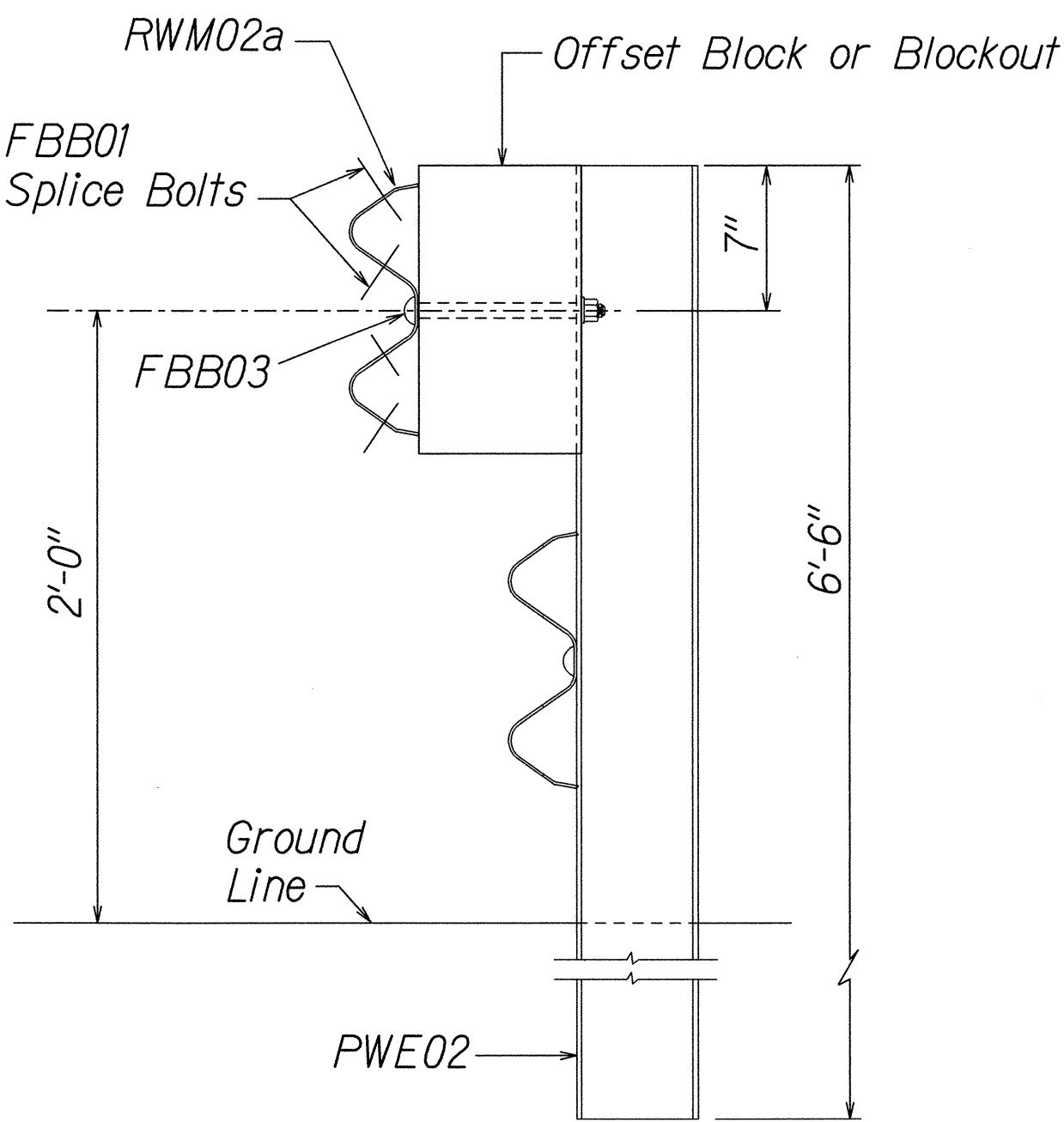


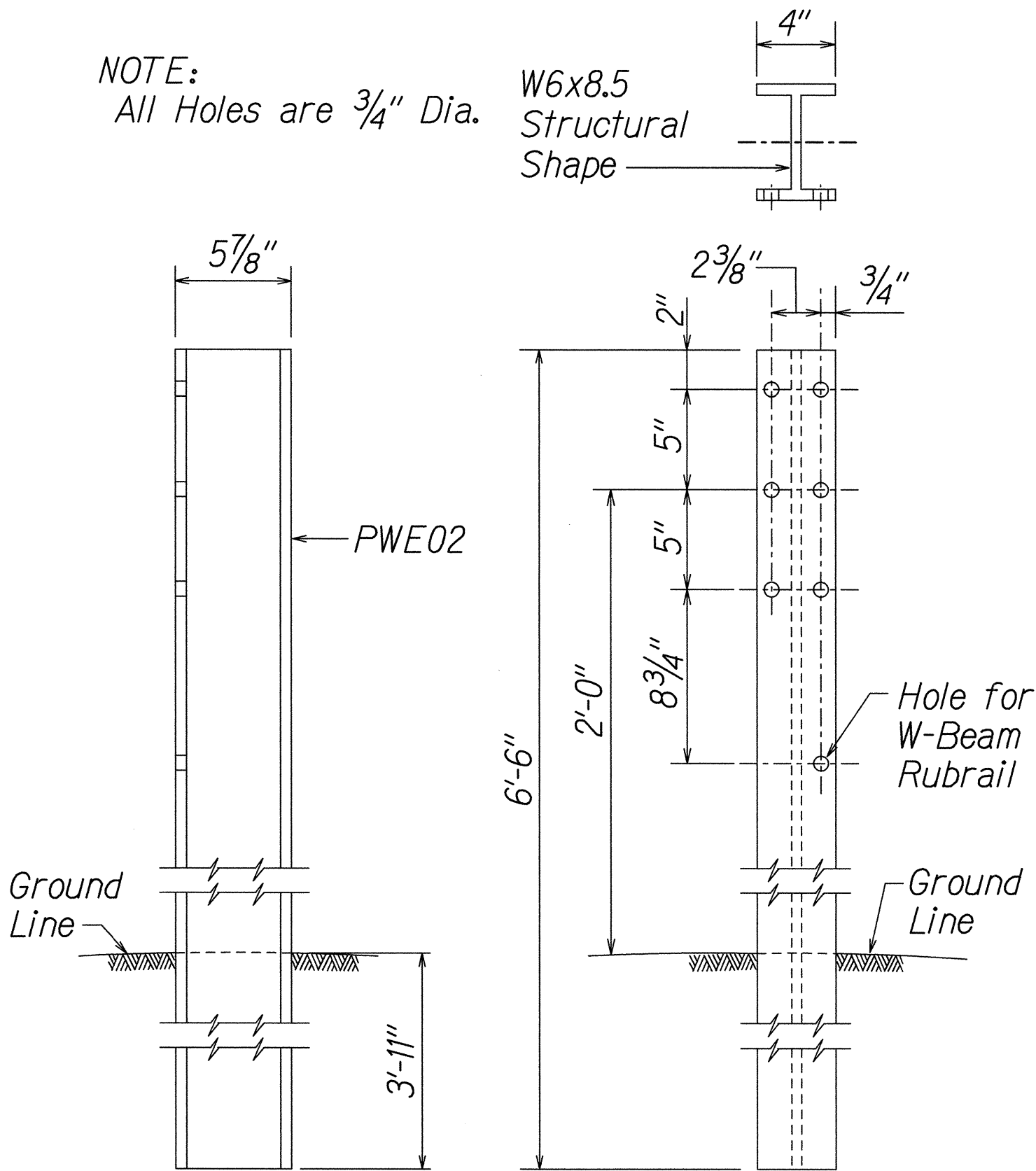


FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	ER-14(1)	2006	18	34



ELEVATION

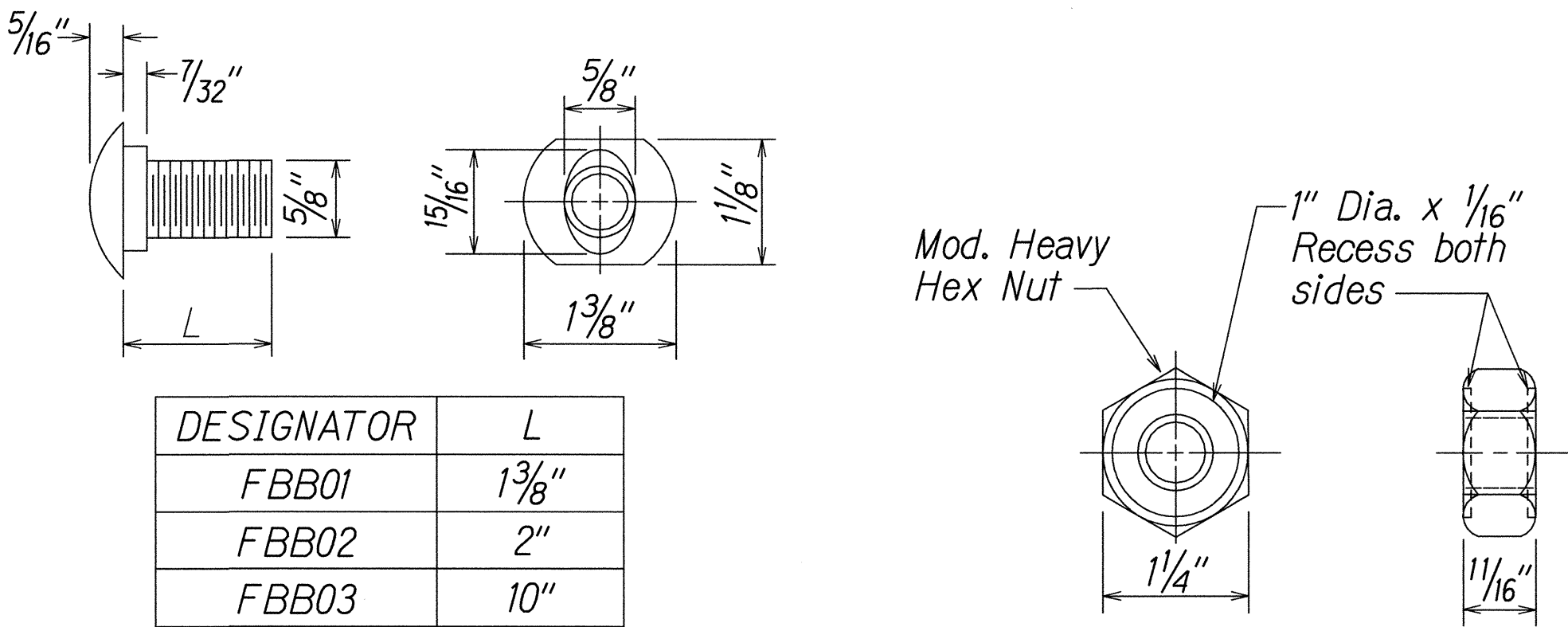
STRONG POST RUBRAIL  
(W-BEAM) GUARDRAIL



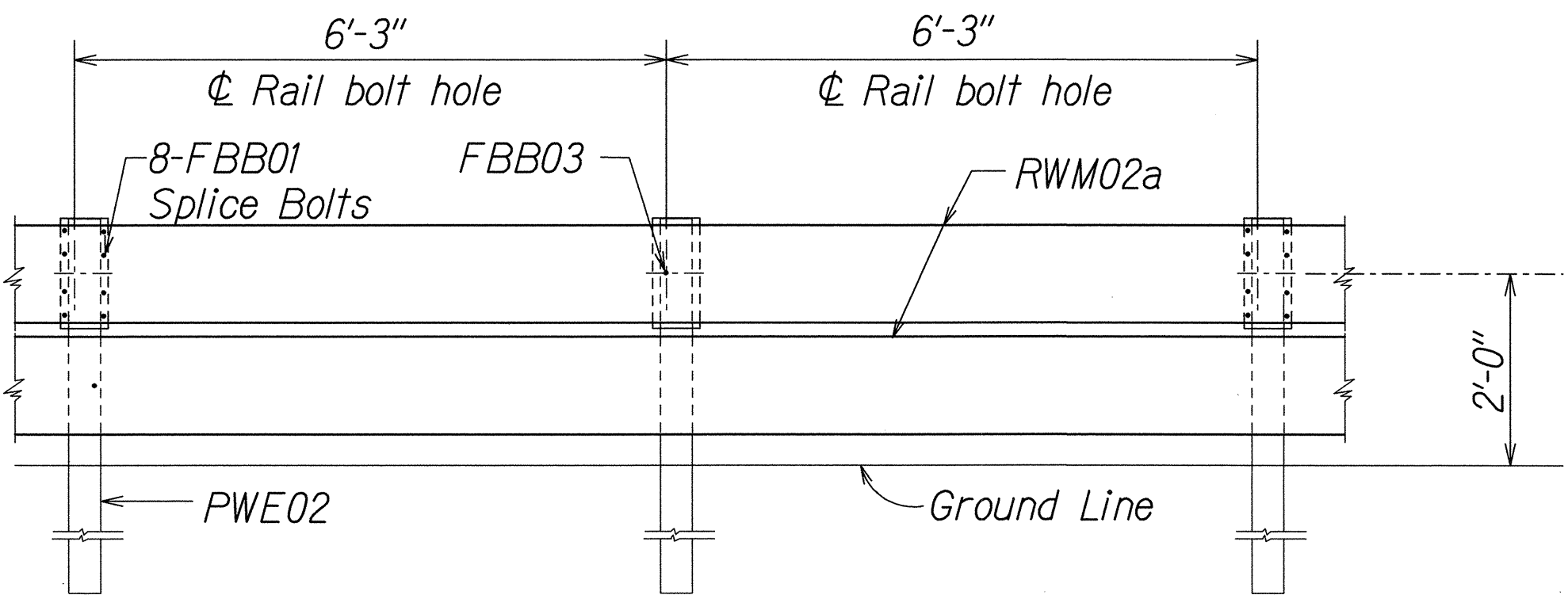
SIDE

FRONT

W-BEAM STRONG POST (PWE02)

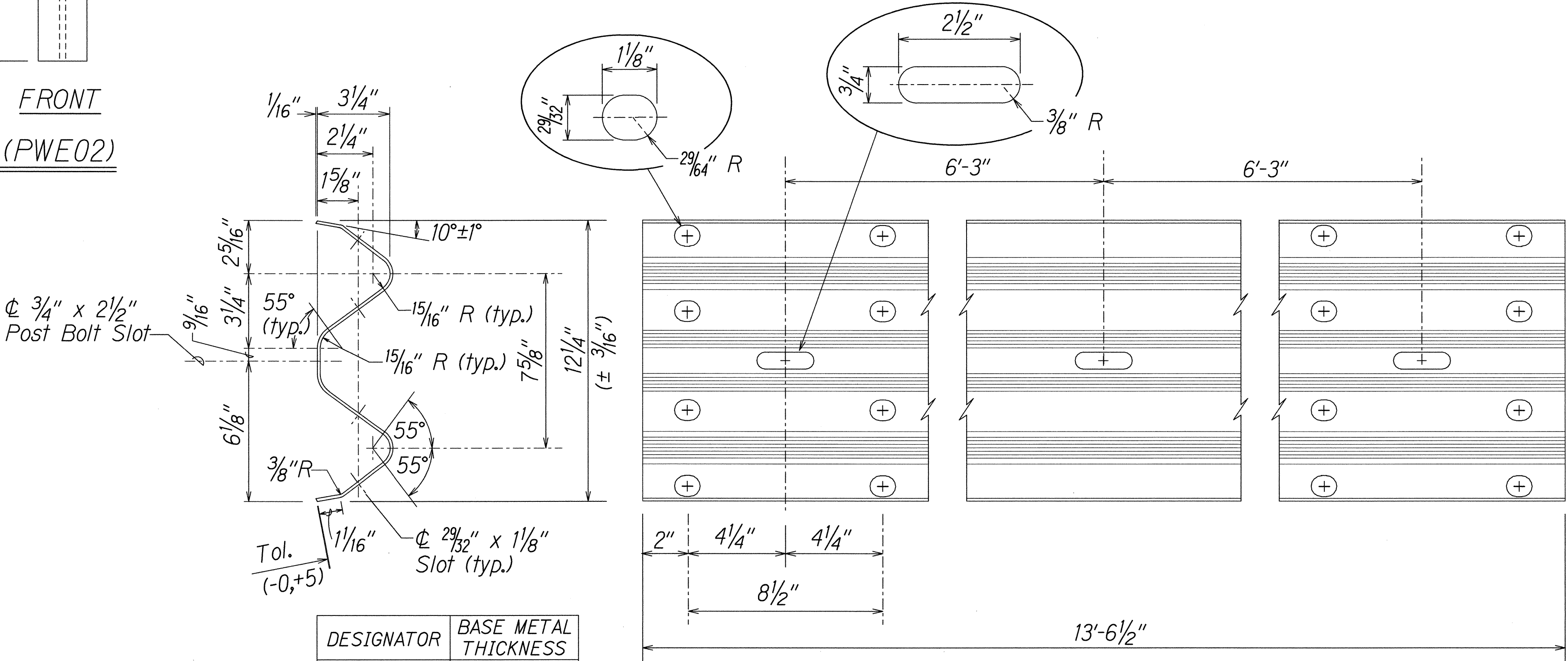


GUARDRAIL BOLTS AND RECESSED NUT

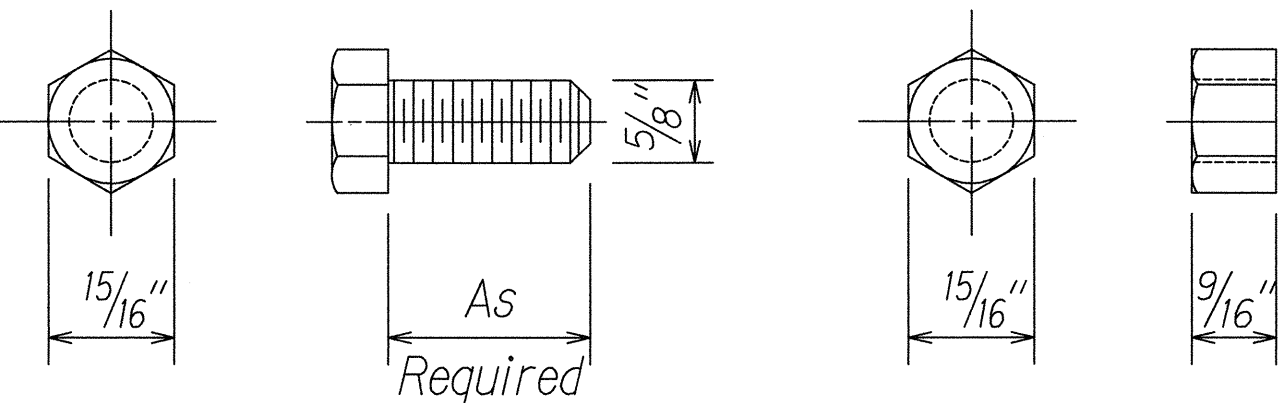


ELEVATION

STRONG POST RUBRAIL (W-BEAM) GUARDRAIL WITH  
RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT



2 SPACE W-BEAM GUARDRAIL (RWM02a)



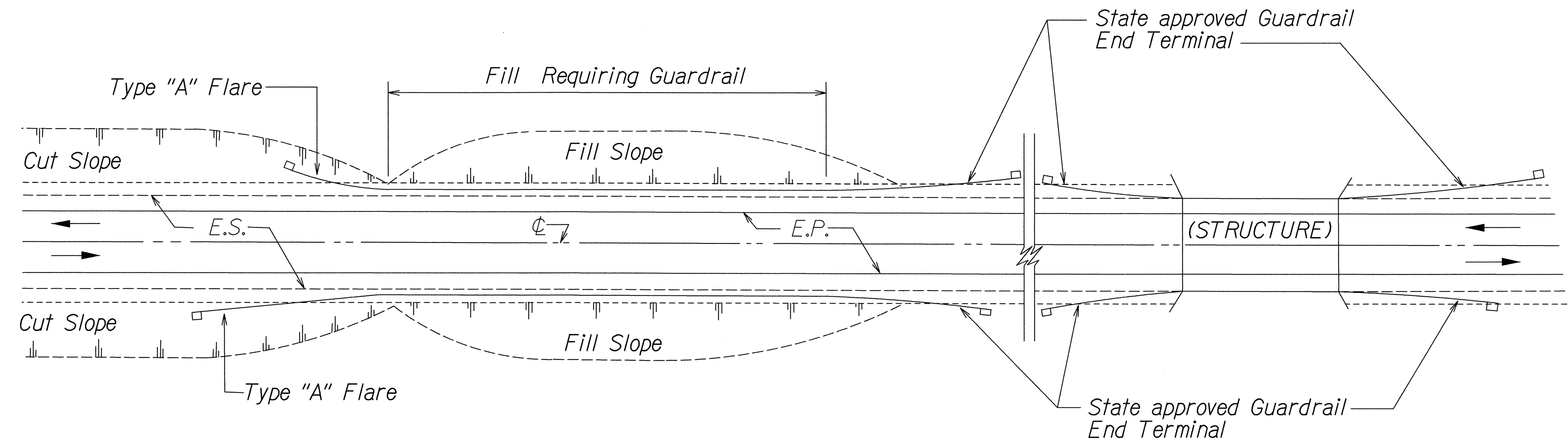
HEX BOLT & NUT (FBX16a)

4/26/06	Revised Sheet
Date	Revision

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**STRONG POST RUBRAIL**  
**(W-BEAM) GUARDRAIL**  
*Kuhio Highway Emergency Repairs*  
*Vicinity of MP 21.7 (Waipapa Stream)*  
**FEDERAL AID PROJECT NO. ER-14(1)**  
Scale: NTS Date: April 2006

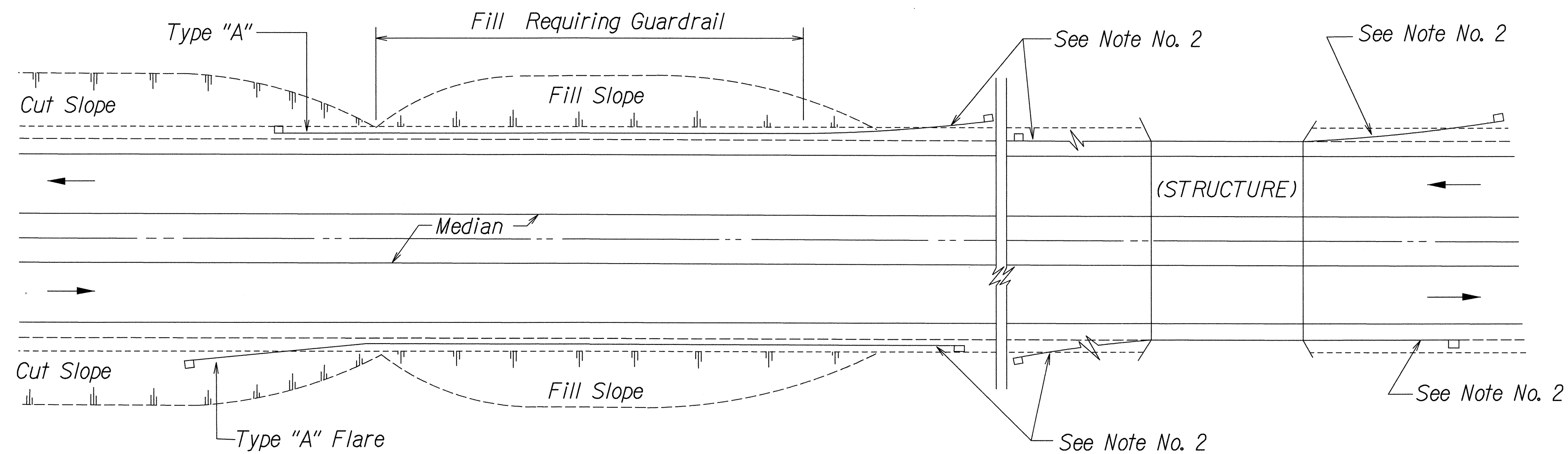
SHEET No. C12 OF 17 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	ER-14(1)	2006	19	34



PLAN

TWO WAY ROADWAY



PLAN

ONE WAY ROADWAY (DIVIDED HIGHWAY)

NOTES:

1. Metal Guardrail connection to concrete structures requires End Post Connection. See Structure Plans.
2. Depending on the existing field conditions, the Engineer shall determine which guardrail end terminal should be installed.
3. Refer to State's most current approved Product List for NCHRP 350 approved Guardrail End Terminals.

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QUANTITIES BY	
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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**GUARDRAIL DETAILS**

*Kuhio Highway Emergency Repairs  
Vicinity of MP 21.7 (Wailapa Stream)  
FEDERAL AID PROJECT NO. ER-14(1)*

Scale: NTS Date: April 2006

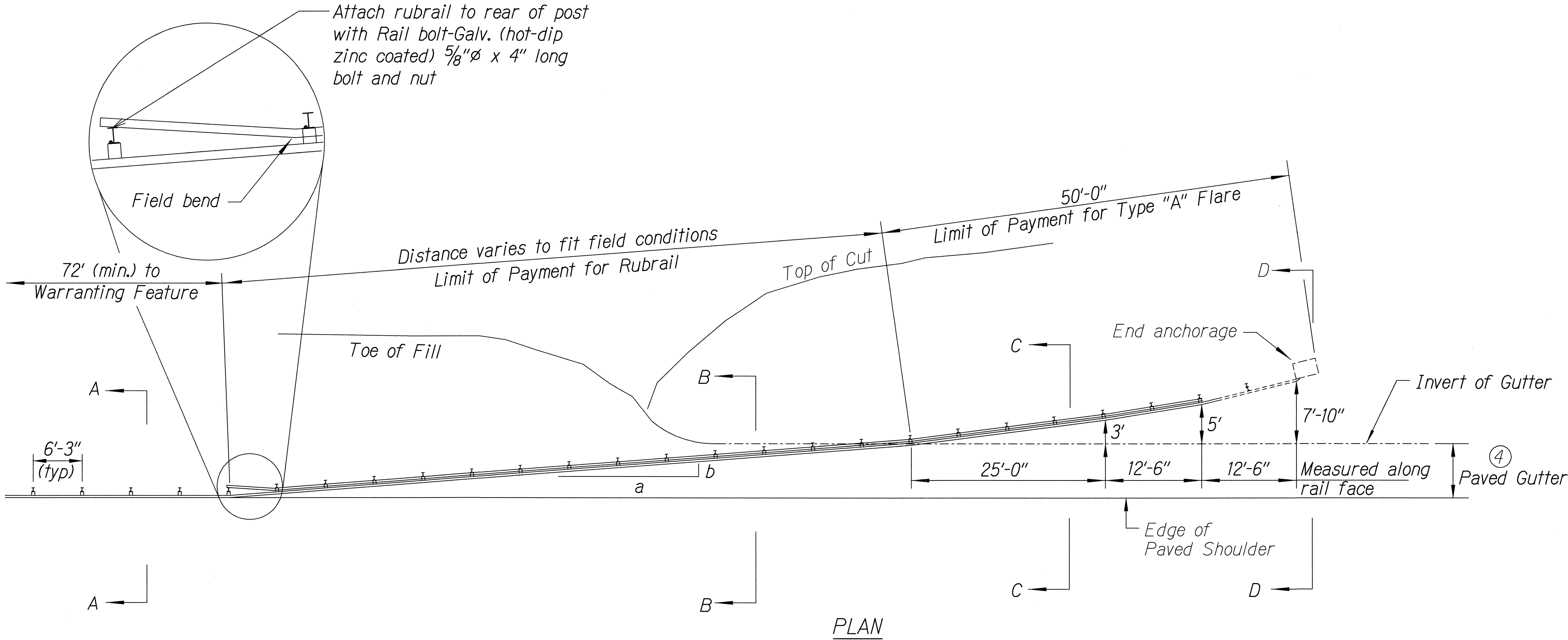
SHEET No. C13 OF 17 SHEETS



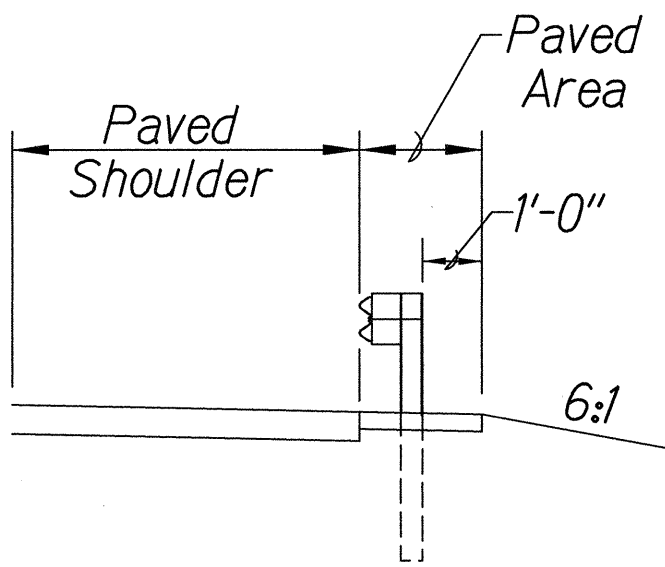
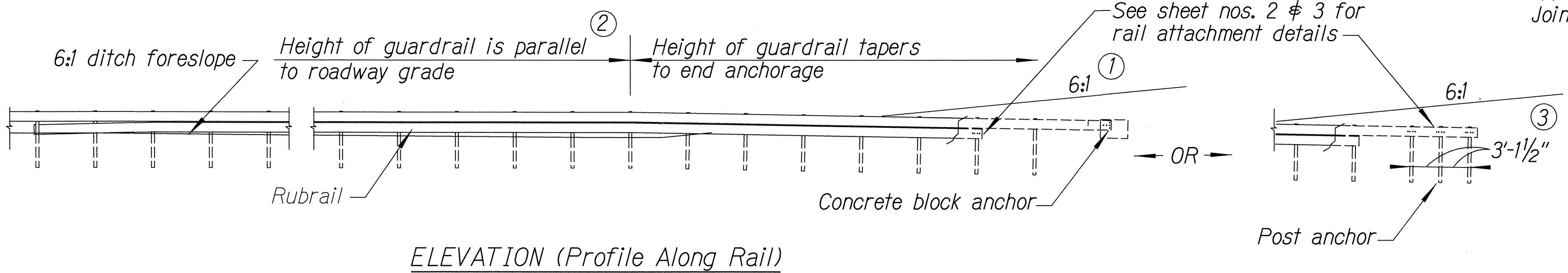
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	ER-14(1)	2006	20	34

General Notes

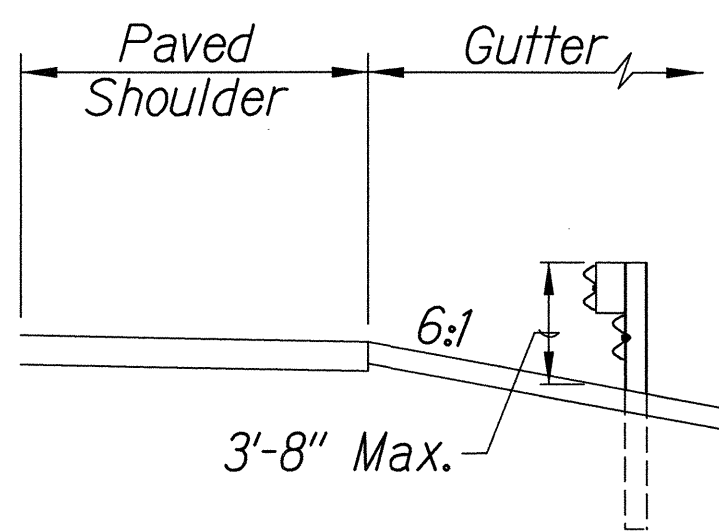
- A 6:1 or flatter slope is desirable. However, a steeper or flatter existing slope may be used.
- Height of guardrail may be tapered down in elevation to maintain 3'-8" maximum height.
- All posts are 8'-0" in length from where the guardrail flares away from the shoulder back to the post anchor. Posts for the post anchor are 6'-0" long.
- Variable Paved Gutter offsets may be used to fit field conditions.
- The Guardrail Posts shall be located away from the gutter/swale invert.
- All fasteners, posts, blocks and rail elements shall conform to the latest edition and amendments of "A Guide to Standardized Highway Barrier Rail Hardware," a report prepared and approved by the AASHTO-AGCARTBA Joint Cooperative Committee.



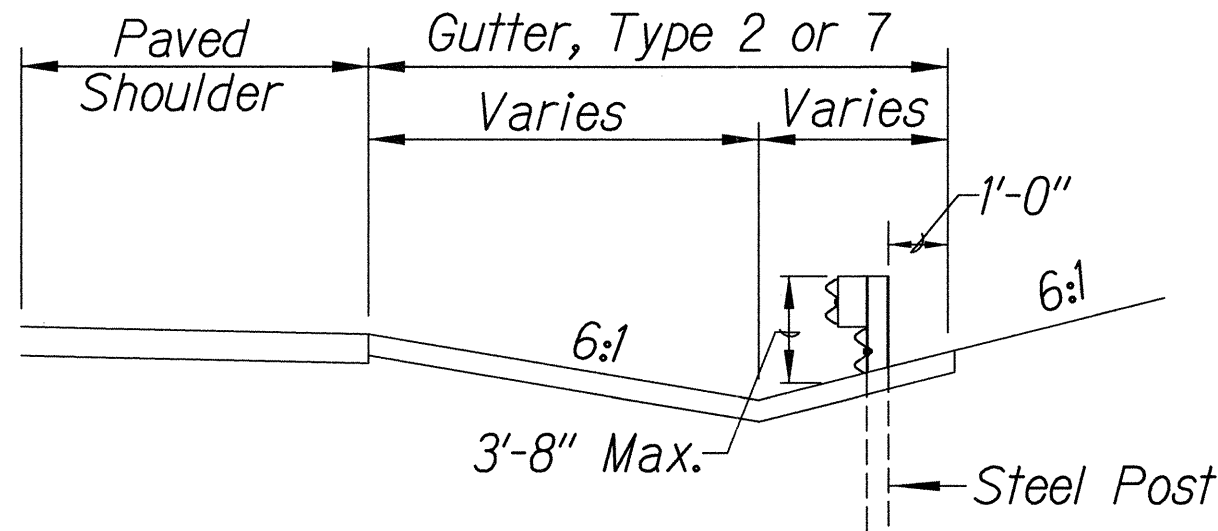
Design speed mph	a:b
68	15:1
62	13:1
56	12:1
50	11:1
43	10:1
37	9:1
31	7:1



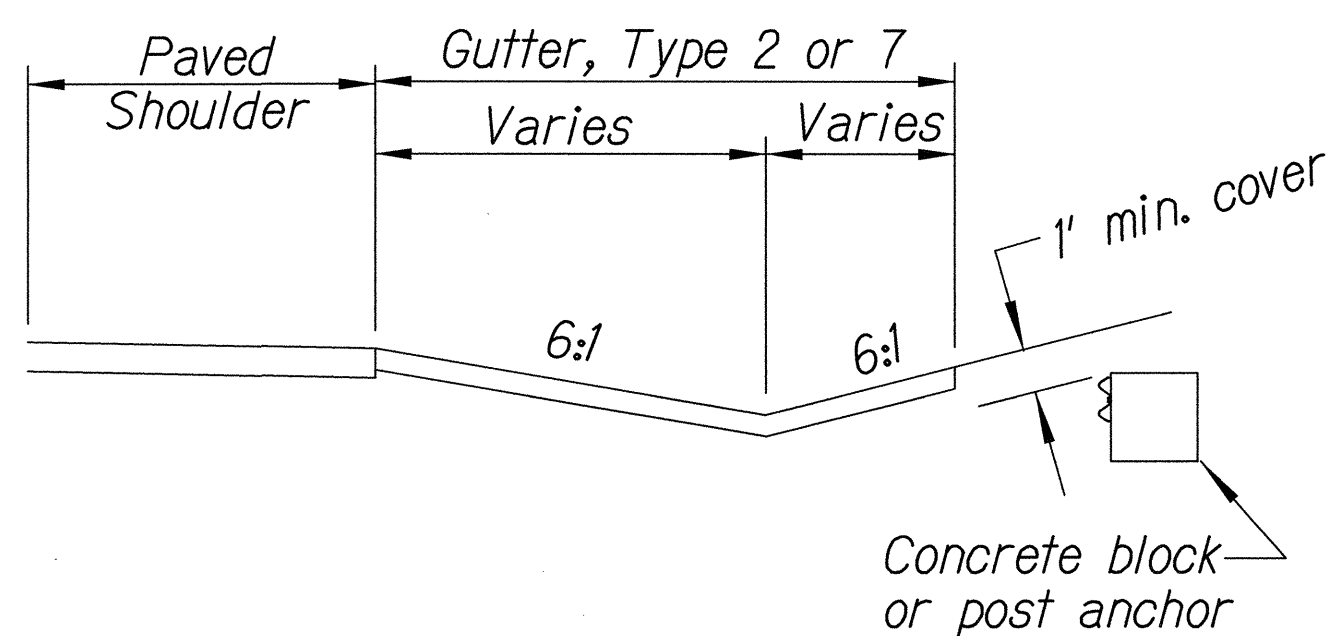
Section A-A



Section B-B  
(With Rubrail)



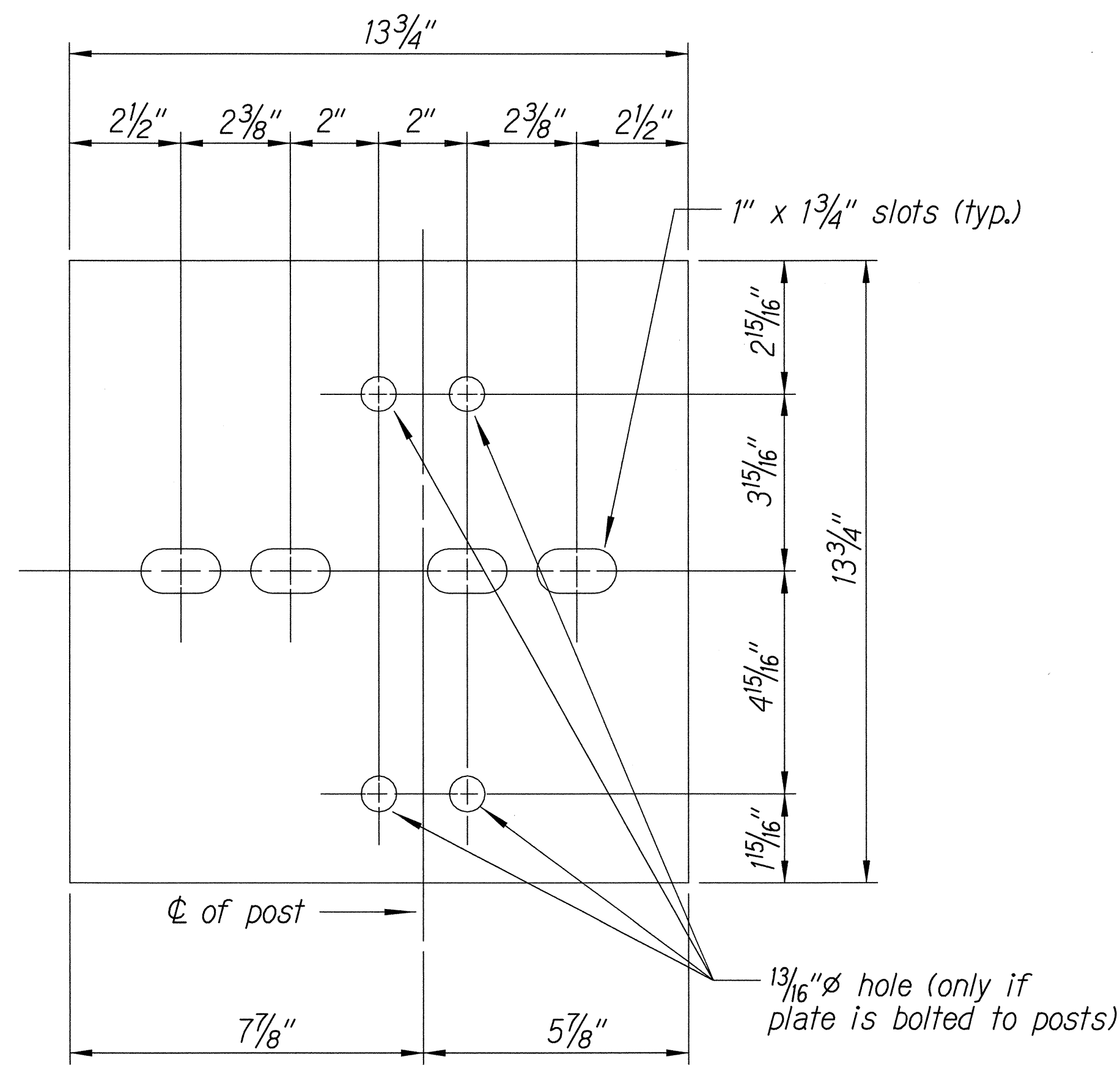
Section C-C  
(With Rubrail)



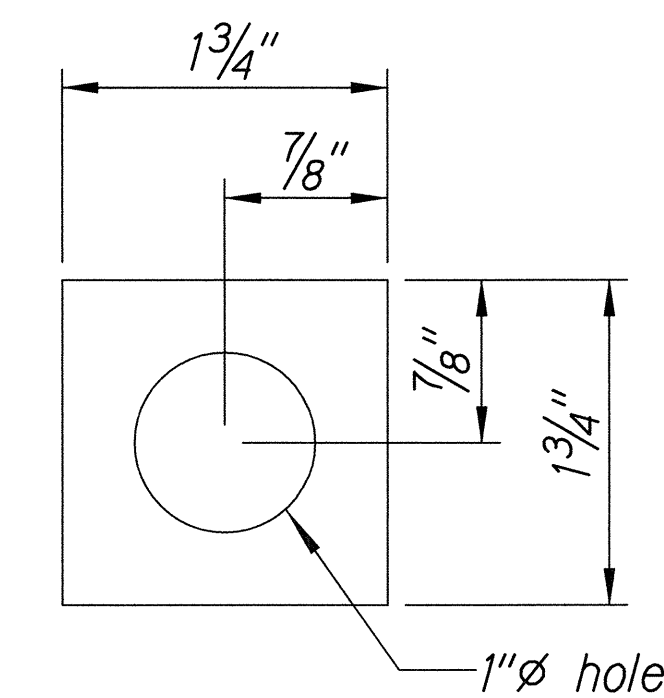
BACKSLOPE ANCHOR TERMINAL (WITH 6:1 PAVED GUTTER AND TYPE "A" FLARE)

4/26/06	Revised Sheet
Date	Revision
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION <b>TYPE "A" FLARE</b> <i>Kuhio Highway Emergency Repairs</i> <i>Vicinity of MP 21.7 (Wailapa Stream)</i> FEDERAL AID PROJECT NO. ER-14(1) Scale: NTS Date: April 2006	
SHEET No. C14 OF 17 SHEETS	

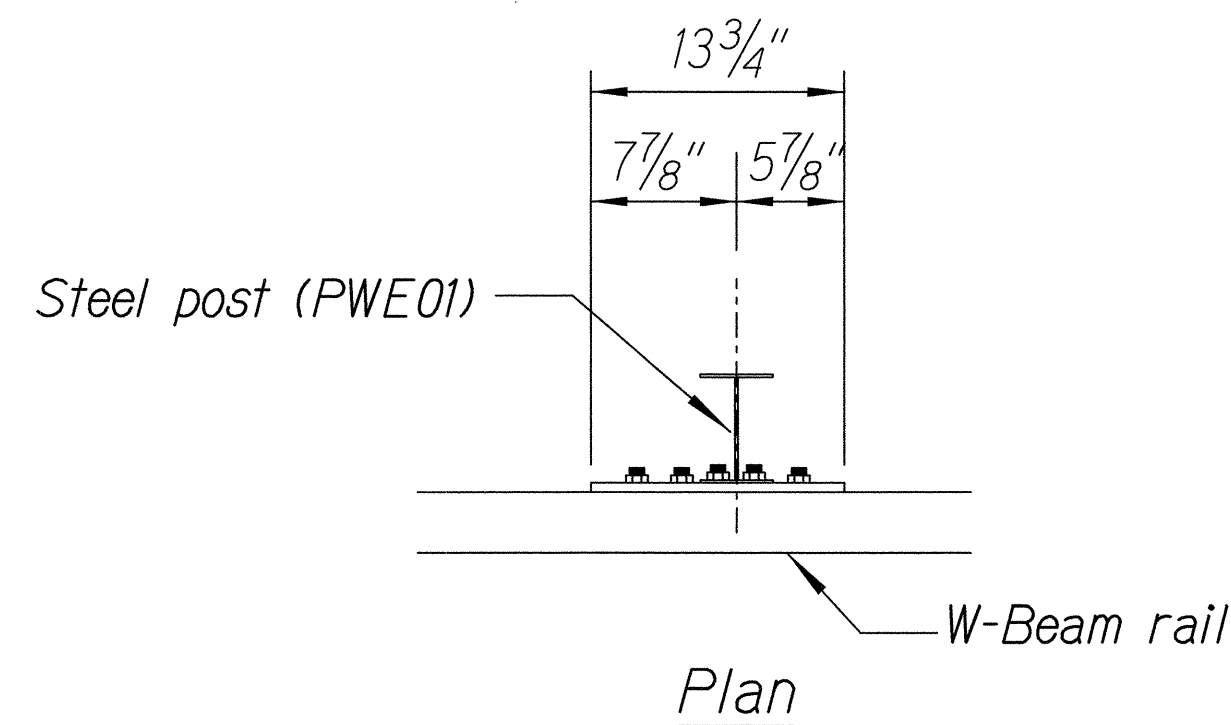
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	ER-14(1)	2006	21	34



Steel Plate - 1/2"  
(Hot-dip Zinc Coated Galvanized  
Welded or Bolted to Post)

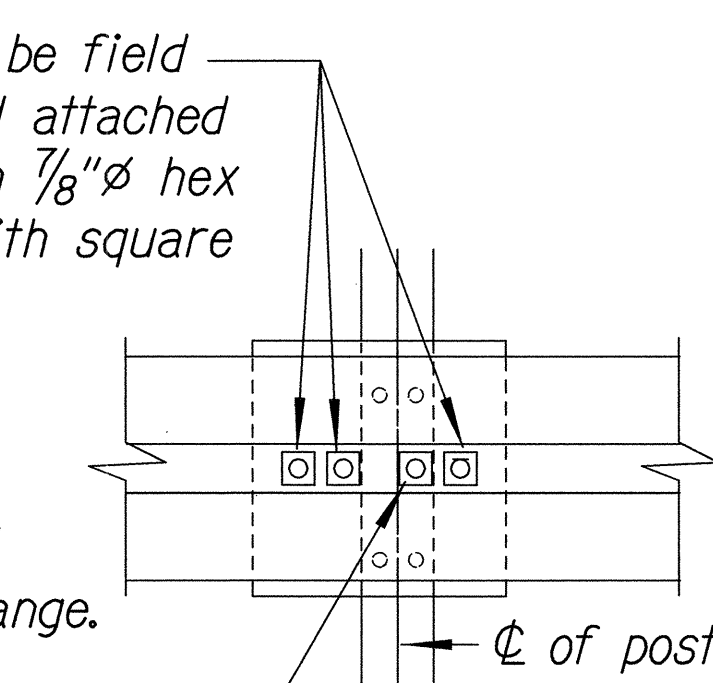


Square Washer  
(3/16" Thick - Hot-dip  
Zinc Coated Galvanized)

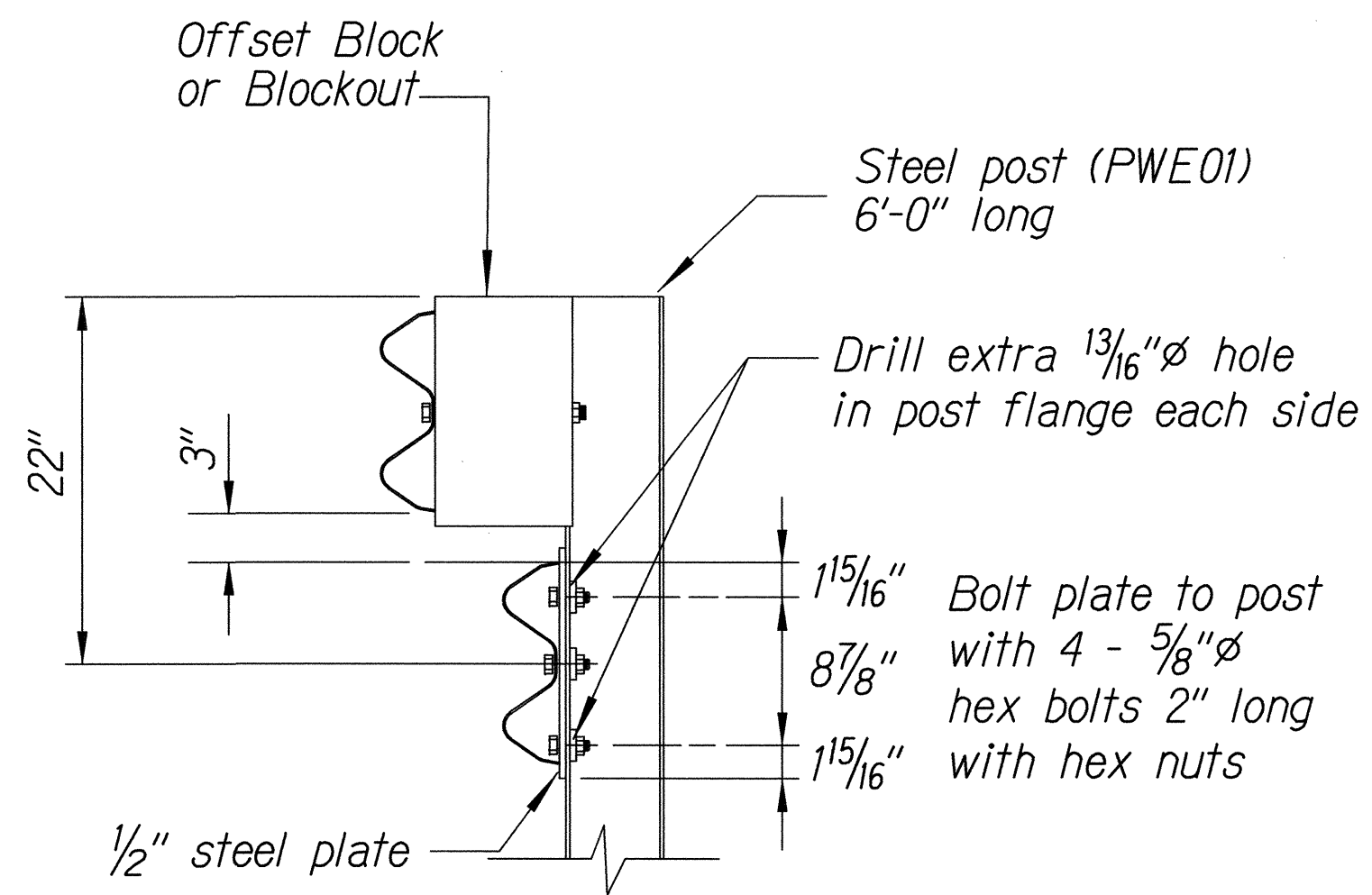


3 - 7/8"  $\phi$  holes to be field drilled in rail and attached to steel plate with 7/8"  $\phi$  hex bolts 1 15/16" long with square washer

1"  $\phi$  holes to be field drilled in rail and through post flange. Attach to steel plate with 7/8"  $\phi$  hex bolts 2" long with square washer

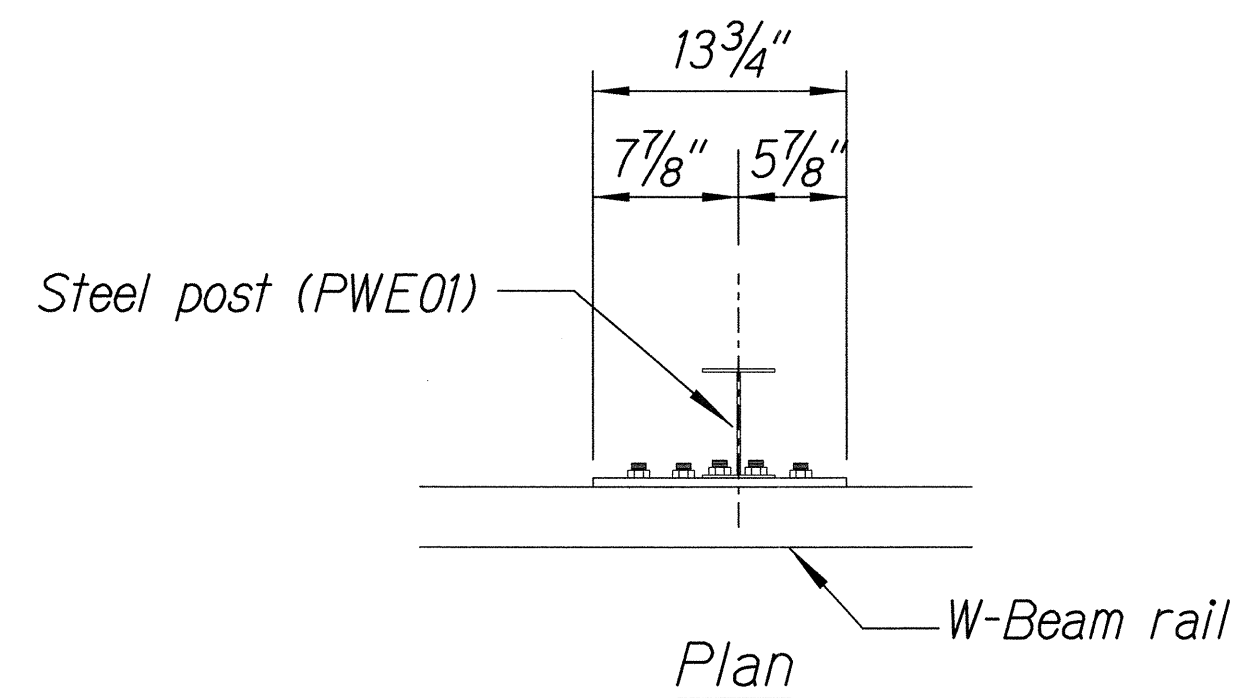


Front View



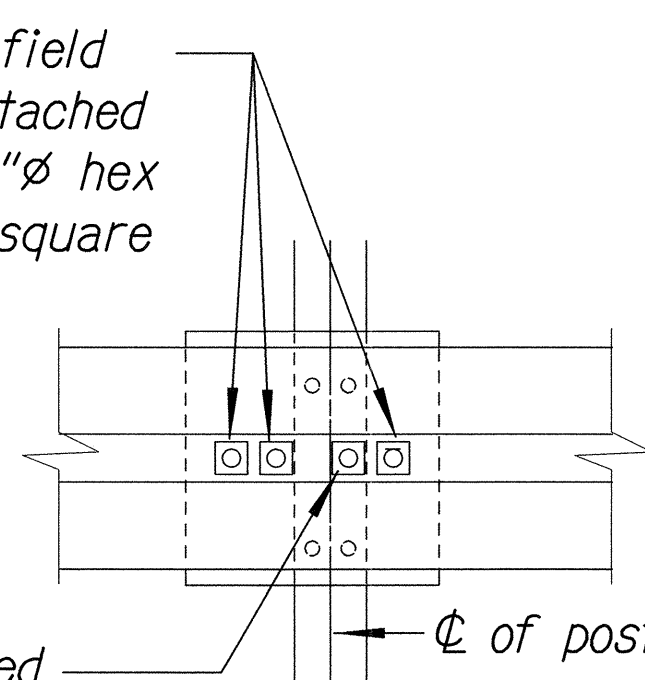
Elevation

#### RUBRAIL ANCHOR DETAILS

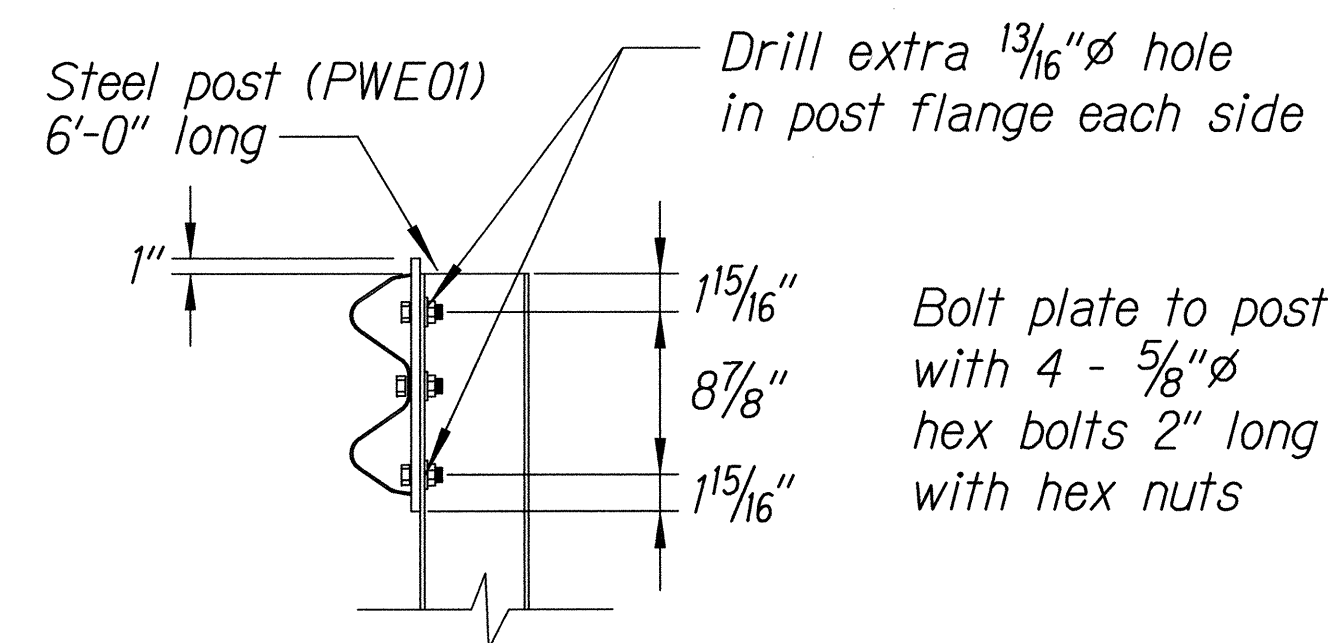


3 - 7/8"  $\phi$  holes to be field drilled in rail and attached to steel plate with 7/8"  $\phi$  hex bolts 1 15/16" long with square washer

1"  $\phi$  holes to be field drilled in rail and through post flange. Attach to steel plate with 7/8"  $\phi$  hex bolts 2" long with square washer



Front View



Elevation

#### POST ANCHOR DETAILS

#### BACKSLOPE ANCHOR TERMINAL END ANCHORAGE DETAILS (TYPE "A" FLARE)

#### Note:

All fasteners, posts, blocks and rail elements shall conform to the latest edition and amendments of "A Guide to Standardized Highway Barrier Rail Hardware," a report prepared and approved by the AASHTO-AGCARTBA Joint Cooperative Committee.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

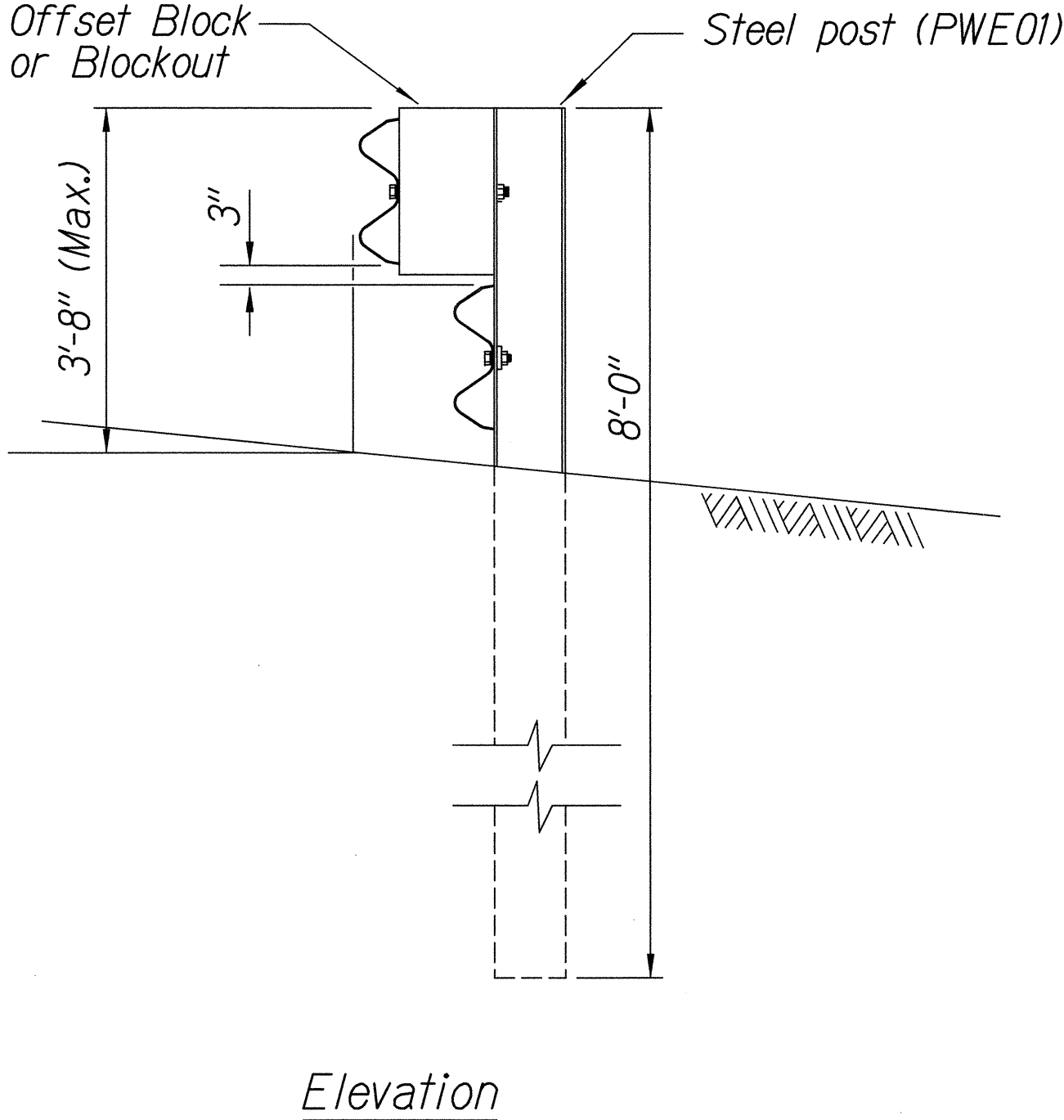
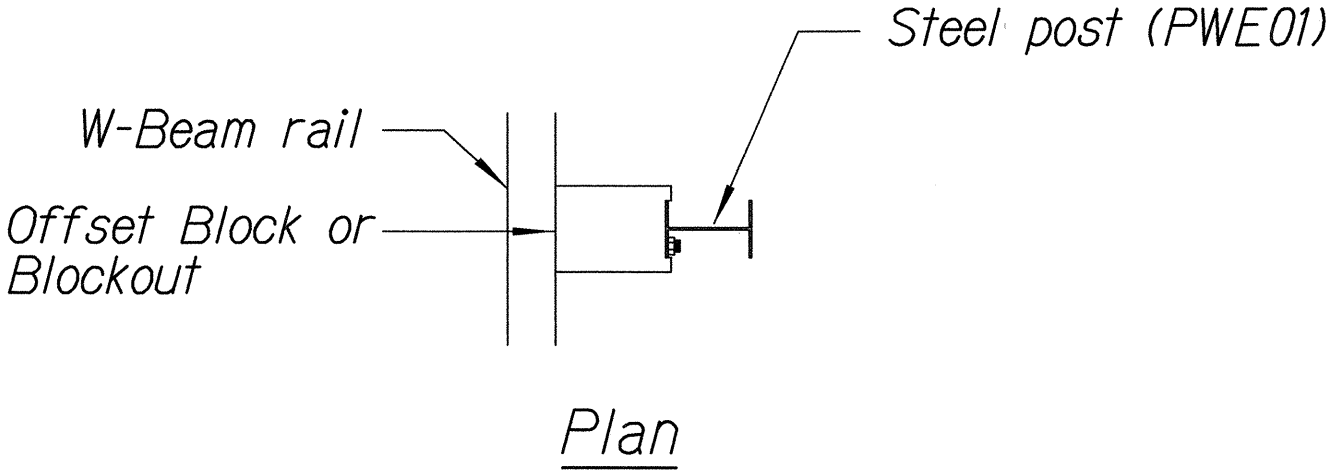
#### TYPE "A" FLARE

Kuhio Highway Emergency Repairs  
Vicinity of MP 21.7 (Wailapa Stream)  
FEDERAL AID PROJECT NO. ER-14(1)  
Scale: NTS Date: April 2006

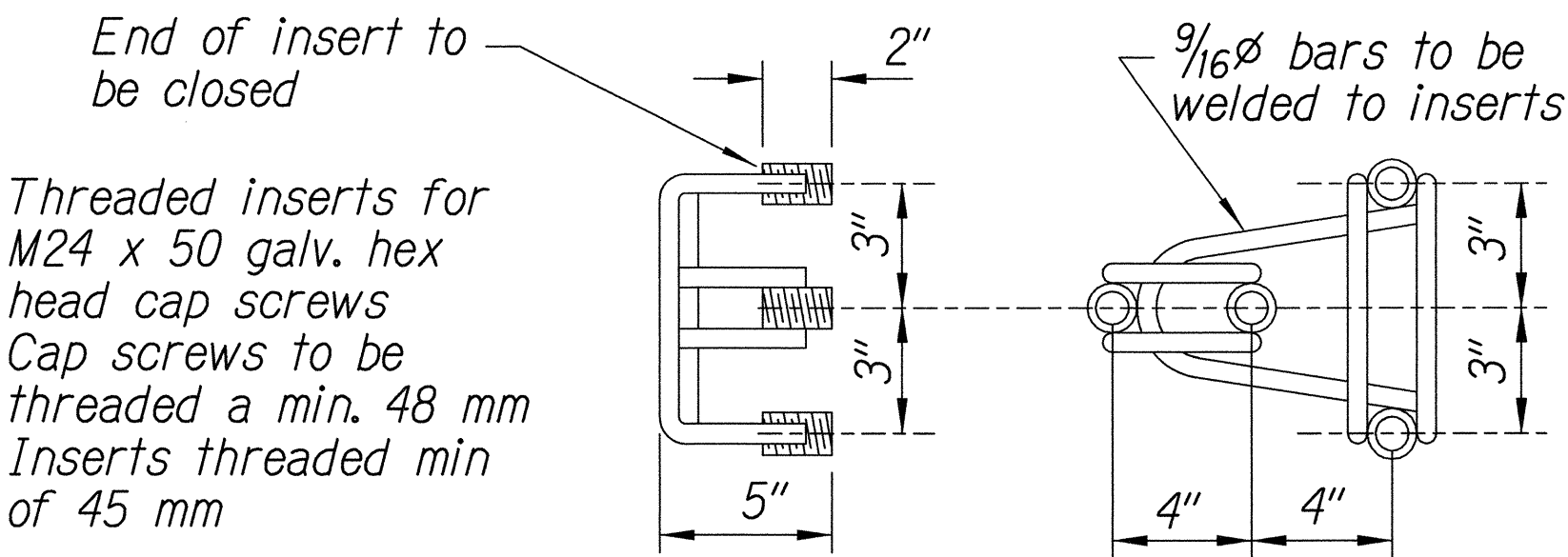
SHEET No. C15 OF 17 SHEETS

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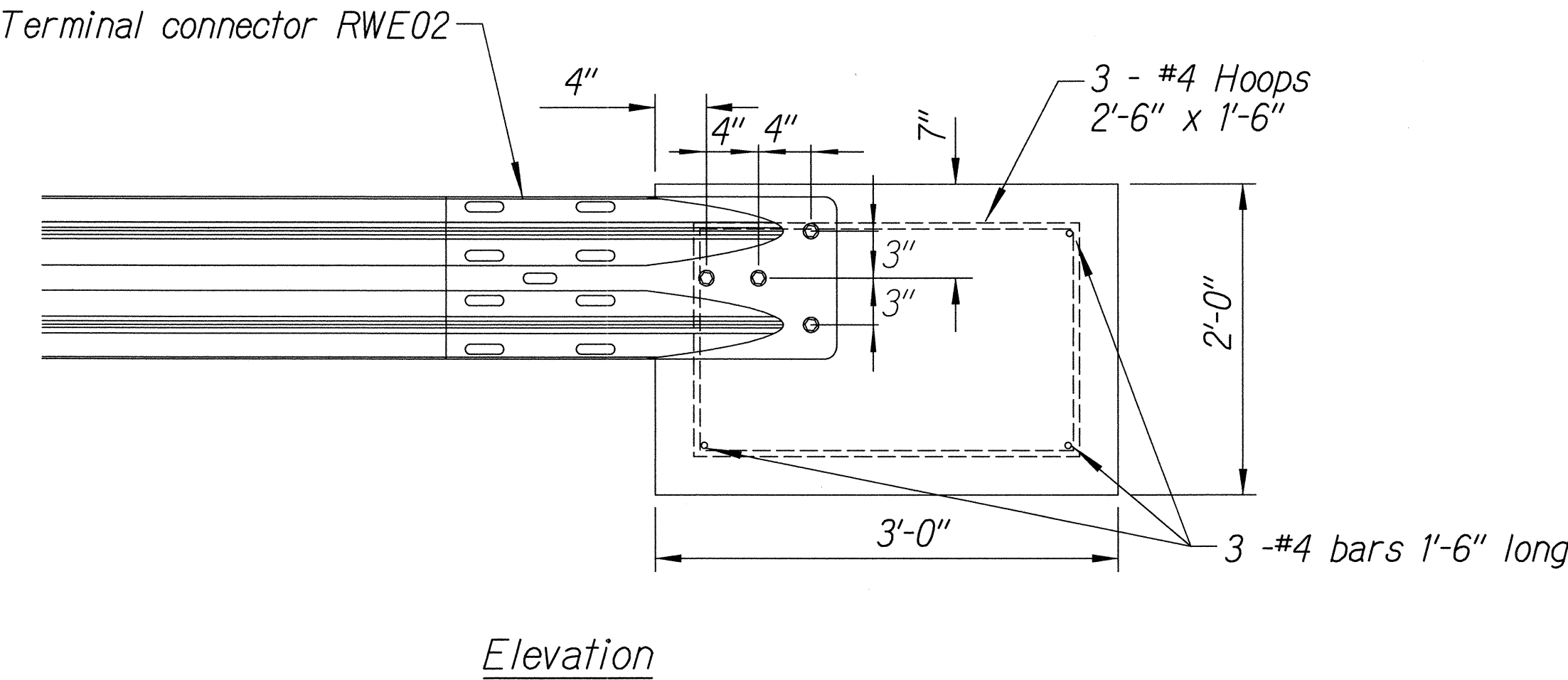
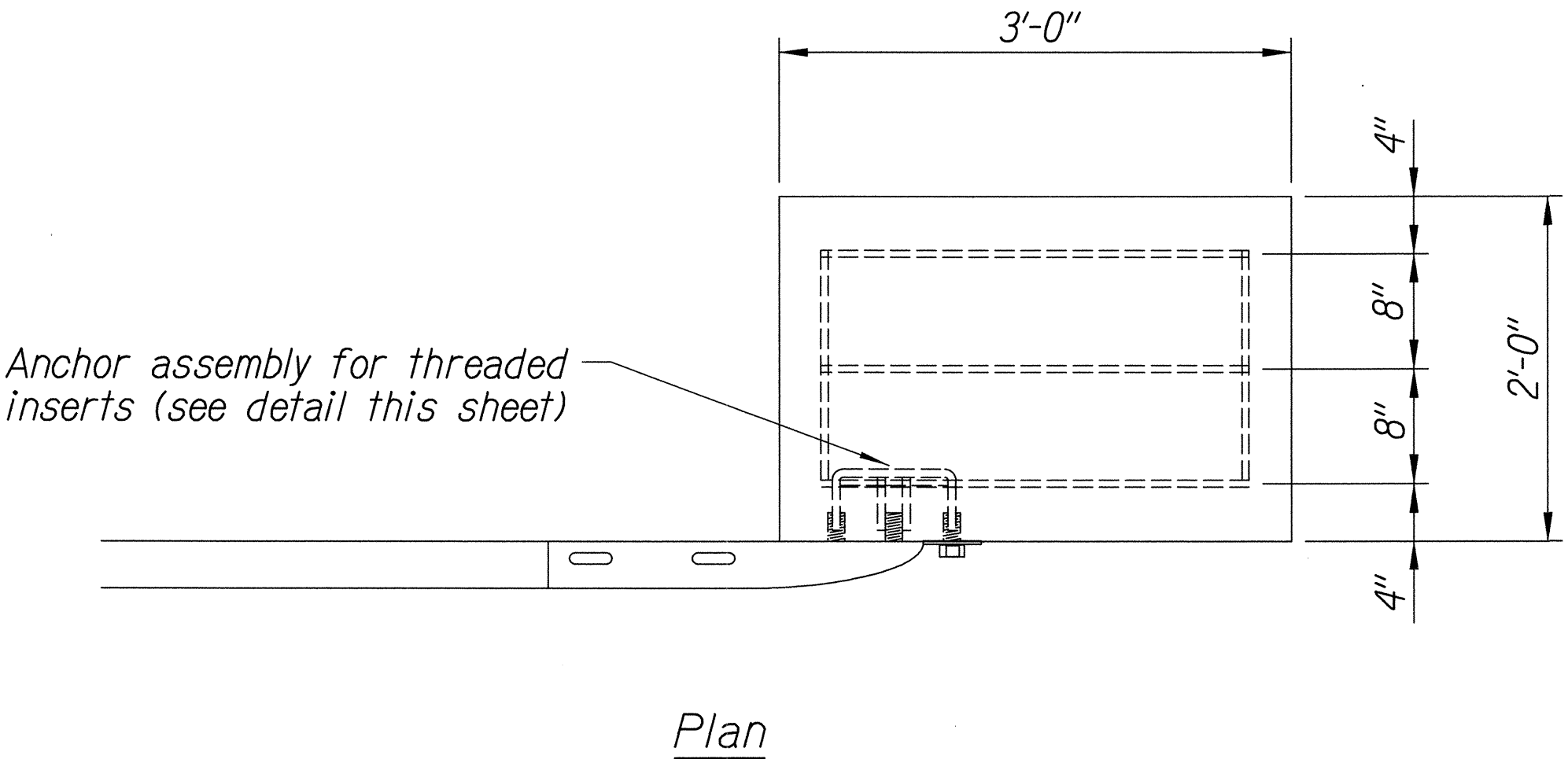
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	ER-14(1)	2006	22	34



STEEL POST GUARDRAIL  
WITH RUBRAIL



ANCHOR ASSEMBLY  
CONCRETE BLOCK ANCHOR



CONCRETE BLOCK ANCHOR  
(2' X 2' X 3')

BACKSLOPE ANCHOR TERMINAL END ANCHORAGE DETAILS  
(TYPE "A" FLARE)

Note:

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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

TYPE "A" FLARE  
  
Kuhio Highway Emergency Repairs  
Vicinity of MP 21.7 (Wailapa Stream)  
FEDERAL AID PROJECT NO. ER-14(1)  
Scale: NTS Date: April 2006

SHEET No. C16 OF 17 SHEETS

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