICAL CURVE |
| VCP | VITRIFIED CLAY PIPE |
| Vert | VERTICAL |
| Via | VIADUCT |
| Vol | VOLUME |

## W

| | |
|---|---|
| W | WEST,<br>WIDTH |
| WB | WESTBOUND |
| WH | WEEP HOLE |
| WM | WIRE MESH |
| WS | WATER SURFACE |
| WSP | WELDED STEEL PIPE |
| Wt | WEIGHT |
| WV | WATER VALVE |
| WW | WINGWALL |
| WWLOL | WINGWALL LAYOUT LINE |

## X

| | |
|---|---|
| X Sec | CROSS SECTION |
| Xing | CROSSING |

## Y

| | |
|---|---|
| Yr | YEAR |
| Yrs | YEARS |

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 11 | 26 |

Grace M. Tsushima
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Grace M. Tsushima No. C49814 Exp. 9-30-14 CIVIL — STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED 3-10-14

### 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 |
| $lb/ft^3$, pcf | POUNDS PER CUBIC FOOT |
| tsf | TONS PER SQUARE FOOT |
| mph, MPH * | MILES PER HOUR |
| ø | NOMINAL DIAMETER |
| oz | OUNCE |
| lb | POUND |
| kip | 1,000 POUNDS |
| cal | CALORIE |
| ft | FOOT OR FEET |
| gal | GALLON |

* For use on a sign panel only

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# ABBREVIATIONS (SHEET 2 OF 2)

NO SCALE

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

**REVISED STANDARD PLAN RSP A10B**

2010 REVISED STANDARD PLAN RSP A10B

6-7-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 12 | 26 |

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

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

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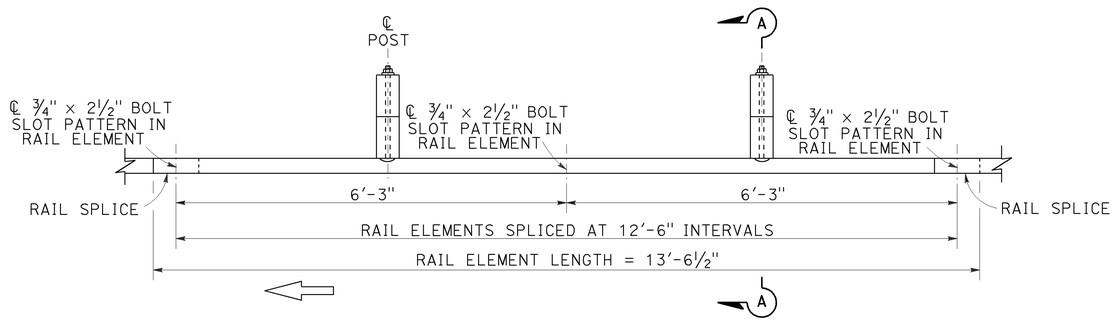
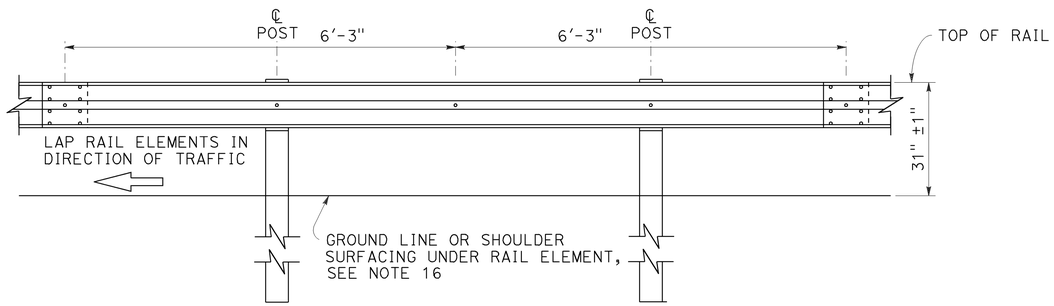
TO ACCOMPANY PLANS DATED 3-10-14

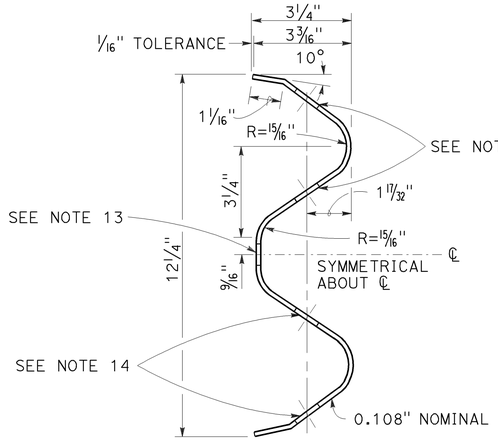



PLAN




ELEVATION

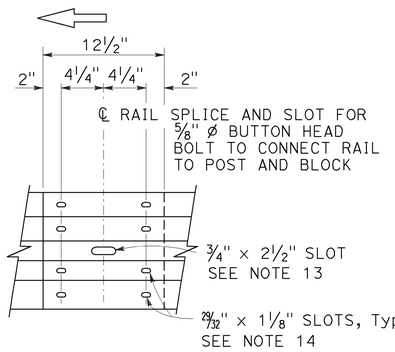
# MIDWEST GUARDRAIL SYSTEM WITH WOOD POST AND BLOCKS




SECTION THRU RAIL ELEMENT

## NOTES:

1. For details of steel post installations, see Revised Standard Plan RSP A77L2.
2. For details of standard hardware used to construct MGS, see Revised Standard Plan RSP A77M1.
3. For details of wood posts and wood blocks used to construct MGS, see Revised Standard Plan RSP A77N1.
4. For additional installation details, see Revised Standard Plan RSP A77N3.
5. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
6. For MGS typical layouts, see the A77P, A77Q and A77R Series of Standard Plans.
7. If railing is connected to terminal system end treatment, use 31" height terminal system end treatment.
8. For MGS end anchor details, see Revised Standard Plans RSP A77S1 and RSP A77T2.
9. For details of MGS transition to bridge railing, see Revised Standard Plan RSP A77U4.
10. For additional details of MSG connection to bridge railing, see Revised Standard Plans RSP A77U1, RSP A77U2 and RSP A77V1.
11. For MGS connection details to abutments and walls, see Revised Standard Plan RSP A77U3.
12. For typical MGS delineation and dike positioning details, see Revised Standard Plan RSP A77N4.
13. Slotted hole for bolted connection of rail element to block and post. See "Section Thru Rail Element".
14. Slotted holes for splice bolts to overlap ends of rail element. See "Section Thru Rail Element".
15. Additional hole in uppermost portion of line post is for potential future adjustments of railing height. See Revised Standard Plan RSP A77N1.
16. Install posts in soil.



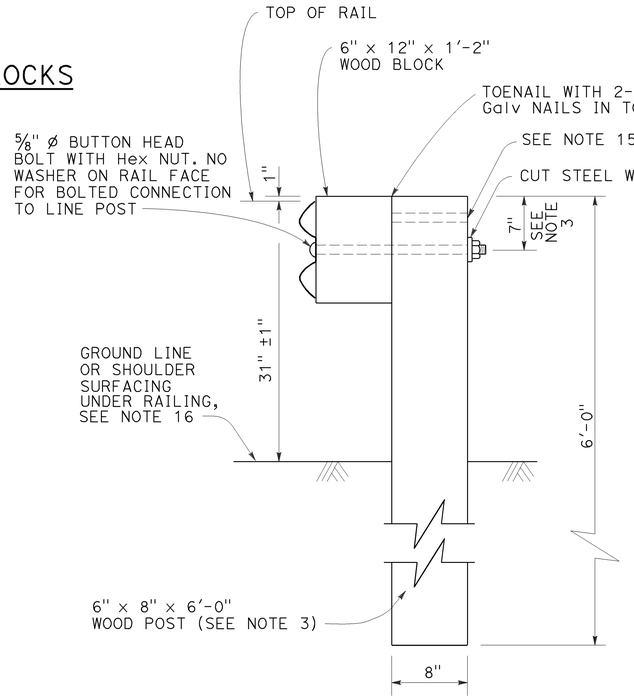

ELEVATION

## RAIL ELEMENT SPLICE DETAIL

a) Connect the over lapped end of the rail elements with ⅝" ø x 1⅜" button head oval shoulder splice bolts inserted into the 29/32" x 1⅛" slots and bolted together with ⅝" ø recessed hex nuts. Recess of hex nut points toward rail element. A total of 8 bolts and nuts are to be used at each rail splice connection.

b) The ends of the rail elements are to be overlapped in the direction of traffic (see details).

c) 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 WOOD LINE POST INSTALLATION

See Note 4

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# MIDWEST GUARDRAIL SYSTEM STANDARD RAILING SECTION (WOOD POST WITH WOOD BLOCK)

NO SCALE

RSP A77L1 DATED JULY 19, 2013 SUPPLEMENTS STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77L1**

2010 REVISED STANDARD PLAN RSP A77L1

7-3-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 13 | 26 |

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

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

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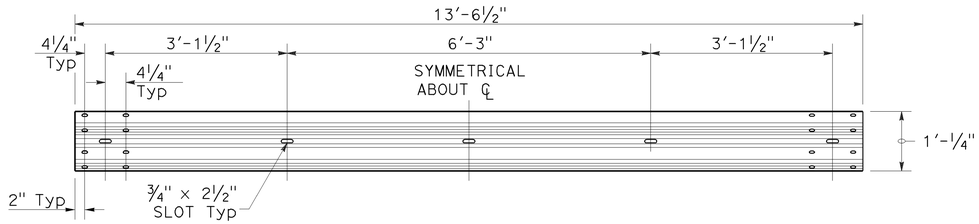
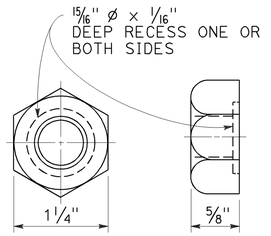
TO ACCOMPANY PLANS DATED 3-10-14



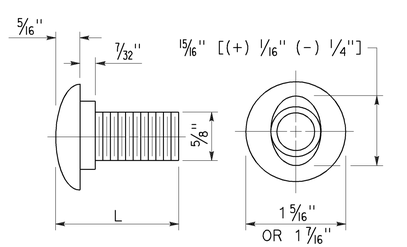

## TYPICAL RAIL ELEMENT

**NOTE:**

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




## ⅝" Ø RECESS NUT

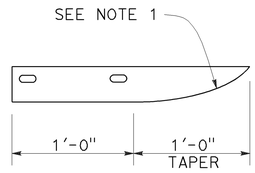



## ⅝" Ø BUTTON HEAD BOLT

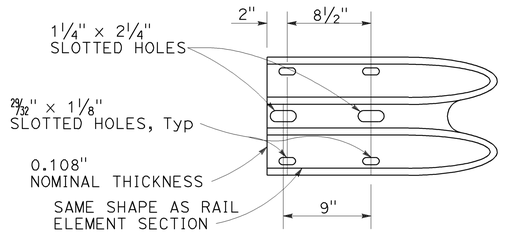
### BUTTON HEAD BOLT

| L | THREAD LENGTH |
|---|---|
| 1⅜" | 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 |
| ** 2¾" | 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**

7-3-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 14 | 26 |

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

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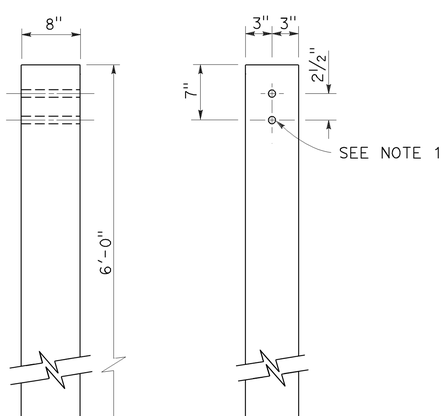
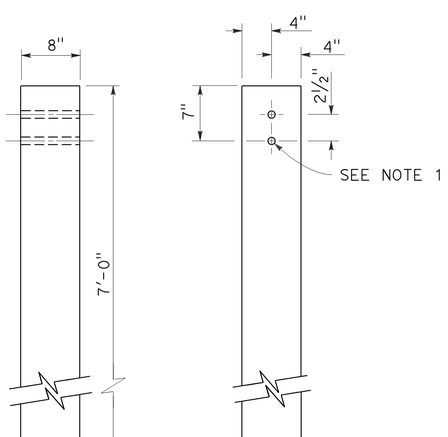
TO ACCOMPANY PLANS DATED 3-10-14



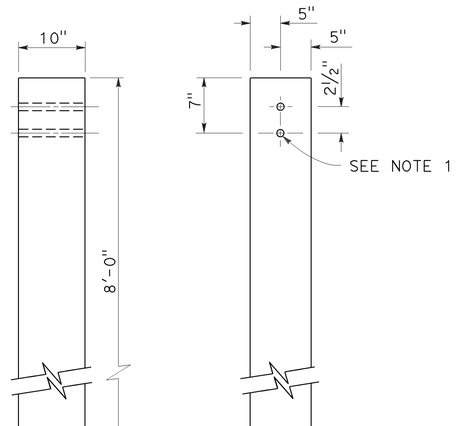

SIDE FRONT

6" x 8" WOOD POST
See Note 3




SIDE FRONT

8" x 8" WOOD POST
See Note 4

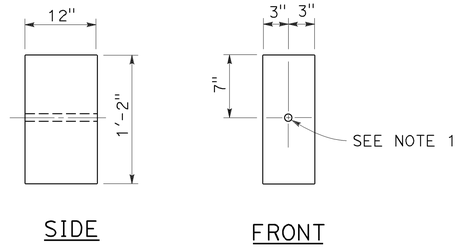



SIDE FRONT

10" x 10" WOOD POST
See Note 5

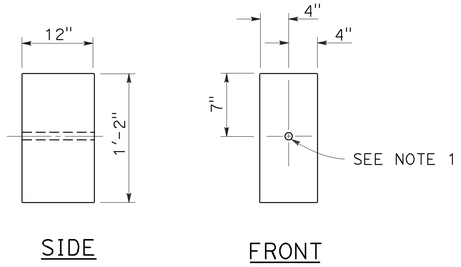
## NOTES:

1. All holes in wood posts and blocks shall be ¾" Dia ± 1/16".
2. Dimensions shown for wood post are nominal.
3. This post and block combination used for standard line post sections of MGS.
4. This post and 8" x 12" block combination used for line post sections of MGS on narrow roadways.
5. This post and 8" x 12" block combination is typically used where strengthened line post sections of MGS are warranted to shield fixed objects.
6. See Revised Standard Plan RSP A77L3 for use of 6" x 8" and 8" x 8" wood blocks.



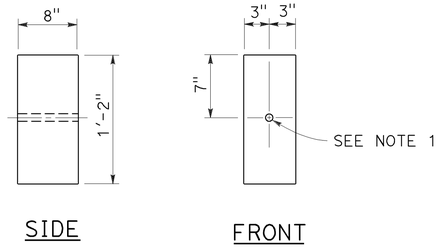

SIDE FRONT

6" x 12" WOOD BLOCK
See Note 3



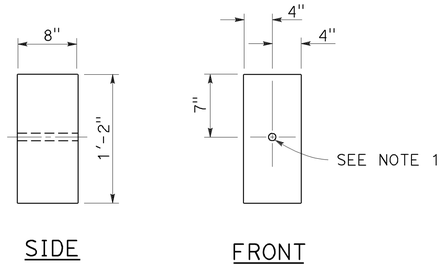

SIDE FRONT

8" x 12" WOOD BLOCK




SIDE FRONT

6" x 8" WOOD BLOCK
Only for use with metal beam guard rail see Note 6




SIDE FRONT

8" x 8" WOOD BLOCK
Only for use with metal beam guard rail see Note 6

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# MIDWEST GUARDRAIL SYSTEM WOOD POST AND WOOD BLOCK DETAILS

NO SCALE

RSP A77N1 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77N1**

2010 REVISED STANDARD PLAN RSP A77N1

7-3-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 15 | 26 |

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

November 15, 2013
PLANS APPROVAL DATE

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

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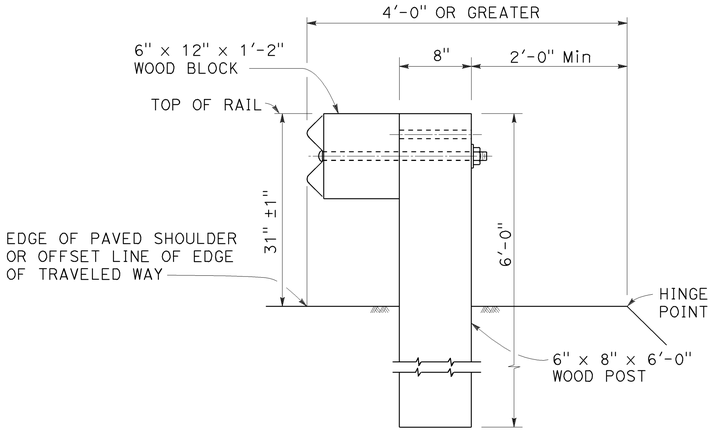
TO ACCOMPANY PLANS DATED 3-10-14

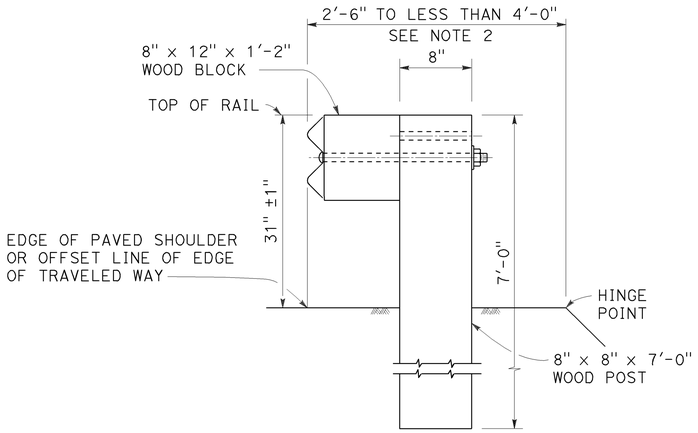
2010 REVISED STANDARD PLAN RSP A77N3




DETAIL A

TYPICAL ROADWAY INSTALLATION

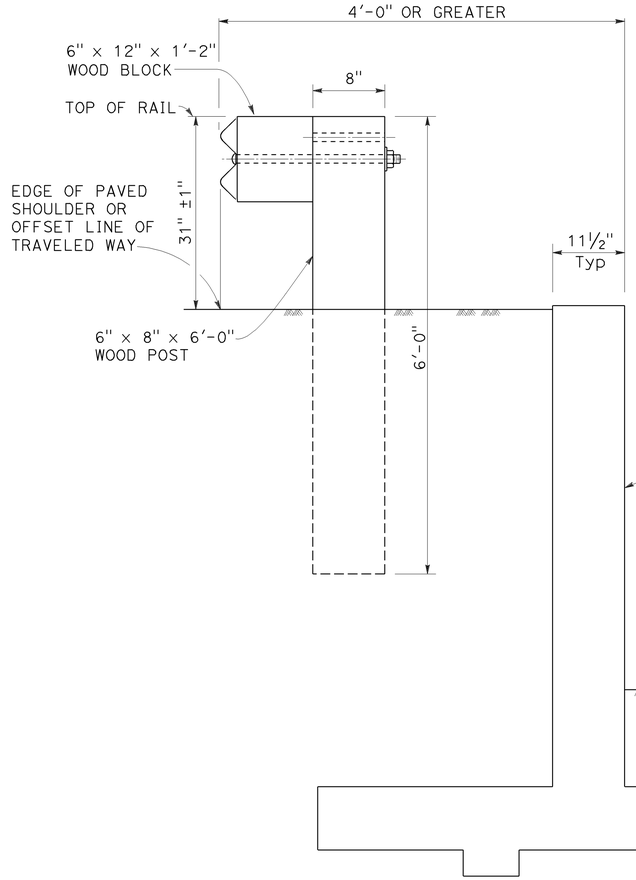
See Note 1



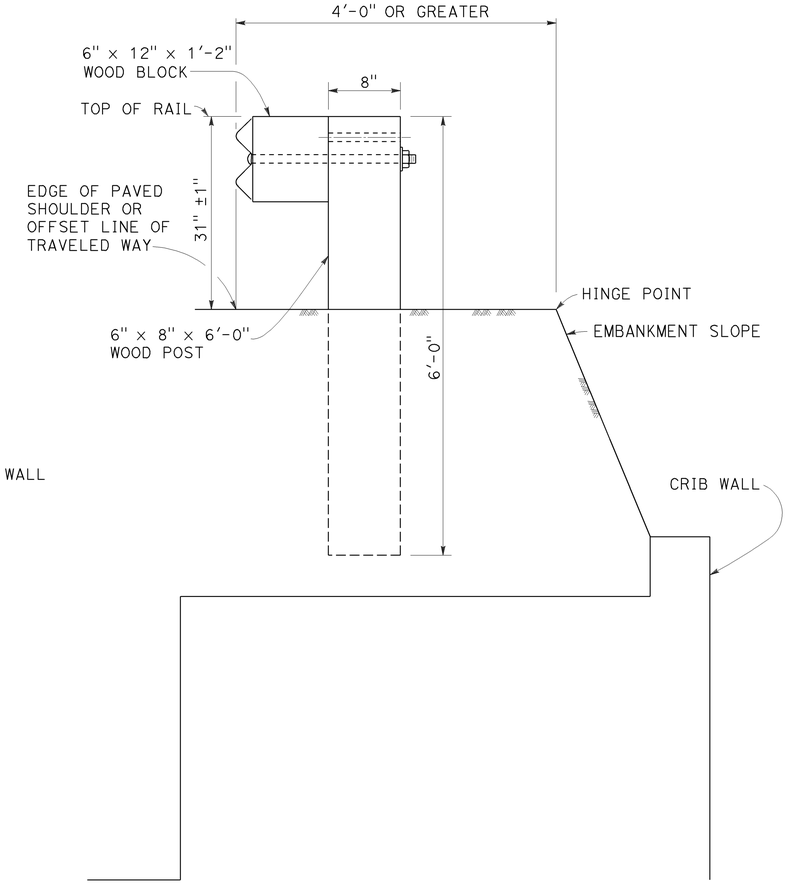

DETAIL B

NARROW ROADWAY INSTALLATION

See Note 1




DETAIL C




DETAIL D

## POST EMBEDMENT

## INSTALLATION AT EARTH RETAINING WALLS

NOTES:

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

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

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

**REVISED STANDARD PLAN RSP A77N3**

10-29-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 16 | 26 |

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Randell D. Hiatt
No. C50200
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CIVIL
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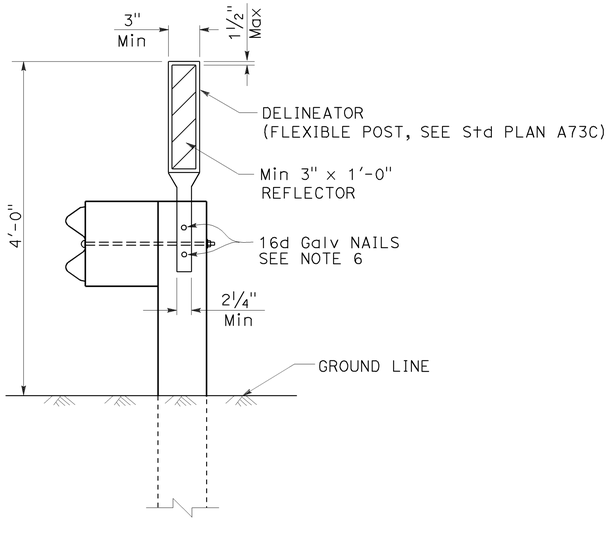
TO ACCOMPANY PLANS DATED 3-10-14

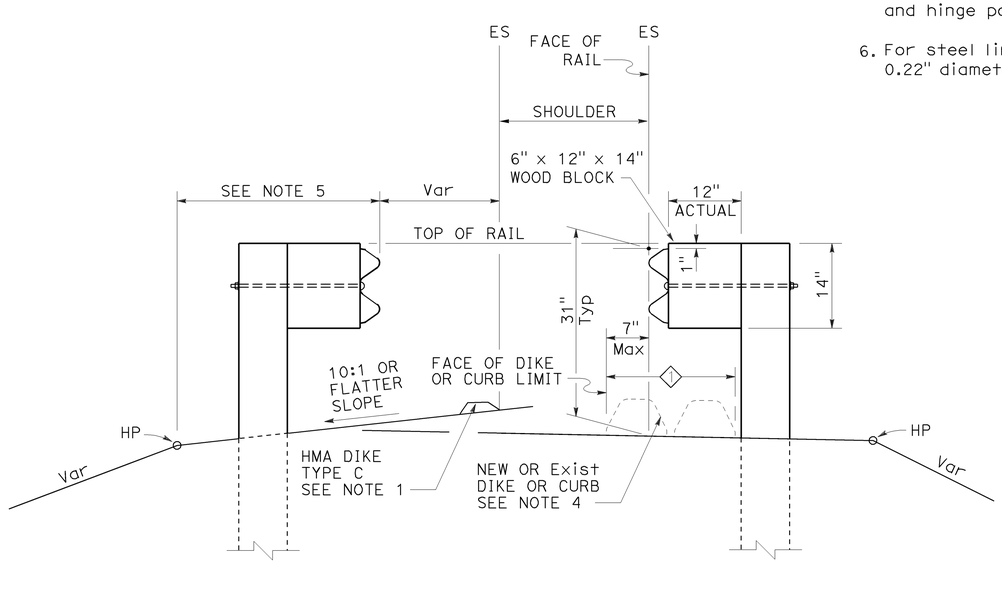
## NOTES:

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 9/32" diameter holes.




## MGS DELINEATION

See Note 3




## DIKE POSITIONING

See Note 1

◇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**

7-10-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 17 | 26 |

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

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Randell D. Hiatt
No. C50200
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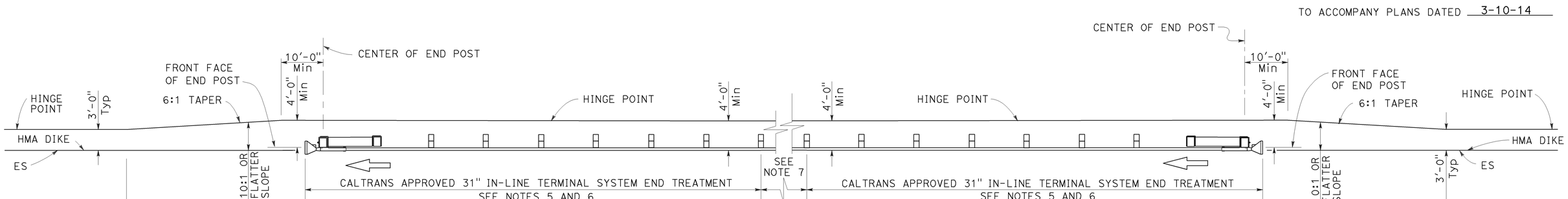
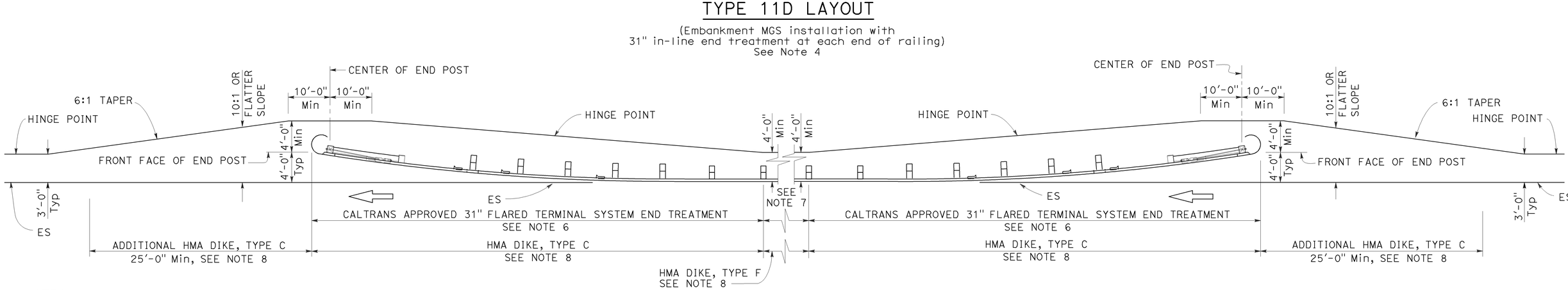
TO ACCOMPANY PLANS DATED 3-10-14




## 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

6-19-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
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| 03 | Sac | 104 | 3.7/8.5 | 18 | 26 |

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

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

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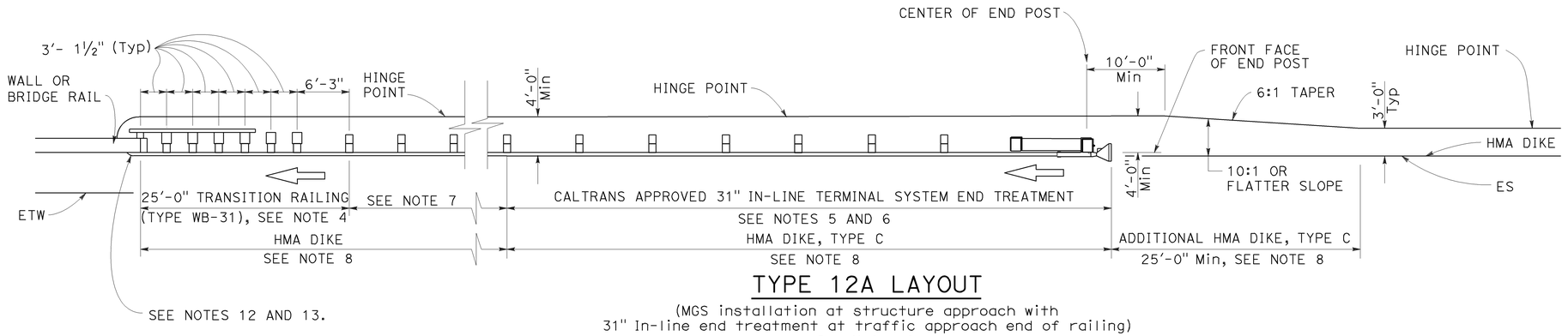
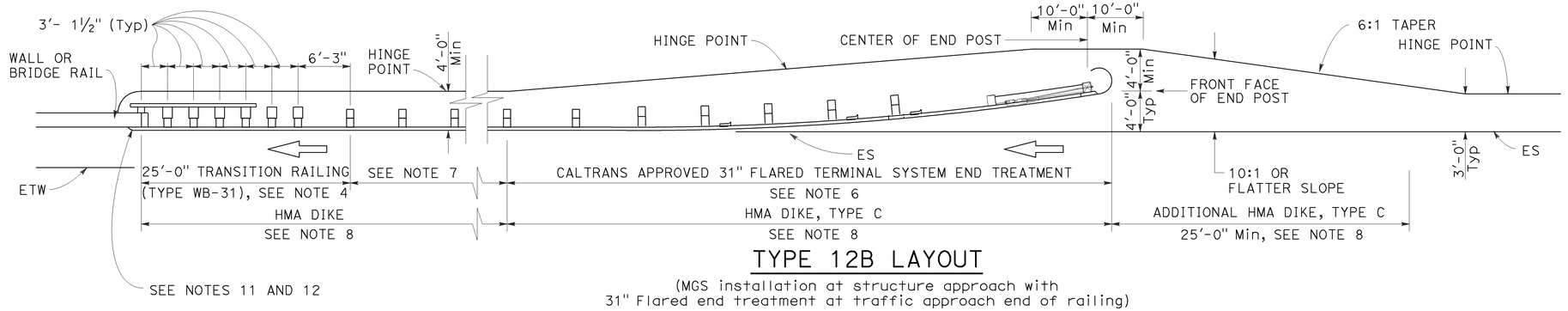
TO ACCOMPANY PLANS DATED 3-10-14




## TYPE 12A LAYOUT

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




## TYPE 12B LAYOUT

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

NOTES:

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 posts with 6" x 12" x 1'-2" wood blocks where applicable and when specified.
4. For Transition Railing (Type WB-31) details for Types 12A and 12B Layouts, see Revised Standard Plan RSP A77U4.
5. 31" in-line terminal system end treatments are used where site conditions will not accommodate a 31" flared end treatment.
6. The type 31" of terminal system end treatment to be used will be shown on the Project Plans.
7. Dependent on site conditions (embankment height, side slopes, or other fixed objects), it may be advisable to construct additional guard railing (a length equal to multiples of 12'-6" with 6'-3" post spacing) between the transition railing and end treatment. A 12.5 degree angle of departure can be drawn on the Project Plans from the edge of traveled way through the outer most point of the fixed object to determine the additional length of railing needed.
8. Where placement of dike is required with guard railing installations, see Revised Standard Plan RSP A77N4 for dike positioning details.
9. Type 12A or Type 12B Layouts are typically used:
   a. To the right of approaching traffic, at the end of a structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
   b. To the left of approaching traffic, at the end of a structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
   c. To the right of approaching traffic at the end of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.
   d. To the right of approaching traffic at the end of the structure on multilane freeways or expressways with decked median on the bridge.
10. See Revised Standard Plan RSP A77Q3 for typical layout used left of approaching traffic at the ends of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.
11. For additional details of typical connections to bridge rail, see Connection Detail AA on Revised Standard Plans RSP A77U1 and RSP A77U2 and Connection Detail FF on Revised Standard Plans RSP A77V1 and RSP A77V2.
12. For additional details of a typical connection to walls or abutments, see Revised Standard Plan RSP A77U3.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR STRUCTURE APPROACH

NO SCALE

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

# REVISED STANDARD PLAN RSP A77Q1

2010 REVISED STANDARD PLAN RSP A77Q1

6-19-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
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| 03 | Sac | 104 | 3.7/8.5 | 19 | 26 |

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

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

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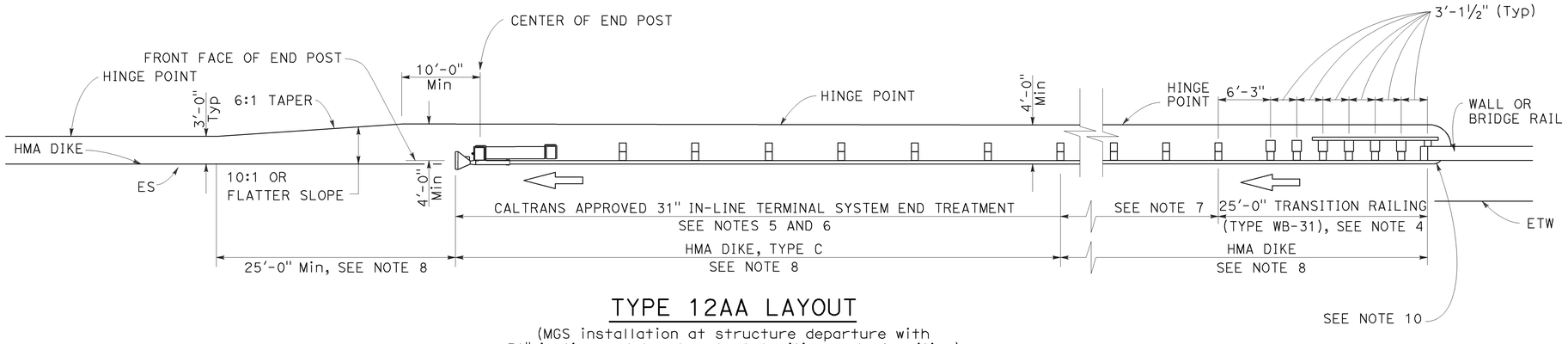
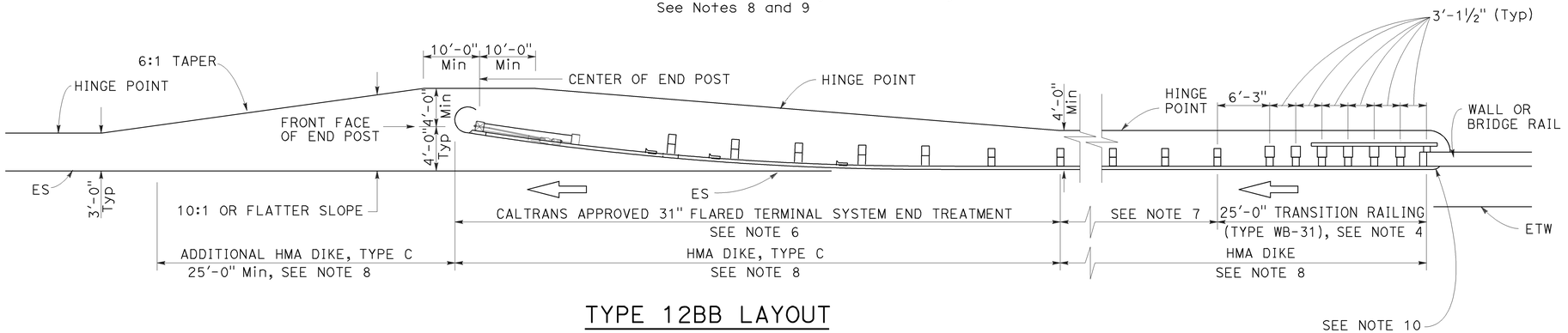
TO ACCOMPANY PLANS DATED 3-10-14




## TYPE 12AA LAYOUT

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




## TYPE 12BB LAYOUT

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

NOTES:

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 notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 12" x 1'-2" wood blocks where applicable and when specified.
4. For Transition Railing (Type WB-31) details for Types 12AA and 12BB Layouts, see Revised Standard Plan RSP A77U4.
5. 31" in-line terminal system treatments are used where site conditions will not accommodate a 31" flared end treatment.
6. The type of 31" terminal system to be used will be shown on the Project Plans.
7. Dependent on site conditions (embankment height, side slopes, other fixed objects), it may be advisable to construct additional MGS (a length equal to multiples of 12'-6" with 6'-3" post spacing) between the transition railing and 31" end treatments.
8. Where placement of dike is required with MGS installations, see Revised Standard Plan RSP A77N4 for dike positioning details.
9. Type 12AA or Type 12BB Layouts are typically used to the right of traffic departing a structure on two-way conventional highways where the roadbed width across the structure is less than 40 feet.
10. For additional details of typical connections to bridge rail, see Connection Detail CC on Revised Standard Plan RSP A77U2 and Connection Detail HH on Revised Standard Plan RSP A77V2.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR STRUCTURE DEPARTURE

NO SCALE

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

**REVISED STANDARD PLAN RSP A77Q4**

2010 REVISED STANDARD PLAN RSP A77Q4

6-19-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 20 | 26 |

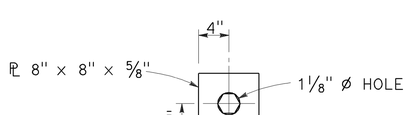
Randell D. Hiatt
REGISTERED CIVIL ENGINEER

November 15, 2013
PLANS APPROVAL DATE

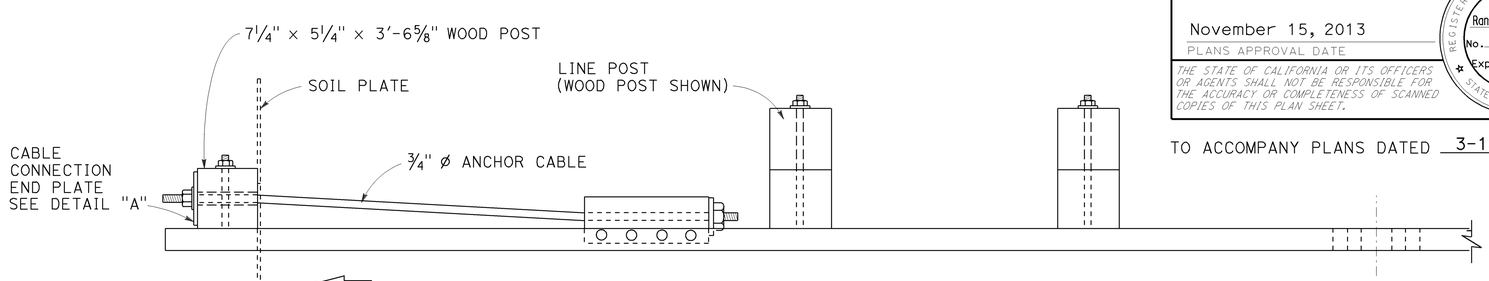
REGISTERED PROFESSIONAL ENGINEER — Randell D. Hiatt — No. C50200 — Exp. 6-30-15 — CIVIL — STATE OF CALIFORNIA

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.

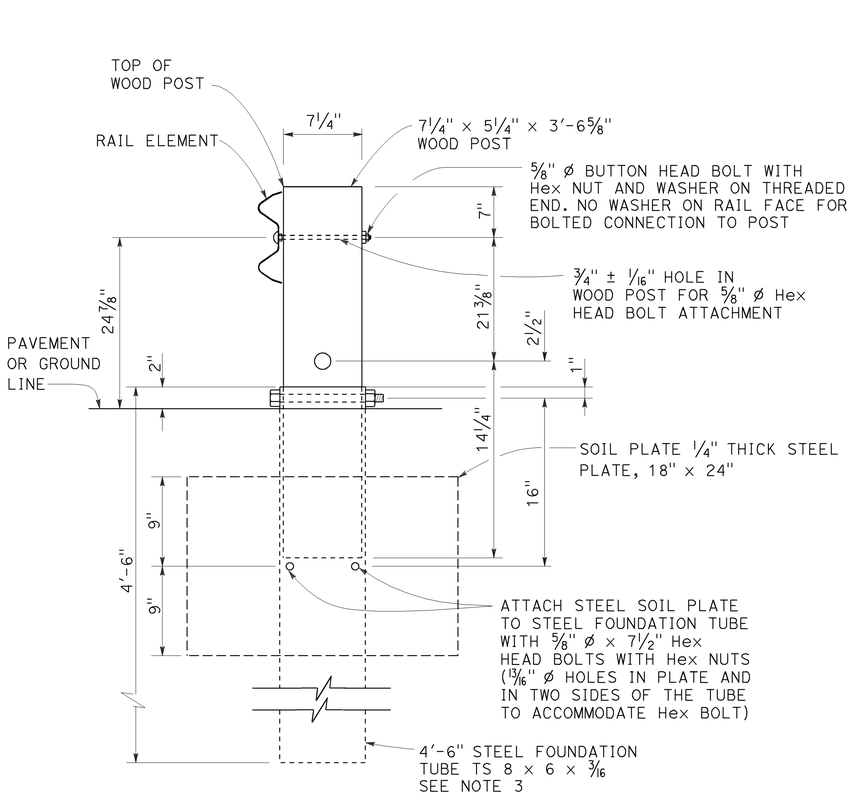
TO ACCOMPANY PLANS DATED 3-10-14



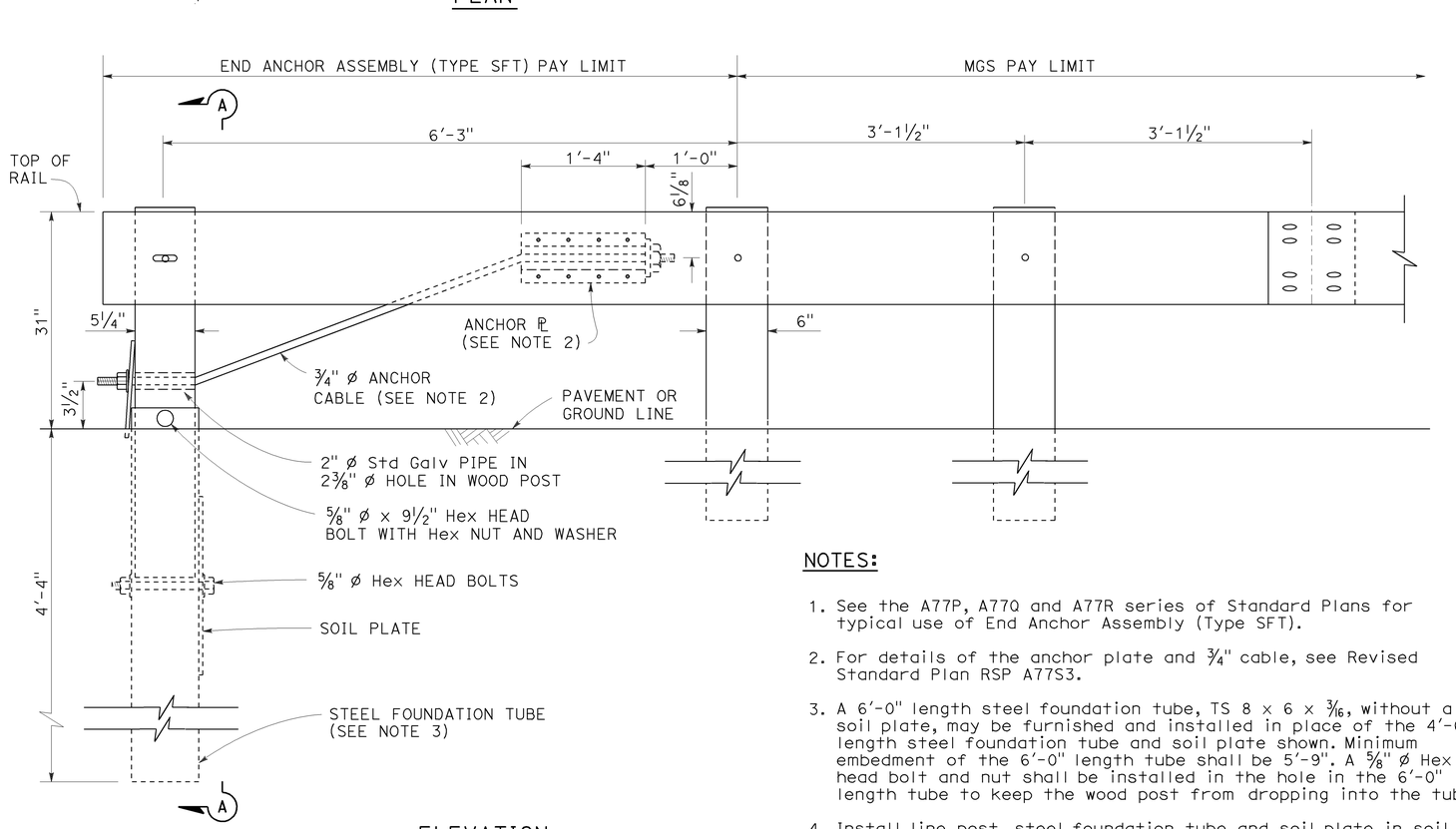

## DETAIL "A"
## CABLE CONNECTION END PLATE




PLAN




SECTION A-A




ELEVATION

## END ANCHOR ASSEMBLY (TYPE SFT)
See Note 1

NOTES:

1. See the A77P, A77Q and A77R series of Standard Plans for typical use of End Anchor Assembly (Type SFT).
2. For details of the anchor plate and 3/4" cable, see Revised Standard Plan RSP A77S3.
3. A 6'-0" length steel foundation tube, TS 8 x 6 x 3/16, without a soil plate, may be furnished and installed in place of the 4'-6" length steel foundation tube and soil plate shown. Minimum embedment of the 6'-0" length tube shall be 5'-9". A 5/8" ø Hex head bolt and nut shall be installed in the hole in the 6'-0" length tube to keep the wood post from dropping into the tube.
4. Install line post, steel foundation tube and soil plate in soil.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# MIDWEST GUARDRAIL SYSTEM END ANCHOR ASSEMBLY (TYPE SFT)

NO SCALE

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

**REVISED STANDARD PLAN RSP A77S1**

**2010 REVISED STANDARD PLAN RSP A77S1**

10-4-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 21 | 26 |

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

November 15, 2013
PLANS APPROVAL DATE

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

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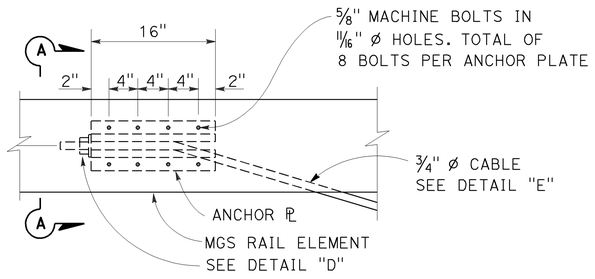
TO ACCOMPANY PLANS DATED 3-10-14

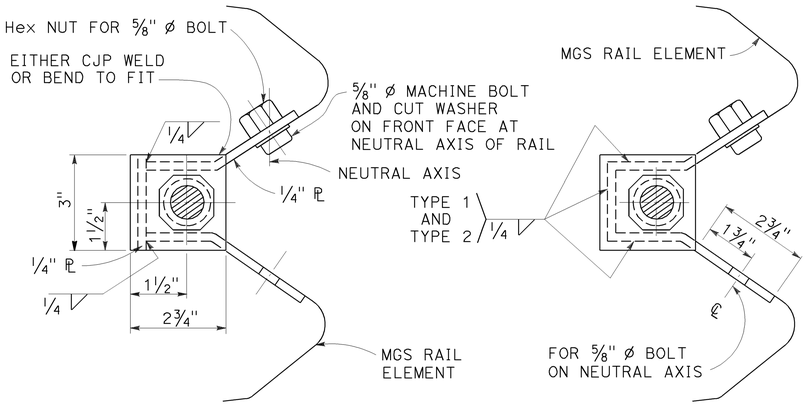
**NOTE:**

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




## ANCHOR PLATE DETAIL

(MGS shown, TBB similar)

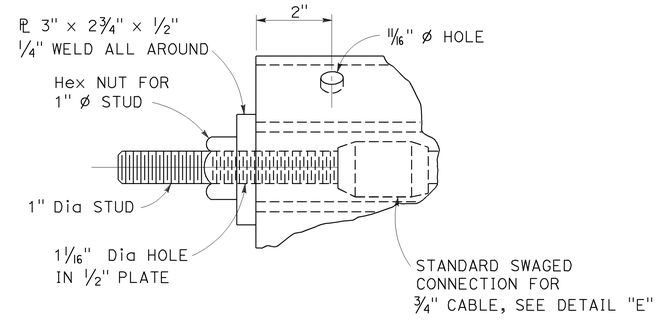



**NOTE:**

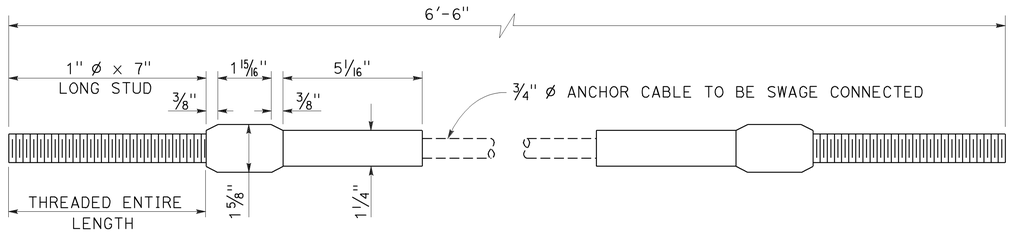
Dimensioning applies to both types.

SECTION A-A
(ALTERNATIVE TYPE 1)

SECTION A-A
(ALTERNATIVE TYPE 2)




## DETAIL "D"




## ANCHOR CABLE WITH SWAGED FITTING AND STUD
DETAIL "E"

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# METAL RAILING ANCHOR CABLE AND ANCHOR PLATE DETAILS

NO SCALE

RSP A77S3 DATED NOVEMBER 15, 2013 SUPERSEDES RSP A77S3
DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77S3**

**2010 REVISED STANDARD PLAN RSP A77S3**

10-4-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 22 | 26 |

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

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

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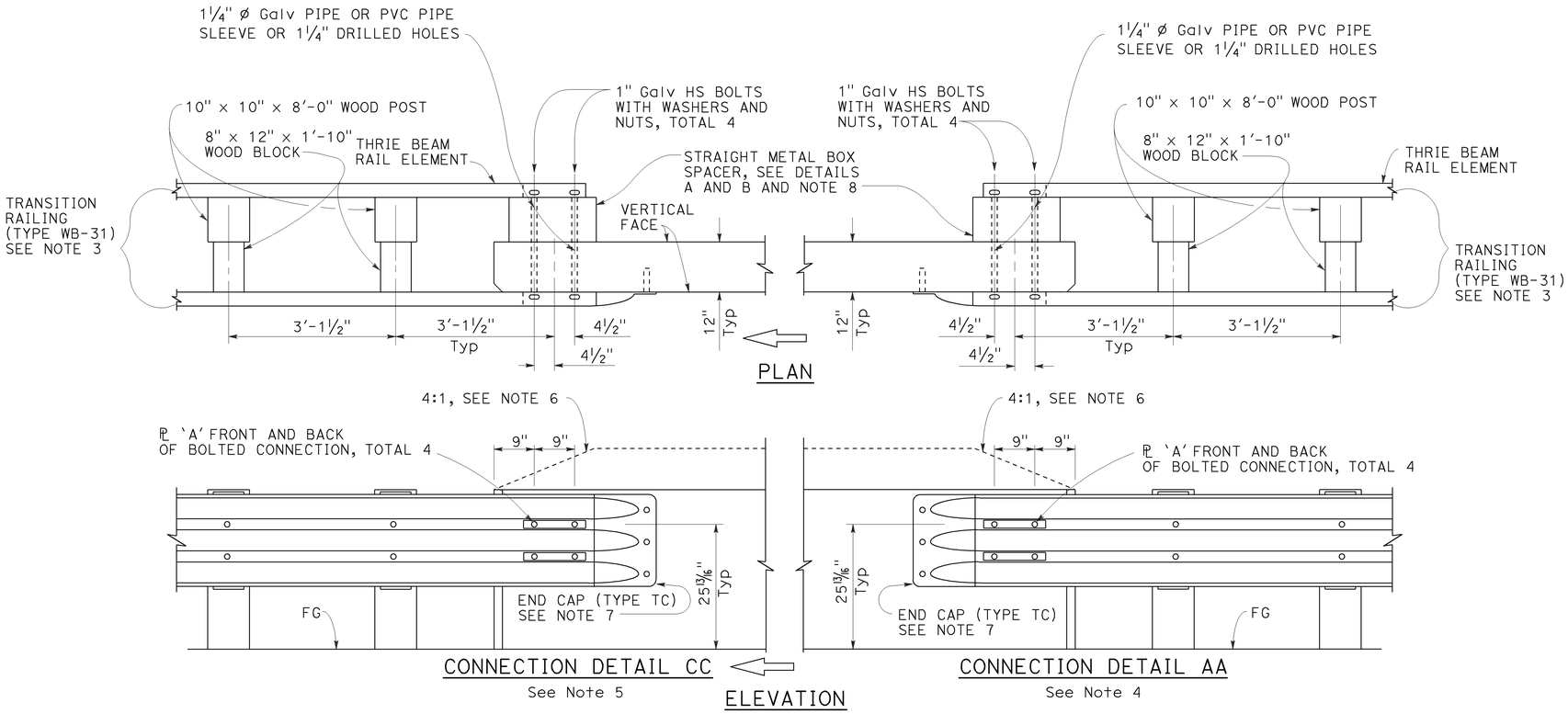
TO ACCOMPANY PLANS DATED 3-10-14




## MIDWEST GUARDRAIL SYSTEM CONNECTION TO BRIDGE RAILING WITHOUT SIDEWALK

## NOTES:

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

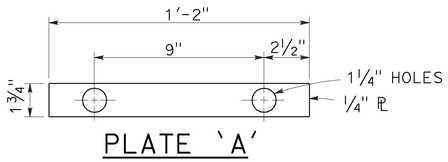



PLATE 'A'

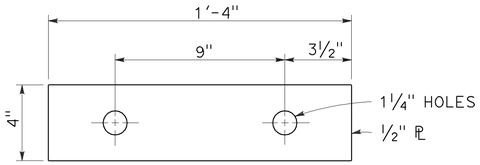
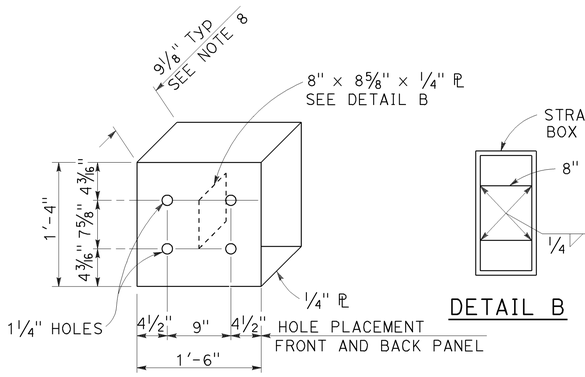
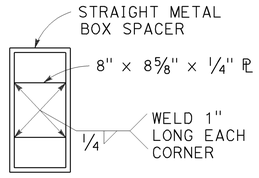



PLATE 'B'
(For backside of connection BB)




DETAIL A

STRAIGHT METAL BOX SPACER




DETAIL B

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

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

**REVISED STANDARD PLAN RSP A77U2**

2010 REVISED STANDARD PLAN RSP A77U2

6-20-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 23 | 26 |

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

November 15, 2013
PLANS APPROVAL DATE

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

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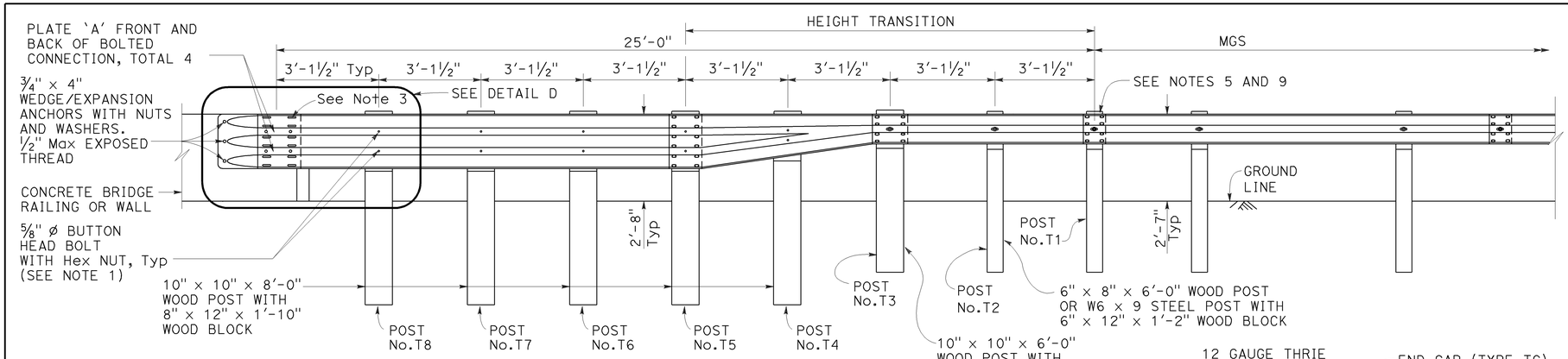
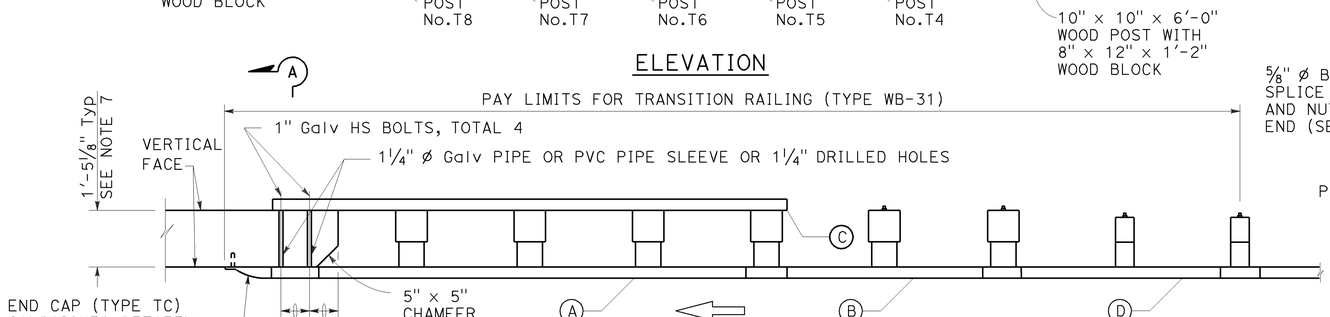


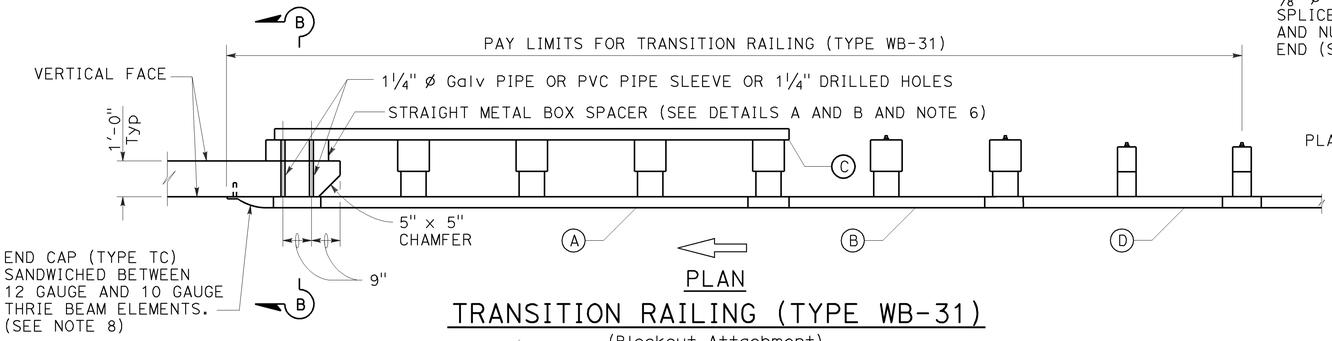

ELEVATION




PLAN

## TRANSITION RAILING (TYPE WB-31)

(No Blockout Attachment)




PLAN

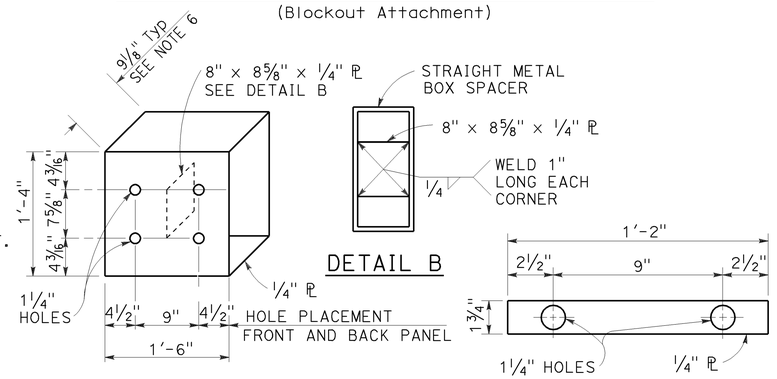
## TRANSITION RAILING (TYPE WB-31)

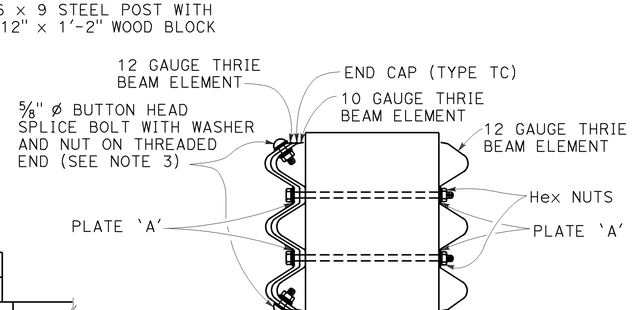
(Blockout Attachment)

### LEGEND:

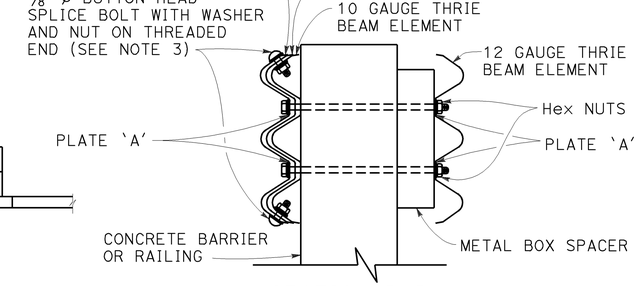
- (A) NESTED THRIE BEAM ELEMENTS (ONE 12 GAUGE ELEMENT NESTED OVER ONE 10 GAUGE ELEMENT).
- (B) ONE ASYMMETRICAL 10 GAUGE "W" BEAM TO THRIE BEAM ELEMENT.
- (C) ONE 12 GAUGE THRIE BEAM ELEMENT.
- (D) ONE 10 GAUGE "W" BEAM RAIL ELEMENT (7'-3½"LENGTH)

10 GAUGE = 0.138" THICK
12 GAUGE = 0.108" THICK

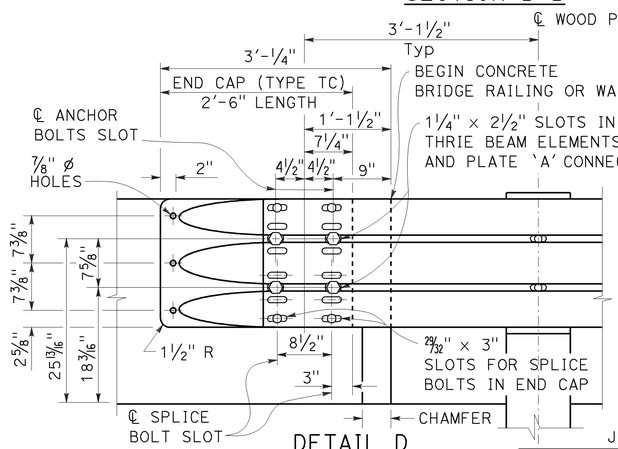



SECTION A-A




SECTION B-B




DETAIL D

## NOTES:

TO ACCOMPANY PLANS DATED 3-10-14

1. Use ⅝" ø Button head bolts and hex nuts for connections to posts. No washer on rail face for bolted connections to post.
2. The nested rail elements, end cap, and 'W' beam to thrie beam element may be spliced together prior to bolting the elements to the wood post and concrete barrier or railing.
3. Exterior splice bolt holes for rail element splices at Post No. T5 and the connection to the concrete barrier or railing shall be the standard 29/32" x 1⅛" slot size. Interior splice bolt holes at these locations may be increased up to 1¼" ø. Only the top 4 and the bottom 4 splice bolts with washers and nuts are required for rail splices at Post No. T5 and the connection to the concrete barrier or railing.
4. The top elevation of Posts No. T2 through No. T7 shall not project more than 1" above the top elevation of the rail element.
5. Typically, the railing connected to Transition Railing (Type WB-31) will be either standard railing section of MGS with height transition ratio of 150:1 or a Caltrans approved 31" end treatment attached to Post No. T1.
6. The depth of the metal box spacer varies from the 9⅛" to 1½" and is dependent on the width of the concrete railing or wall. The combined dimension for the depth of the metal box spacer plus the width of railing or wall is typically 21⅛". Where the space between the backside of the concrete railing or wall and the rear thrie beam element is less than 1½", metal plates similar to Plate 'A' are to be used as spacers.
7. Where the width of the concrete railing or wall is greater than 17⅛", wood blocks are to be used to fill the space created between the backside of Posts No. T5 through No. T8 and the rear thrie beam element. These wood blocks shall be 8" in width and 1'-2" in length. The dimension between the front thrie beam element and the rear thrie beam element is to match the width of the concrete railing or wall.
8. End cap may be installed over 12 gauge and 10 gauge thrie beam elements where transition railing is installed on the departure end of bridge railing.
9. Conform standard railing section height to 31" at Post No. T1 using height transition ratio of 150:1.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# MIDWEST GUARDRAIL SYSTEM TRANSITION RAILING (TYPE WB-31)

NO SCALE

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

**REVISED STANDARD PLAN RSP A77U4**

**2010 REVISED STANDARD PLAN RSP A77U4**

10-4-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 24 | 26 |

REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

Gurinderpal Bhullar
No. C48815
Exp. 9-30-14
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED 3-10-14

## 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 | | |
|---|---|---|---|---|---|---|---|
| | | | | | X | Y | Z ** |
| | TANGENT 2L | MERGING L | SHIFTING L/2 | SHOULDER L/3 | 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% |
| mph | ft | 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 recommmended distances.

2010 REVISED STANDARD PLAN RSP T9

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**

4-30-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 25 | 26 |

REGISTERED CIVIL ENGINEER

April 19, 2013
PLANS APPROVAL DATE

Gurinderpal Bhullar
No. C48815
Exp. 9-30-14
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

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

TO ACCOMPANY PLANS DATED 3-10-14

## NOTES:

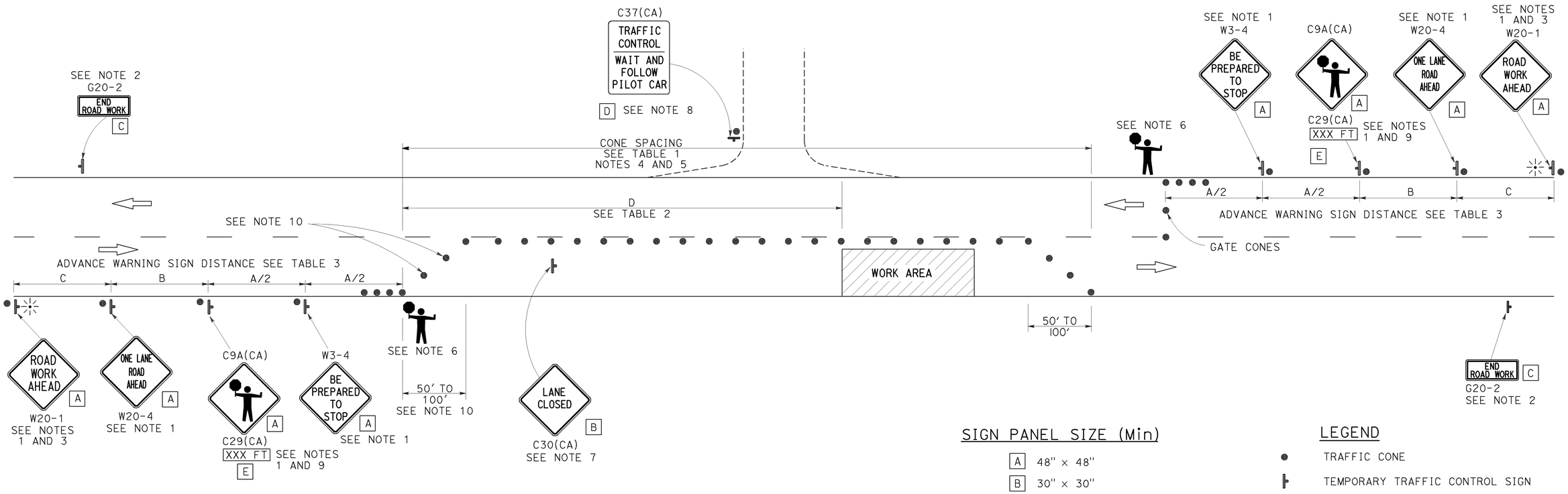
See Revised Standard Plan RSP T9 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as approriate, 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




## NOTES:

1. 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.
2. 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.
3. 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.
4. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
5. Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.
6. 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.
7. 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.
8. When a pilot car is used, place a C37(CA) "TRAFFIC CONTROL-WAIT AND FOLLOW PILOT CAR" sign with black legend on white background at all intersections, driveways and alleys without a flagger within 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.
9. An optional C29(CA) sign may be placed below the C9A(CA) sign.
10. Either traffic cones or barricades shall be placed on the taper. Barricades shall be Type I, II, or III.

## SIGN PANEL SIZE (Min)

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

## LEGEND

- TRAFFIC CONE
- TEMPORARY TRAFFIC CONTROL SIGN
- PORTABLE FLASHING BEACON
- FLAGGER

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

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

## REVISED STANDARD PLAN RSP T13

2010 REVISED STANDARD PLAN RSP T13

4-2-13

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 03 | Sac | 104 | 3.7/8.5 | 26 | 26 |

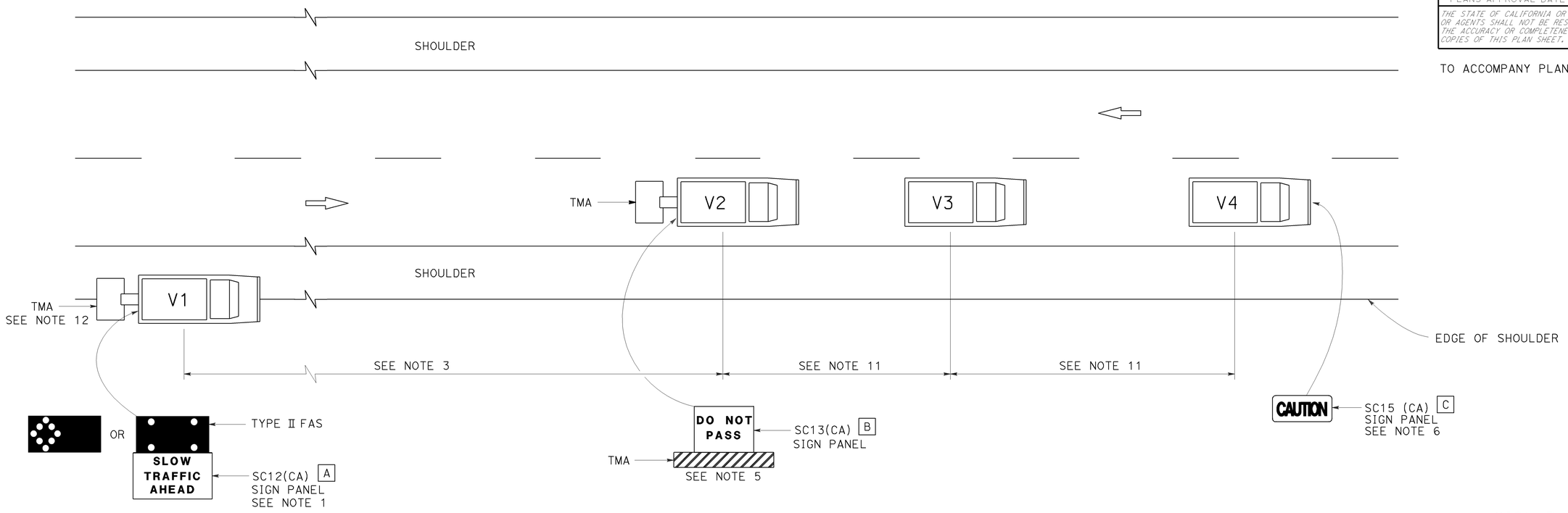
REGISTERED CIVIL ENGINEER

April 19, 2013
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Gurinderpal Bhullar
No. C48815
Exp. 9-30-14
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 3-10-14




## 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

12-18-12