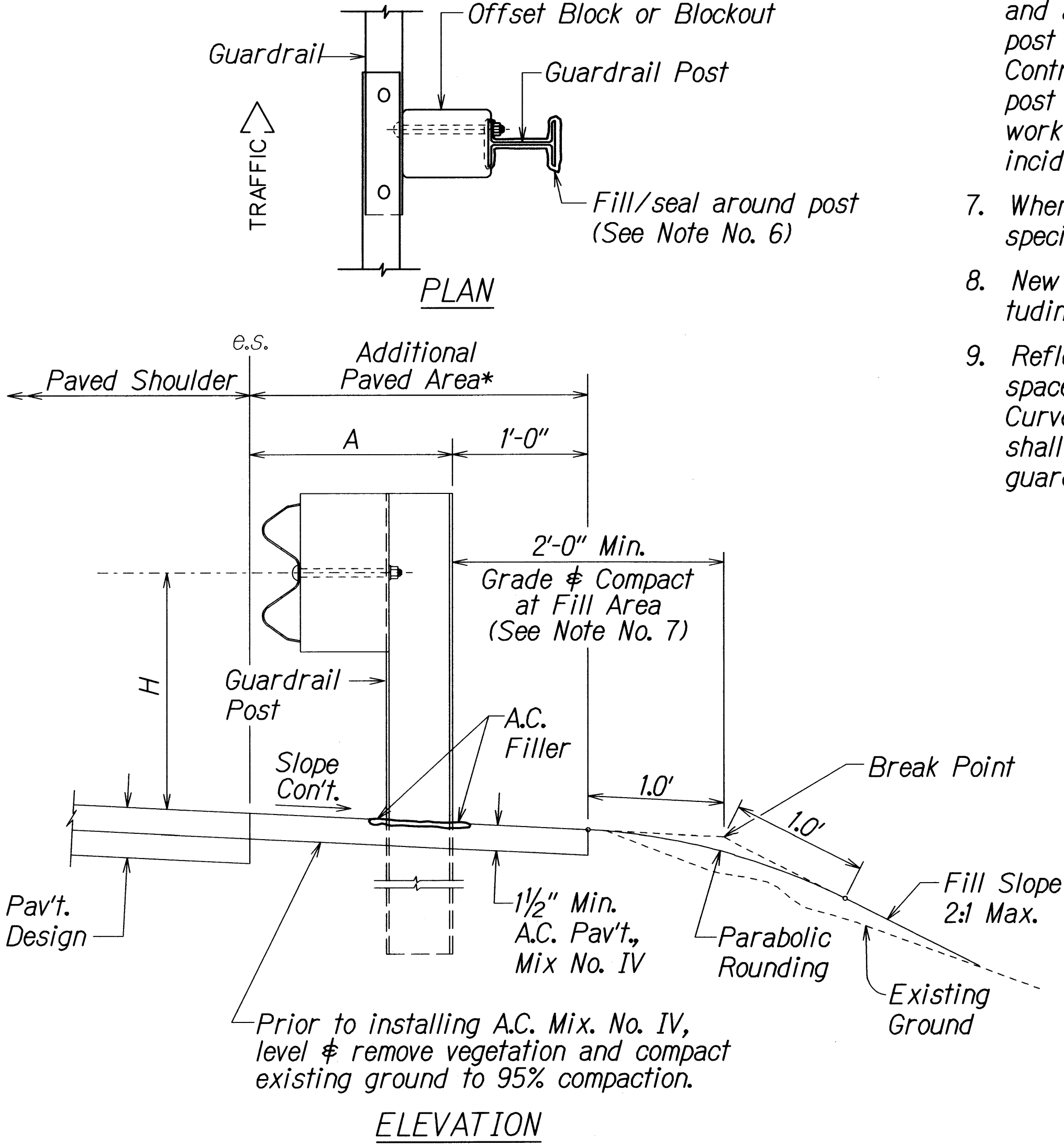
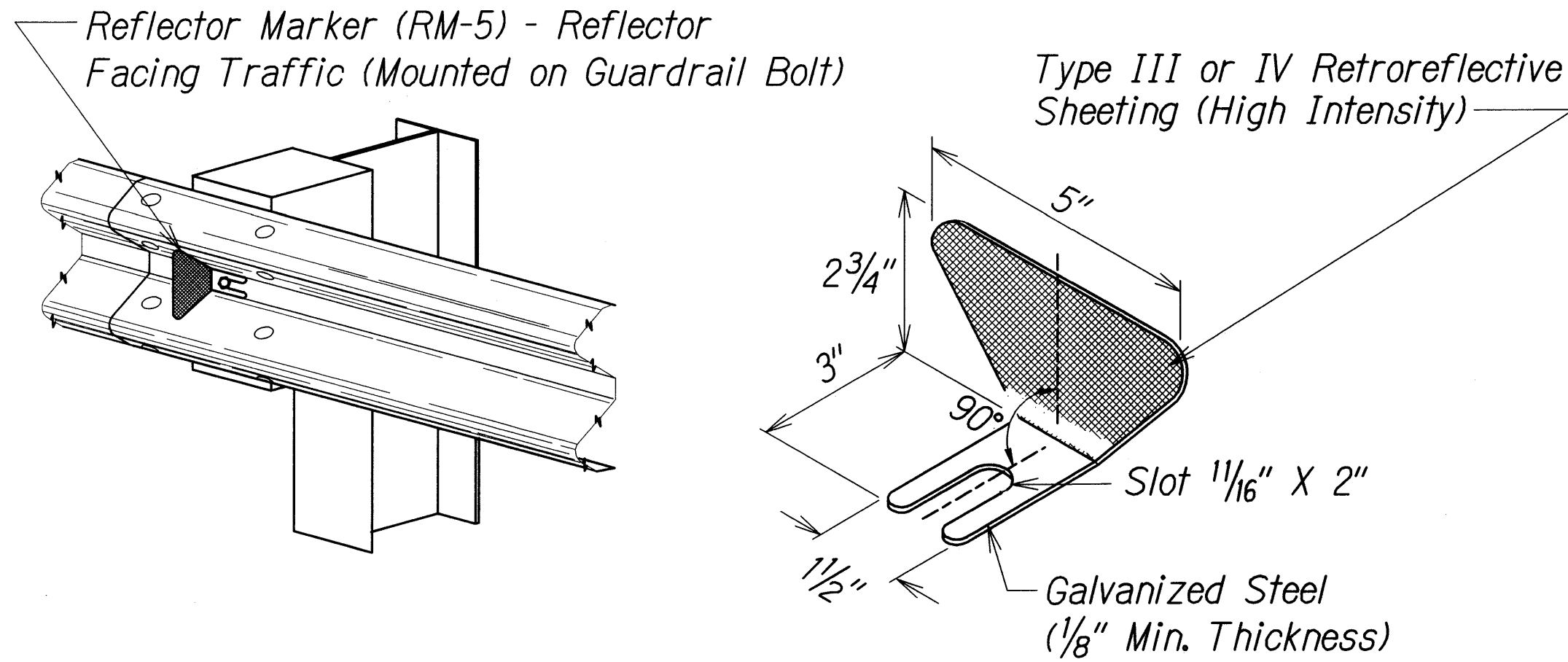
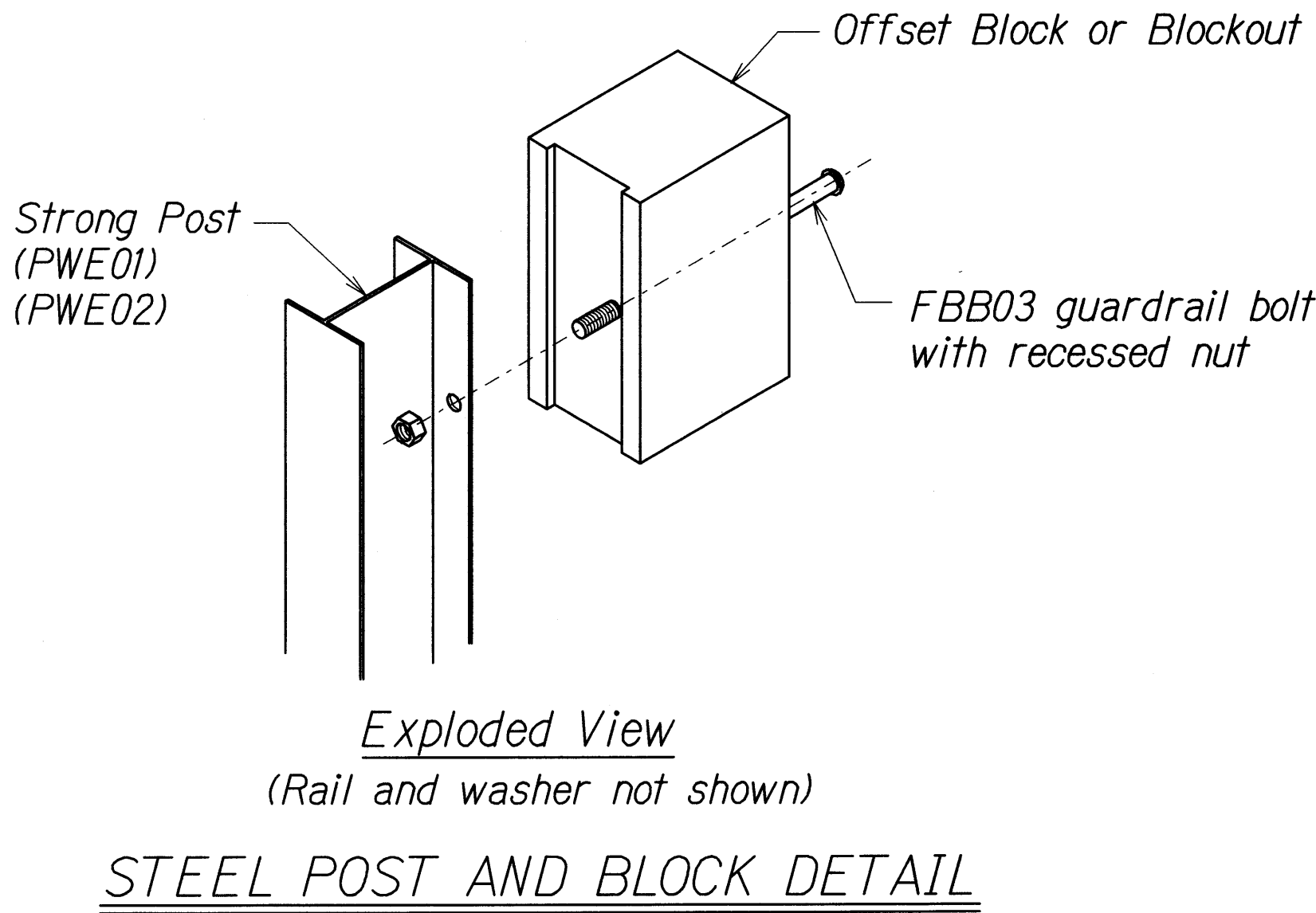
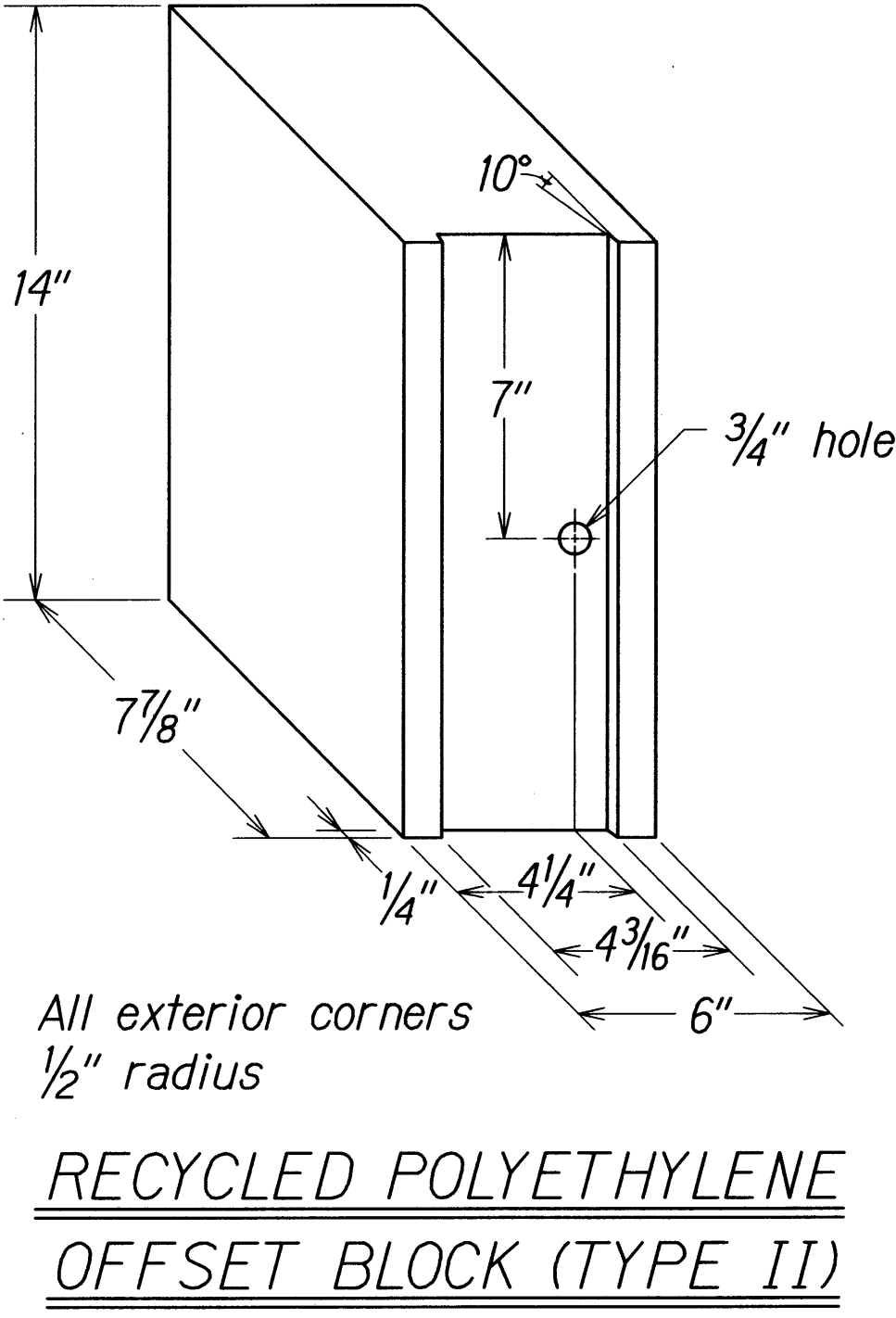
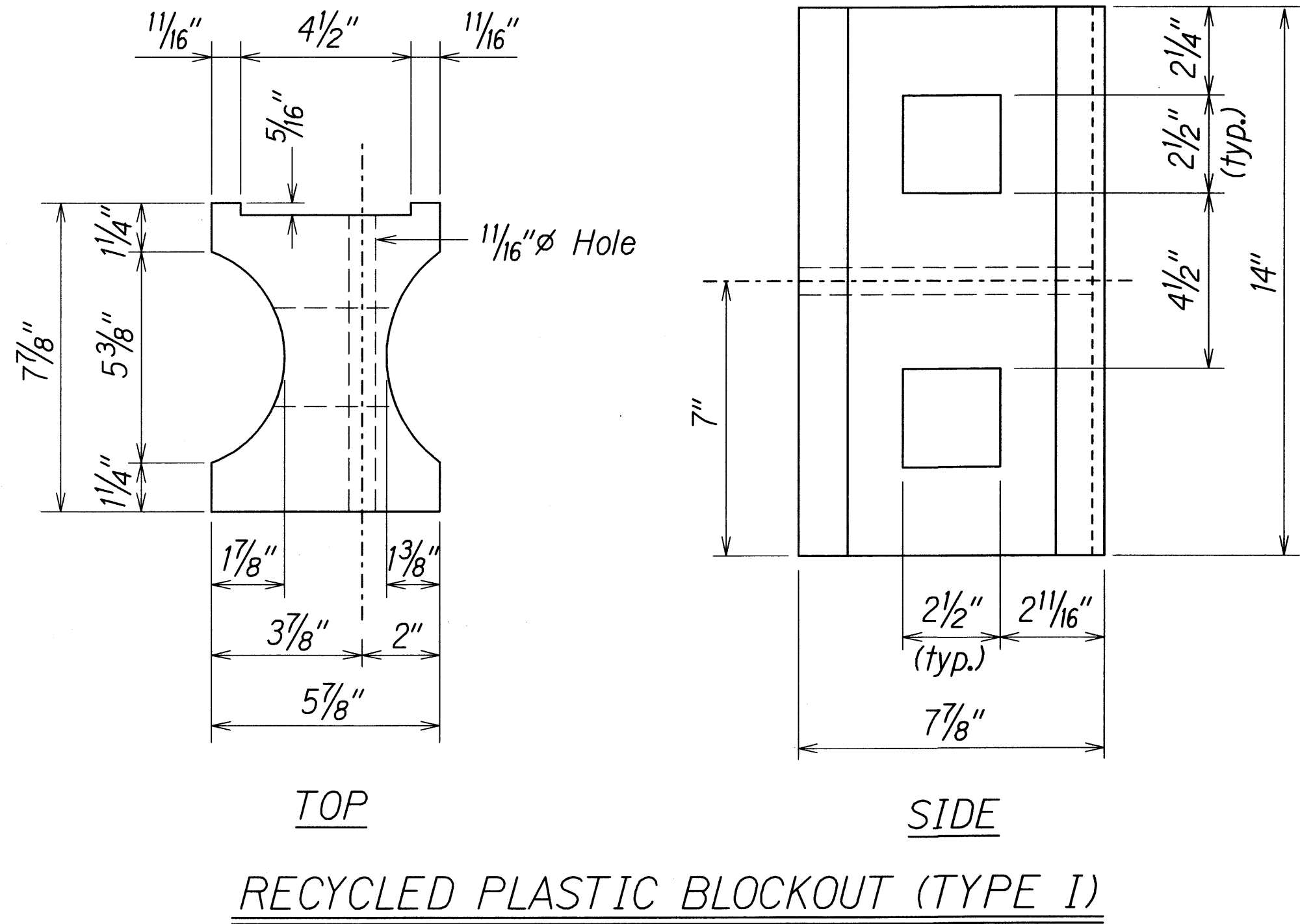


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360B-01-12M	2012	8	31

GENERAL NOTES

- All hardware, posts and fasteners shall be hot-dip zinc coated galvanized after fabrication. No punching, drilling or cutting will be permitted after galvanizing.
- Where conditions require, special post lengths in increments of 6 inches may be specified.
- All fasteners, posts, and rail elements (i.e. FBB03, PWE01, RWM02b, etc.) 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-AGC-ARTBA Joint Cooperative Committee, Subcommittee On New Highway Materials, Task Force 13 Report. Dimensions of fasteners, posts and rail elements have been converted from metric units into their present form.
- The Recycled Plastic Block or Offset Block shall be approved by the State.
- All new guardrail systems (system consists of total length of guardrail including both end treatments) shall include the Additional Paved Area.
- After the guardrail posts are installed in the paved area, the Contractor shall fill/seal around each guardrail post and all cracks in the paved area caused during the guardrail post installation. If required by the inspector/engineer, the Contractor shall tamper the paved area around the guardrail post prior to filling/sealing. All costs associated with this work shall not be paid for separately, but shall be considered incidental to the various guardrail items.
- When standards for the fill slope area cannot be met, a site specific, engineer approved design may be used.
- New A.C. pavement at guardrails shall extend 6 feet longitudinally beyond terminal ends.
- Reflector Markers (RM-5) mounted on guardrails shall be spaced every 25 feet. Spacing of RM-5's on Horizontal Curves shall comply with Table III-1 of the MUTCD. RM-5's shall not be installed on Terminal Sections. RM-5 on new guardrail shall be incidental to guardrail pay item.



GUARDRAIL TYPE	DIMENSION	
	H	A
Strong Post W-Beam	1'-9 5/8"	1'-6"
Strong Post Rubrail (W-Beam)	2'-0"	1'-6"
Modified or Strong Post Thrie Beam	2'-0"	2'-0"

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

GUARDRAIL DETAILS & NOTES

HANA HIGHWAY RESURFACING

Vicinity of Waikani Bridge to Kapaula Bridge

Project No. 360B-01-12M

Scale: NTS

Date: December, 2011

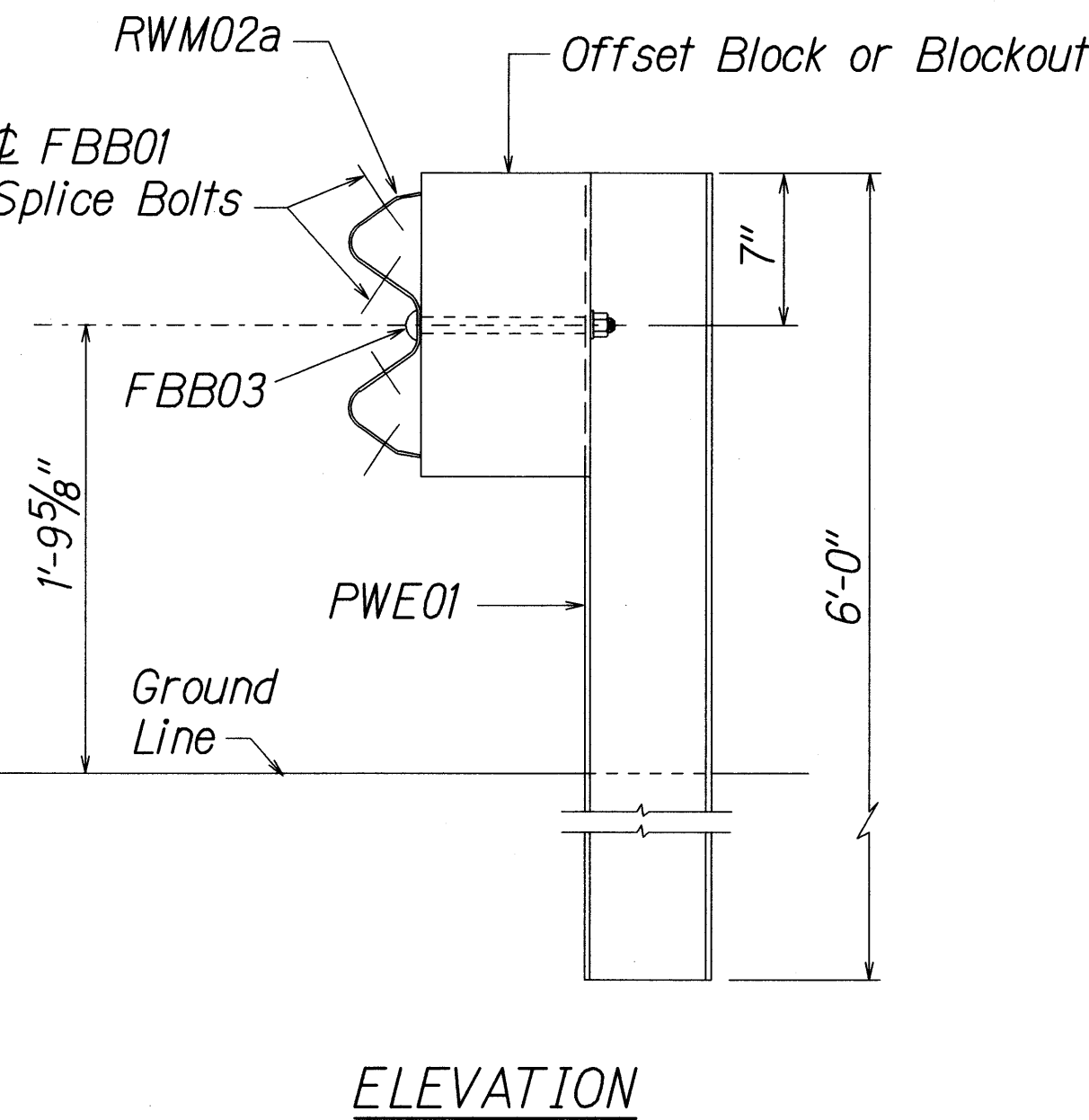
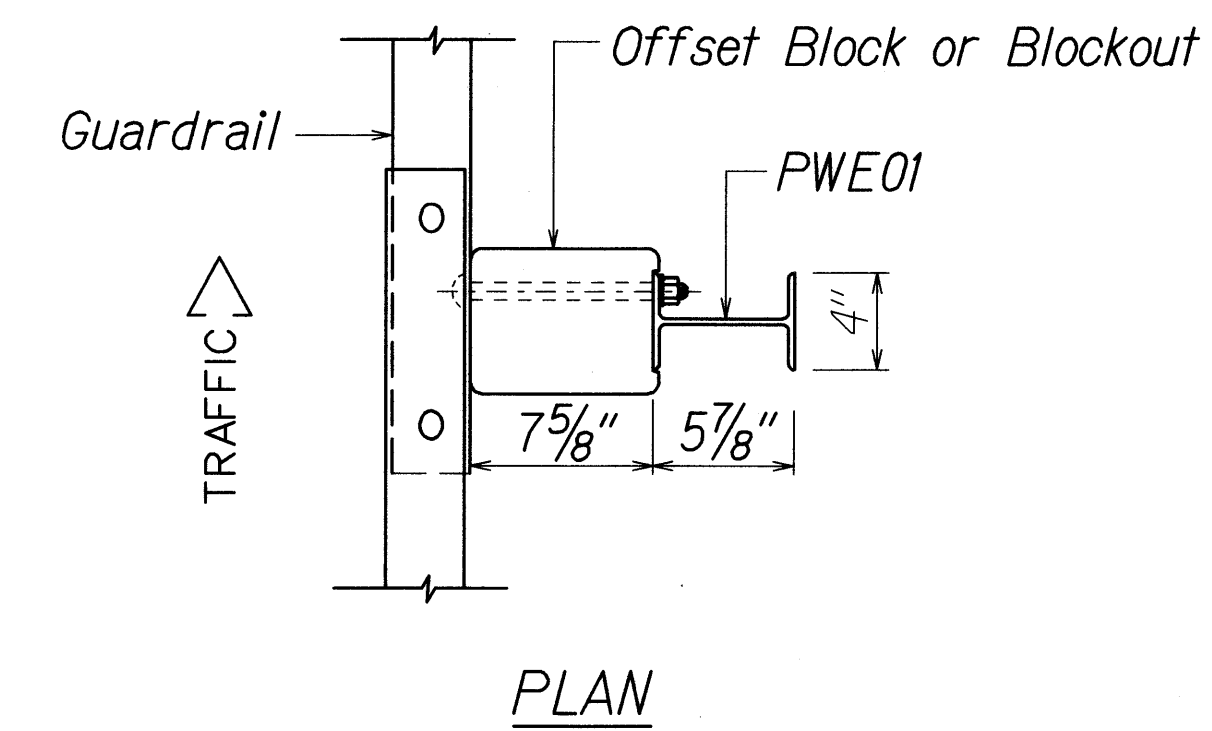
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SHEETS

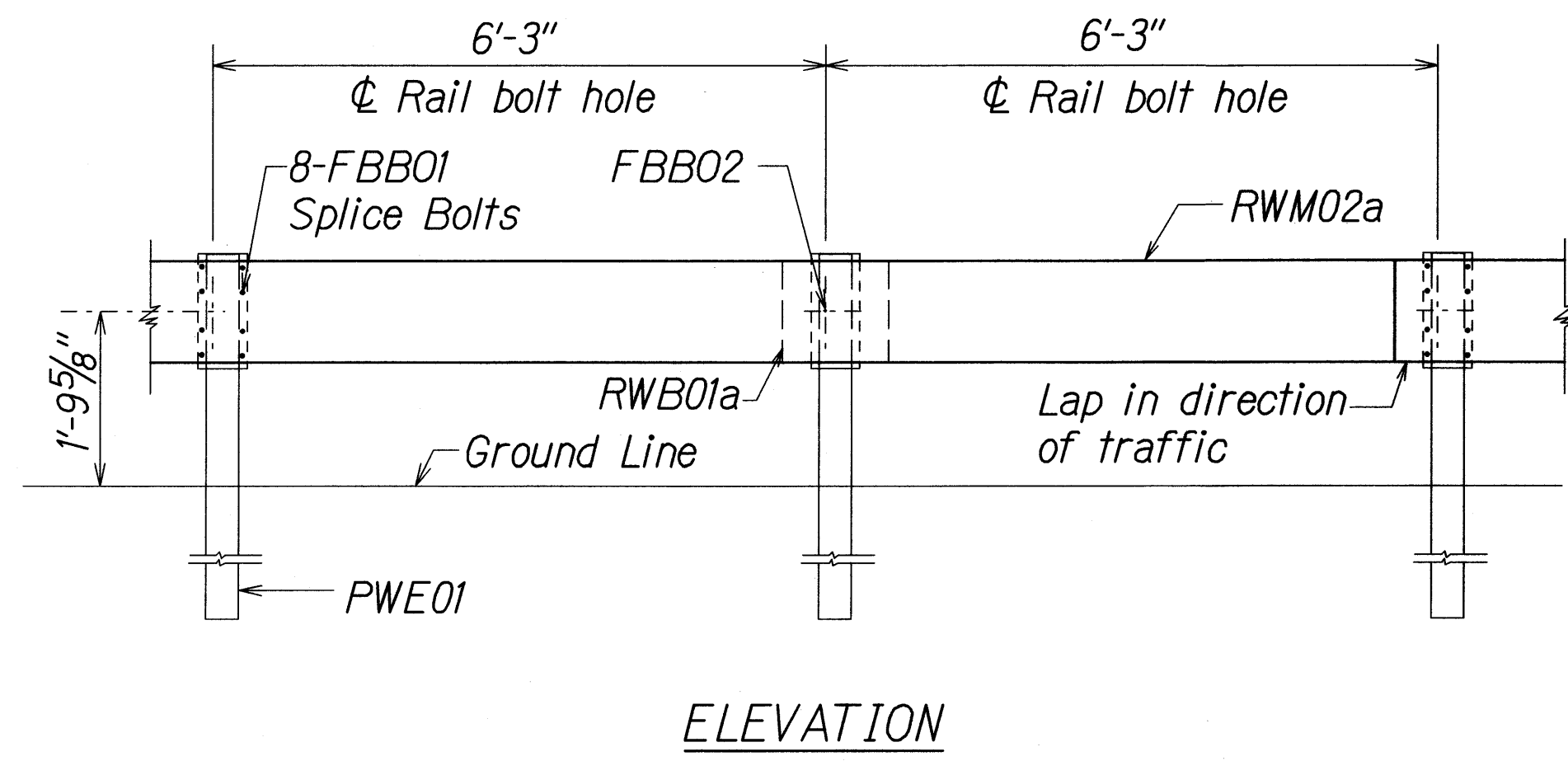
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DESIGNED BY	
QUANTITIES BY	
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ORIGINAL PLAN	
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18/2/01 14/ruby guardrail/resurfacing (standard plan TE-50, 08/07/00)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360B-01-12M	2012	9	31

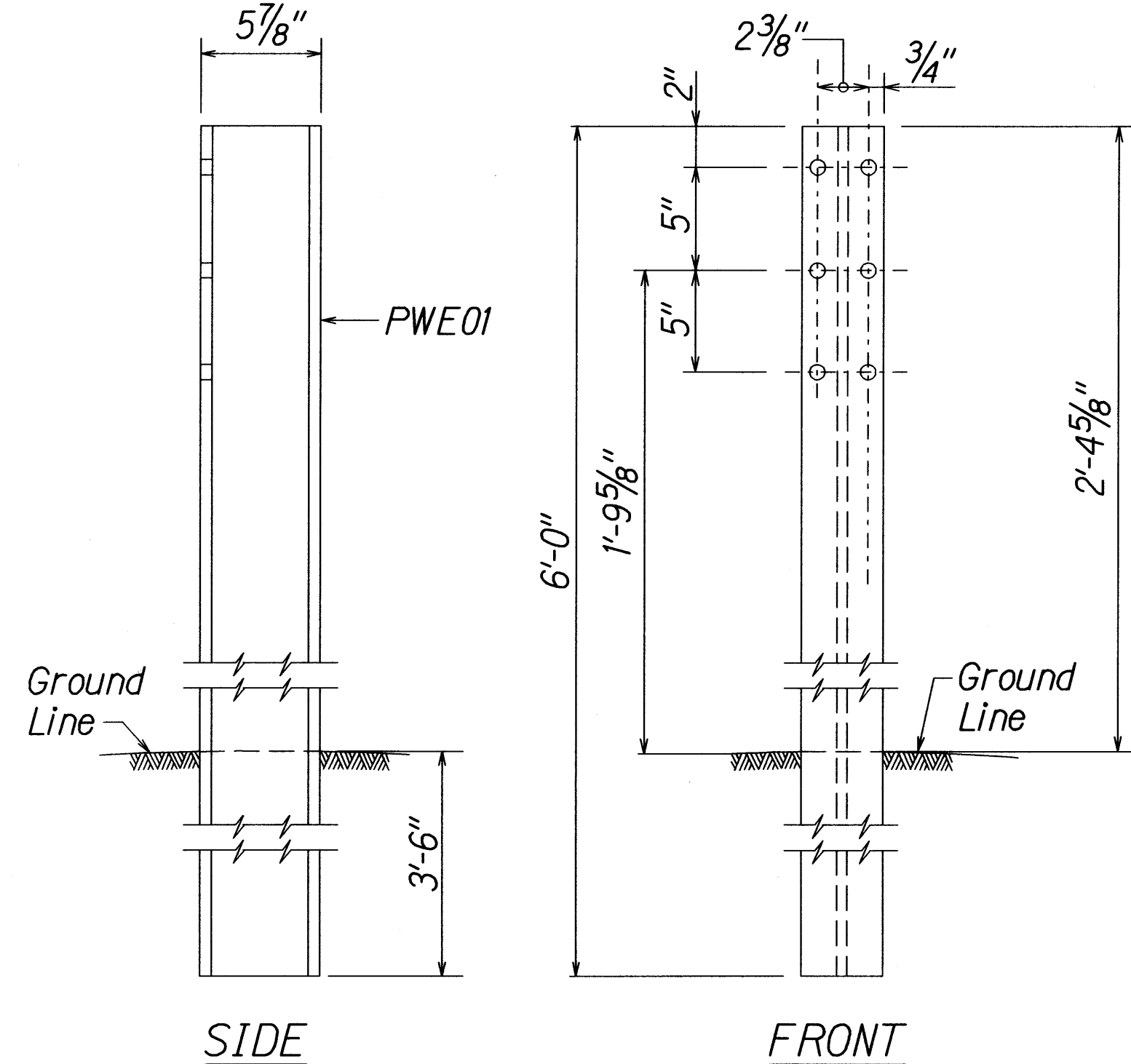


STRONG POST W-BEAM GUARDRAIL
(SGR04a)

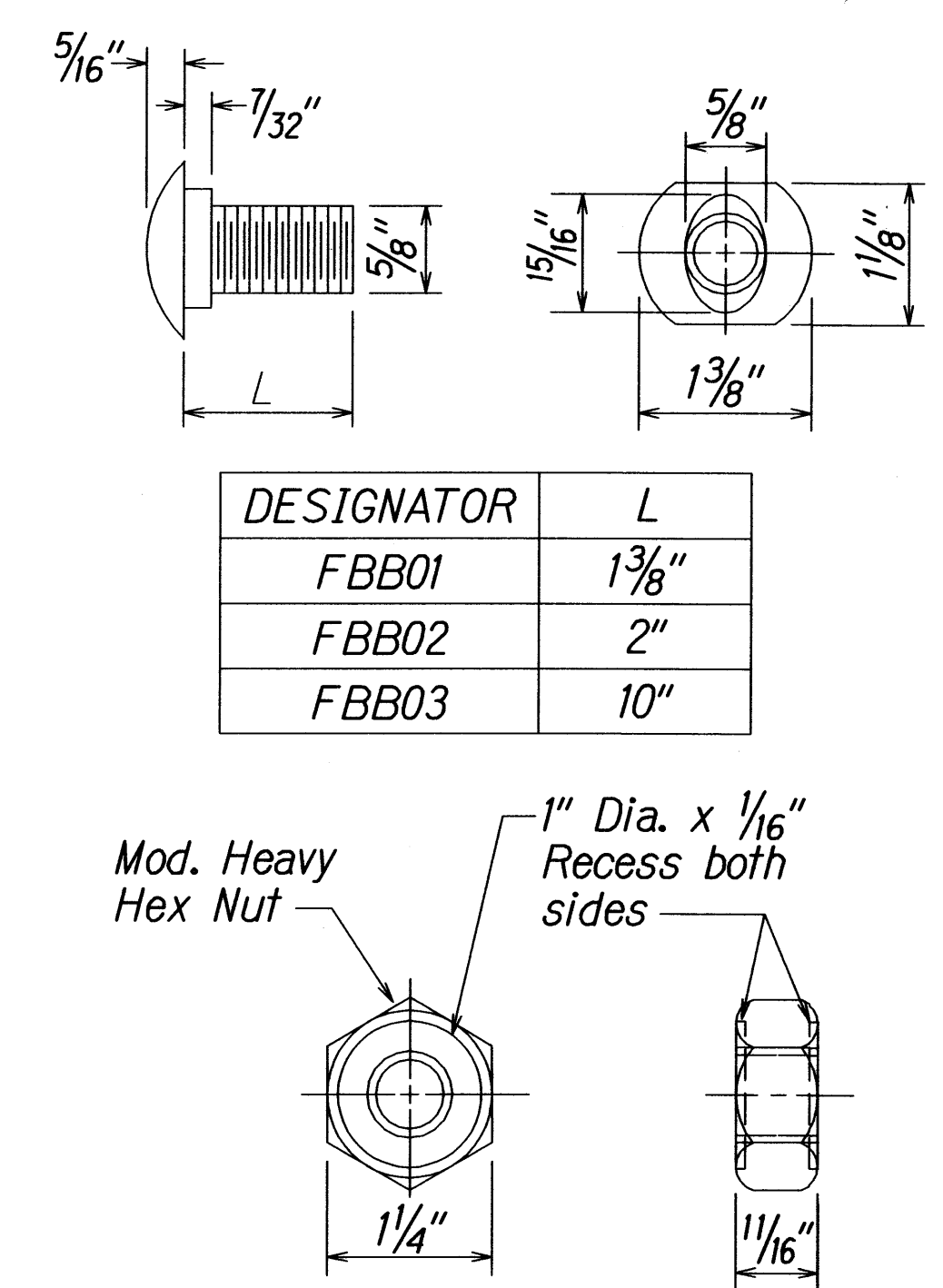


STRONG POST W-BEAM GUARDRAIL WITH
RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT

NOTE:
All Holes are
3/4" Dia.

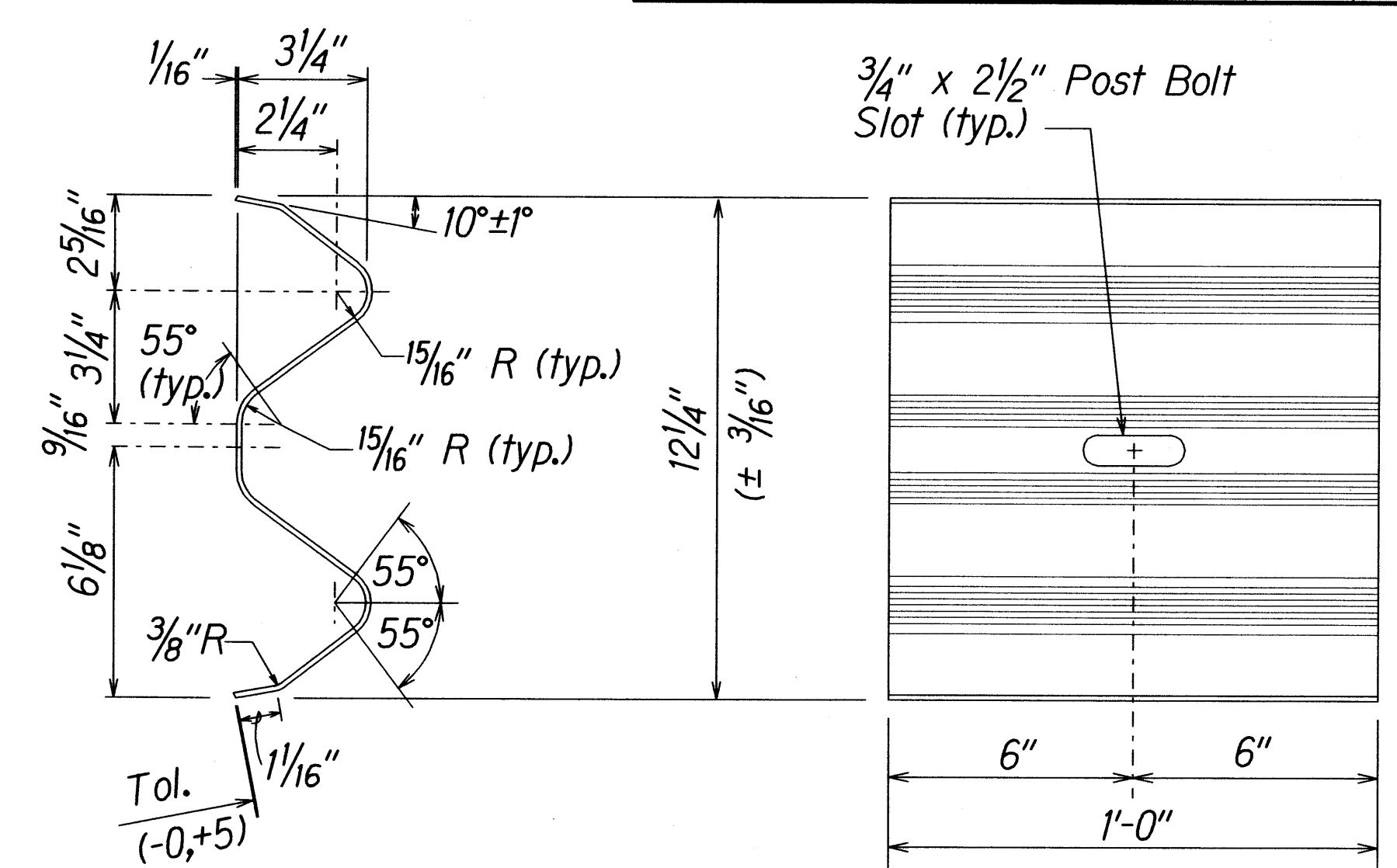


W-BEAM STRONG POST (PWE01)



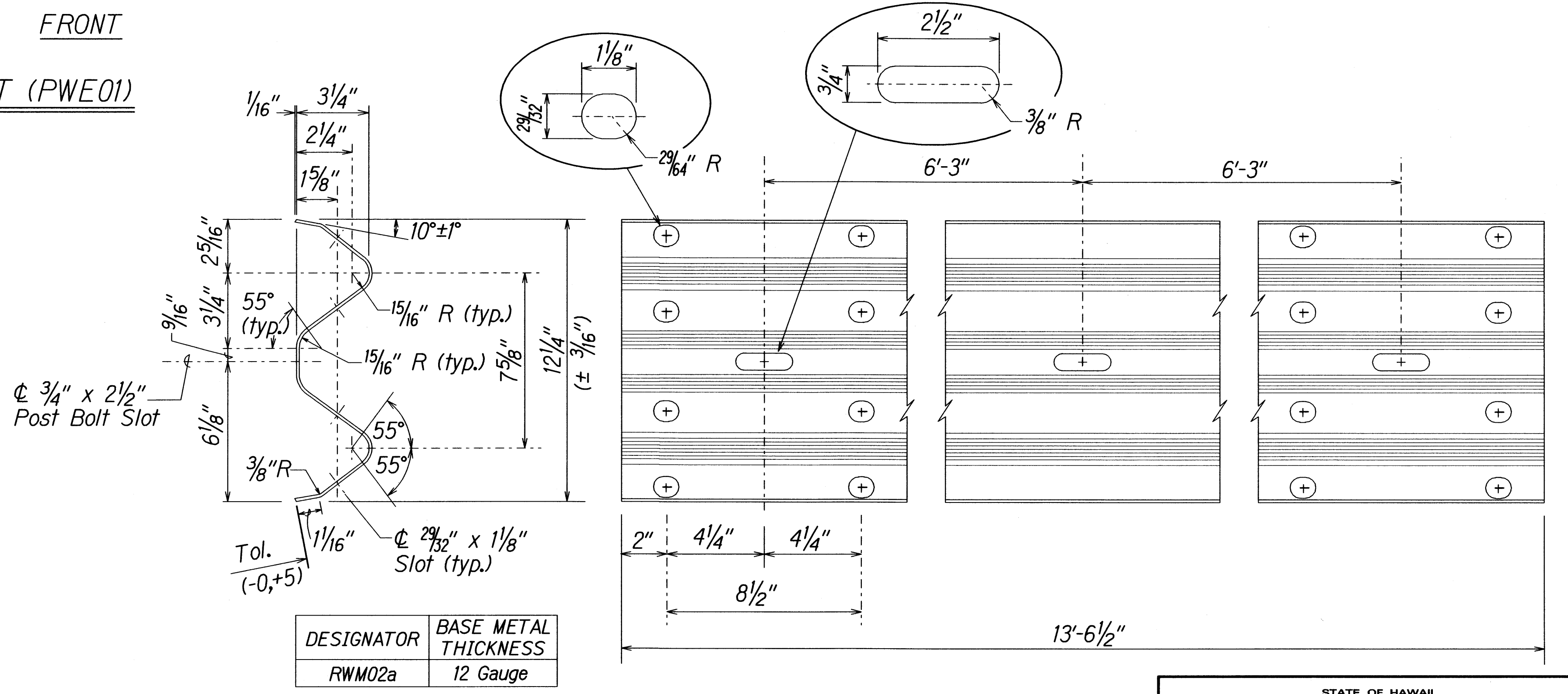
DESIGNATOR	L
FBB01	1 3/8"
FBB02	2"
FBB03	10"

GUARDRAIL BOLTS AND
RECESSED NUT



DESIGNATOR	BASE METAL THICKNESS
RWB01a	12 Gauge

W-BEAM BACK-UP-PLATE (RWB01a)



DESIGNATOR	BASE METAL THICKNESS
RWM02a	12 Gauge

2 SPACE W-BEAM GUARDRAIL (RWM02a)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRONG POST W-BEAM GUARDRAIL
HANA HIGHWAY RESURFACING
Vicinity of Waikani Bridge to Kapaula Bridge
Project No. 360B-01-12M
Scale: NTS
Date: December, 2011

SHEET No. 2 OF 6 SHEETS

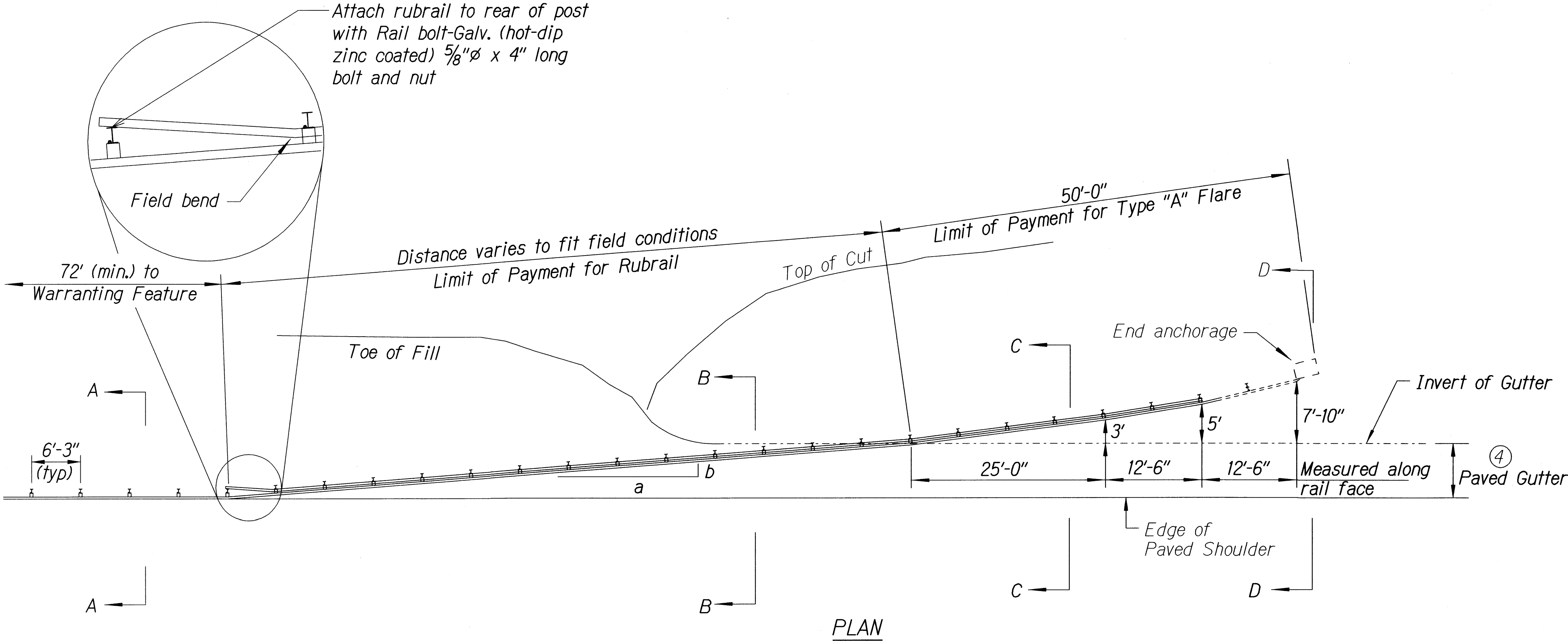
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16/13/01 tdr:cub/guardrail/wkiansodp Standard Plan TE-50 r03/06/87

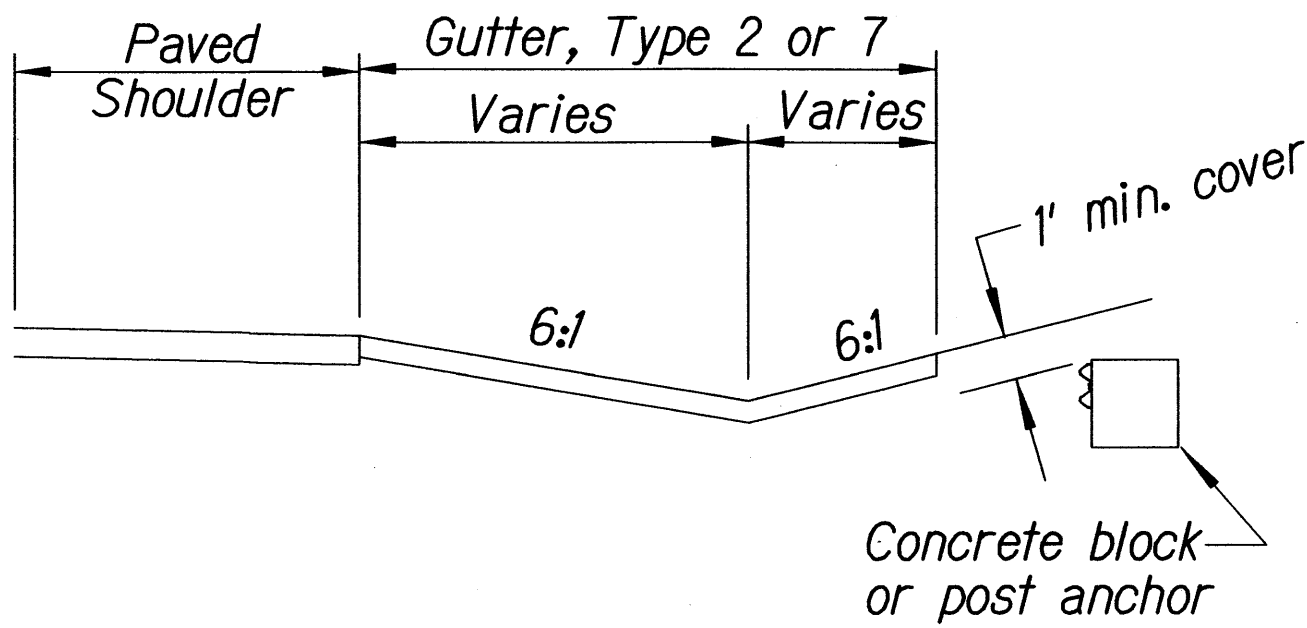
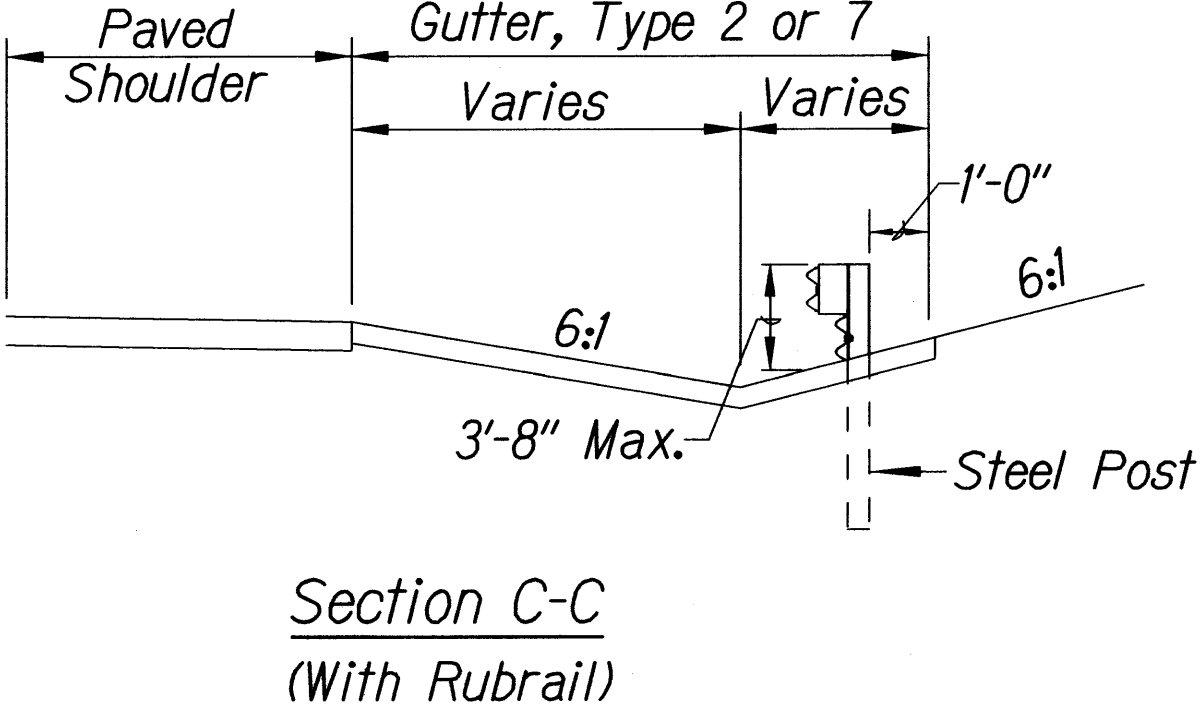
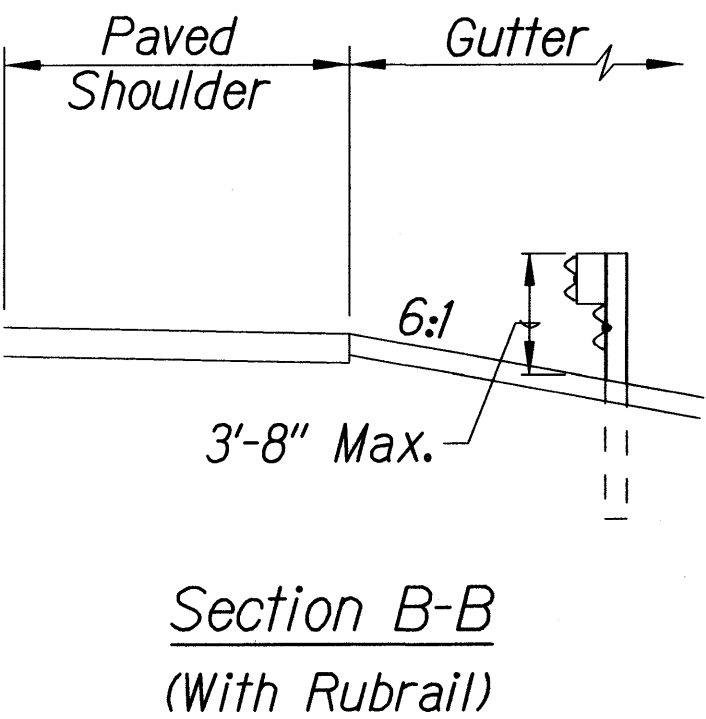
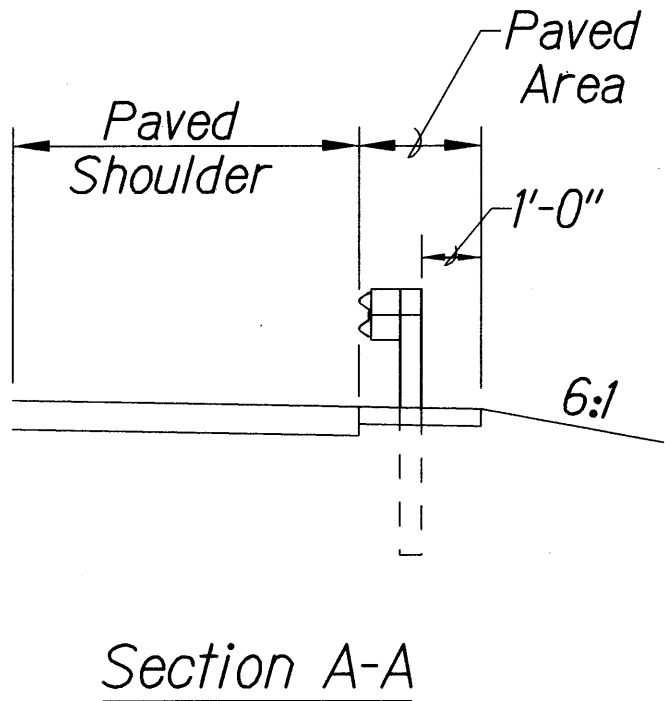
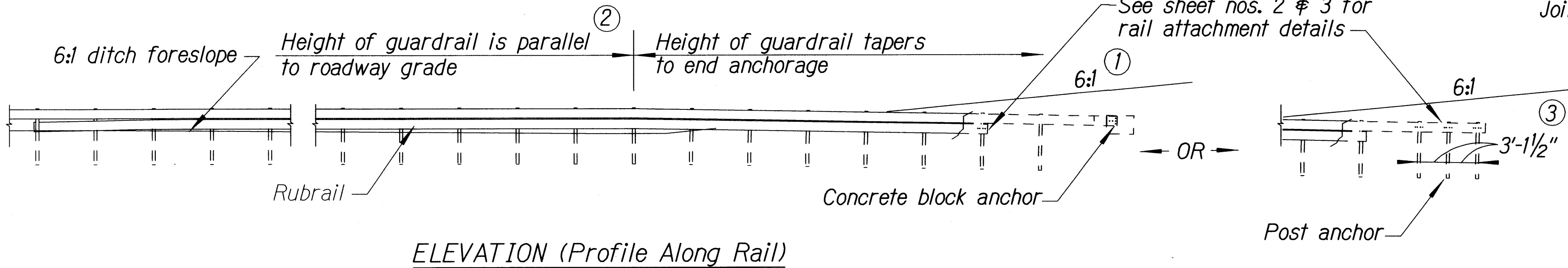
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360B-01-12M	2012	10	31

General Notes

1. A 6:1 or flatter slope is desirable. However, a steeper or flatter existing slope may be used.
2. Height of guardrail may be tapered down in elevation to maintain 3'-8" maximum height.
3. 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.
4. Variable Paved Gutter offsets may be used to fit field conditions.
5. The Guardrail Posts shall be located away from the gutter/swale invert.
6. 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



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

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

TYPE "A" FLARE

HANA HIGHWAY RESURFACING

Vicinity of Waikani Bridge to Kapaula Bridge

Project No. 360B-01-12M

Scale: NTS

Date: December, 2011

SHEET No. 3

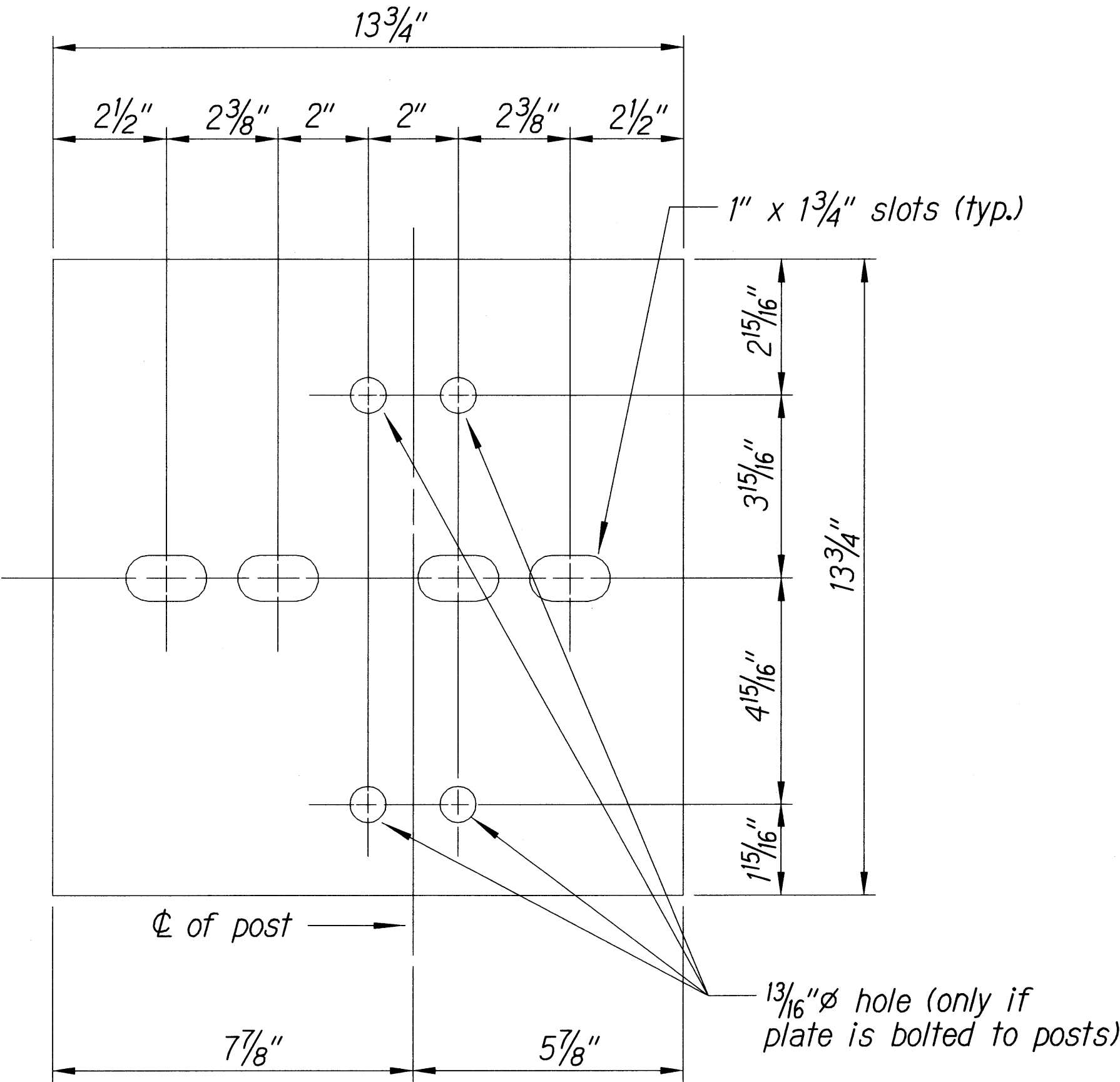
OF 6

SHEETS

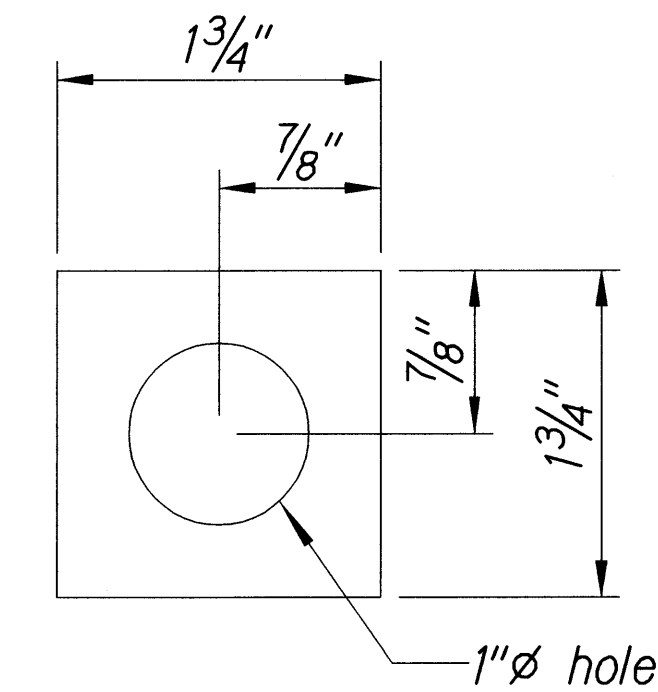
ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
NOTE BOOK	
NO. 1000	

18/2/1/01 tdr/rub/guardrail/gp/represent/tdgn (standard plan TE-58, 07/01/86, TE-59, 11/03/89 & TE-60, 07/01/86)

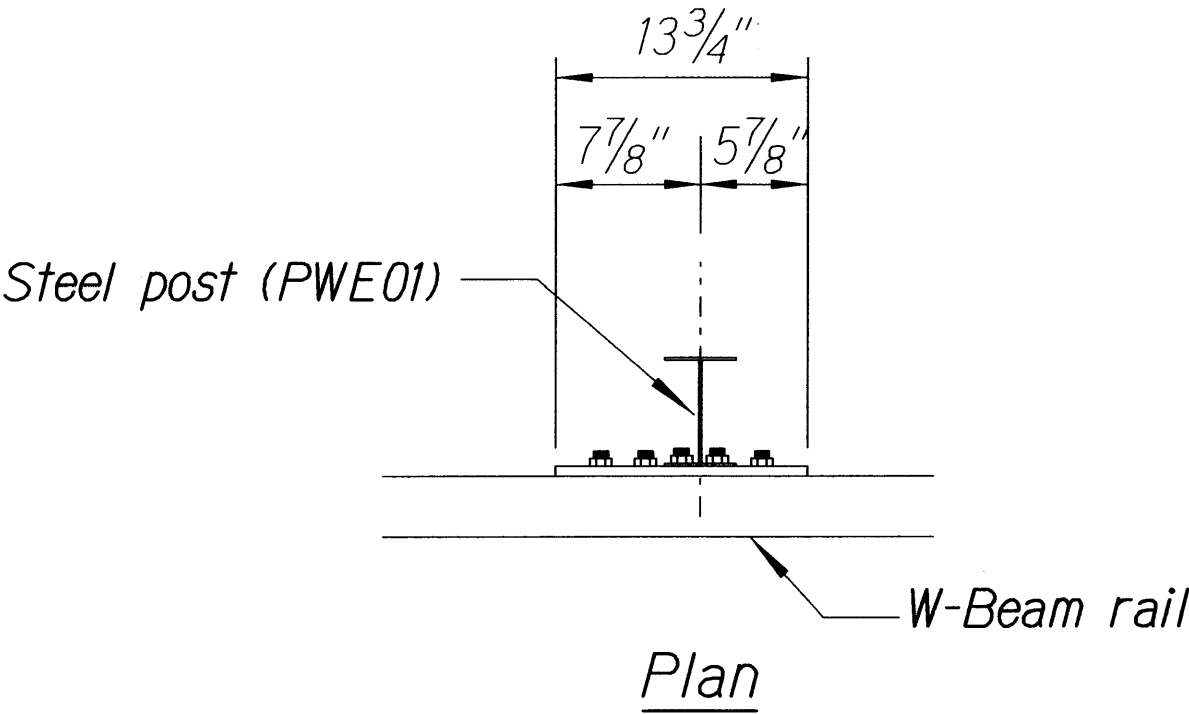
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360B-01-12M	2012	11	31



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

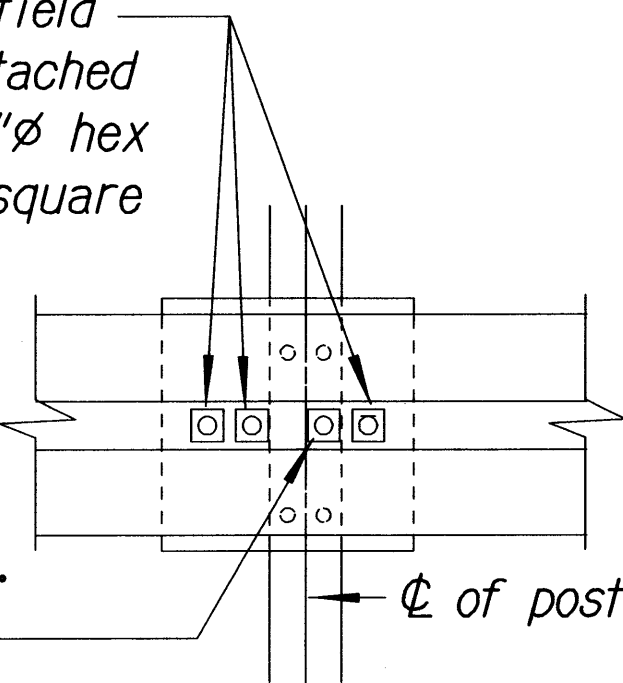


Square Washer
(3/16" Thick - Hot-dip
Zinc Coated Galvanized)

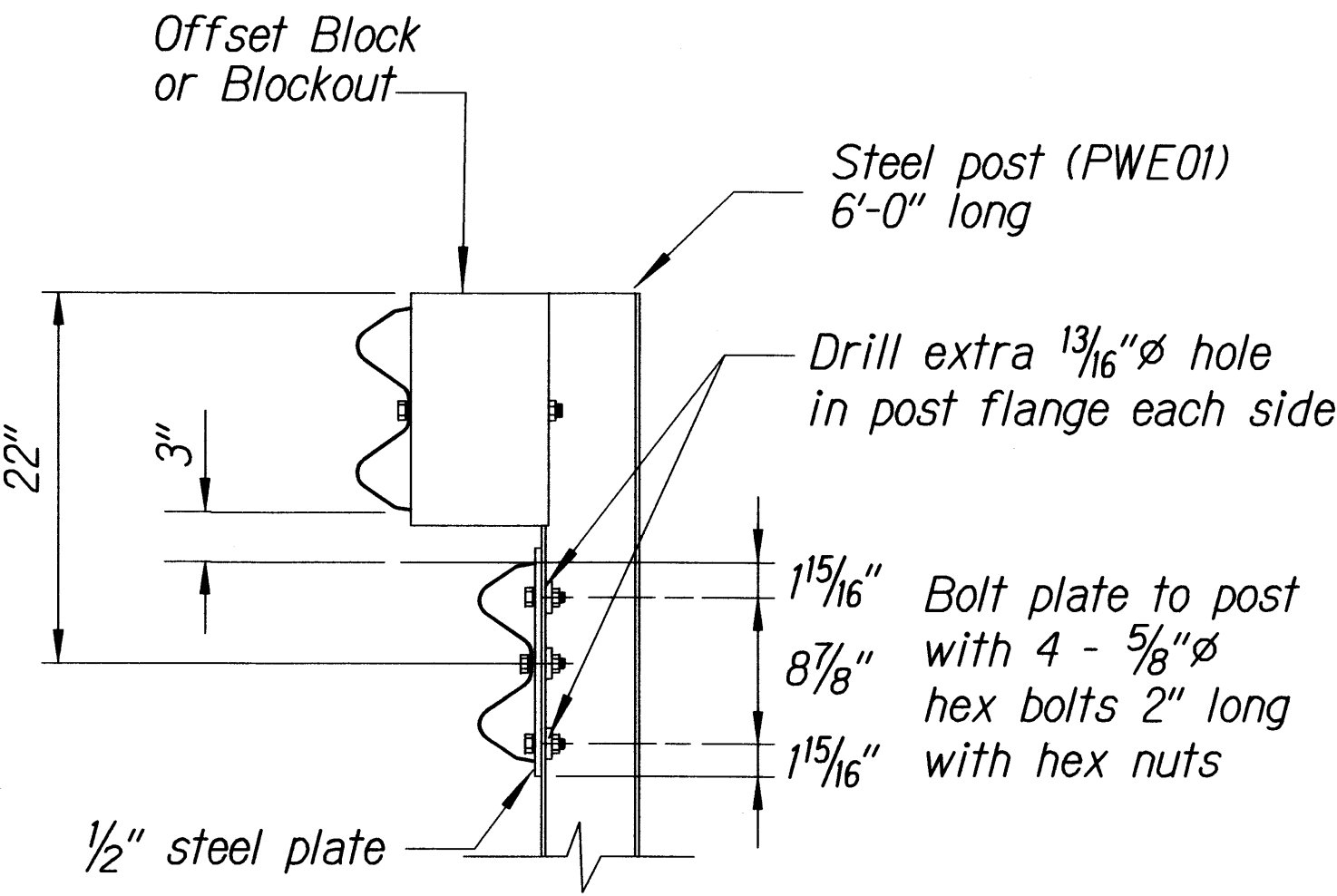


3 - 7/8" ϕ holes to be field drilled in rail and attached to steel plate with 7/8" ϕ hex bolts 1 5/16" long with square washer

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

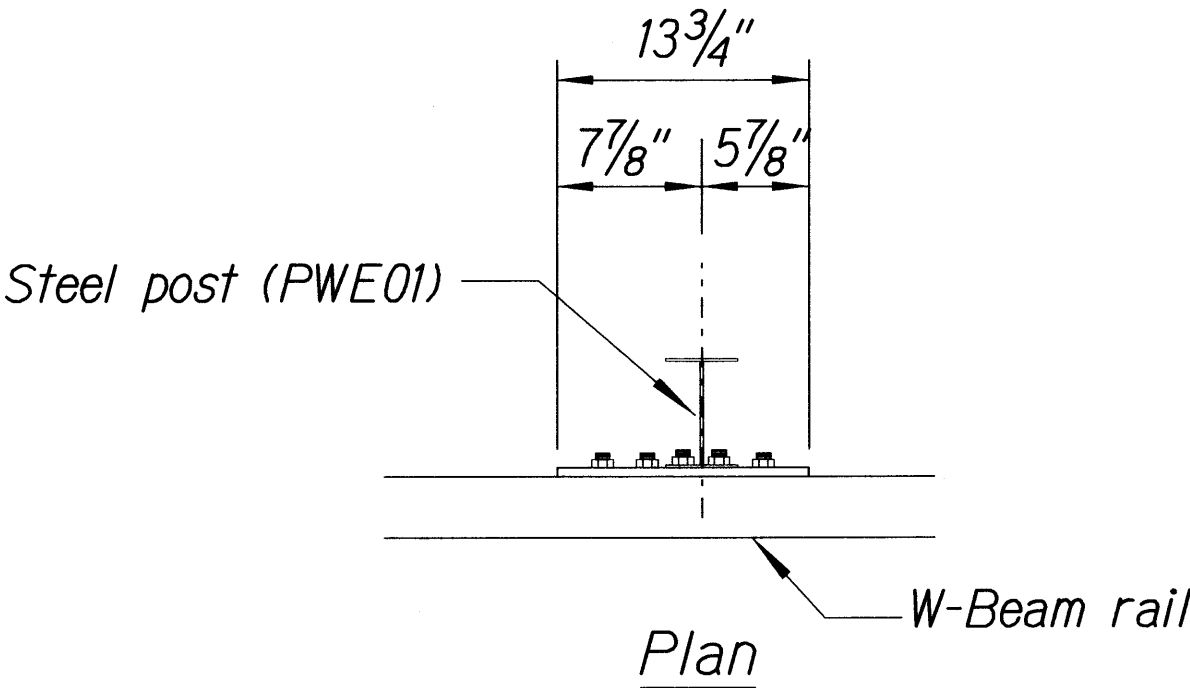


Front View



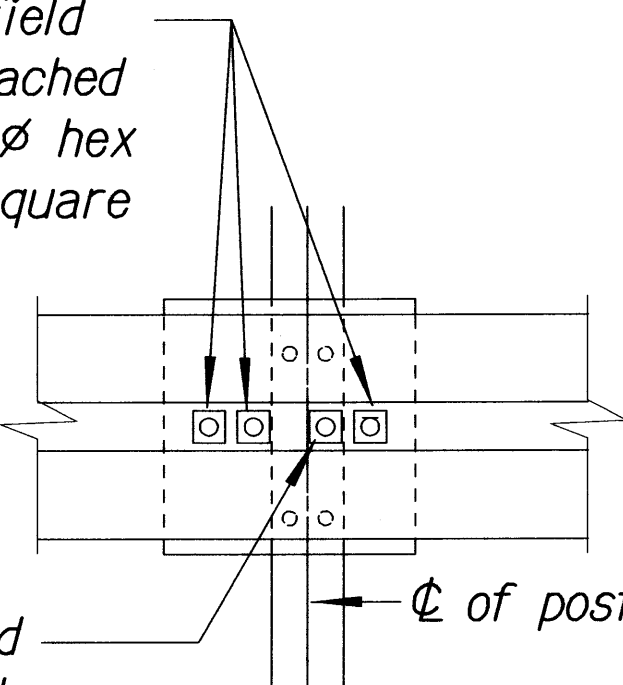
Elevation

RUBRAIL ANCHOR DETAILS

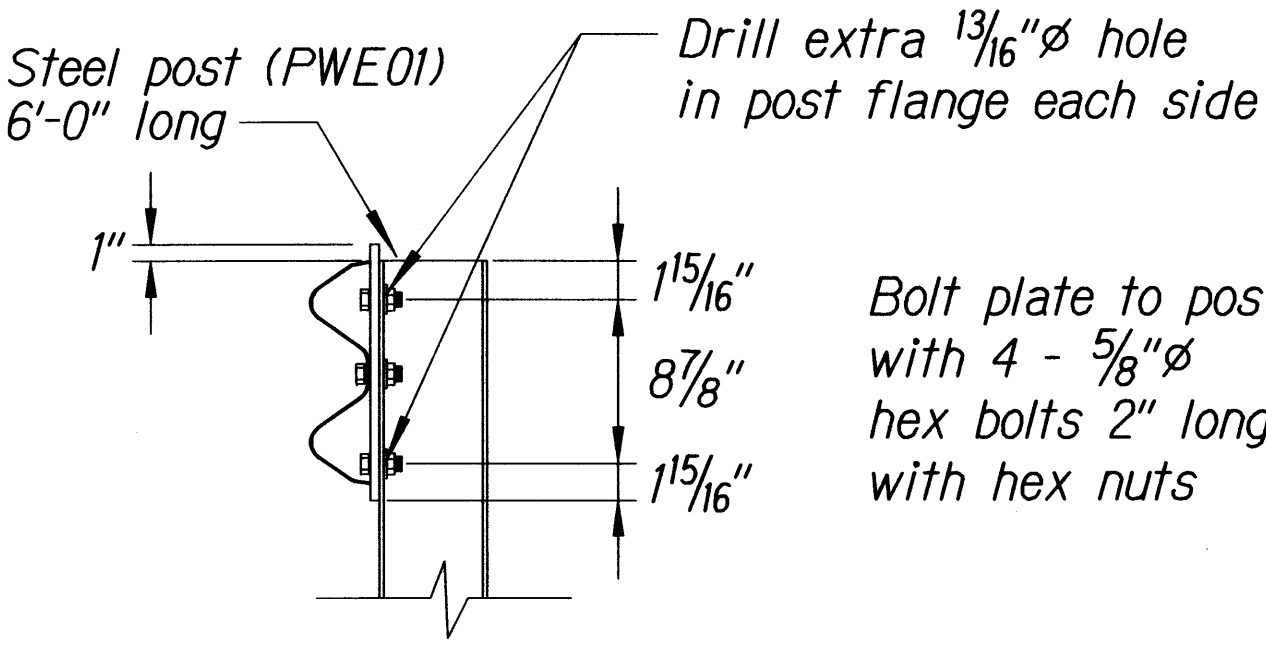


3 - 7/8" ϕ holes to be field drilled in rail and attached to steel plate with 7/8" ϕ hex bolts 1 5/16" long with square washer

1" ϕ holes to be field drilled in rail and through post flange. Attach to steel plate with 7/8" ϕ 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.

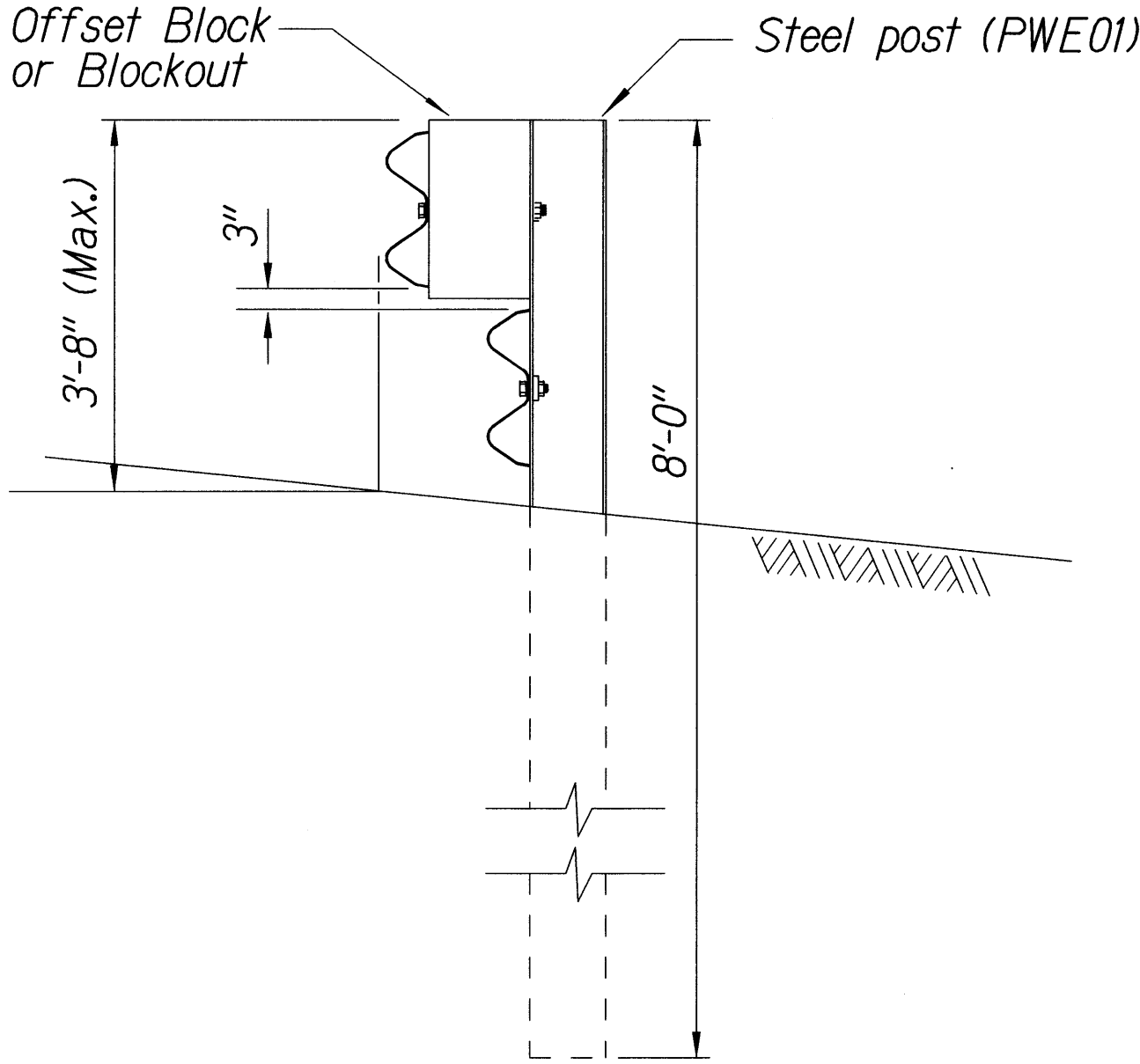
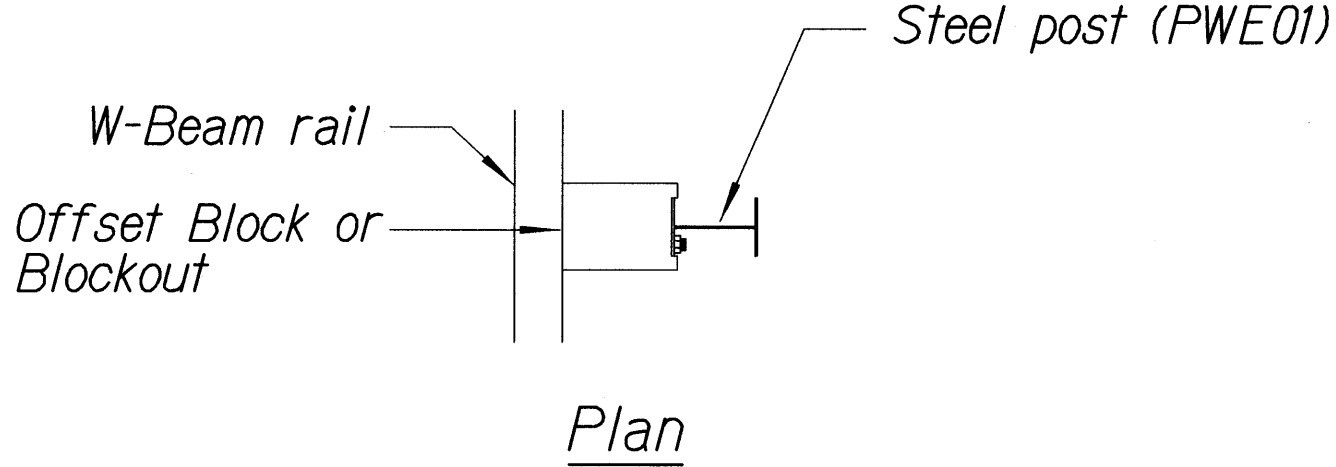
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE "A" FLARE

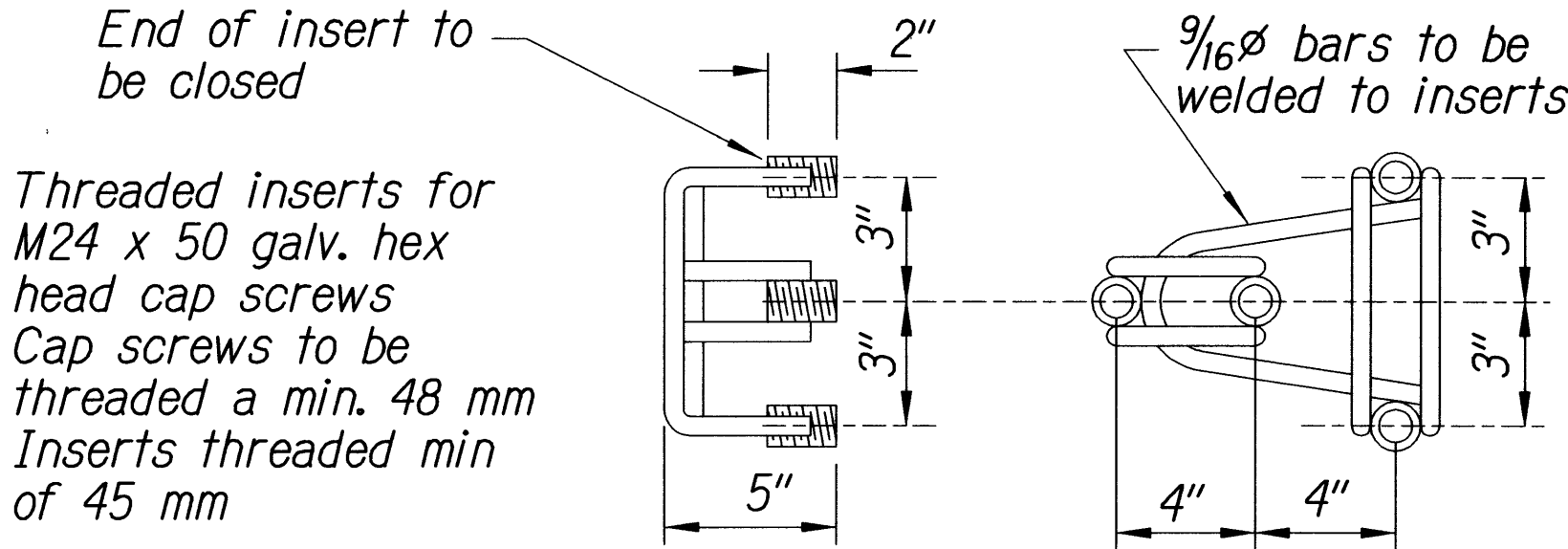
HANA HIGHWAY RESURFACING
Vicinity of Waikani Bridge to Kapaula Bridge
Project No. 360B-01-12M

Scale: NTS Date: December, 2011

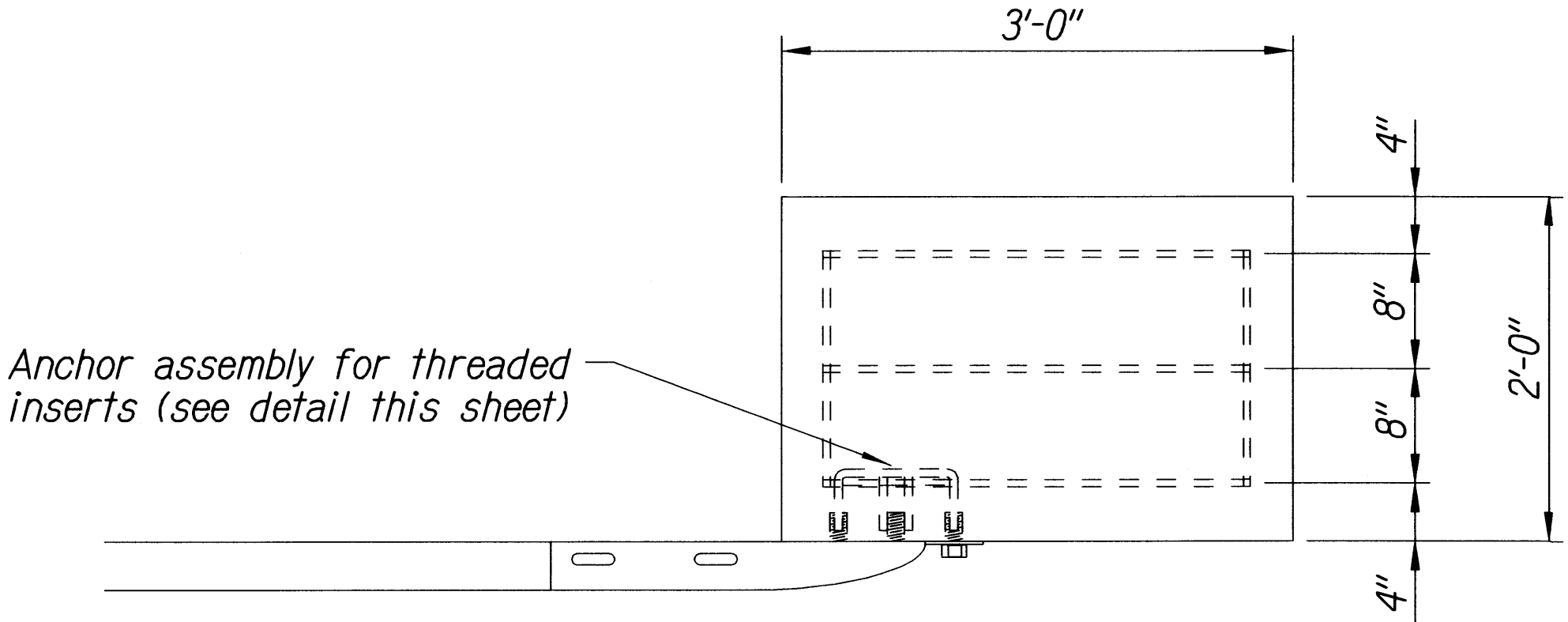
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360B-01-12M	2012	12	31



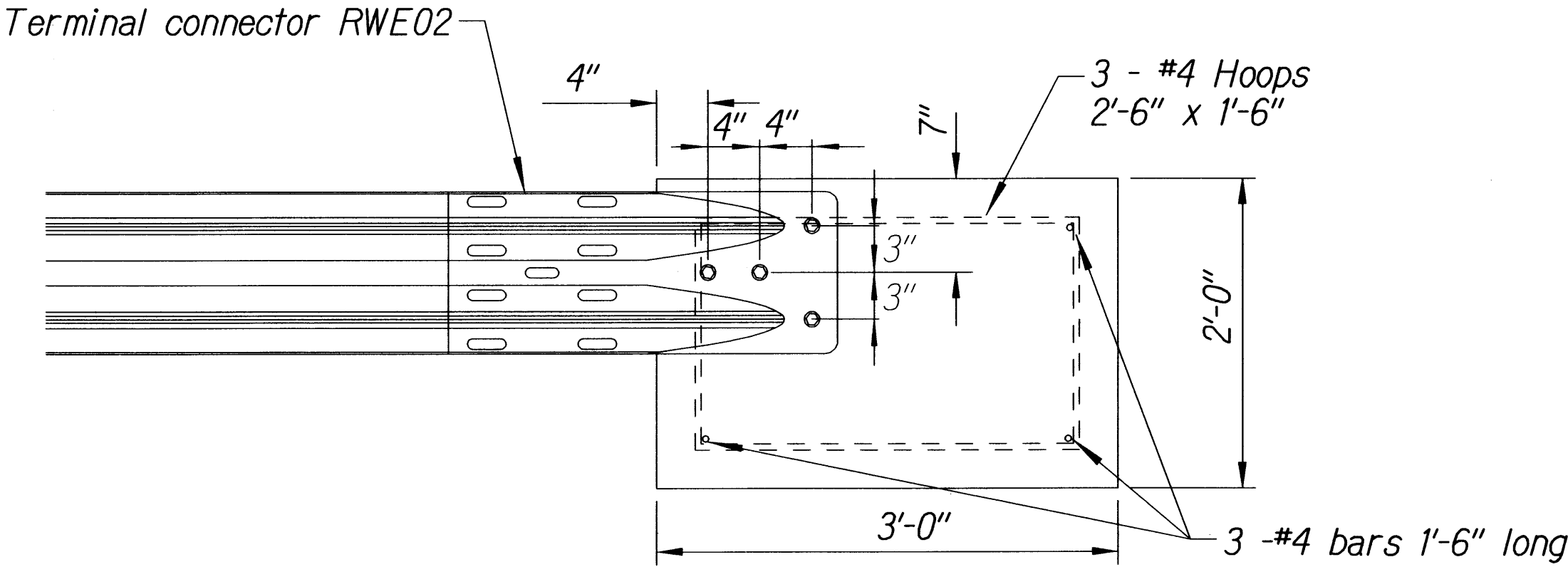
STEEL POST GUARDRAIL
WITH RUBRAIL



ANCHOR ASSEMBLY
CONCRETE BLOCK ANCHOR



Plan



Elevation

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

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

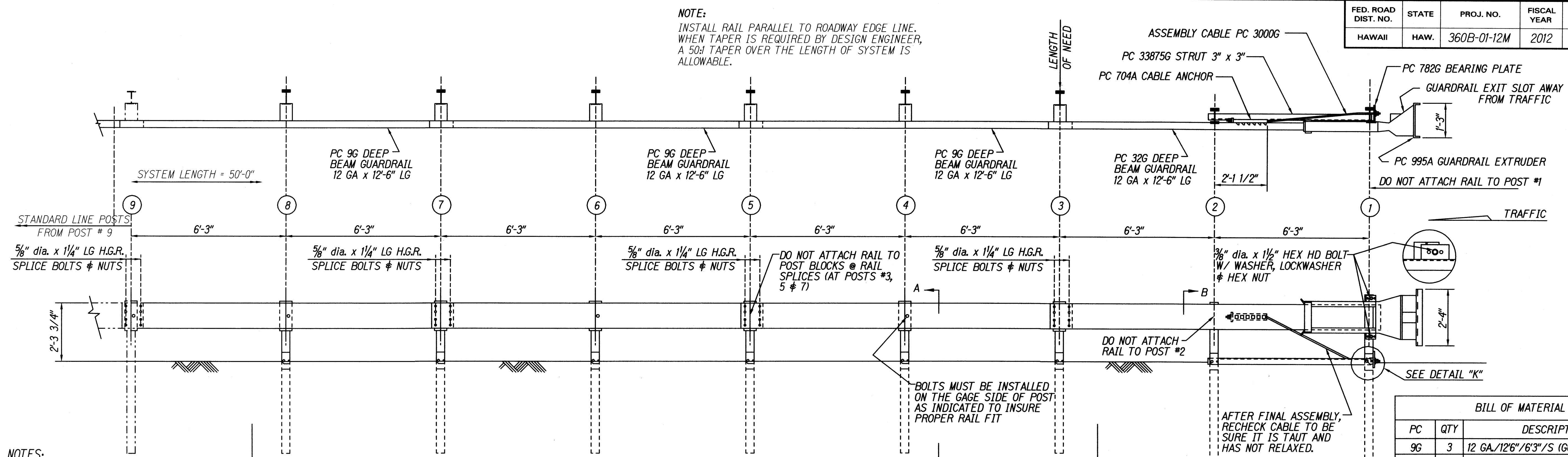
TYPE "A" FLARE
HANA HIGHWAY RESURFACING
Vicinity of Waikani Bridge to Kapaula Bridge
Project No. 360B-01-12M
Scale: NTS Date: December, 2011

SHEET No. 5 OF 6 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DESIGNED BY	
QUANTITIES BY	CHECKED BY	
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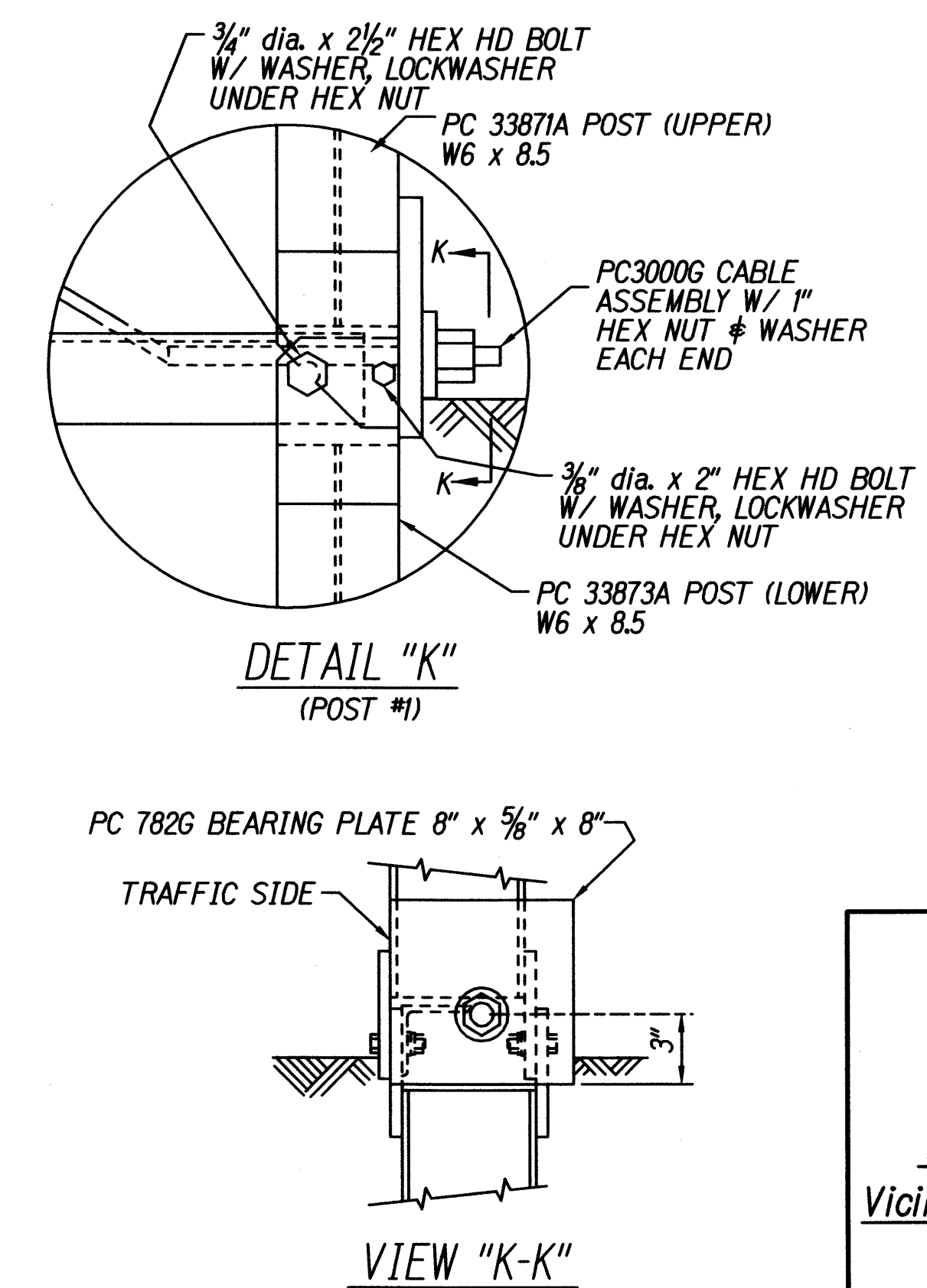
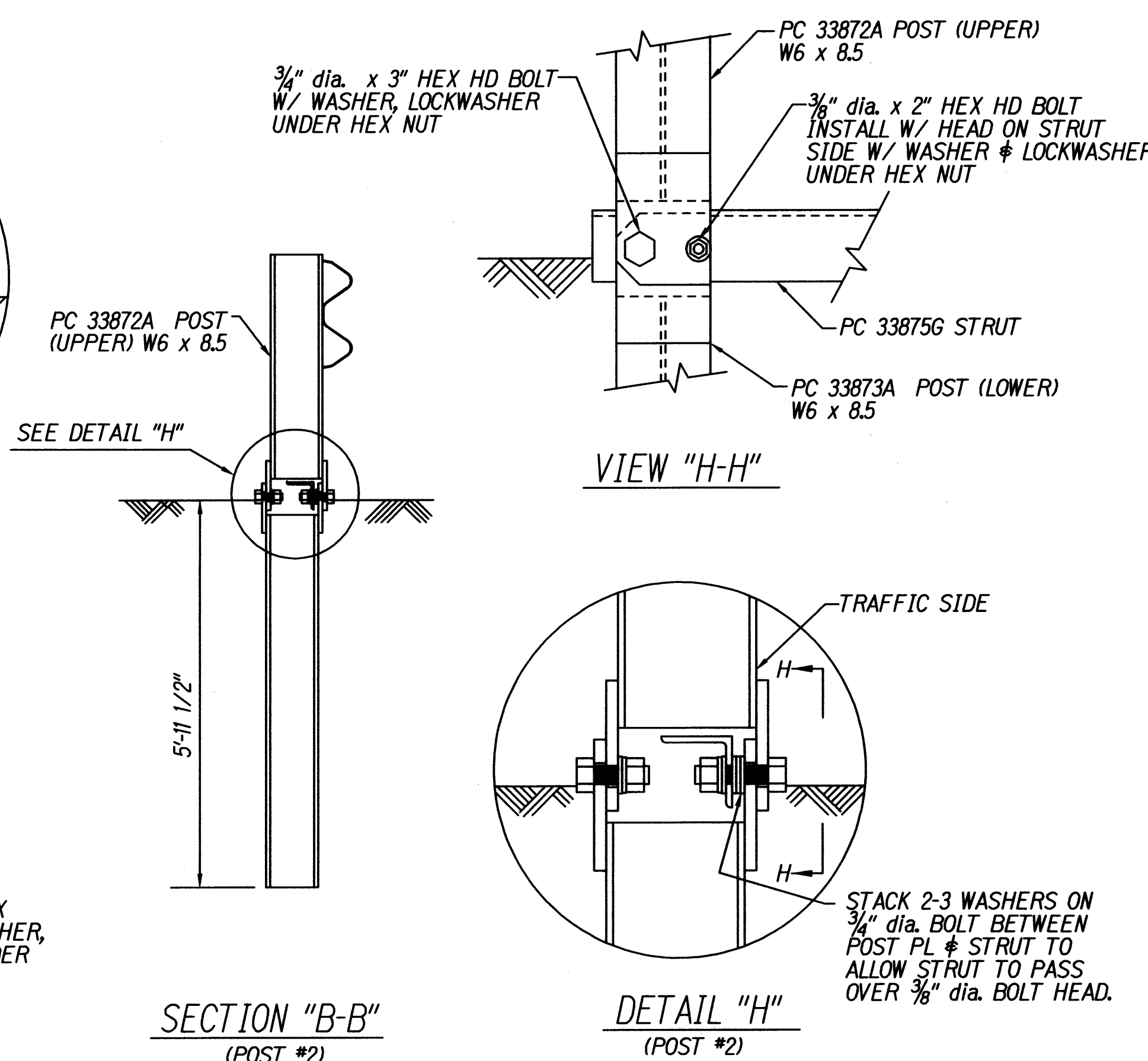
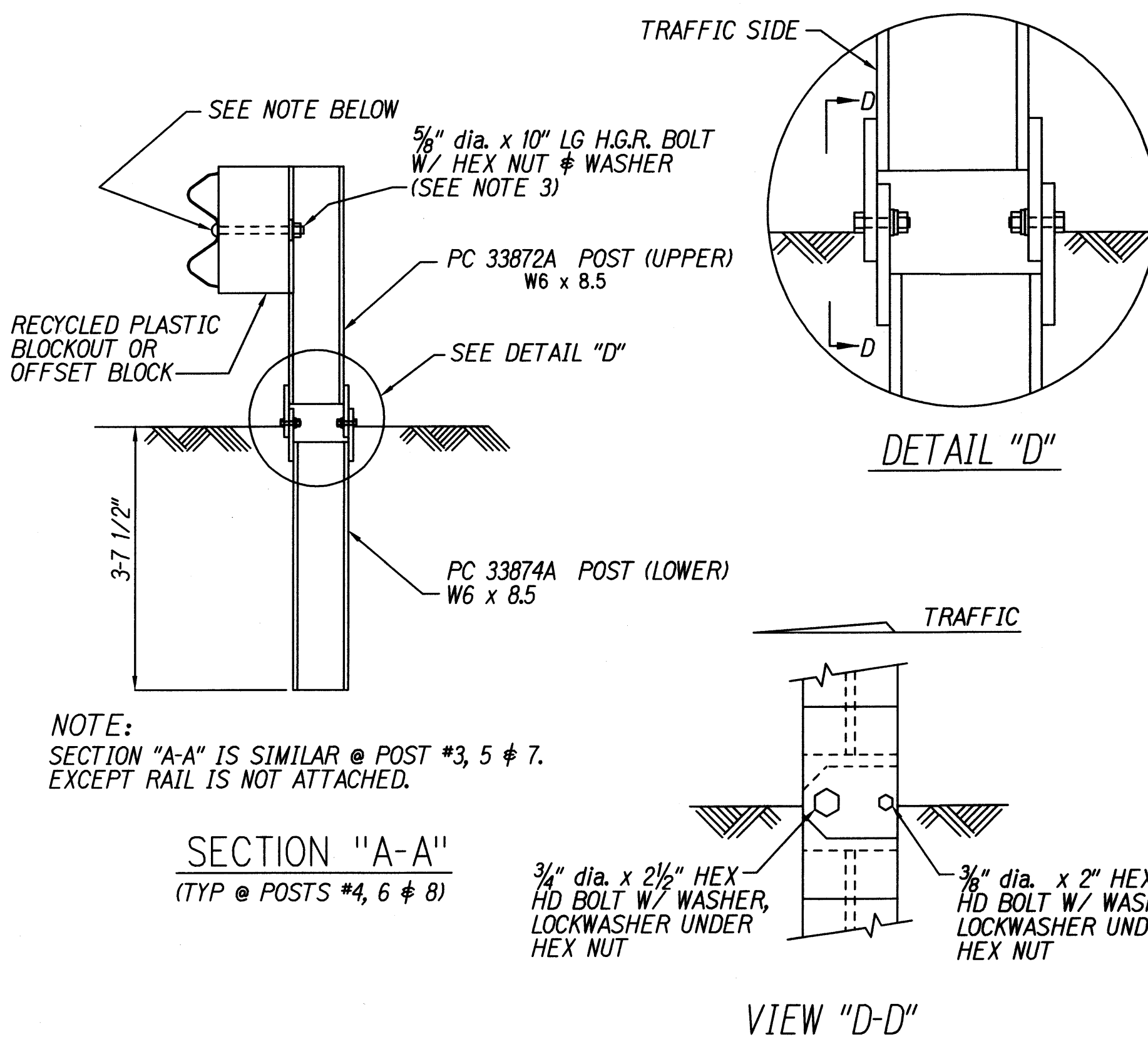
13/01/99 tdt/ruby/guardrail/guardrail.dgn Standard Plan TE-58 07/01/86, TE-59 11/03/89 & TE-60 07/01/86

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360B-01-12M	2012	13	31



- NOTES:
- 1.) DO NOT ATTACH GUARDRAIL TO POST # 1.
 - 2.) DO NOT ATTACH GUARDRAIL TO POST BLOCKS AT GUARDRAIL LAP SPLICES. (AT POSTS #3, 5 & 7)
 - 3.) THE 5/8" FLAT WASHER IS USED UNDER THE NUT, BEHIND THE POST ONLY. NO WASHER IS USED AT THE RAIL.
 - 4.) MANUFACTURER SUGGESTS CUSTOMER TO PROVIDE REFLECTORIZATION OF TERMINAL.

BILL OF MATERIAL		
PC	QTY	DESCRIPTION
9G	3	12 GA./126"/6'3"/S (GUARDRAIL)
32G	1	12 GA./126"/6'3"/S ANC (GUARDRAIL)
704A	1	CABLE ANCHOR BRACKET
782G	1	5/8" x 8" x 8" BEARING PLATE
995A	1	ET-2000 PLUS EXTRUDER
3000G	1	CABLE 3/4" x 6"
3300G	6	5/8" WASHER
3340G	38	5/8" HEX NUT
3360G	32	5/8" dia. x 1 1/4" SPLICE BOLT
3500G	6	5/8" dia. x 10" POST BOLT
3701G	19	3/4" WASHER
3704G	16	3/4" HEX NUT
3717G	15	3/4" dia. x 2 1/2" HEX HD BOLT
3718G	1	3/4" dia. x 3" HEX HD BOLT
3900G	2	1" WASHER
3910G	2	1" HEX NUT
5326B	6	RECYCLED PLASTIC BLOCKOUT OR OFFSET BLOCK
4254G	18	3/8" WASHER
4255G	2	3/8" FENDER WASHERS
4258G	16	3/8" LOCKWASHER
4261G	2	3/8" dia. x 1 1/2" HEX HD BOLT
4699G	16	3/4" LOCKWASHER
6321G	16	3/8" dia. x 2" HEX HD BOLT
6405G	18	3/8" HEX NUT
33871A	1	ET2000 HBA POST #1 TOP
33872A	7	ET2000 HBA POST #2-#8 TOP
33873A	2	ET2000 HBA POST #1-#2 BOTTOM
33874A	6	ET2000 HBA POST #3-#8 BOTTOM
33875G	1	6'-6" ANGLE STRUT ET HBA



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ET-2000 PLUS

HANA HIGHWAY RESURFACING
Vicinity of Waikani Bridge to Kapaula Bridge
Project No. 360B-01-12M

Scale: NTS Date: December, 2011

SHEET No. 6 OF 6 SHEETS

DATE	8/1/00
DESIGNED BY	TRACER BY
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