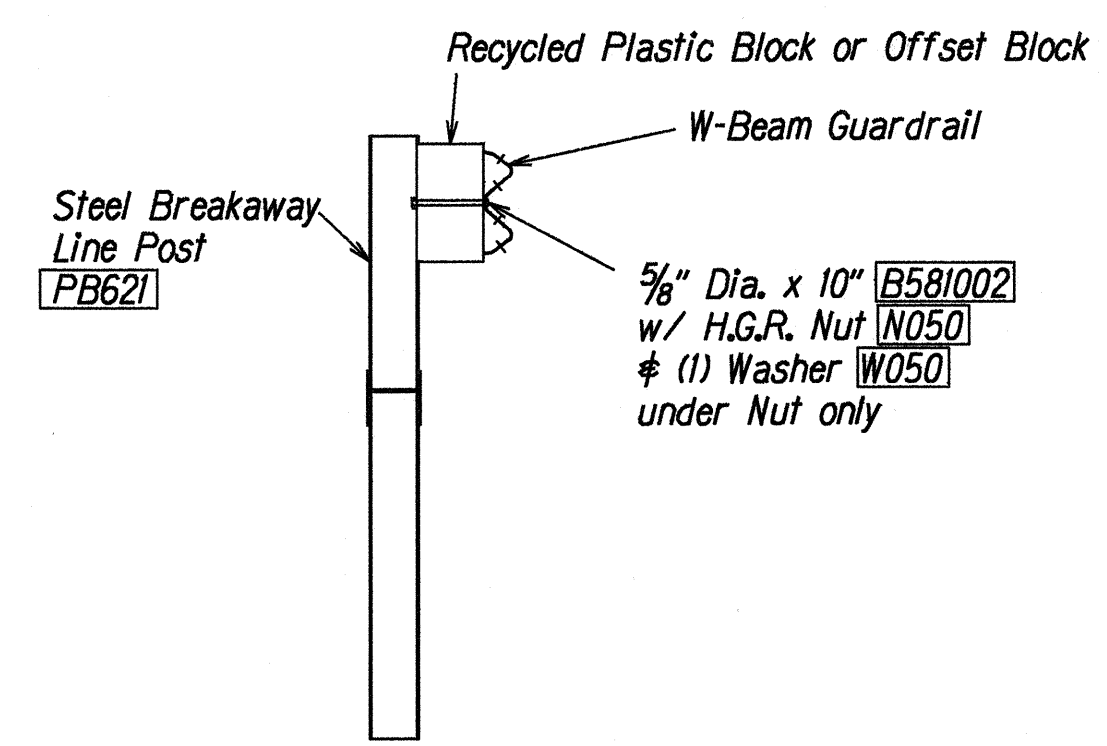
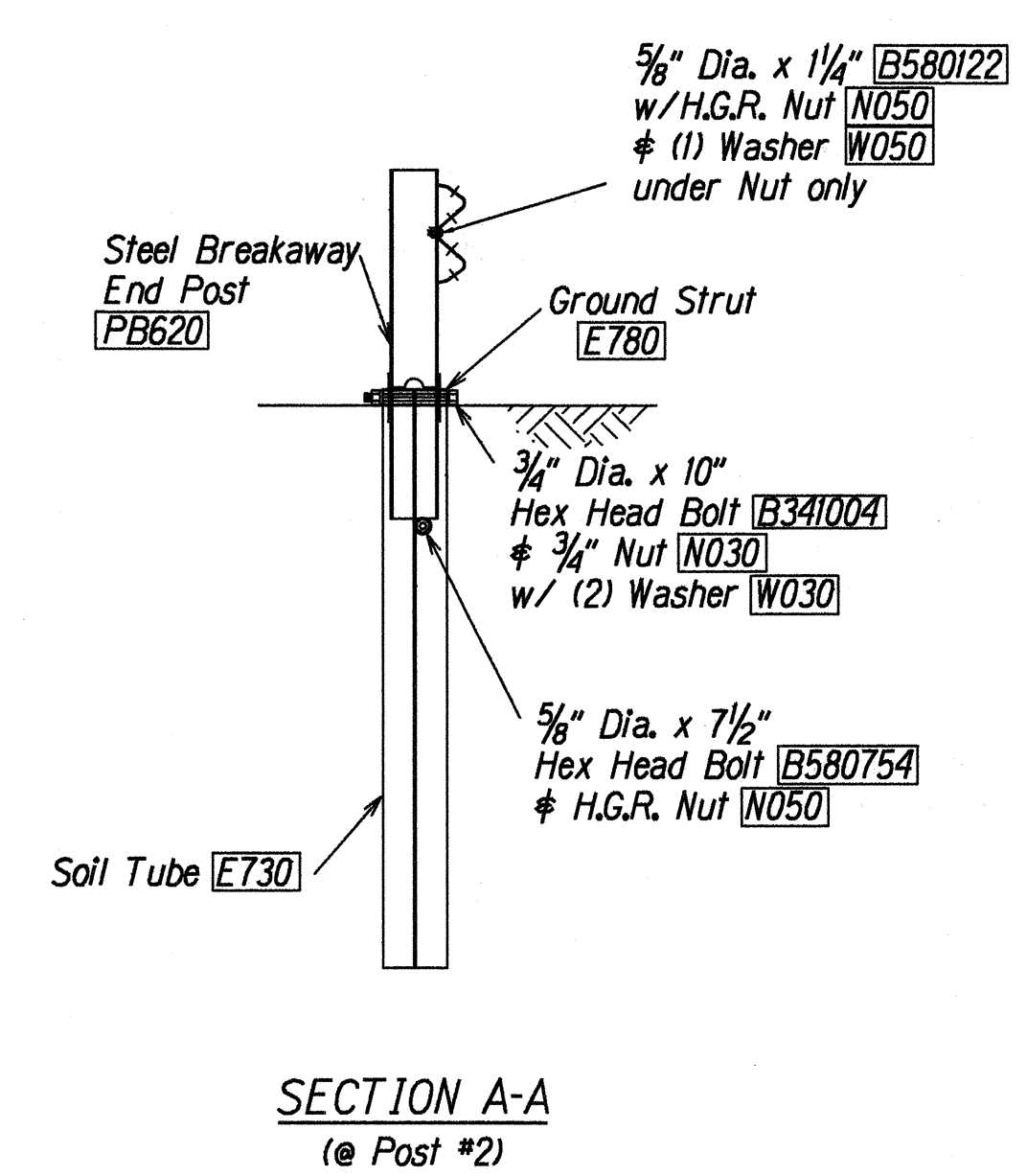
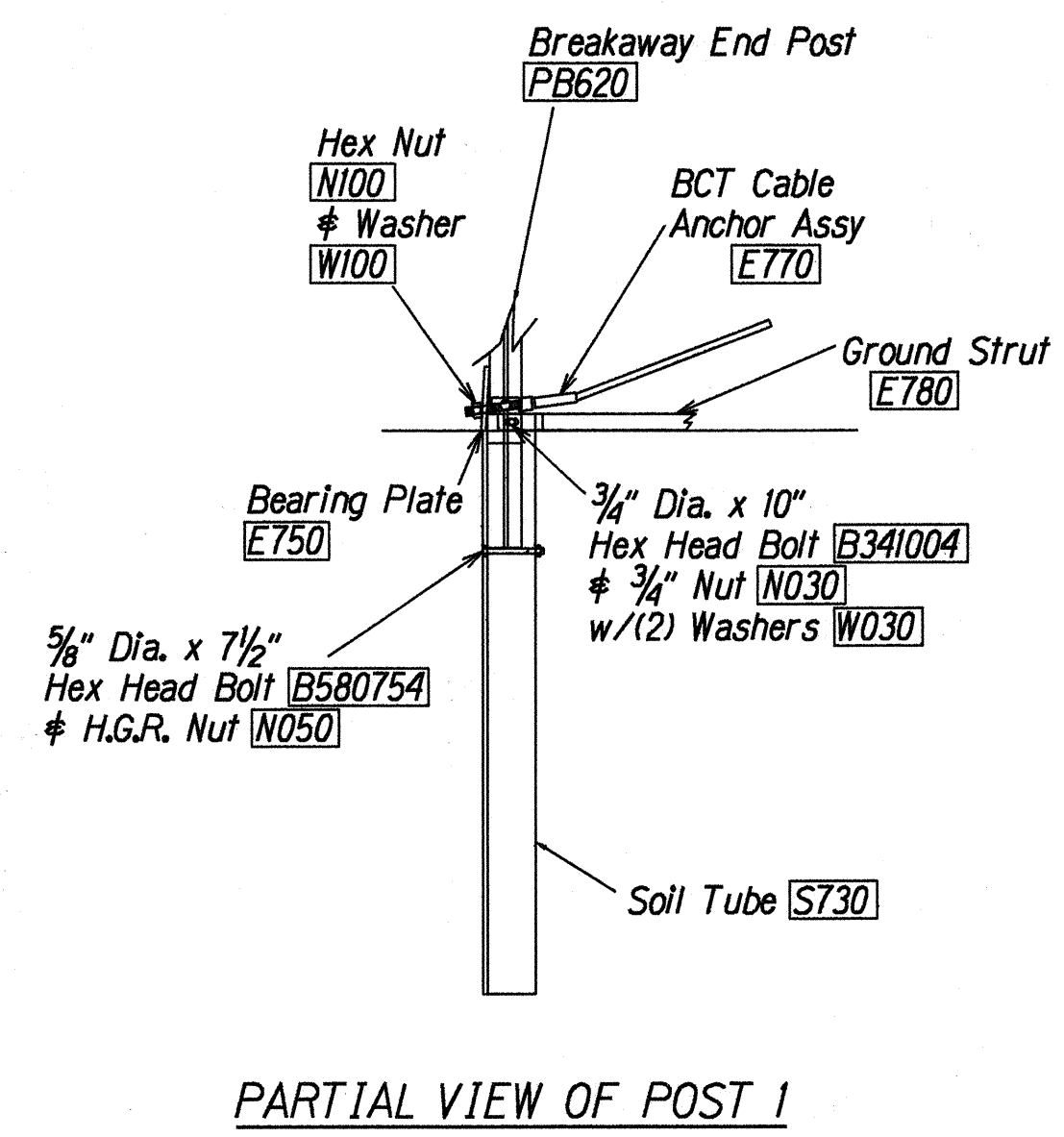
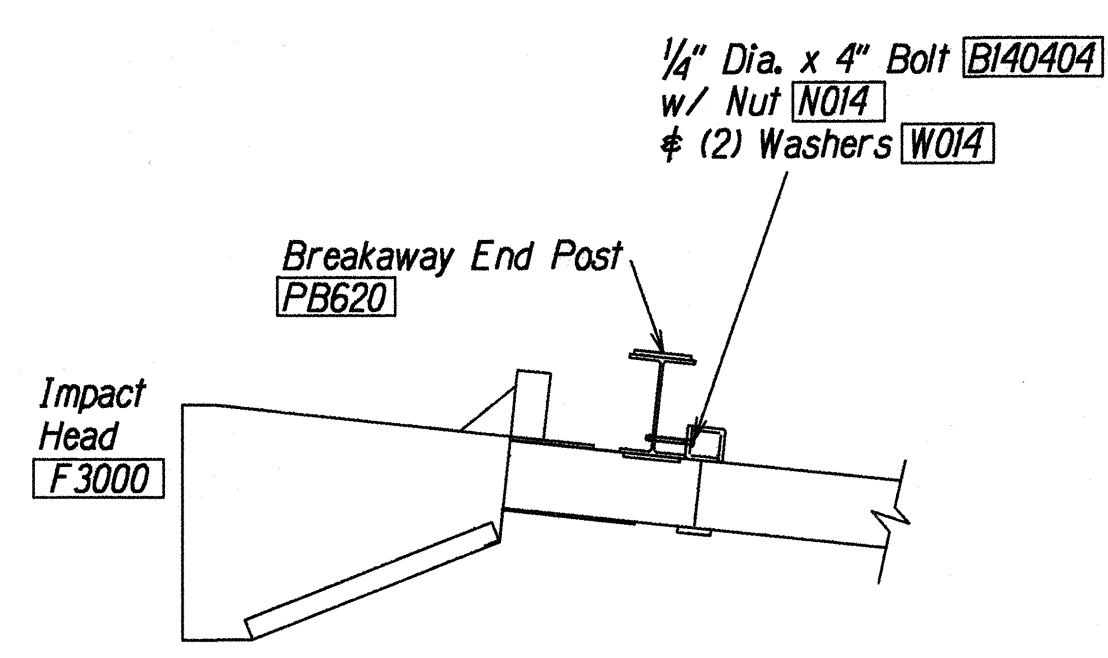
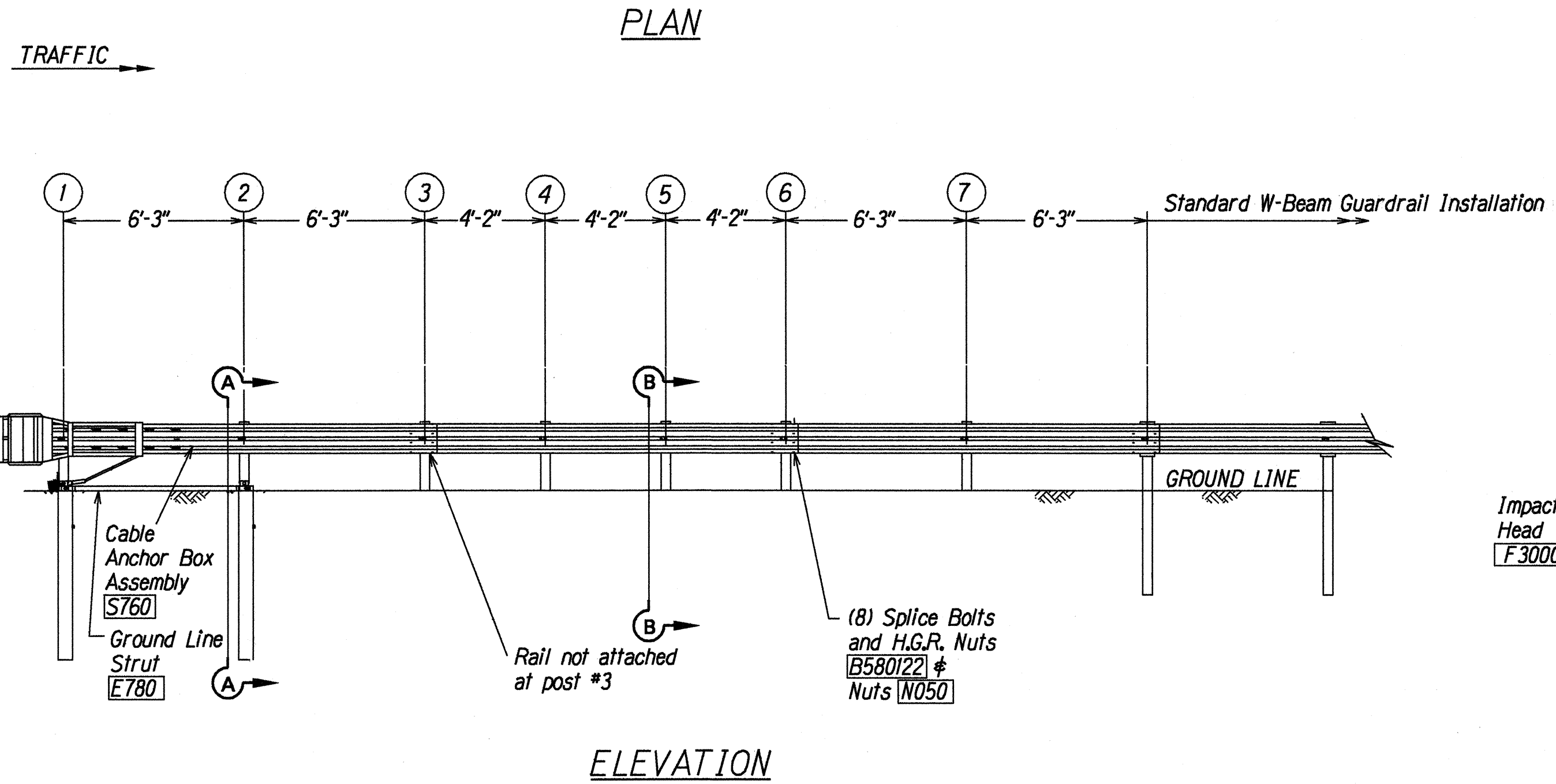
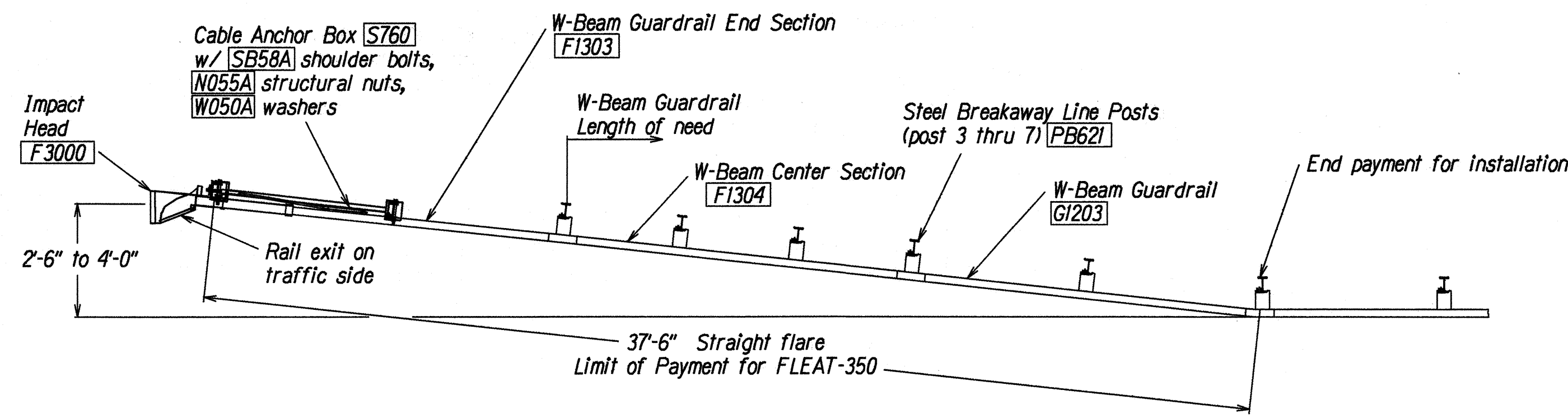


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	6	52



SECTION B-B  
(Typical @ Post 3 - 7)  
NOTE: RAIL NOT BOLTED @ POST #3

- GENERAL NOTES**
1. Breakaway posts are required with the FLEAT Terminal.
  2. All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
  3. The soil tubes shall not protrude more than 4" above ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
  4. The soil tubes may be driven with an approved driving head. Soil tubes should not be driven with the post in the tube. If the tubes are placed in drilled holes, the backfill material must be satisfactorily compacted to prevent settlement.
  5. When rock is encountered during excavation, a 12" Dia. post hole, 20" deep may be used if approved by the engineer. Granular material will be placed in the bottom of the hole approx. 2 1/2" deep to provide drainage. The soil tubes will be field cut to length, placed in the hole and backfilled with adequately compacted material excavated from the hole.
  6. The breakaway cable assembly must be taut. A locking device, (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening nuts.

ITEM NO.	QTY	BILL OF MATERIALS
F3000	1	IMPACT HEAD
F1303	1	W-BEAM GUARDRAIL END SECTION, 12 GA.
F1304	1	W-BEAM GUARDRAIL CENTER SECTION, 12 GA.
G1203	1	W-BEAM GUARDRAIL, 12 GA.
S730	2	*FOUNDATION SOIL TUBE, 6" x 8" x 72"
E750	1	BEARING PLATE
S760	1	CABLE ANCHOR BOX
E770	1	BCT CABLE ANCHOR ASSEMBLY
E780	1	GROUND STRUT
PB620	2	STEEL BREAKAWAY END POST
PB621	5	STEEL BREAKAWAY LINE POST
	5	RECYCLED PLASTIC BLOCKOUT OR OFFSET BLOCK
HARDWARE		
B580122	25	5/8" Dia. x 1 1/4" SPLICE BOLT, POST #2
B580754	2	5/8" Dia. x 7 1/2" HEX BOLT
B341004	2	3/4" Dia. x 10" HEX BOLT
B581002	5	5/8" Dia. x 10" H.G.R. BOLT (POST 3 THRU 7)
N050	32	5/8" Dia. H.G.R. NUT (SPLICE 24, SOIL TUBES 2, POST 2 THRU 7, 6)
N030	2	3/4" Dia. HEX NUT
W050	6	H.G.R. WASHER
W030	4	3/4" ID WASHER
N100	2	1" ANCHOR CABLE HEX NUT
W100	2	1" ANCHOR CABLE WASHER
B140404	2	1/4" x 4" HEX BOLT
N014	2	1/4" HEX NUT
W014	4	1/4" WASHER
SB58A	8	CABLE ANCHOR BOX SHOULDER BOLT
N055A	8	1/2" A325 STRUCTURAL NUT
W050A	16	1 1/16" OD x 9/16" ID A325 STR. WASHER

Foundation Tube Options For Posts 1 & 2

- \*6'-0" Split Foundation Tubes S730
- \*6'-0" Solid Foundation Tubes E731
- \*5'-0" Foundation Tubes S735 W/Soil Plates SP600
- \*4'-6" Foundation Tubes E735 W/Soil Plates SP600

SURVEY PLOTTED BY	DATE	X
DRAWN BY		
DESIGNED BY		
NOTE BOOK		
QUANTITIES BY		
CHECKED BY		
NO.		

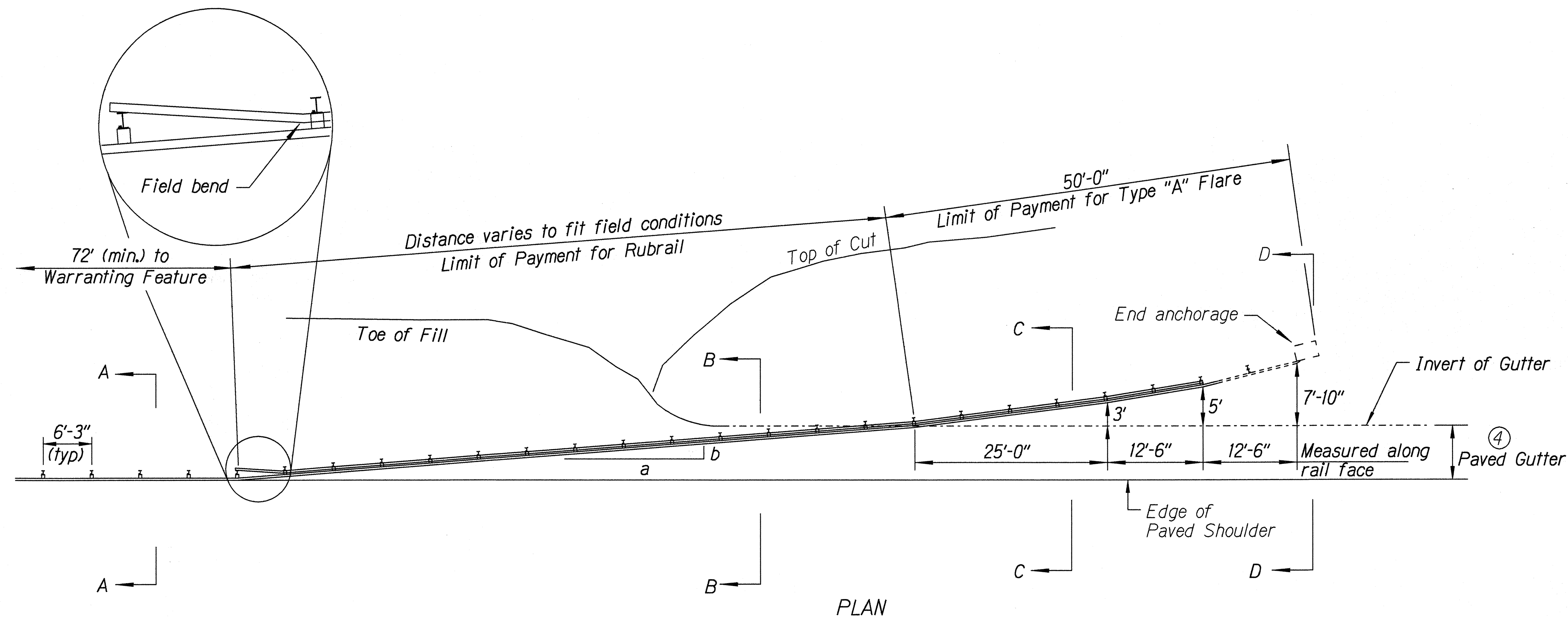
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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**FLEAT-350**  
**FLARED ENERGY ABSORBING TERMINAL**  
HANA HIGHWAY, Dairy Road to Vicinity of Paia Town #  
PIILANI HIGHWAY, Mokulele Hwy. to Wailea Ike Drive  
GUARDRAIL AND SHOULDER IMPROVEMENTS  
Federal-Aid Project No. STP-0900(58)  
Not to Scale Date: March, 2000  
SHEET No. 1 OF 9 SHEETS

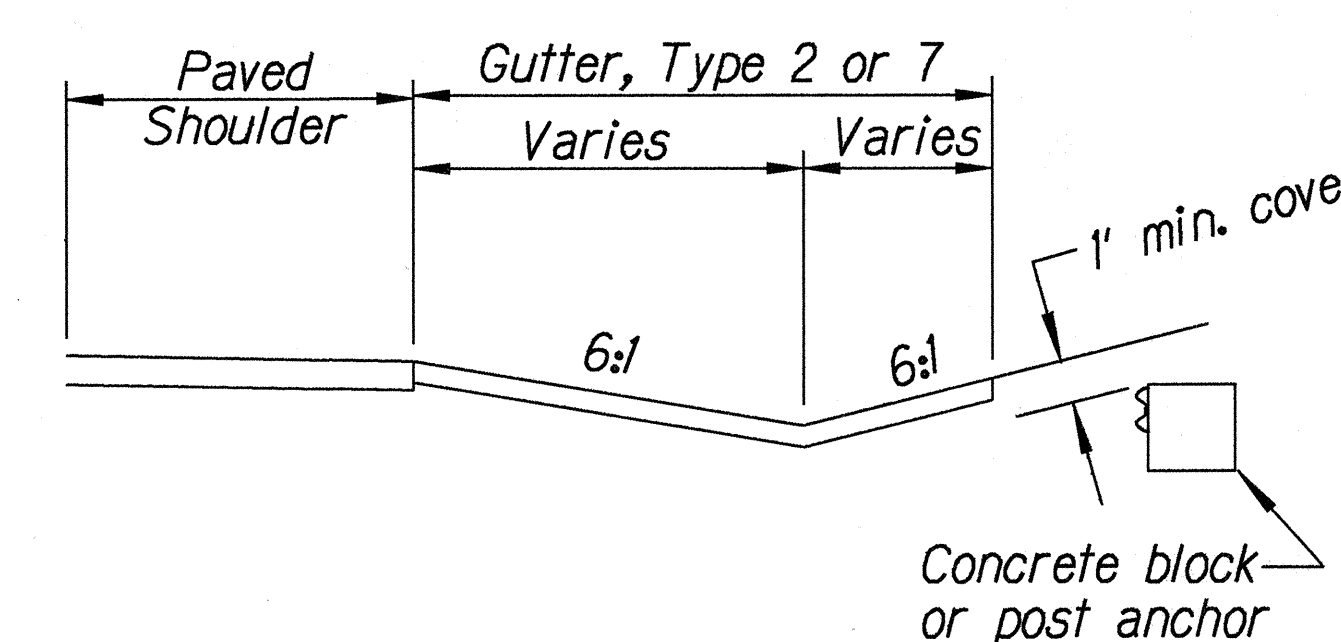
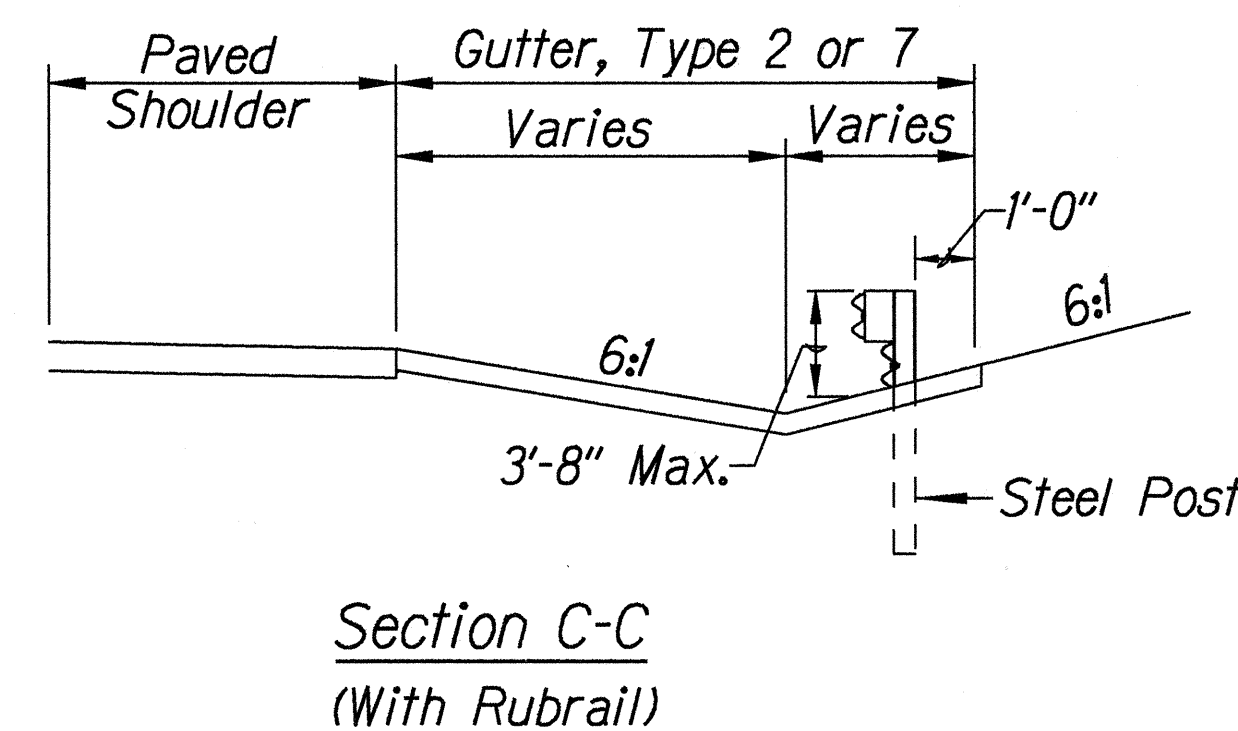
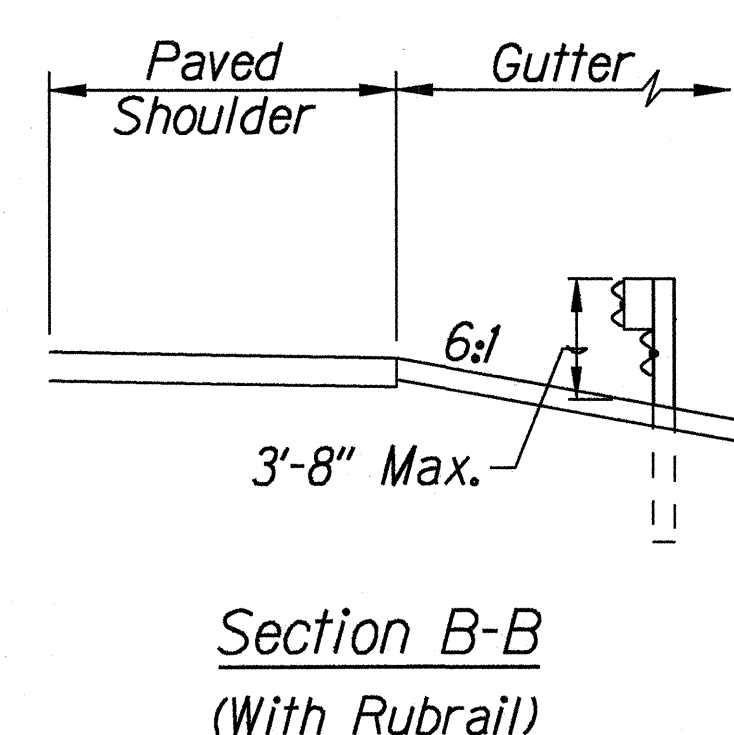
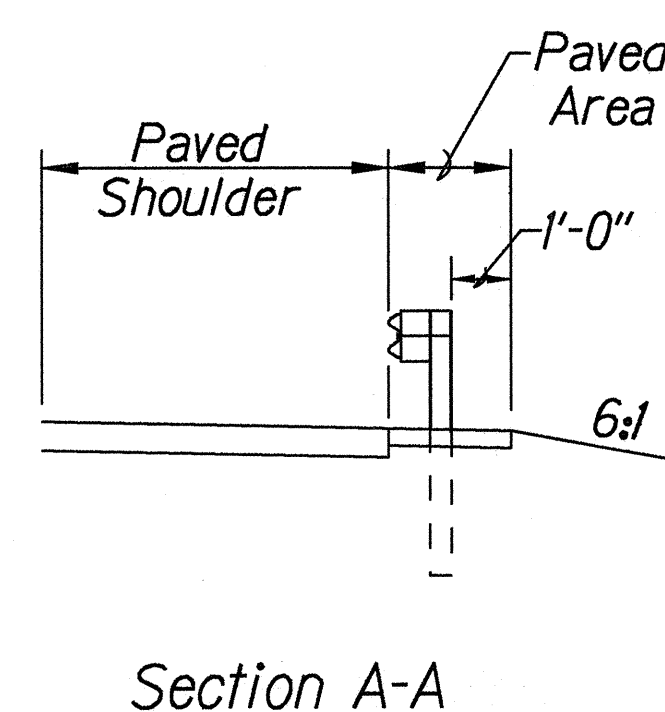
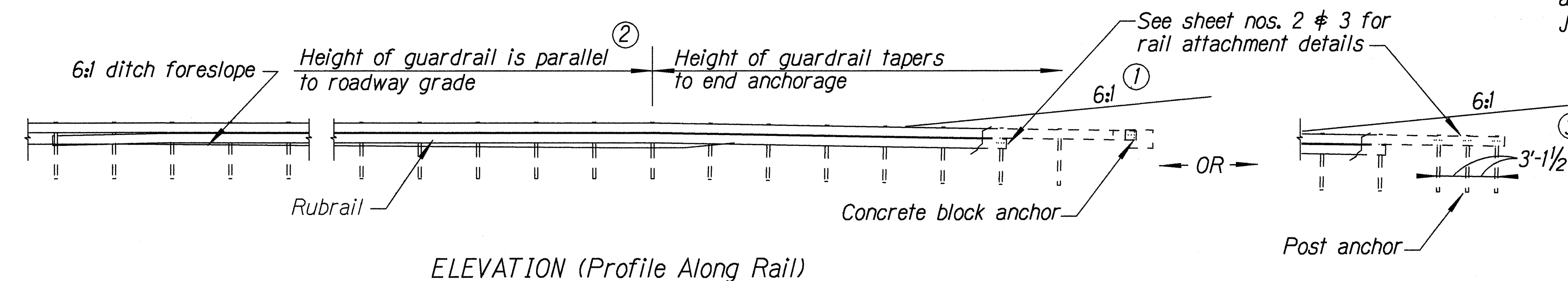
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	7	52

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.*



<i>Design speed mph</i>	<i>a:b</i>
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)

ORIGINAL PLAN	SURVEY PLOTTED BY _____	DATE _____
NOTE BOOK	DRAWN BY <i>X</i>	<i>X</i>
	TRACED BY _____	_____
	DESIGNED BY <i>X</i>	_____
	QUANTITIES BY _____	_____
_____	CHECKED BY _____	_____

3/01/99 [tdlculw@quardrail/q4qneeditch.dan](mailto:tdlculw@quardrail/q4qneeditch.dan) (standard plan TE-58 07/01/86, TE-59 r11/03/89 & TE-60 07/01/86)

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**TYPE "A" FLARE**

HANA HIGHWAY, Dairy Road to Vicinity of Paia Town &  
PIILANI HIGHWAY, Mokulele Hwy. to Wailea Ike Drive  
GUARDRAIL AND SHOULDER IMPROVEMENTS  
Federal-Aid Project No. STP-0900(X58)

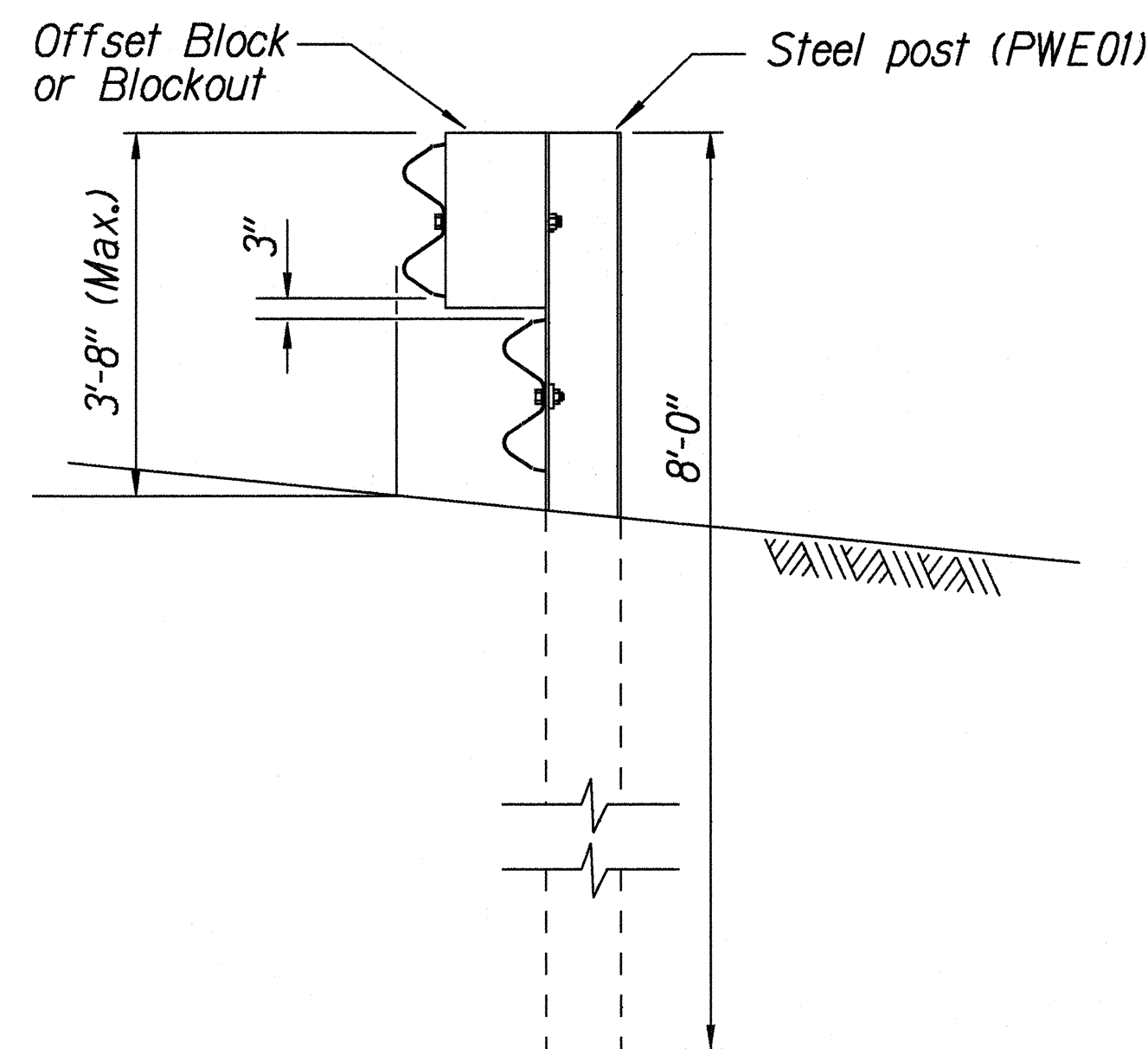
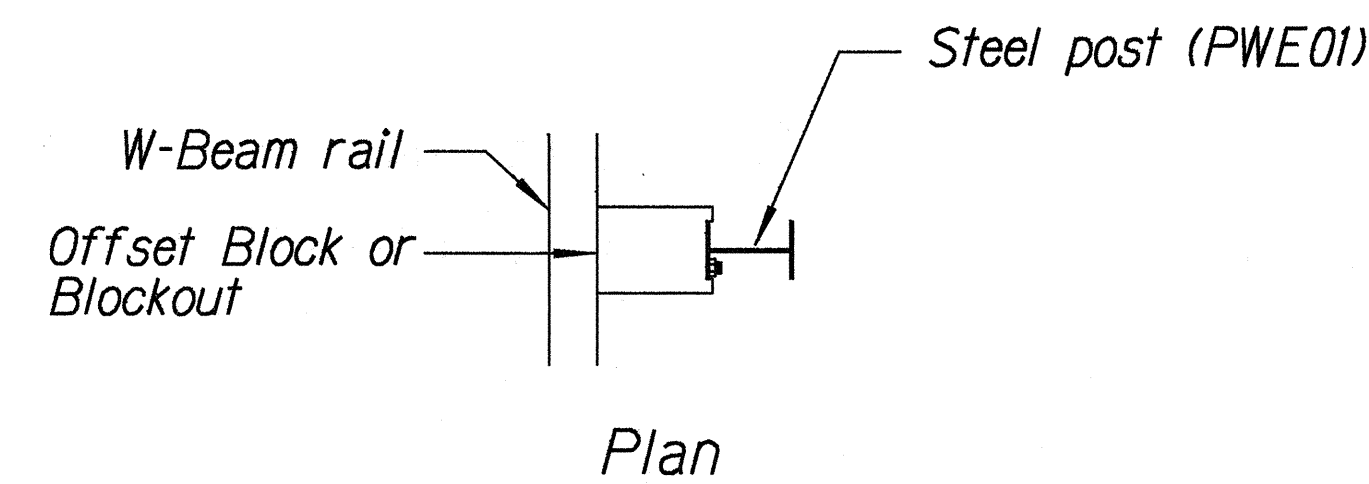
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SHEET No. 1 OF 3 SHEETS

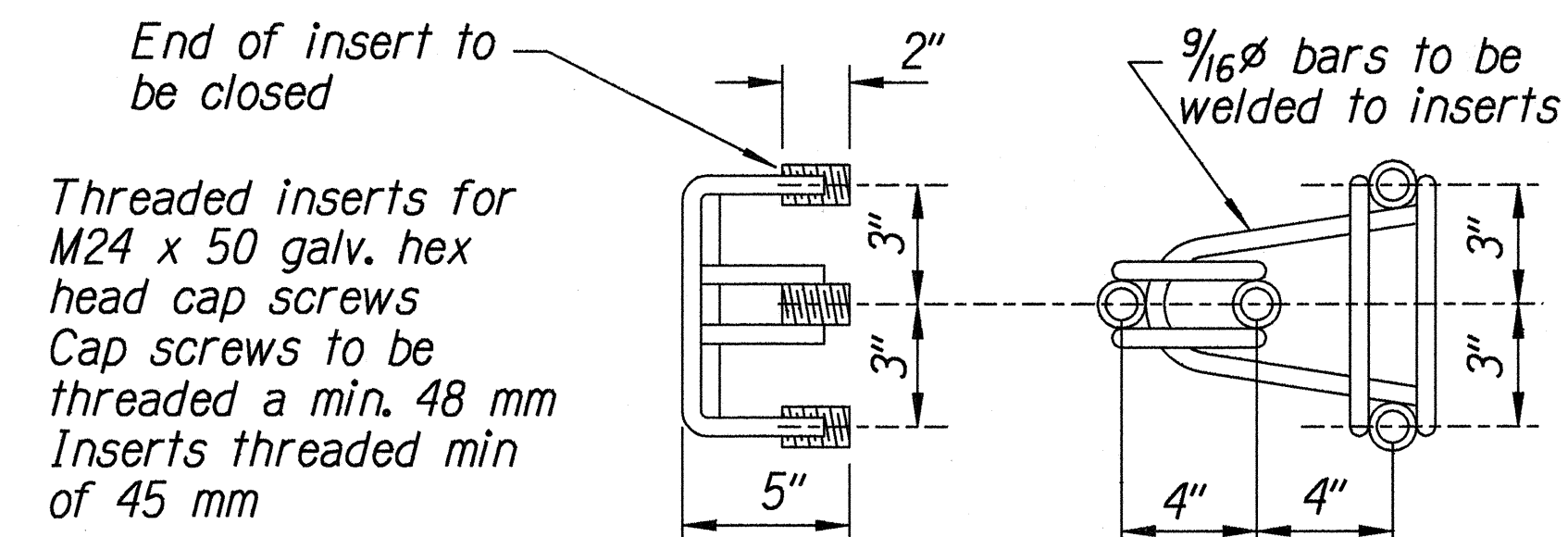




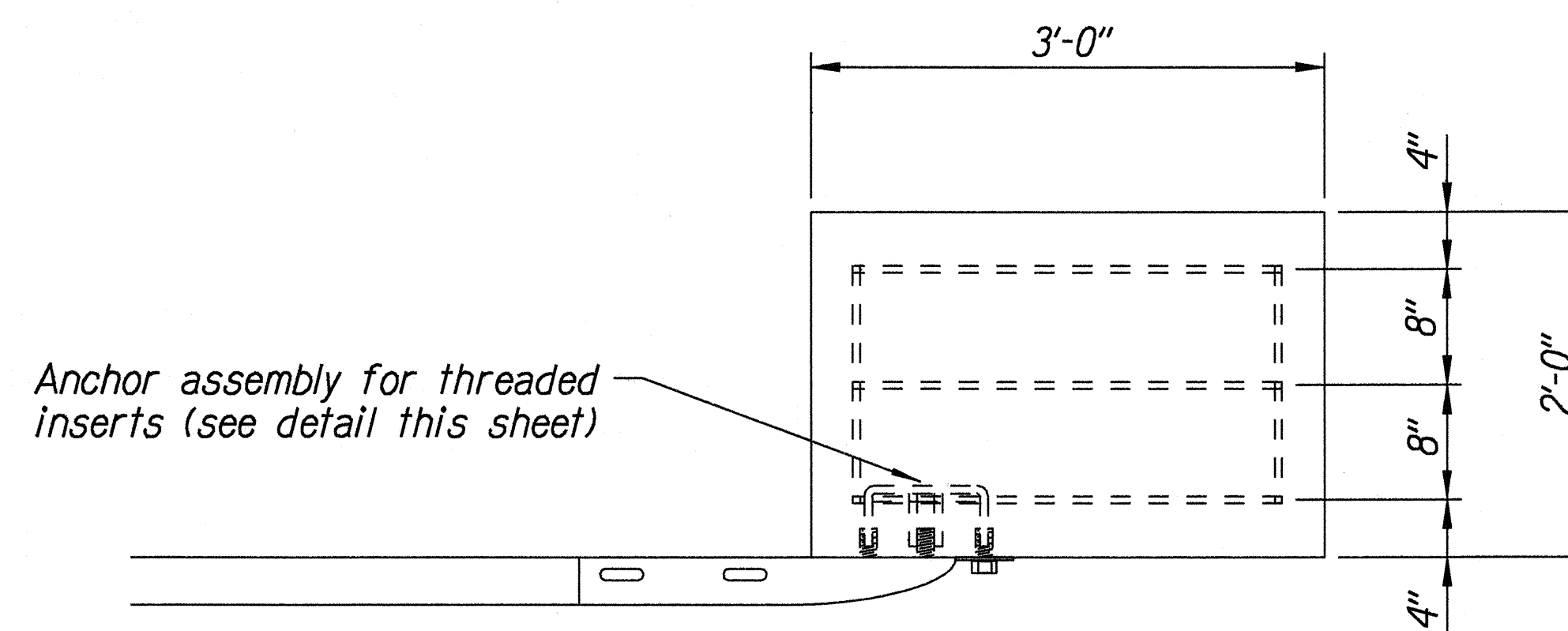
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HAWAII	HAW.	STP-0900(58)	2001	9	52



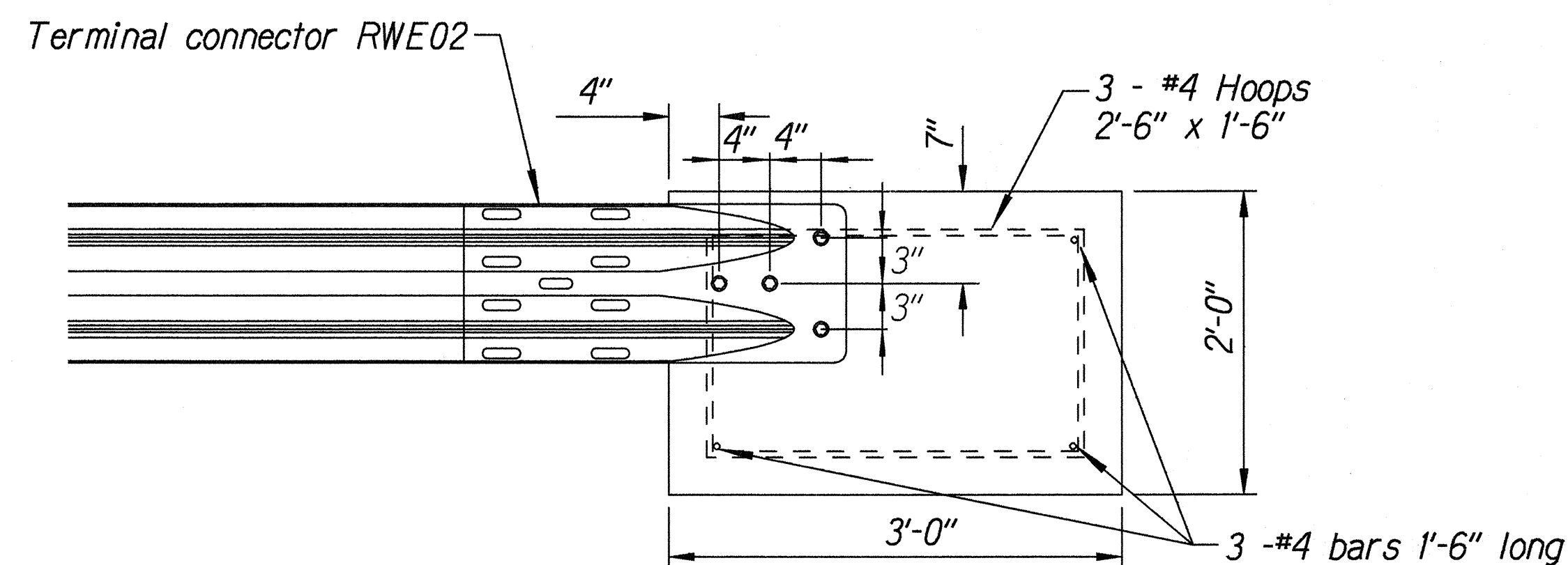
STEEL POST GUARDRAIL  
WITH RUBRAIL



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.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
DRAWN BY	TRACED BY	
NOTE BOOK	QUANTITIES BY	
ddxx	checked by	
N. x.dgn		

r3/01/99 rdrrubyl/guardrail/gdetd1.dgn (standard plan TE-58 07/01/86, TE-59 rll/03/89, TE-60 07/01/86)

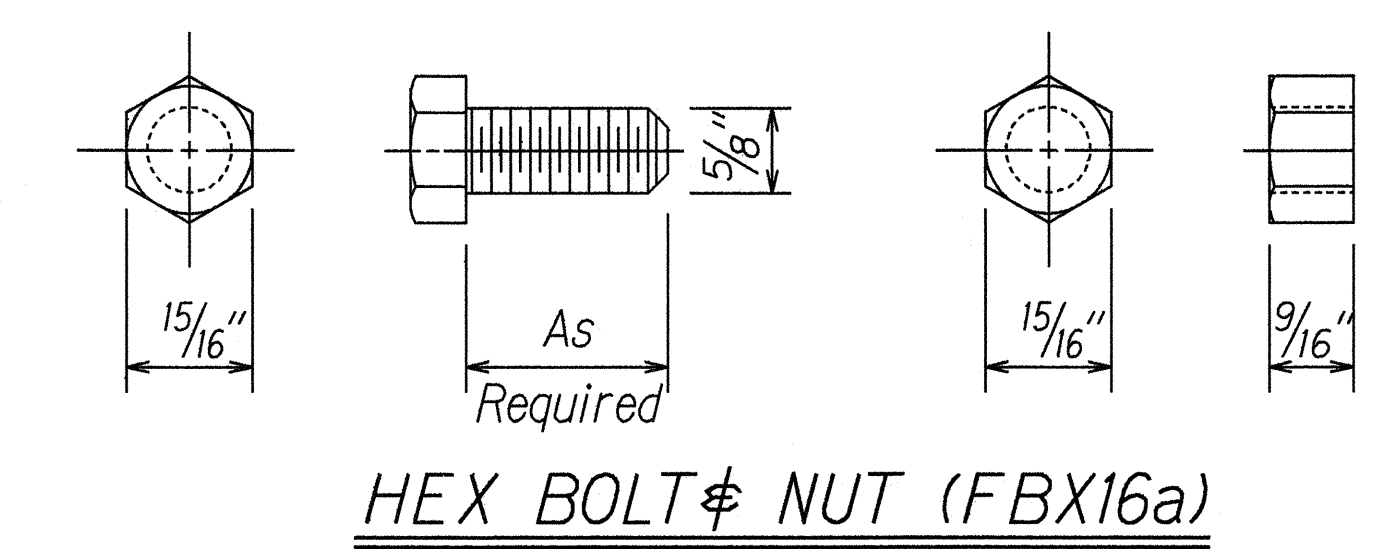
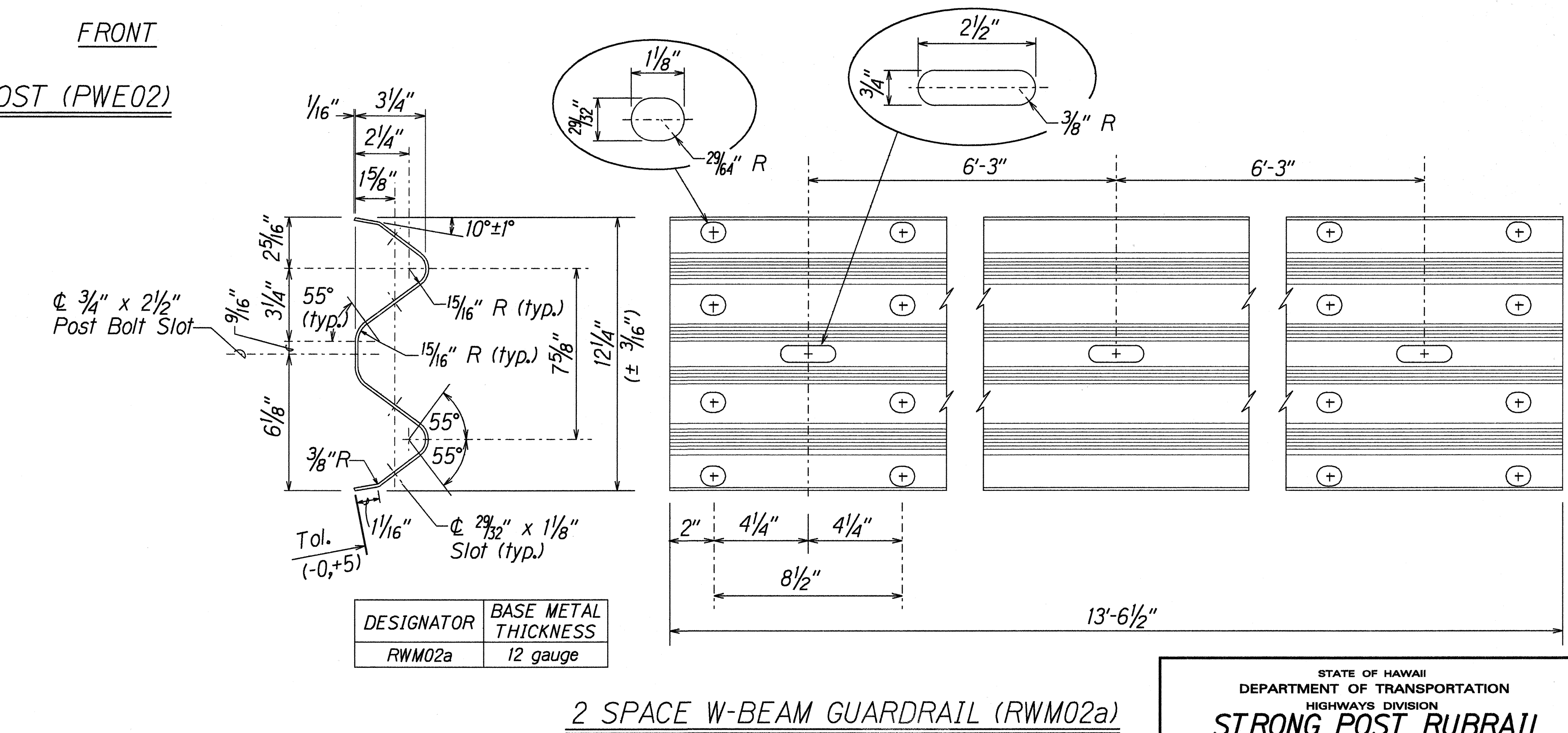
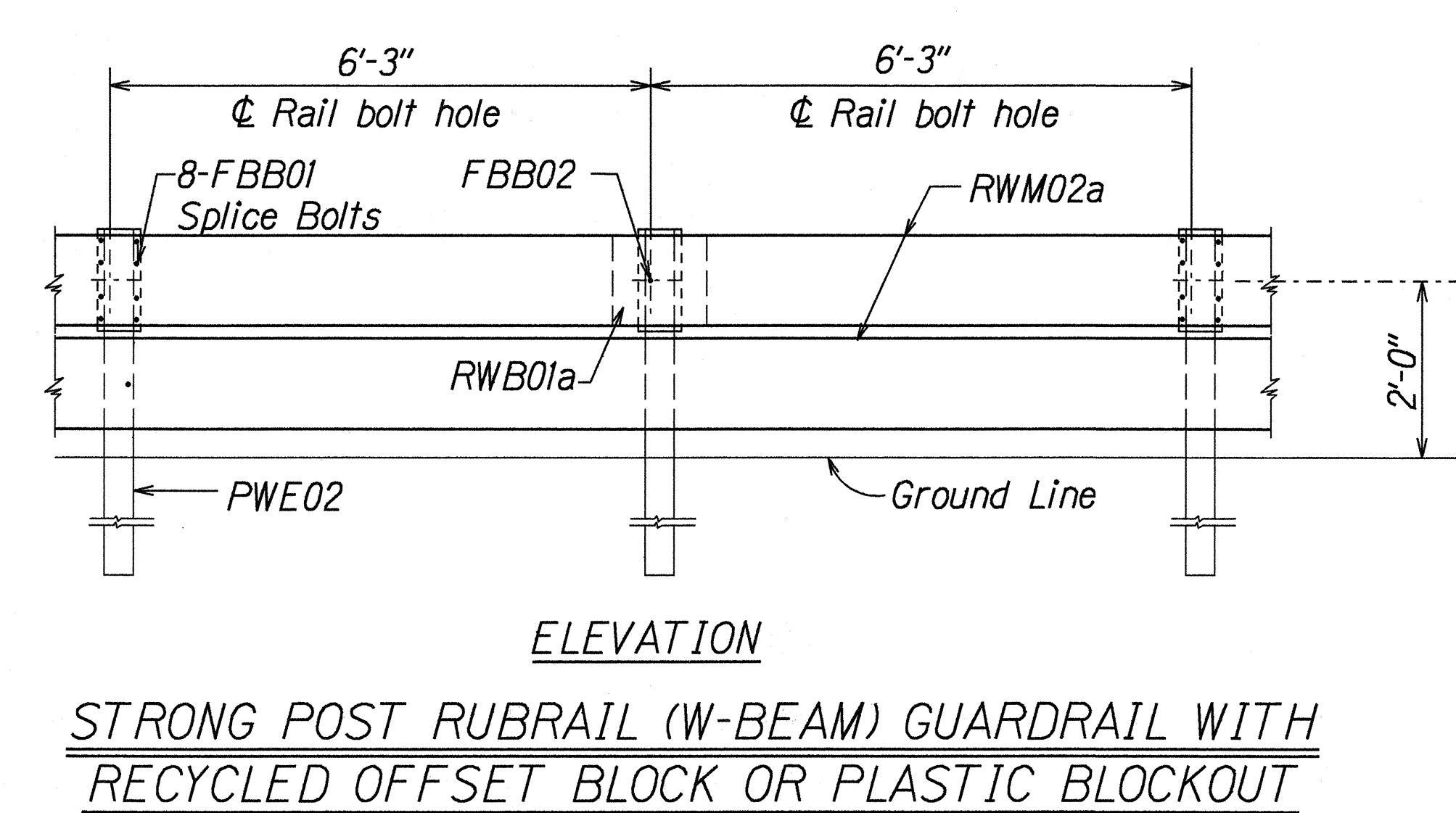
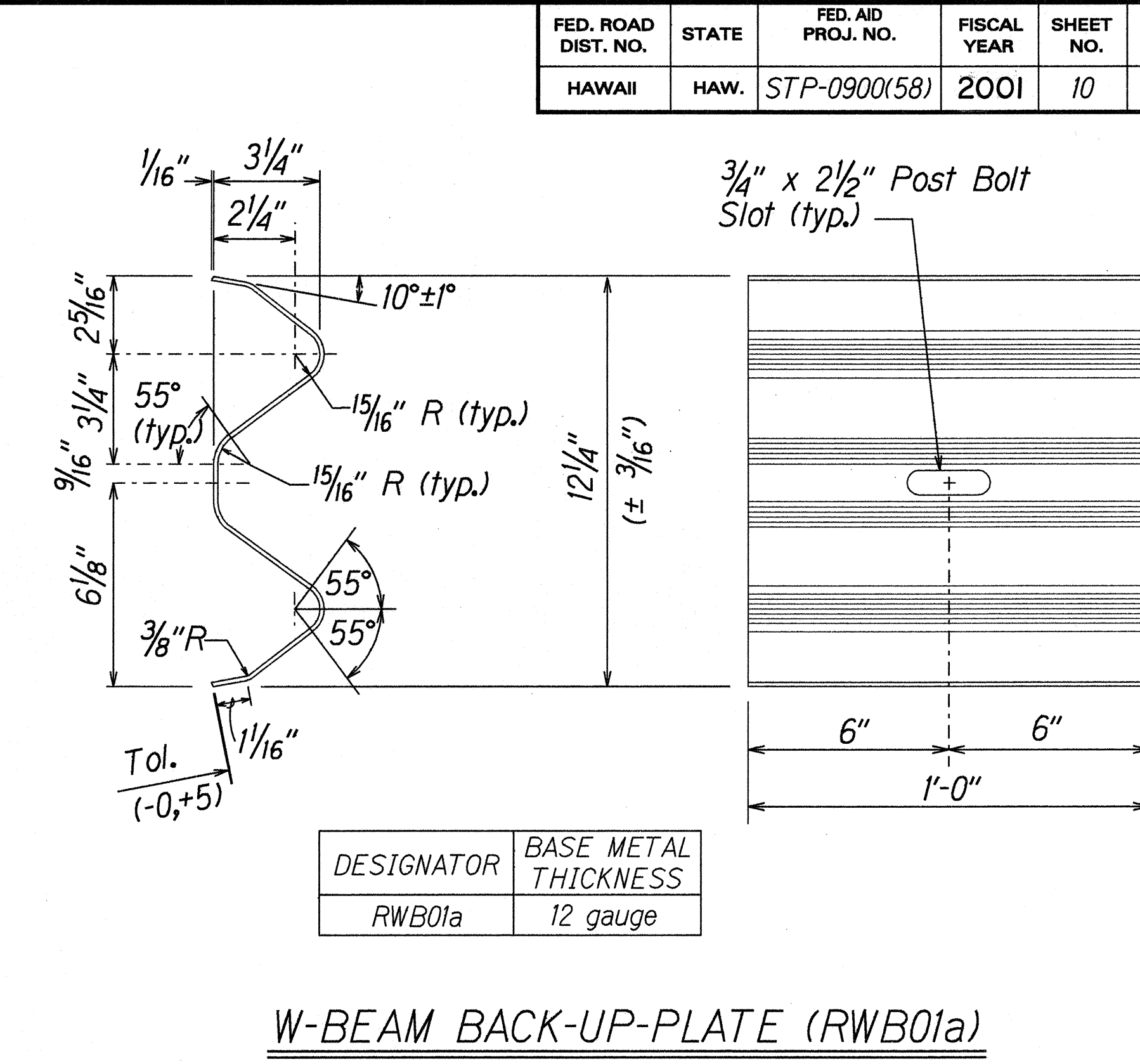
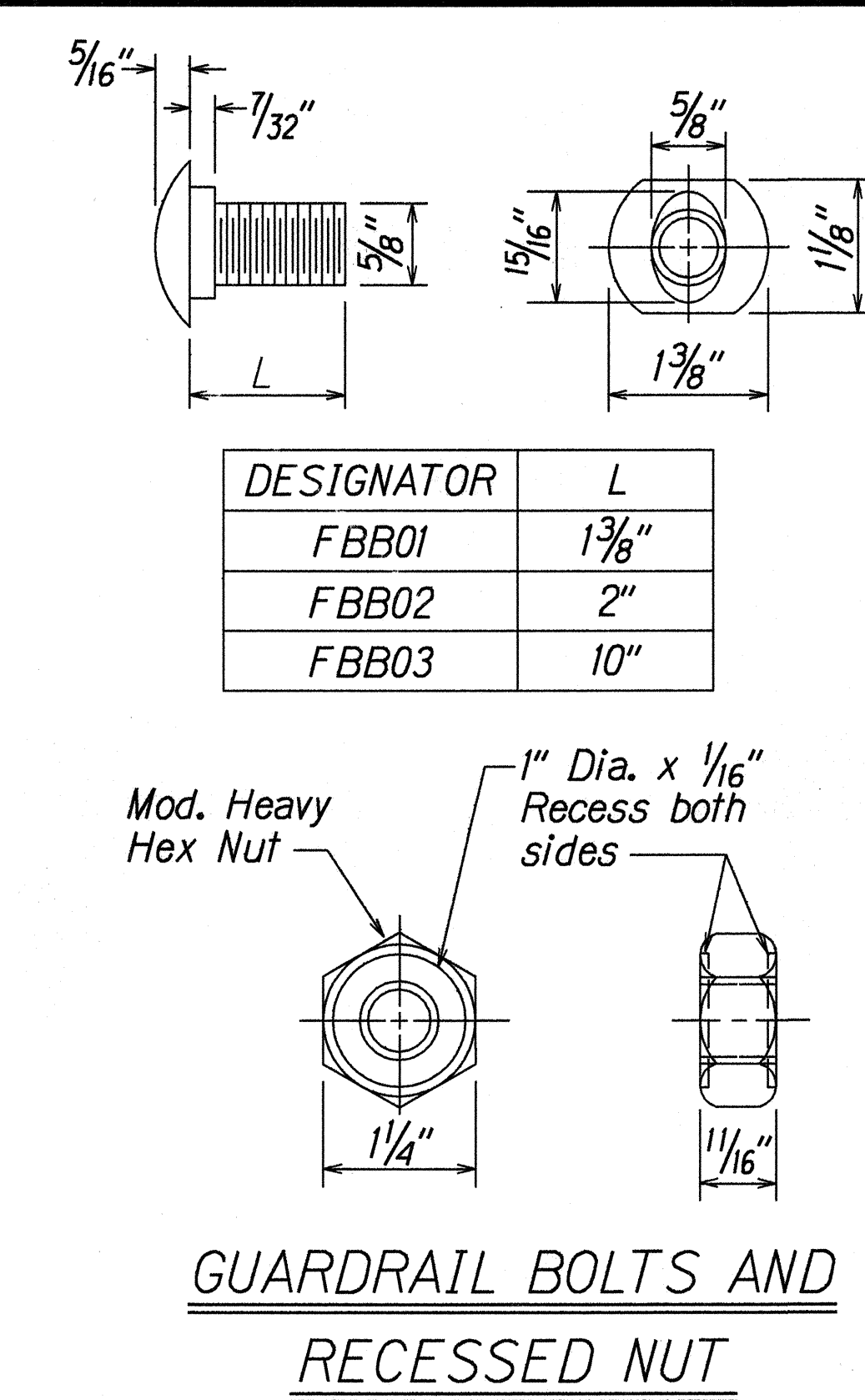
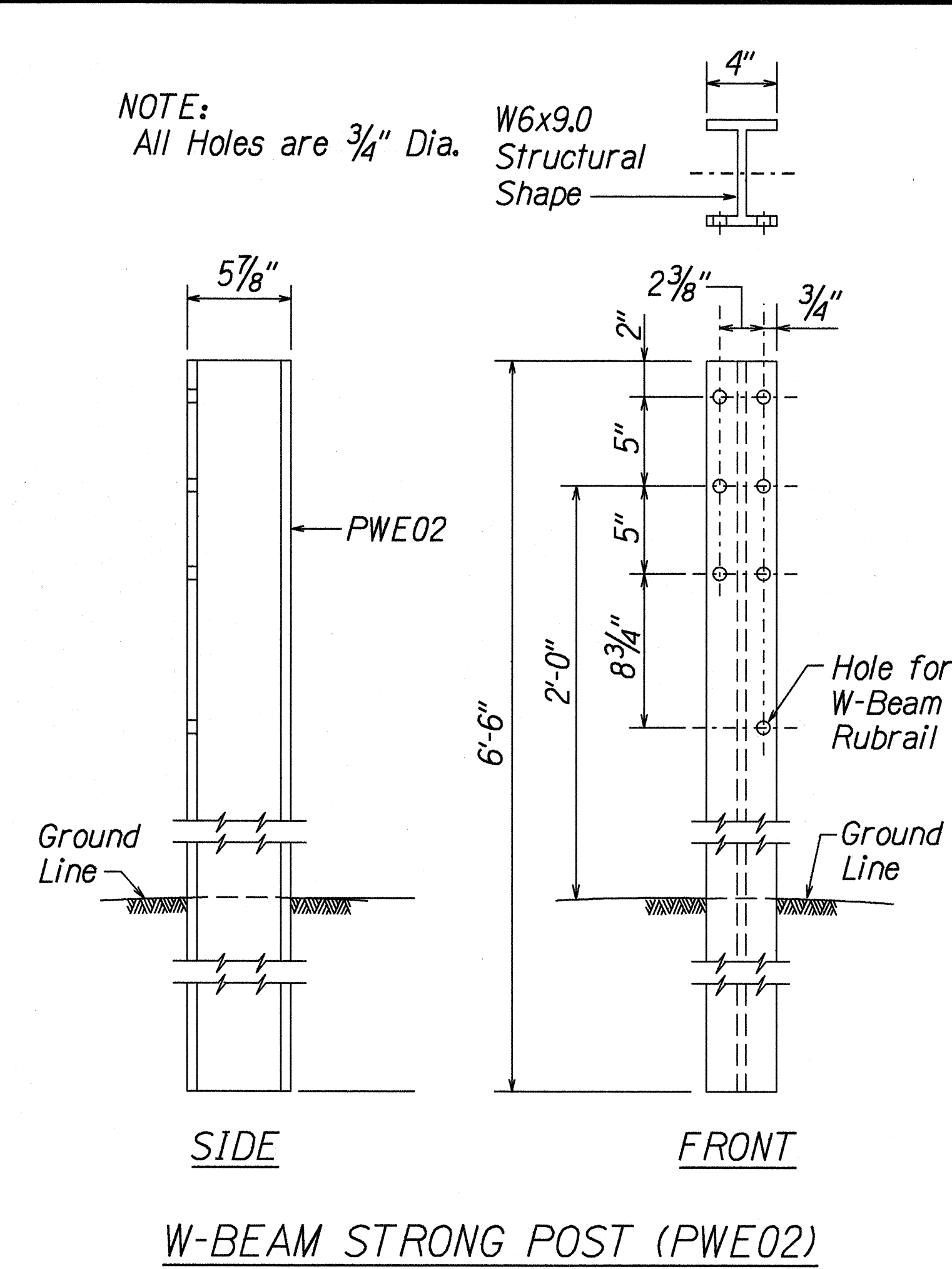
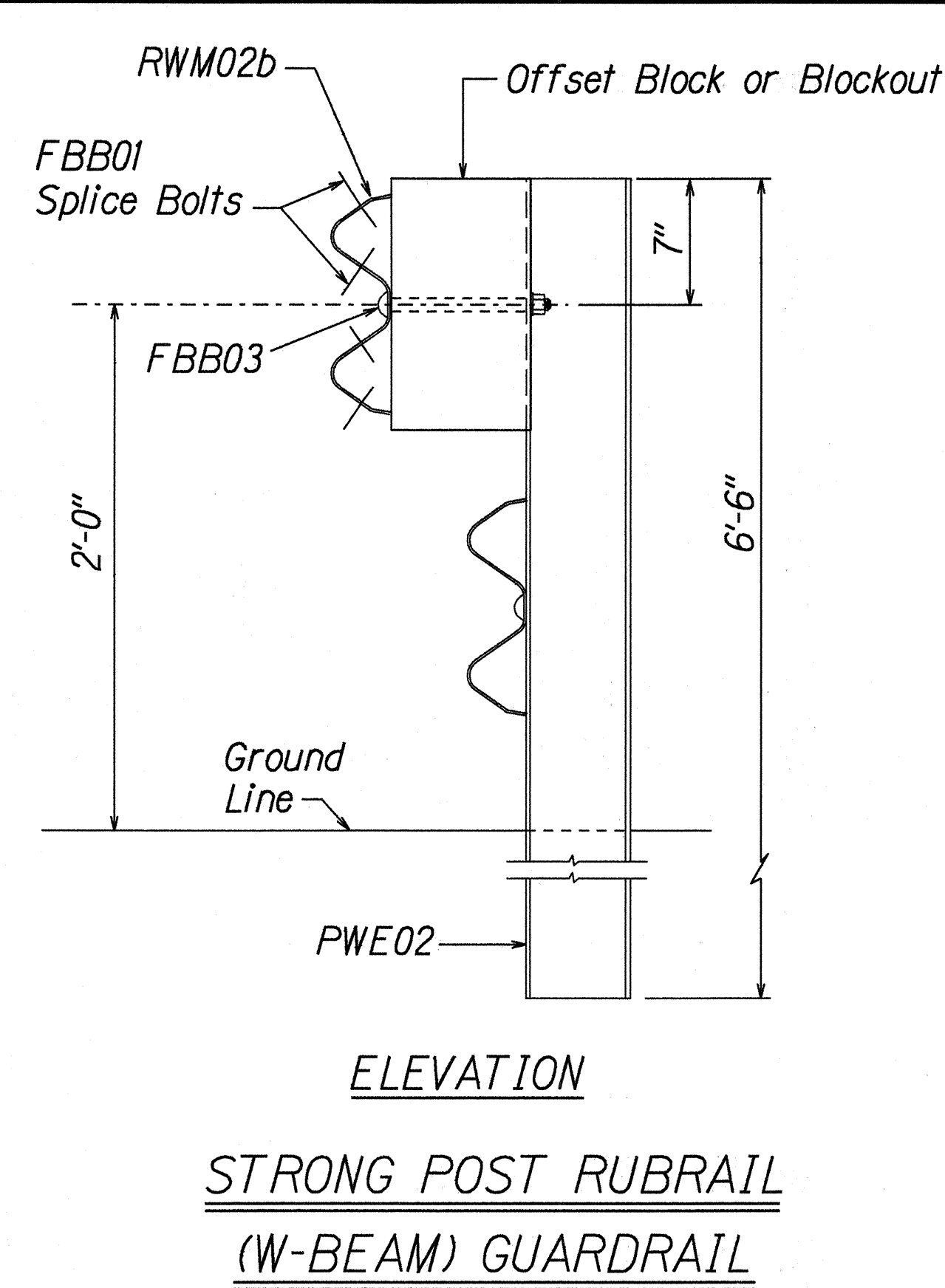
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**TYPE "A" FLARE**  
HANA HIGHWAY, Dairy Road to Vicinity of Paia Town &  
PILILANI HIGHWAY, Mokuale Hwy. to Wailea Ike Drive  
GUARDRAIL AND SHOULDER IMPROVEMENTS  
Federal Aid Project No. STP-0900(58)  
Scale: NTS Date: Oct., 1999

SHEET No. 3 OF 3 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	10	52



13/01/99 10/01/99  
SURVEY PLOTTED BY: DATE: X  
DRAWN BY: X  
CHECKED BY: X  
NOTE BOOK DESIGNED BY: X  
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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

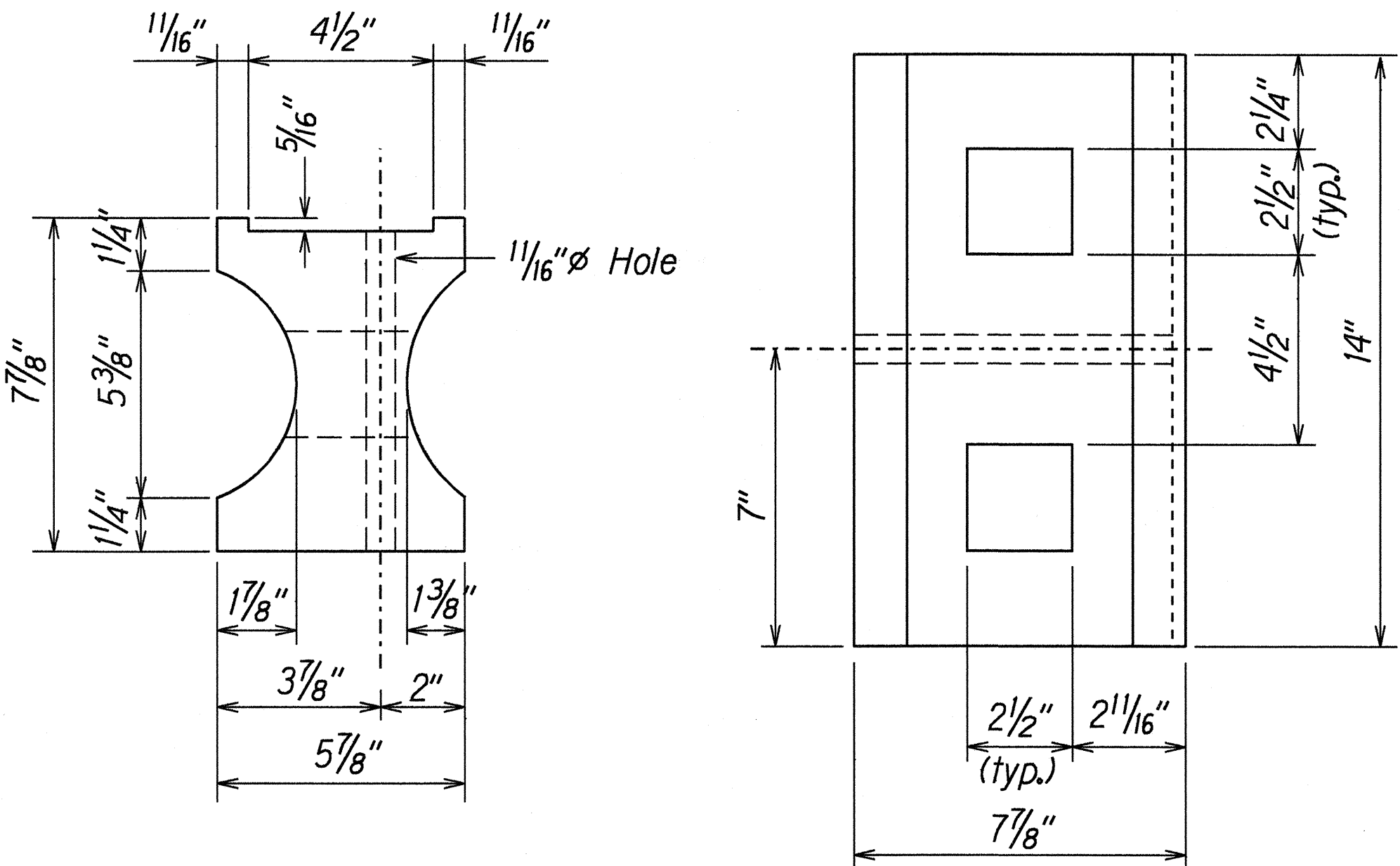
**STRONG POST RUBRAIL (W-BEAM) GUARDRAIL**  
HANA HIGHWAY, Dairy Road to Vicinity of Paia Town & PITALANI HIGHWAY, Mokualele Hwy. to Wailea Ike Drive  
**GUARDRAIL AND SHOULDER IMPROVEMENTS**  
Federal Aid Project No. STP-0900(58)  
Scale: NTS      Date: Oct., 1999

SHEET No. 1 OF 1 SHEETS

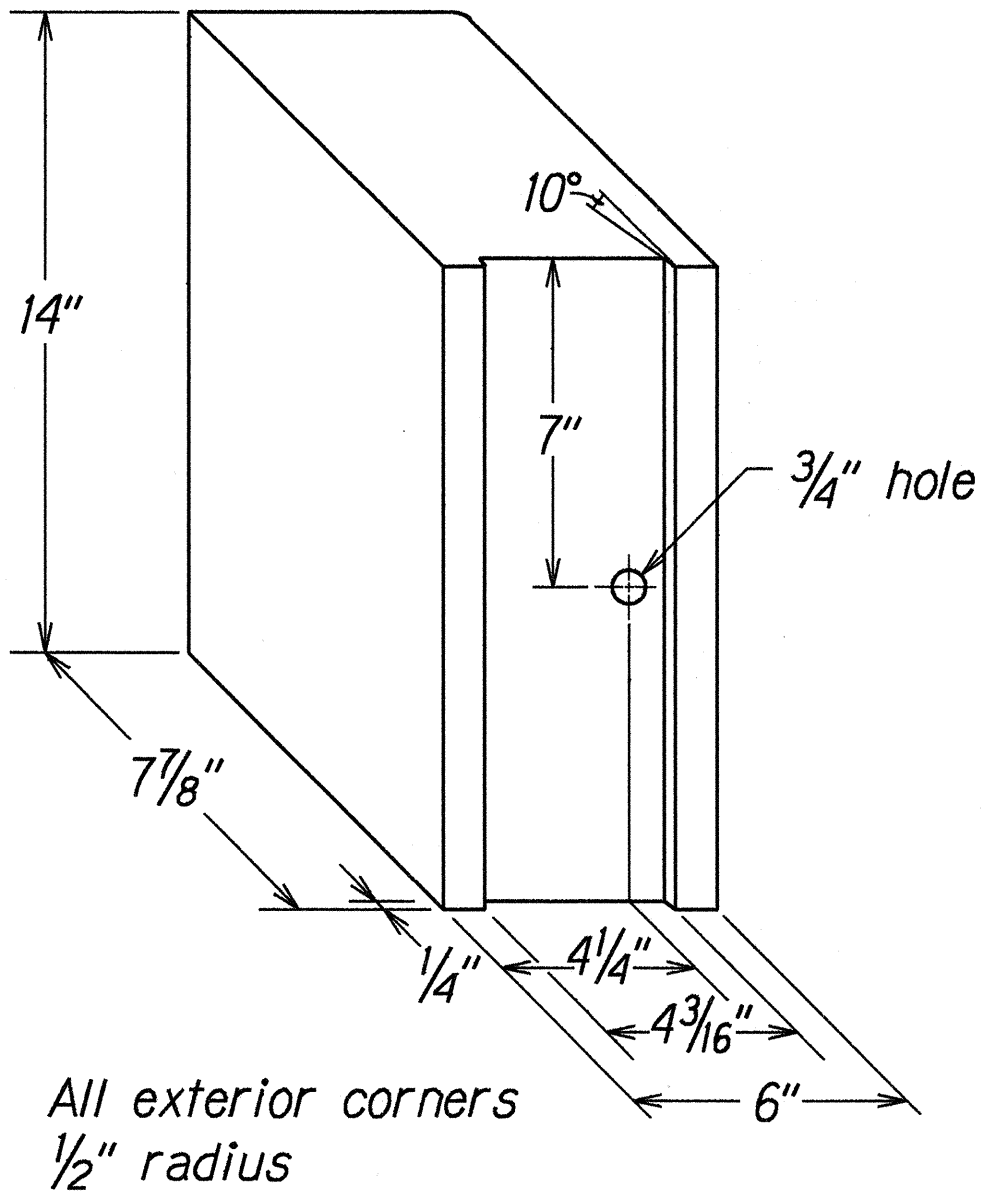
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	11	52

### GENERAL NOTES

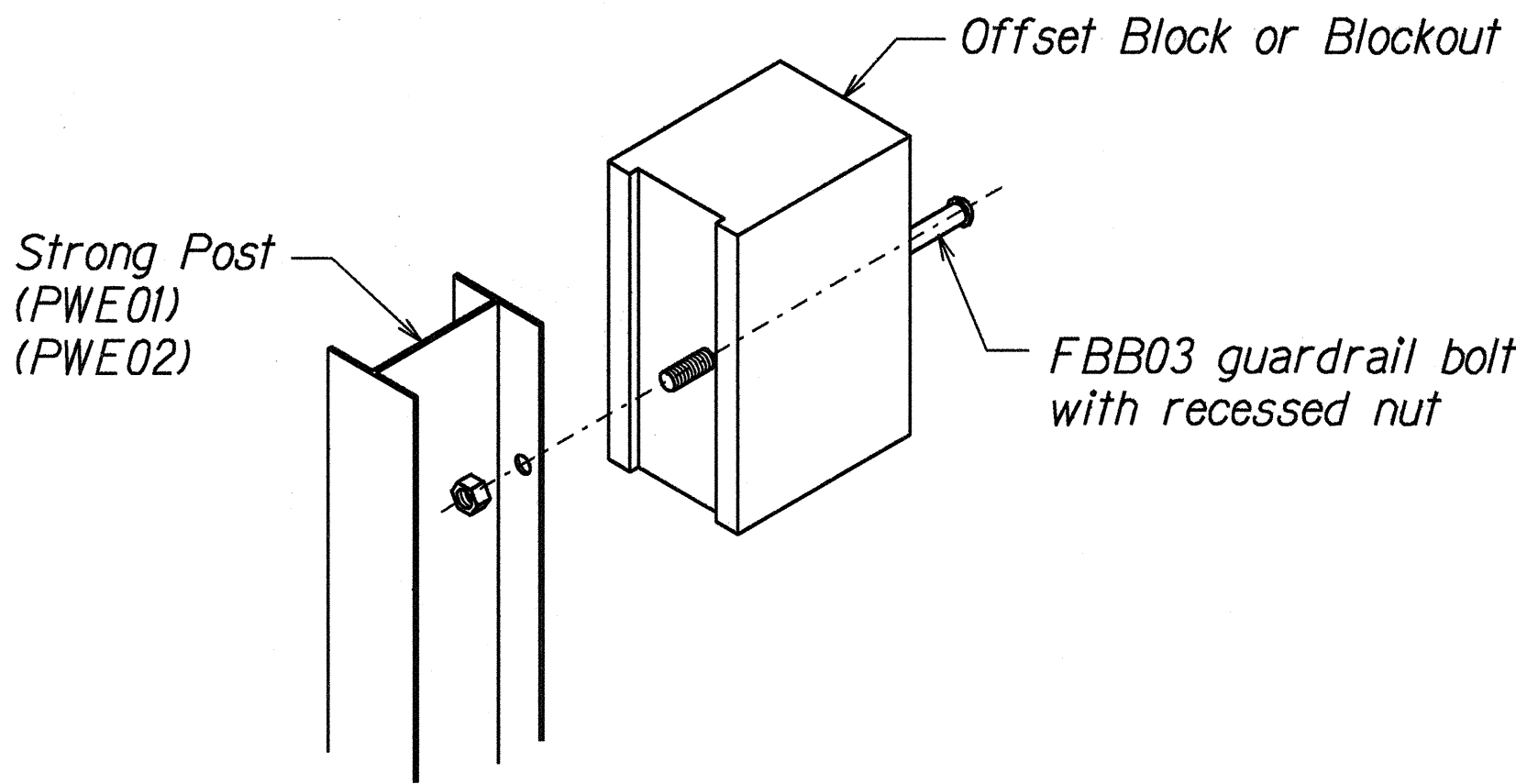
- All hardware, posts and fasteners shall be hot-dip zinc coated galvanized after fabrication. No punching, drilling or cutting will be permitted after galvanizing.
- Where conditions require, special post lengths in increments of 6 inches may be specified.
- All fasteners, posts, and rail elements (i.e. FBB03, PWE01, RWM02a, 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 fastners, 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.
- After the guardrail posts are installed in the paved area, the Contractor shall grout around the guardrail post and seal all cracks in the paved area that was 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 grouting. The cost for 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.



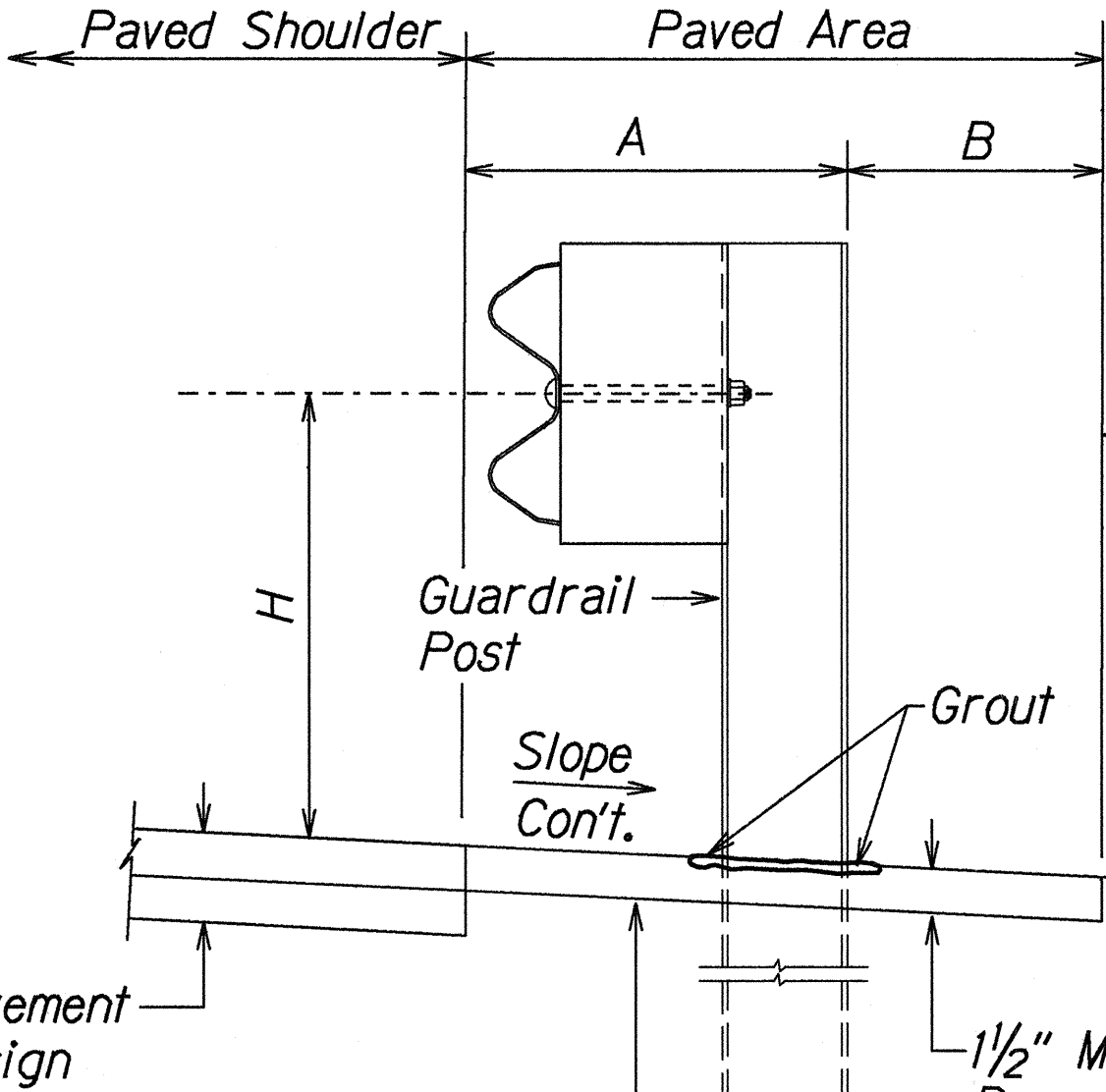
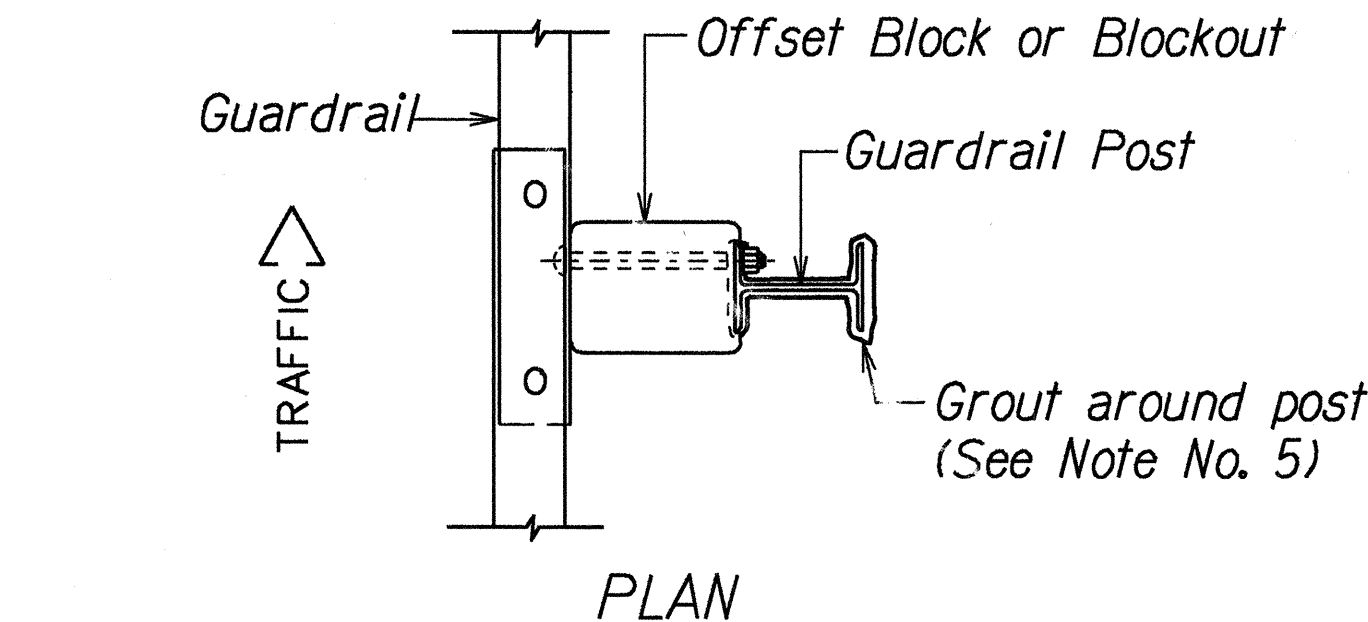
TOP  
SIDE  
RECYCLED PLASTIC BLOCKOUT (TYPE I)



RECYCLED POLYETHYLENE  
OFFSET BLOCK (TYPE II)



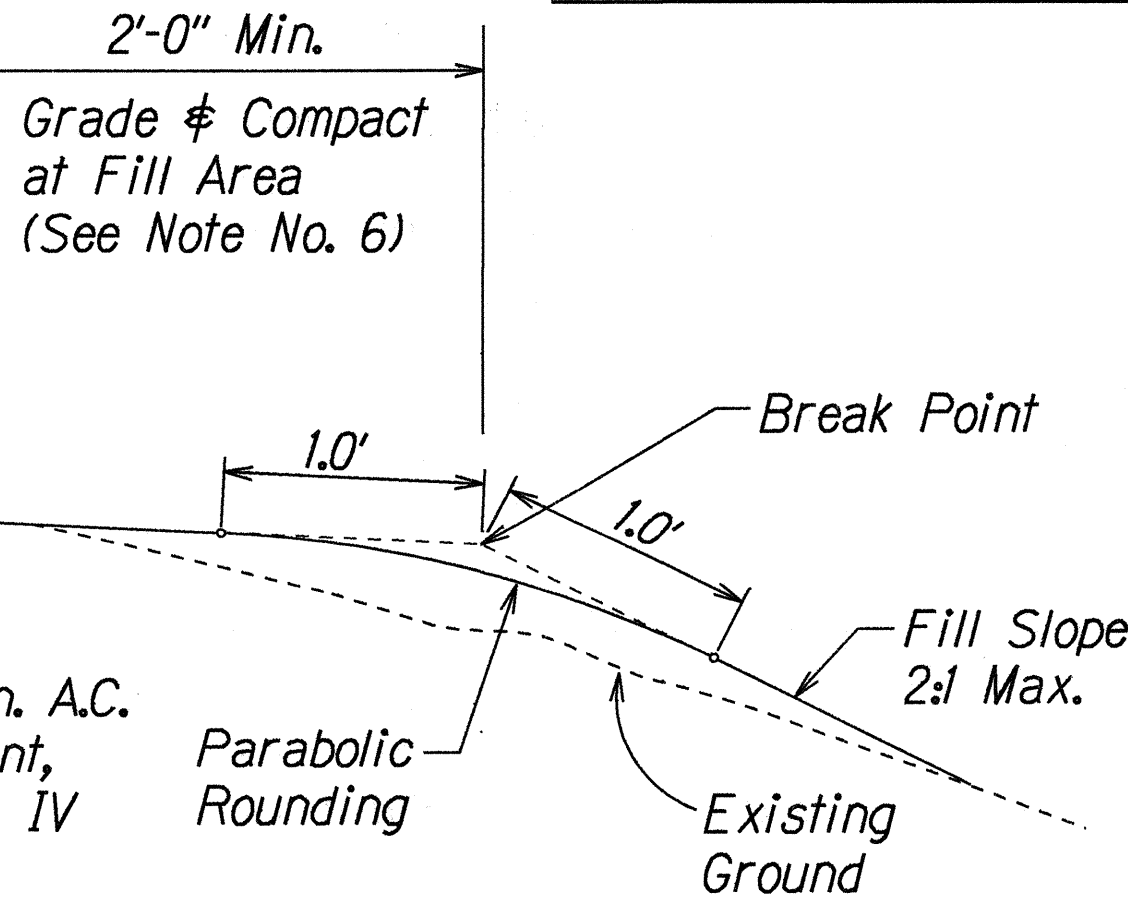
Exploded View  
(Rail and washer not shown)  
STEEL POST AND BLOCK DETAIL



Prior to installing A. C. Mix. No. IV, level & remove vegetation and compact existing ground to 95% compaction.

ELEVATION  
TYPICAL GUARDRAIL INSTALLATION

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



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

### GUARDRAIL DETAILS & NOTES

HANA HIGHWAY, Dairy Road to Vicinity of Paia Town & PIIHLANI HIGHWAY, Mokulele Hwy. to Wailea Ike Drive

GUARDRAIL AND SHOULDER IMPROVEMENTS

Federal Aid Project No. STP-0900(58)

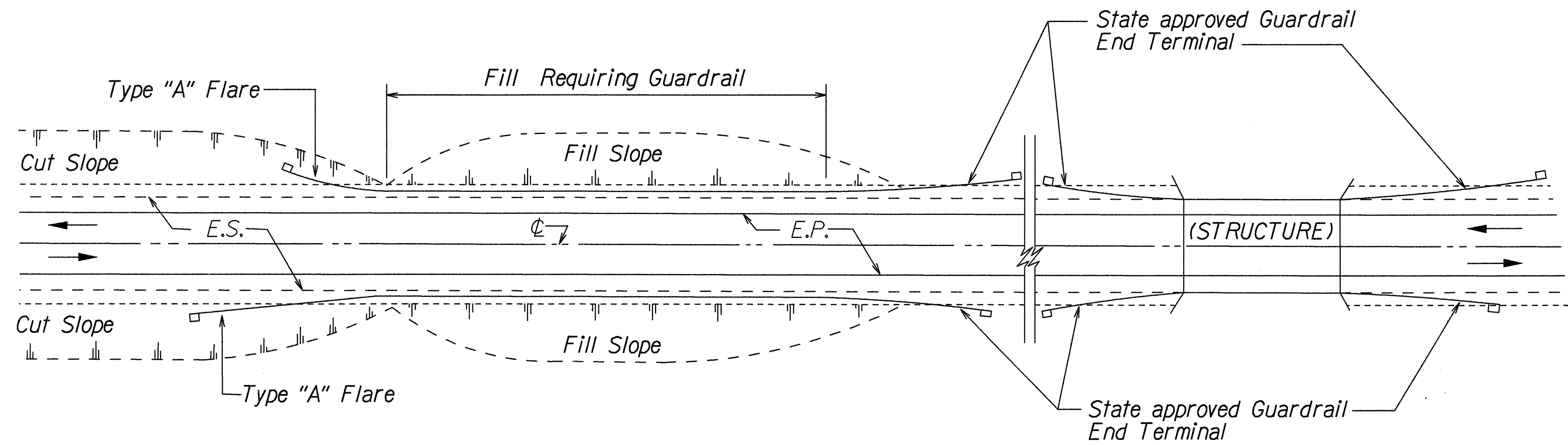
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ORIGINAL PLAN	
NOTE BOOK	
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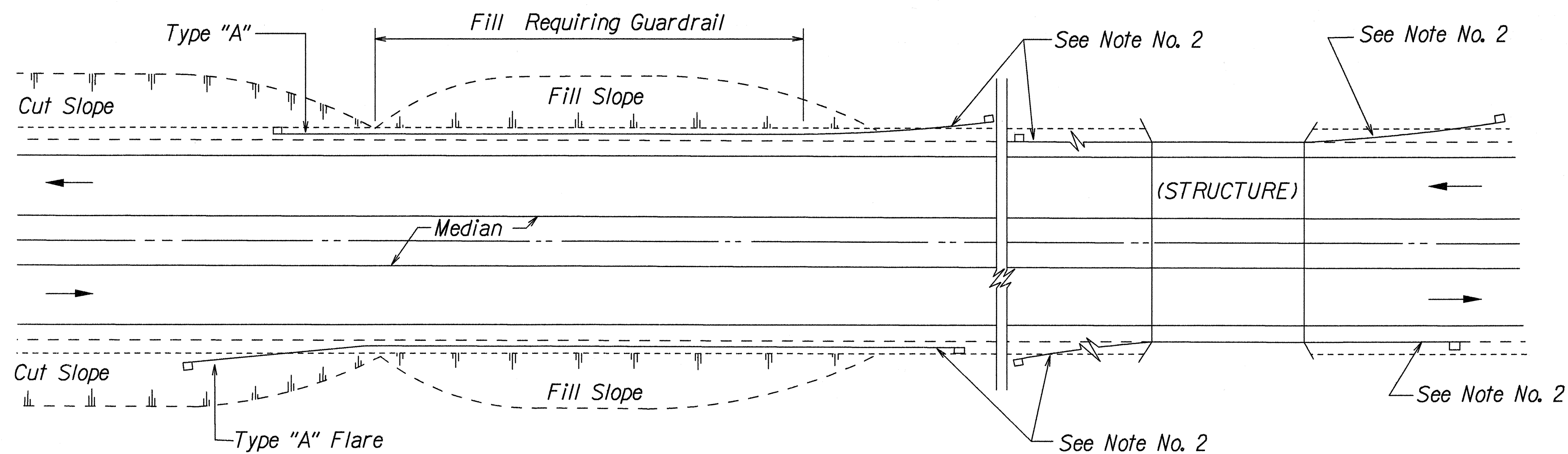
13/01/99 hlruby/guardrail/rev00rev.dgn (standard plan TE-50.103/06/07)



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	12	52



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.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	TRACED BY	
	QUANTITIES BY	
	CHECKED BY	

10/20/99 10/20/99 guardrail/tes@hawaii.gov (standard plan TE-58, 10/20/99)

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

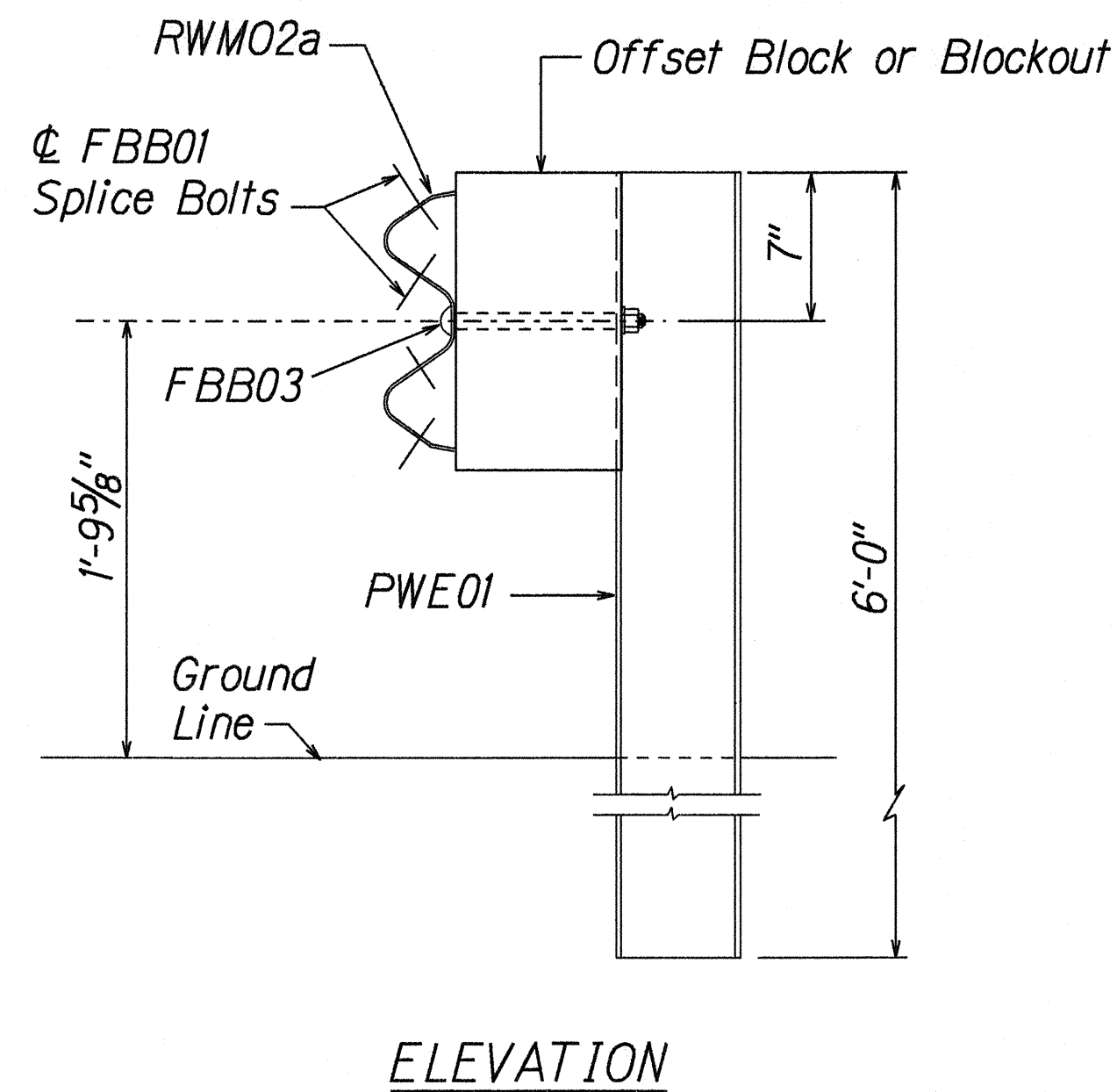
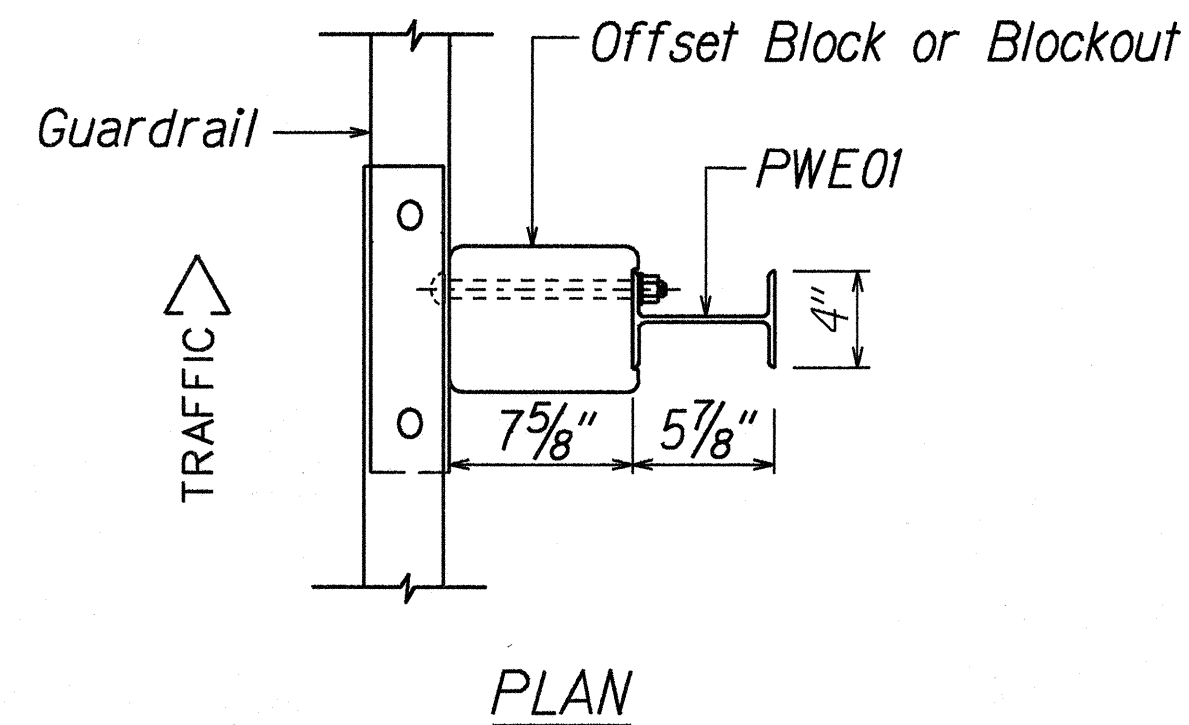
**GUARDRAIL DETAILS**

HANA HIGHWAY, Dairy Road to Vicinity of Paia Town &  
PILANI HIGHWAY, Mokulele Hwy. to Wailea Ike Drive  
GUARDRAIL AND SHOULDER IMPROVEMENTS  
Federal Aid Project No. STP-0900(58)

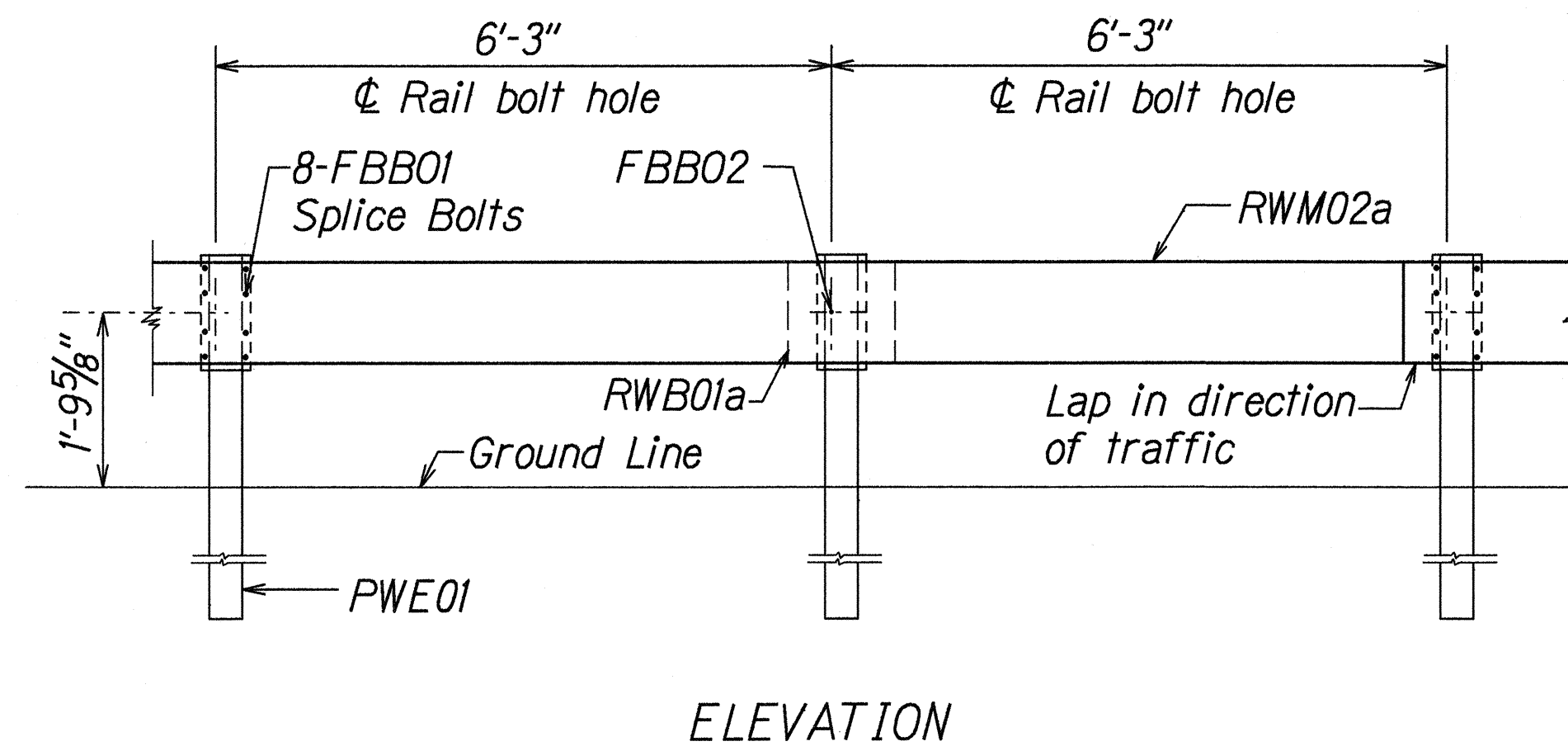
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SHEET No. 1 OF 2 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	13	52

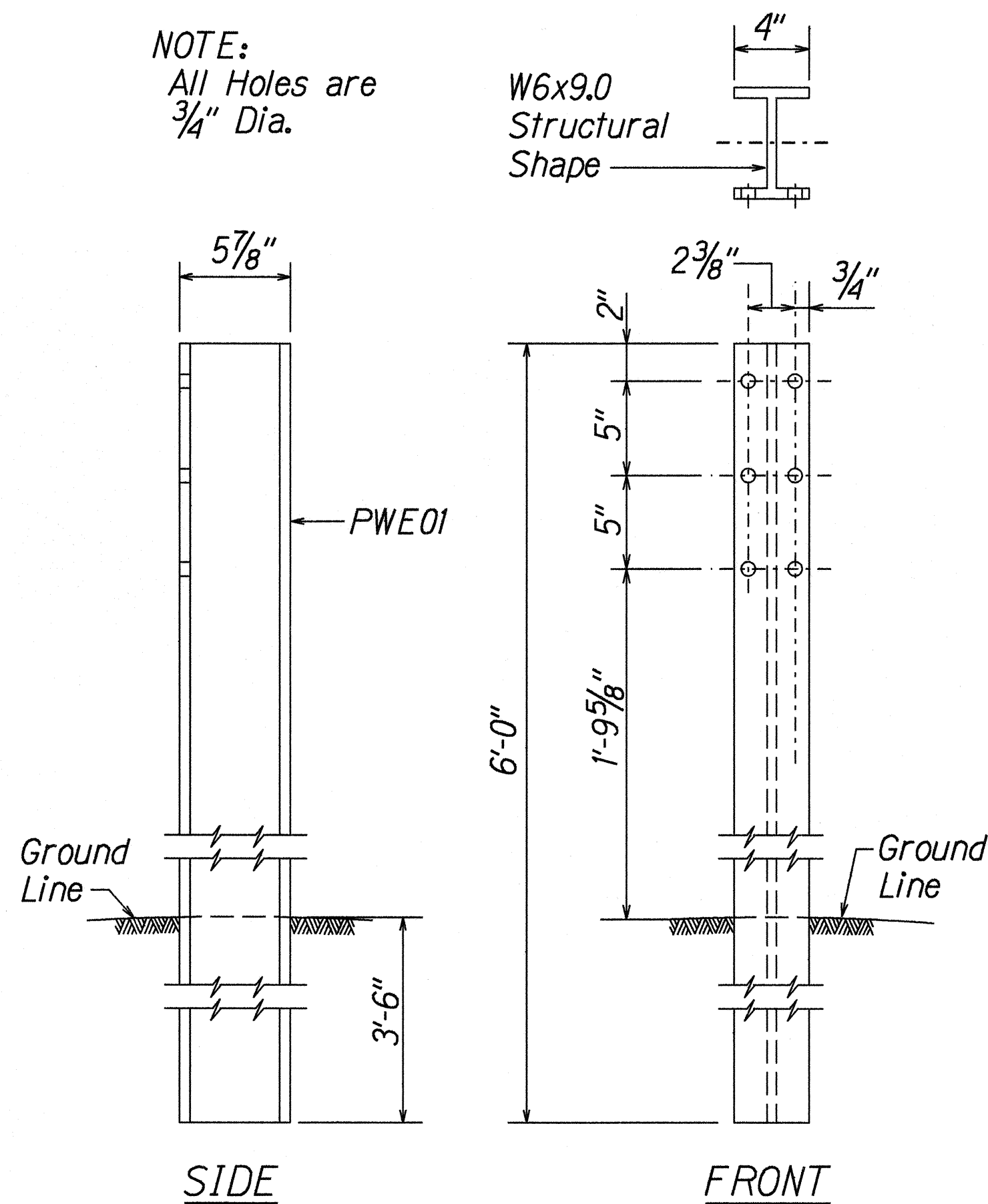


**STRONG POST W-BEAM GUARDRAIL**  
(SGR04a)

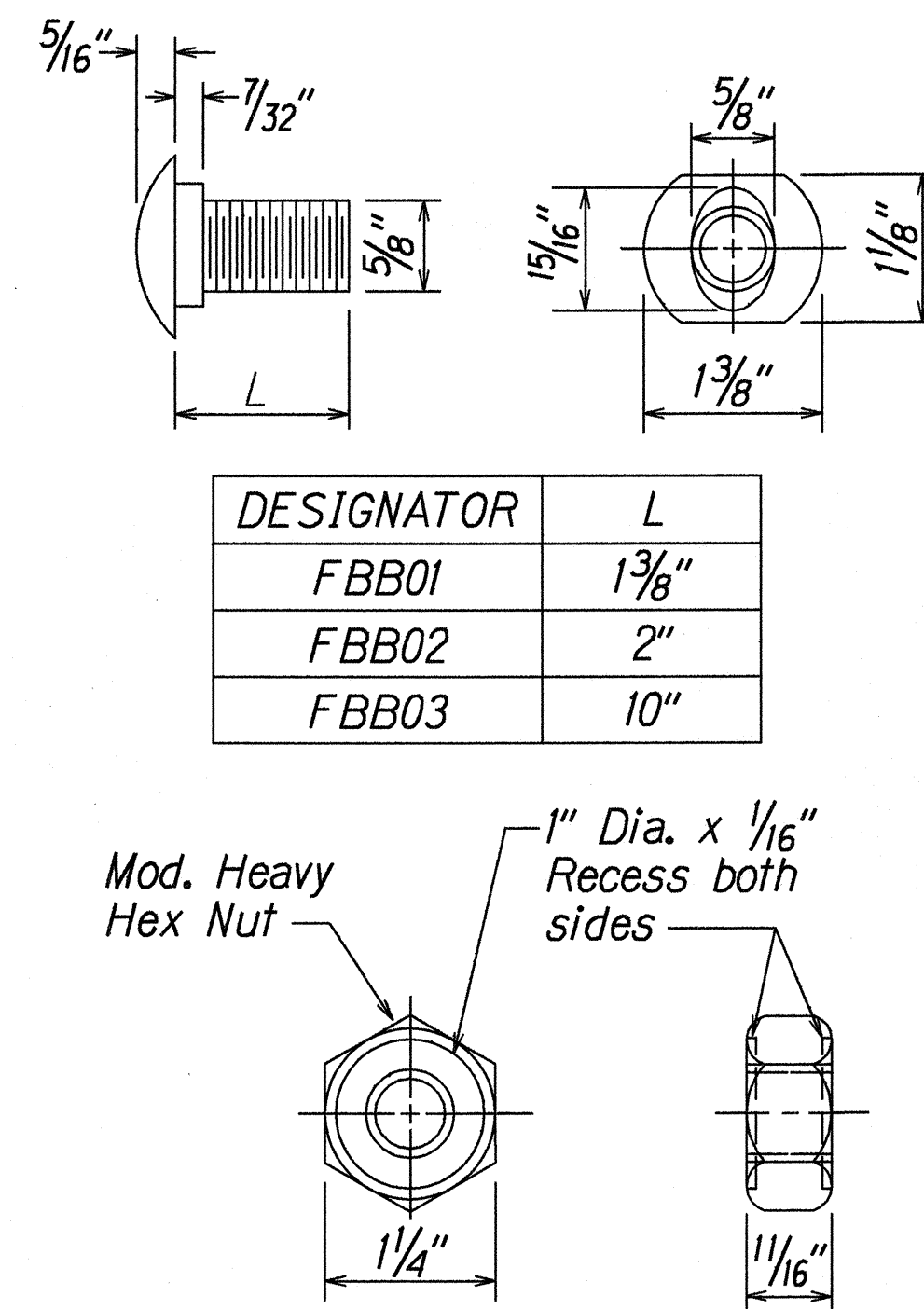


**STRONG POST W-BEAM GUARDRAIL WITH**  
**RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT**

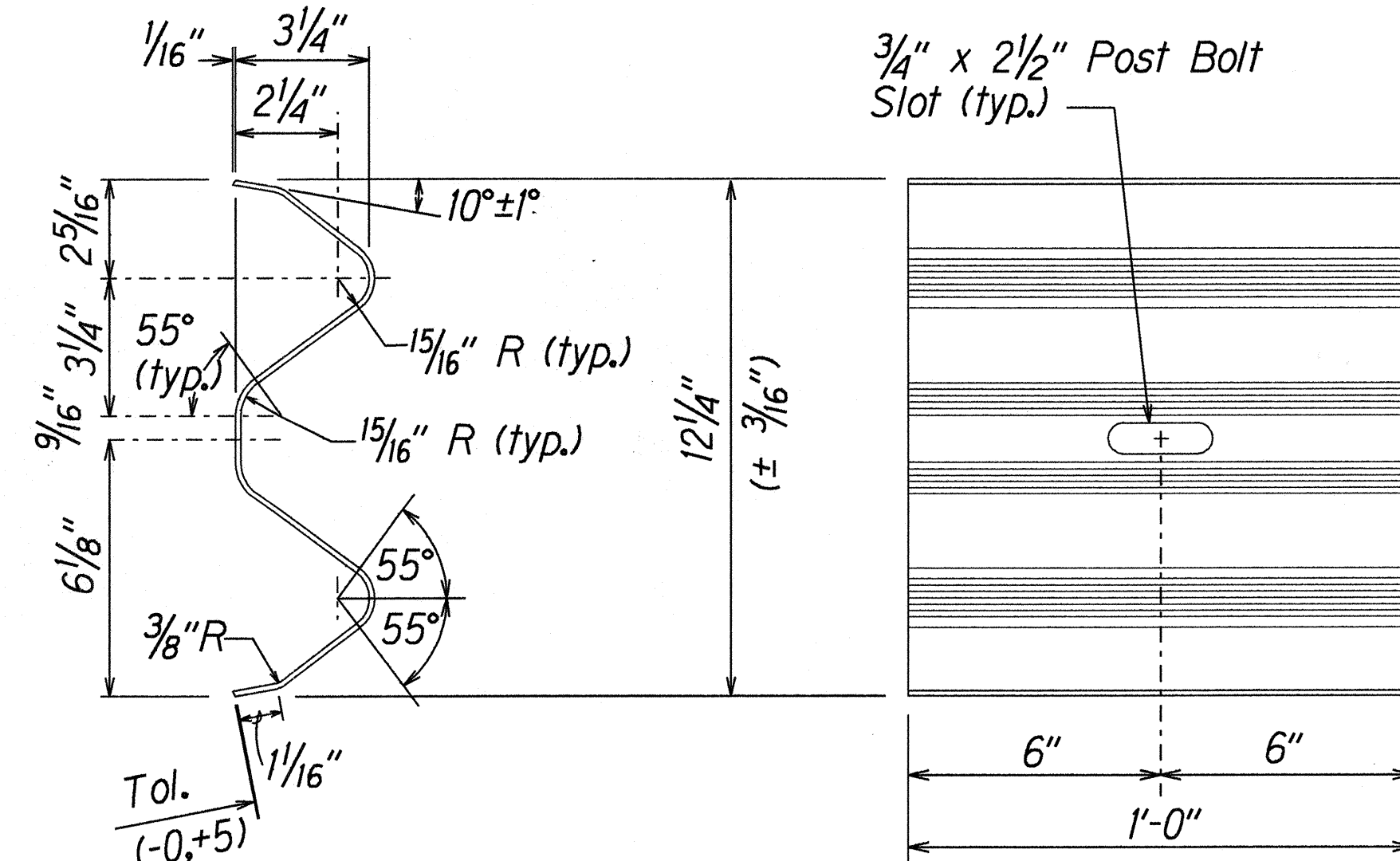
NOTE:  
All Holes are  
3/4" Dia.



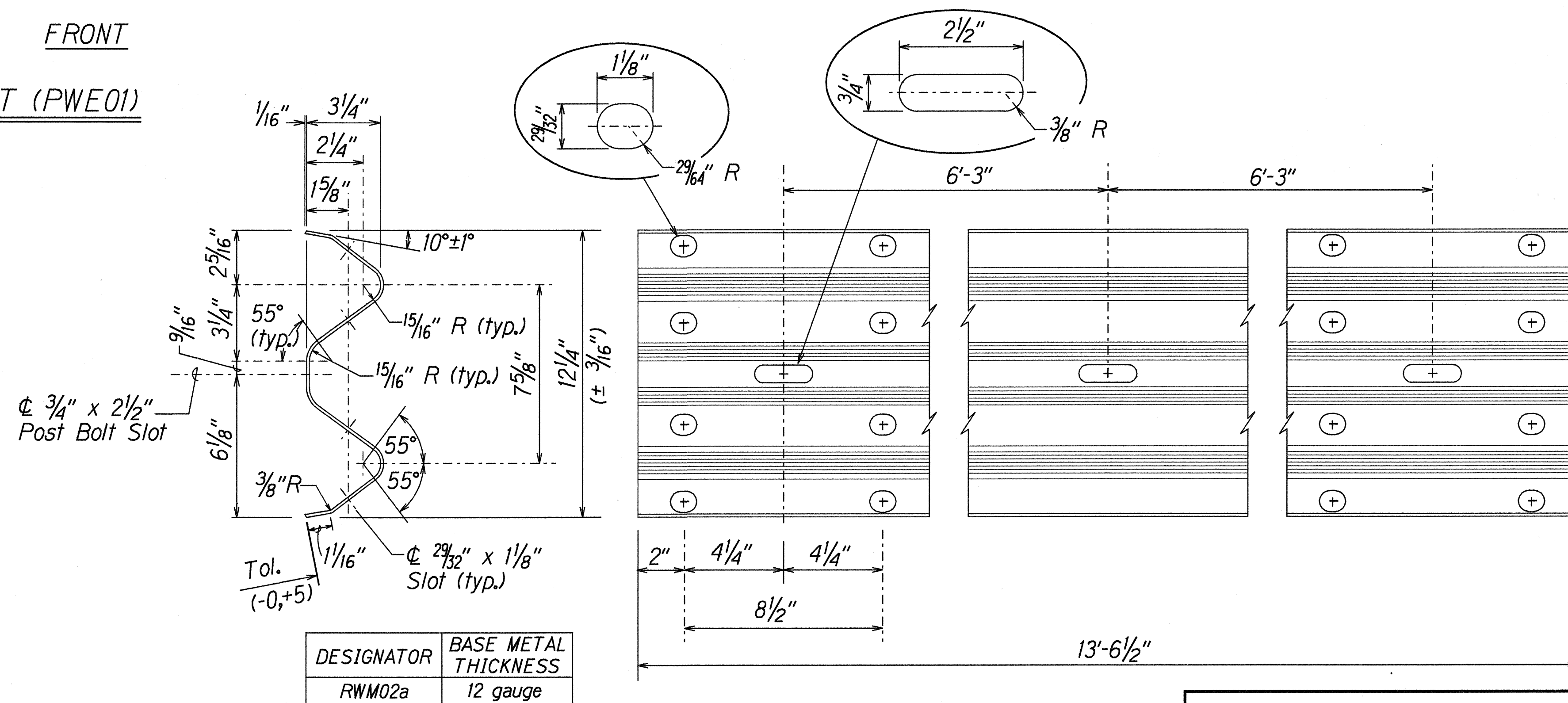
**W-BEAM STRONG POST (PWE01)**



**GUARDRAIL BOLTS AND**  
**RECESSED NUT**



**W-BEAM BACK-UP-PLATE (RWB01a)**



**2 SPACE W-BEAM GUARDRAIL (RWM02a)**

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**STRONG POST W-BEAM GUARDRAIL**  
HANA HIGHWAY, Dairy Road to Vicinity of Paia Town &  
PIILANI HIGHWAY, Mokulele Hwy. to Wailea Ike Drive  
GUARDRAIL AND SHOULDER IMPROVEMENTS  
Federal-Aid Project No. STP-0900(58)  
Scale: NTS Date: Oct., 1999

SHEET No. 1 OF 1 SHEETS

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	
No.	

73/01/99 1d/ruby guardrail/wbeamspdgn (standard plan TE-50 103/06/97)