

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

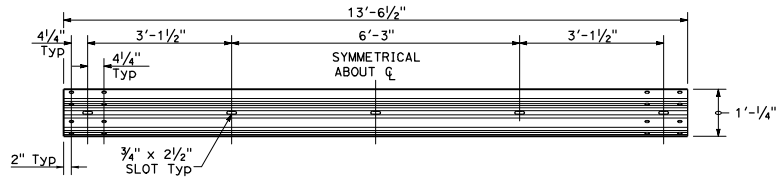
Randell D. Hiatt
REGISTERED CIVIL ENGINEER

October 30, 2015
PLANS APPROVAL DATE

No. C50200
Exp. 6-30-17
CIVIL
STATE OF CALIFORNIA

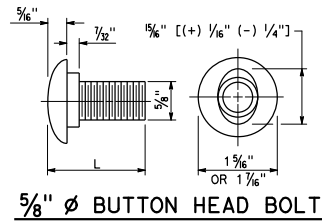
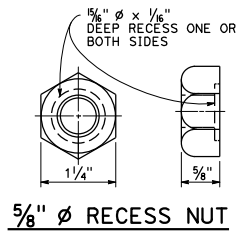
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TYPICAL RAIL ELEMENT

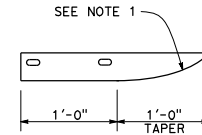
NOTE:
1. Slotted holes for splice bolts to overlap ends of rail element.



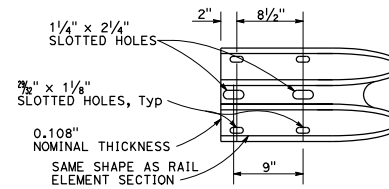
BUTTON HEAD BOLT

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

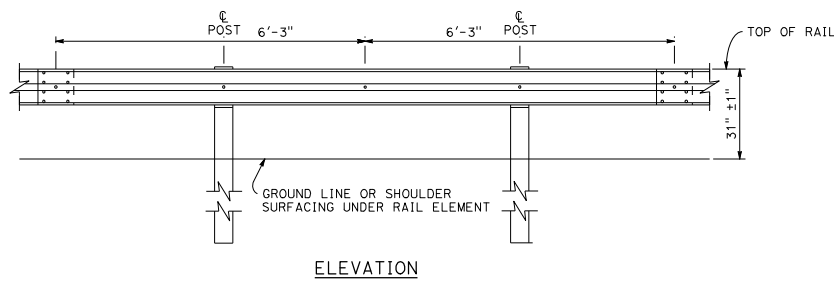
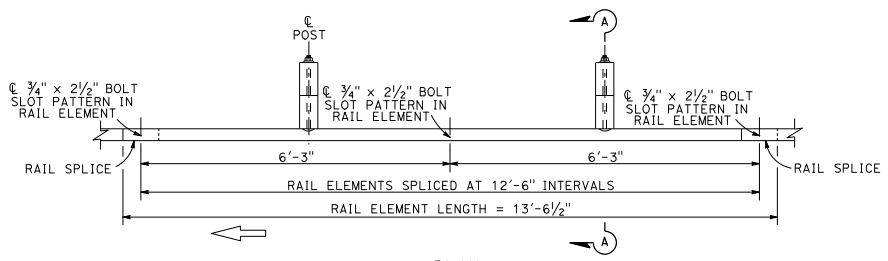


END CAP (TYPE A)

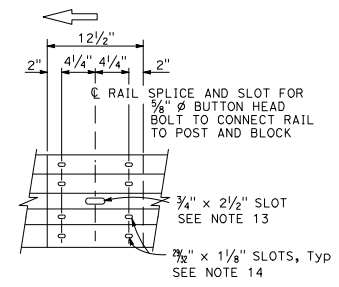
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
**MIDWEST GUARDRAIL SYSTEM
STANDARD HARDWARE**

NO SCALE

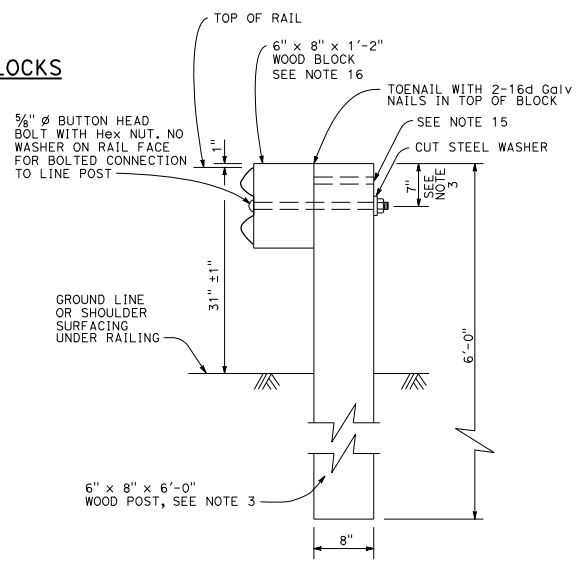
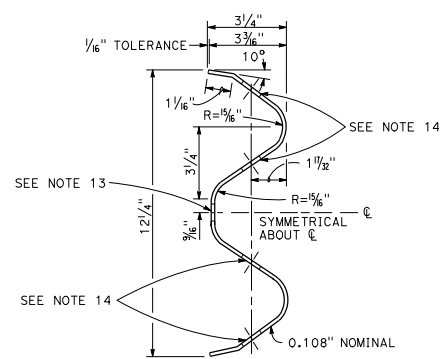
A77M1



MIDWEST GUARDRAIL SYSTEM WITH WOOD POST AND BLOCKS



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



SECTION A-A
TYPICAL WOOD LINE
POST INSTALLATION
See Note 4

D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

Randell D. Hiatt
REGISTERED CIVIL ENGINEER

January 20, 2017
PLANS APPROVAL DATE

Randell D. Hiatt
REGISTERED PROFESSIONAL ENGINEER
No. C50200
Exp. 6-30-17
CIVIL
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED _____

NOTES:

- For details of steel post installations, see Revised Standard Plan RSP A77L2.
- For details of standard hardware used to construct MGS, see Standard Plan A77M1.
- For details of wood posts and wood blocks used to construct MGS, see Revised Standard Plan RSP A77N1.
- For additional installation details, see Standard Plan 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 Standard Plans A77S1 and A77T2.
- For details of MGS transition to bridge railing, see Standard Plan A77U4.
- For additional details of MSG connection to bridge railing, see Standard Plans A77U1, A77U2 and A77V1.
- For MGS connection details to abutments and walls, see Standard Plan A77U3.
- For typical MGS delineation and dike positioning details, see Standard Plan A77N4.
- Slotted hole for bolted connection of rail element to block and post.
- Slotted holes for splice bolts to overlap ends of rail element.
- Slotted hole in uppermost portion of line post is for potential future adjustments of railing height. See Revised Standard Plan RSP A77N1.
- 6" x 12" x 1'-2" block must be used with 6" dike.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
**MIDWEST GUARDRAIL SYSTEM
STANDARD RAILING SECTION
(WOOD POST WITH
WOOD BLOCK)**

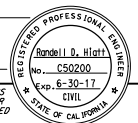
NO SCALE

RSP A77L1 DATED JANUARY 20, 2017 SUPERSEDES STANDARD PLAN A77L1 DATED OCTOBER 30, 2015 - PAGE 49 OF THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP A77L1

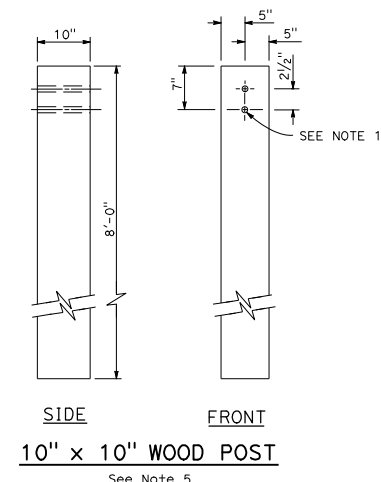
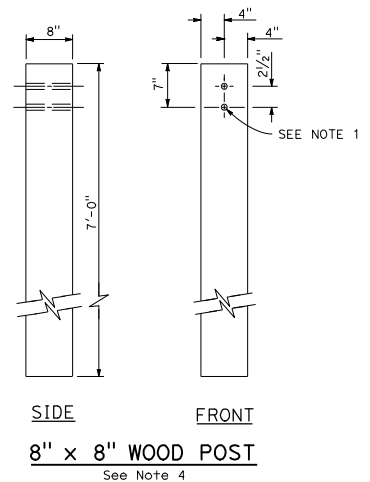
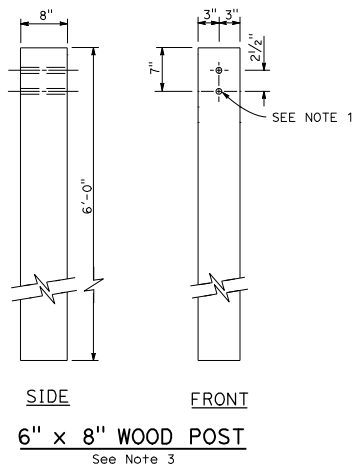
2015 REVISED STANDARD PLAN RSP A77L1

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Randell D. Hiatt REGISTERED CIVIL ENGINEER					
January 20, 2017 PLANS APPROVAL DATE					
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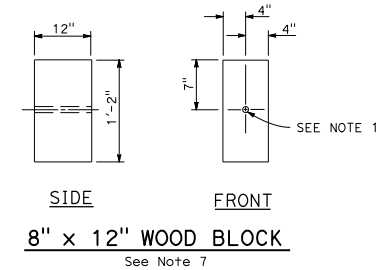
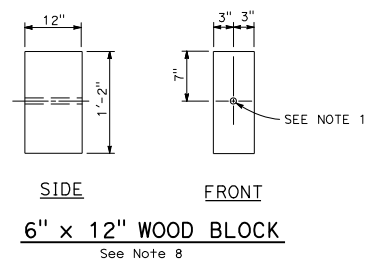
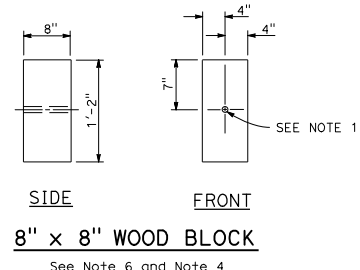
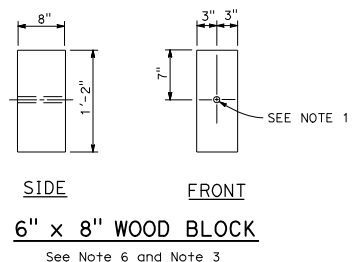
TO ACCOMPANY PLANS DATED _____

2015 REVISED STANDARD PLAN RSP A77N1



NOTES:

1. All holes in wood posts and blocks shall be 3/4" 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.
7. To be used with 8" x 8" x 7'-0" wood post if installed with 6" height dike.
8. To be used with 6" x 8" x 6'-0" wood post if installed with 6" height dike.



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

RSP A77N1 DATED JANUARY 20, 2017 SUPERSEDES STANDARD PLAN A77N1
DATED OCTOBER 30, 2015 - PAGE 53 OF THE STANDARD PLANS BOOK DATED 2015.

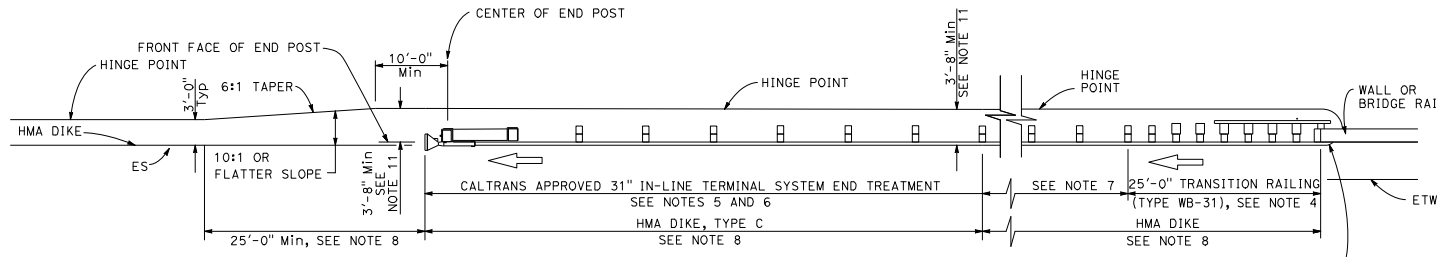
REVISED STANDARD PLAN RSP A77N1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

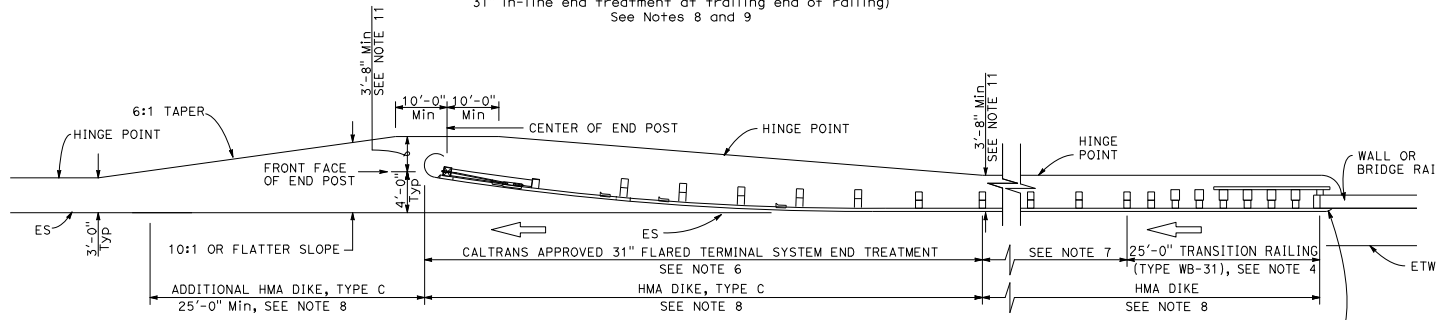
Randell D. Hiatt
 REGISTERED CIVIL ENGINEER
 January 20, 2017
 PLANS APPROVAL DATE
 No. CS0200
 Exp. 6-30-17
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 STATE OF CALIFORNIA

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2015 REVISED STANDARD PLAN RSP A77Q4



TYPE 12AA LAYOUT
(MGS installation at structure departure with 31" in-line end treatment at trailing end of railing)
See Notes 8 and 9



TYPE 12BB LAYOUT
(MGS installation at structure departure with 31" flared end treatment at trailing end of railing)
See Notes 8 and 9

NOTES:

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, RSP A77N2 and Standard Plan A77M1.
- 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 8" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- For Transition Railing (Type WB-31) details for Types 12AA and 12BB Layouts, see Standard Plan A77U4.
- 31" in-line terminal system treatments are used where site conditions will not accommodate a 31" flared end treatment.
- The type of 31" terminal system to be used will be shown on the Project Plans.
- Dependent on site conditions (embankment height, side slopes, other fixed objects), it may be advisable to construct additional MGS (a length equal to multiples of 12'-6" with 6'-3" post spacing) between the transition railing and 31" end treatments.
- Where placement of dike is required with MGS installations, see Standard Plan A77N4 for dike positioning details.
- Type 12AA or Type 12BB Layouts are typically used to the right of traffic departing a structure on two-way conventional highways where the roadbed width across the structure is less than 40 feet.
- For additional details of typical connections to bridge rail, see Connection Detail CC on Standard Plan A77U2 and Connection Detail HH on Standard Plan A77V2.
- Use this offset for 8" block. For 12" block, use 4'-0" Min offset.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
**MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR
STRUCTURE DEPARTURE**

NO SCALE

RSP A77Q4 DATED JANUARY 20, 2017 SUPERSEDES STANDARD PLAN A77Q4
DATED OCTOBER 30, 2015 - PAGE 72 OF THE STANDARD PLANS BOOK DATED 2015.
REVISED STANDARD PLAN RSP A77Q4

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

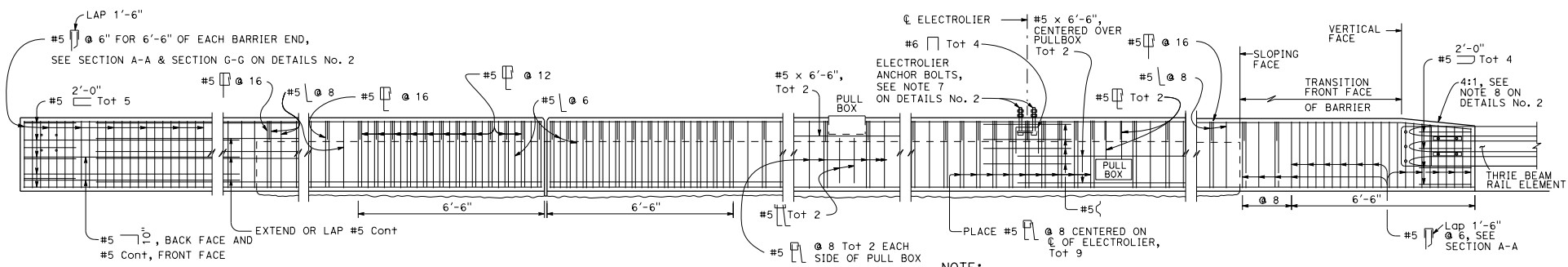
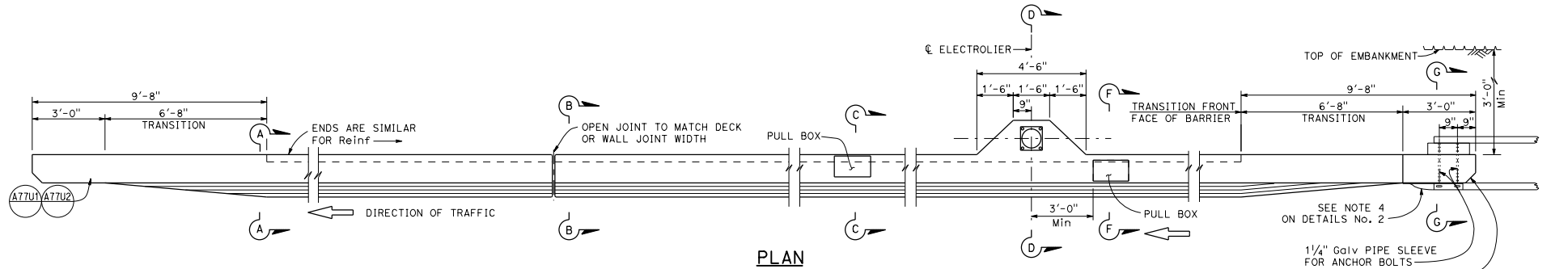
REGISTERED CIVIL ENGINEER
Tillot Satter
No. C42892
EXP. 3-31-20
CIVIL

October 18, 2019
PLANS APPROVAL DATE

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TO ACCOMPANY PLANS DATED _____

2018 REVISED STANDARD PLAN RSP B11-79

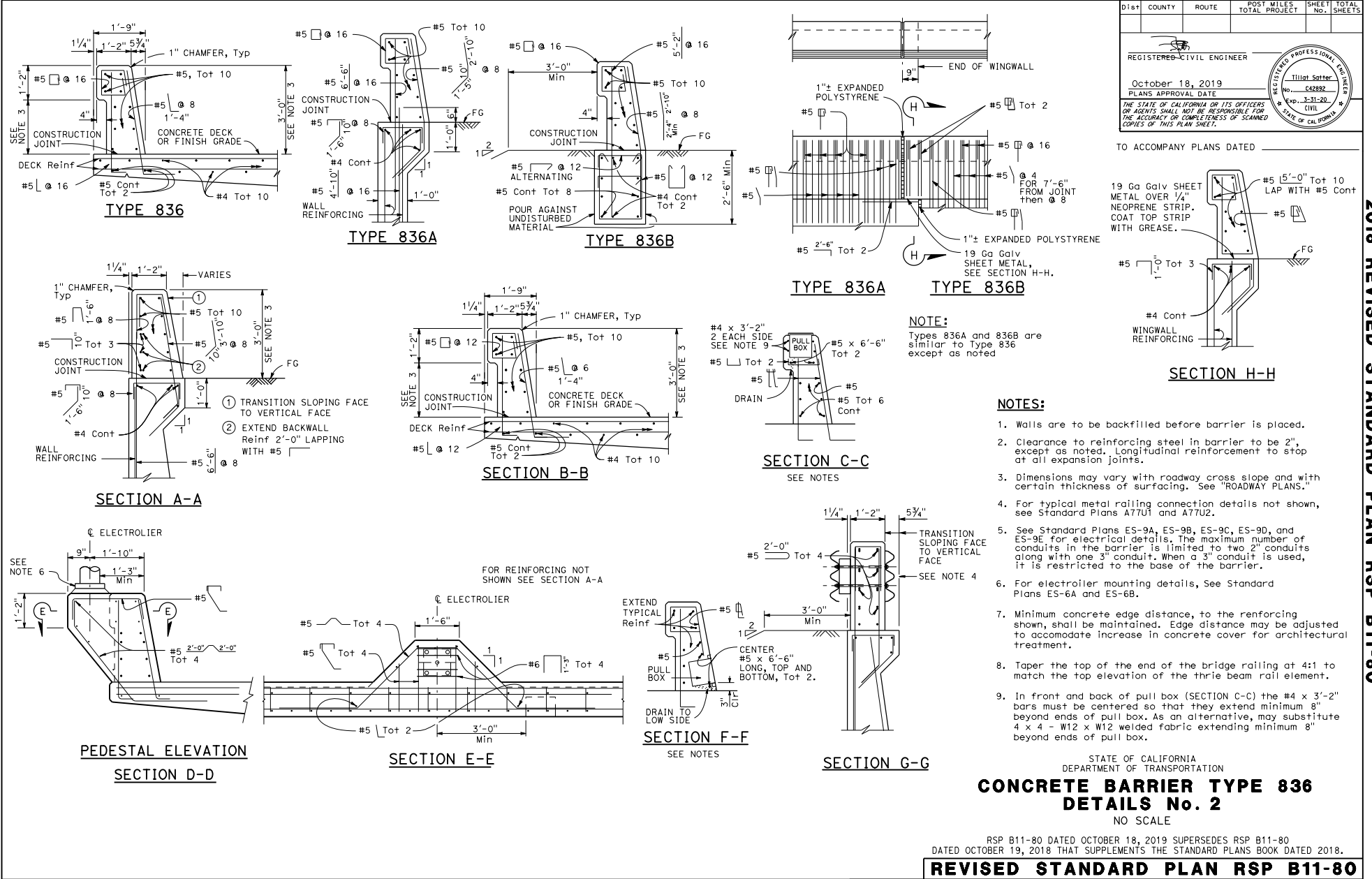


STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
**CONCRETE BARRIER TYPE 836
DETAILS No. 1**

NO SCALE

RSP B11-79 DATED OCTOBER 18, 2019 SUPERSEDES RSP B11-79
DATED OCTOBER 19, 2018 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

REVISED STANDARD PLAN RSP B11-79



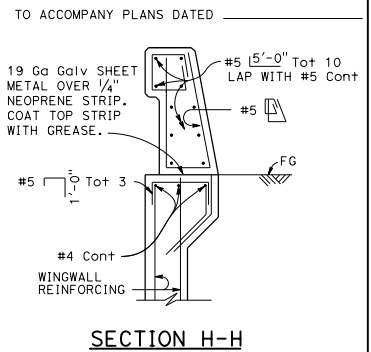
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

October 18, 2019
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER
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No. C42892
Exp. 3-31-20
CIVIL
STATE OF CALIFORNIA

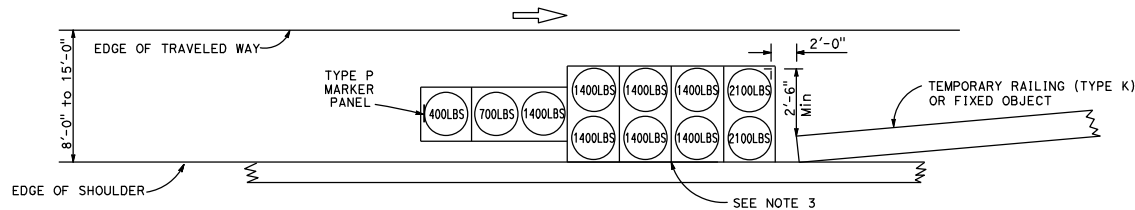


- NOTES:**
1. Walls are to be backfilled before barrier is placed.
 2. Clearance to reinforcing steel in barrier to be 2", except as noted. Longitudinal reinforcement to stop at all expansion joints.
 3. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See "ROADWAY PLANS."
 4. For typical metal railing connection details not shown, see Standard Plans A77U1 and A77U2.
 5. See Standard Plans ES-9A, ES-9B, ES-9C, ES-9D, and ES-9E for electrical details. The maximum number of conduits in the barrier is limited to two 2" conduits along with one 3" conduit. When a 3" conduit is used, it is restricted to the base of the barrier.
 6. For electrolier mounting details, See Standard Plans ES-6A and ES-6B.
 7. Minimum concrete edge distance, to the reinforcing shown, shall be maintained. Edge distance may be adjusted to accommodate increase in concrete cover for architectural treatment.
 8. Taper the top of the end of the bridge railing at 4:1 to match the top elevation of the thrie beam rail element.
 9. In front and back of pull box (SECTION C-C) the #4 x 3'-2" bars must be centered so that they extend minimum 8" beyond ends of pull box. As an alternative, may substitute 4 x 4 - W12 x W12 welded fabric extending minimum 8" beyond ends of pull box.

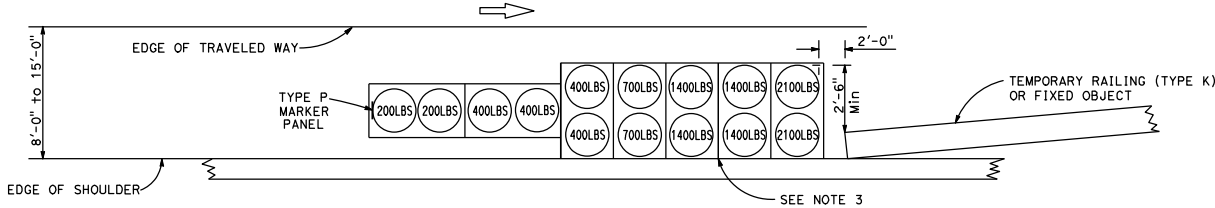
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
CONCRETE BARRIER TYPE 836
DETAILS No. 2
NO SCALE

RSP B11-80 DATED OCTOBER 18, 2019 SUPERSEDES RSP B11-80
DATED OCTOBER 19, 2018 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.
REVISED STANDARD PLAN RSP B11-80

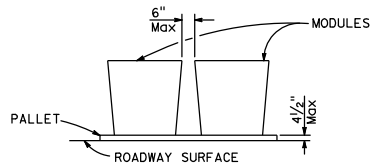
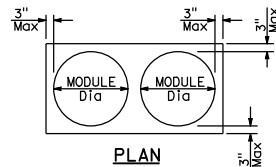
2018 REVISED STANDARD PLAN RSP B11-80



ARRAY 'TS11'
Approach speed less than 45 mph
See Note 6



ARRAY 'TS14'
Approach speed 45 mph or more
See Note 6



ELEVATION
CRASH CUSHION PALLET DETAIL

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS
Randell D. Hiatt REGISTERED CIVIL ENGINEER				
October 30, 2015 PLANS APPROVAL DATE				
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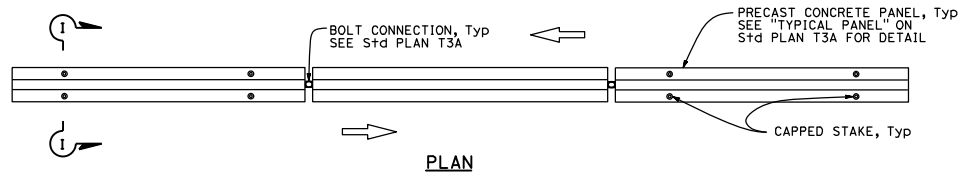
NOTES:

1. (XXX) Indicates sand filled module location and weight of sand in pounds for each module. Module spacing is based on the greater diameter of the module.
2. All sand weights are nominal.
3. The temporary crash cushion arrays shown on this plan shall be used only in locations where there will be traffic on one side of the temporary crash cushion array.
4. Arrays for median shoulders shall conform to details shown on this plan for outside shoulders.
5. Refer to Standard Plan A73B for marker details.
6. For shoulder widths less than 8'-0", appropriate approved crash cushion protection, other than sand filled modules, shall be provided at fixed objects and at approach ends of temporary railing. The specific type of crash cushion shall be as shown on the project plans or as specified in the Special Provisions, or if not shown on the project plans or specified in the Special Provisions, shall be as approved by the Engineer.
7. Approach speeds indicated conform to NCHRP 350 Report criteria.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
**TEMPORARY CRASH CUSHION,
SAND FILLED
(SHOULDER INSTALLATIONS)**

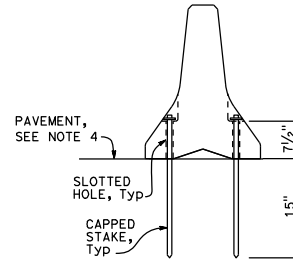
NO SCALE

T2

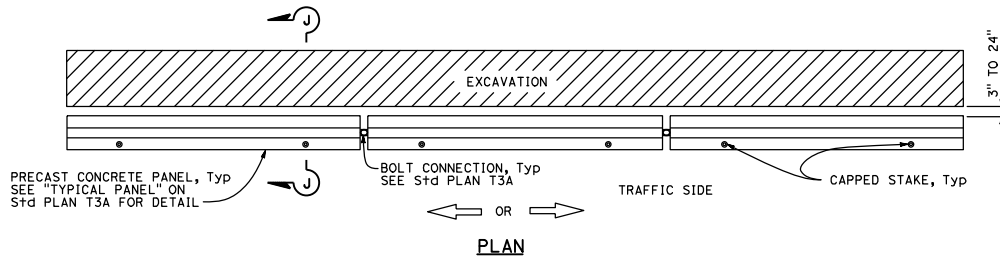


RAILING STAKING CONFIGURATION FOR TWO-WAY TRAFFIC

See Note 2

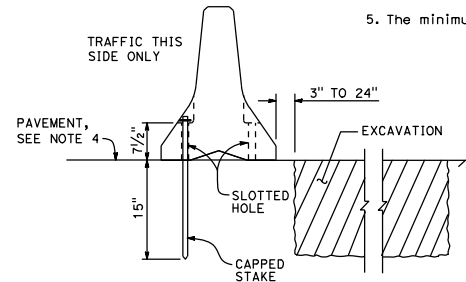


SECTION I-I

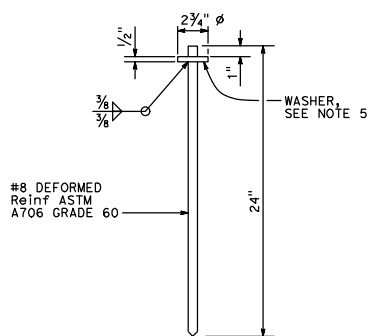


RAILING STAKING CONFIGURATION ADJACENT TO AN EXCAVATION

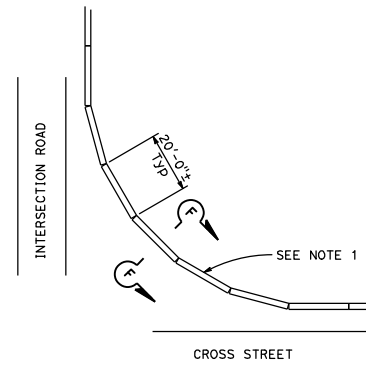
See Note 3



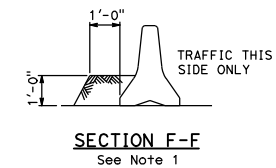
SECTION J-J



CAPPED STAKE DETAIL



CURVED LAYOUT



SECTION F-F
See Note 1

NOTES:

1. Where Type K Temporary Railing is placed on curves and radii that are too severe to connect panels with bolted joints, the railing must be backed continuously with earth fill. See Section F-F.
2. Where Type K Temporary Railing is placed as a temporary or long term barrier in two-way traffic on highways with less than 24" from the edge of traveled way, use four capped stakes per every other panel with end panels staked.
3. Where Type K Temporary Railing is placed 3" to 24" from the edge of an excavation on highways, use two capped stakes per panel along the traffic side.
4. Staked Type K Temporary Railing must be supported by at least 4" thick concrete, hot mix asphalt or existing asphalt concrete pavement.
5. The minimum yield strength for the washer must be 60,000 psi.

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STATE OF CALIFORNIA

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DEPARTMENT OF TRANSPORTATION
**TEMPORARY RAILING
(TYPE K)**
NO SCALE