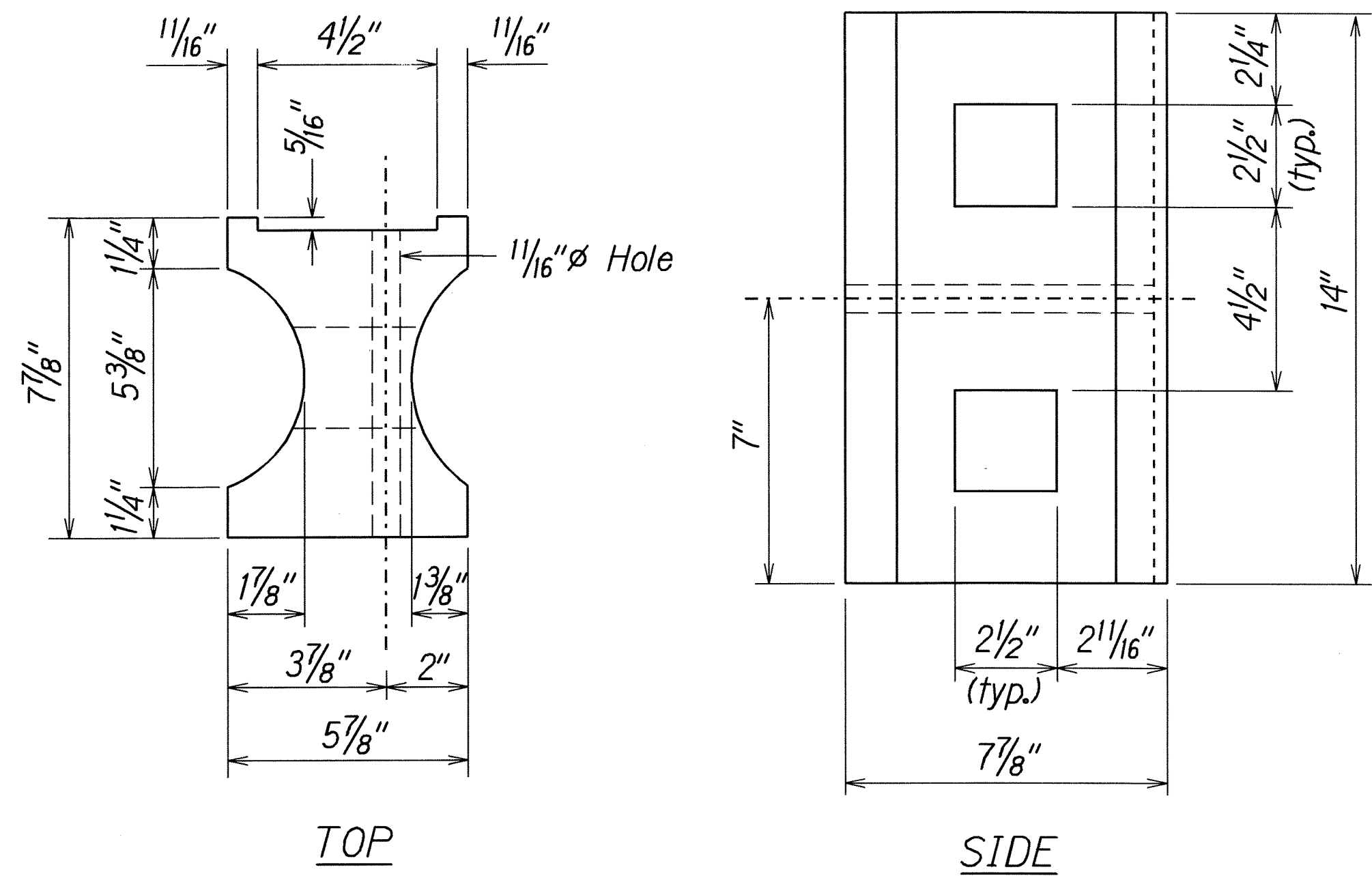
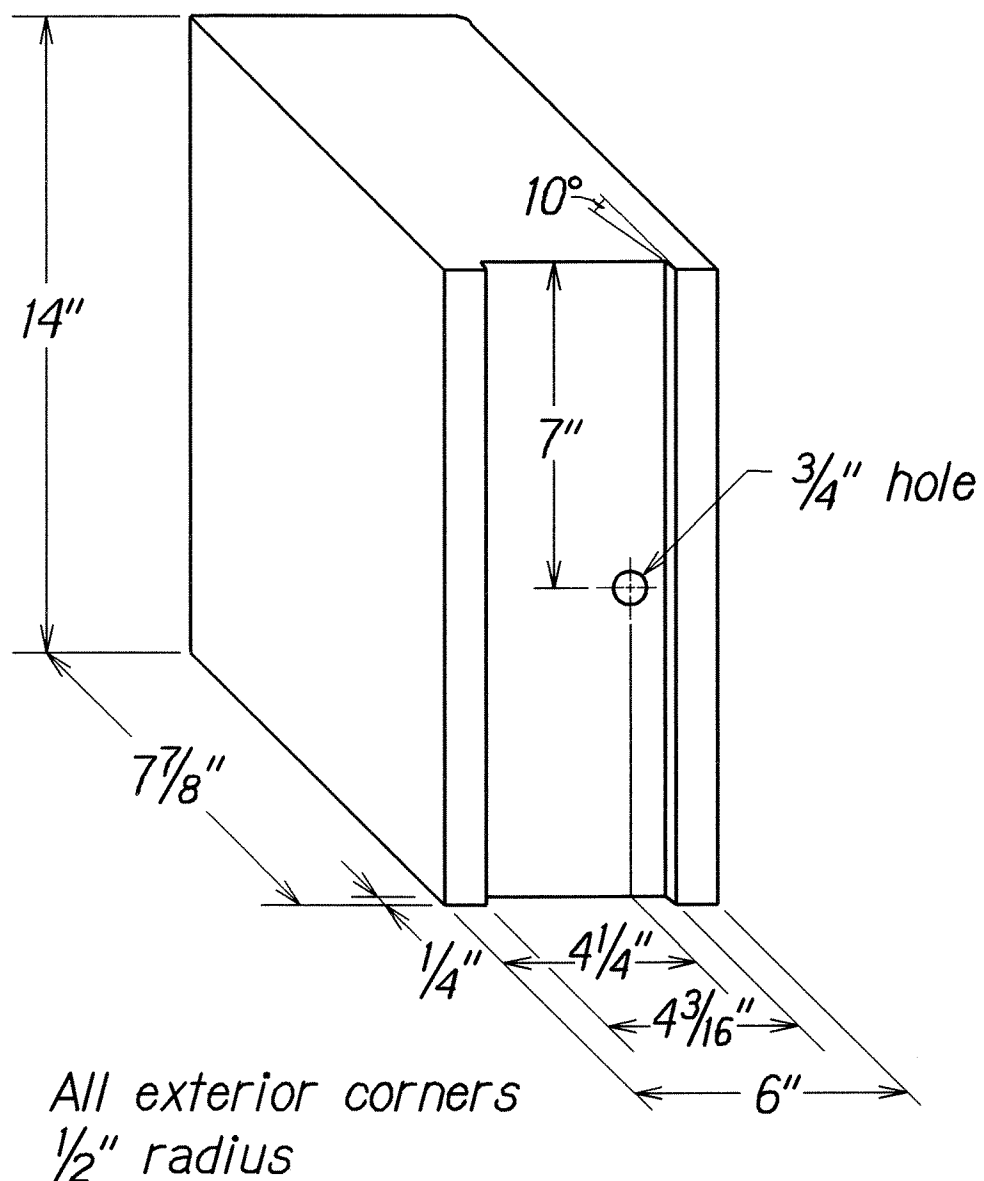


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ARR-056-1(52)	2009	10	21

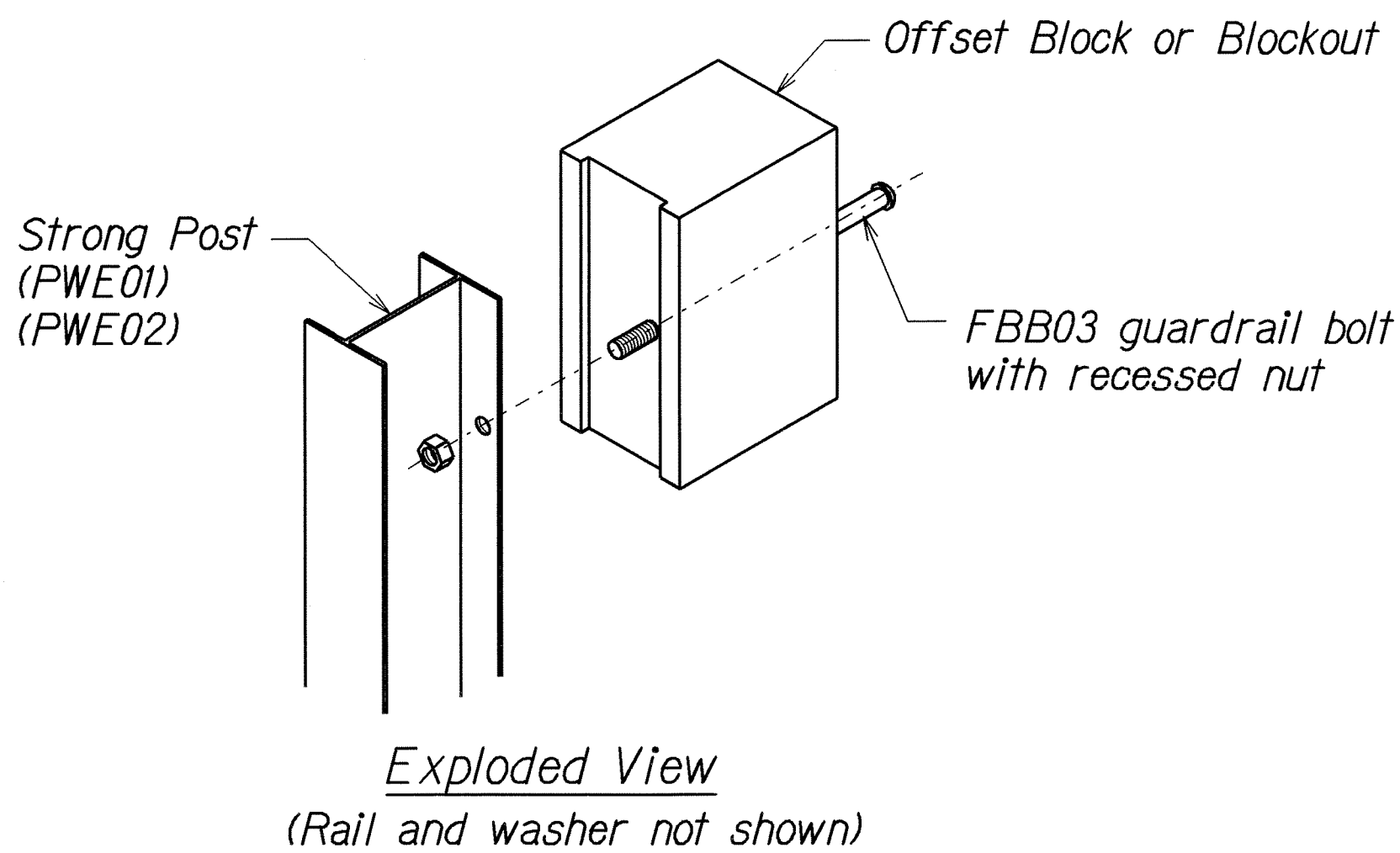


TOP  
SIDE  
RECYCLED PLASTIC BLOCKOUT (TYPE I)

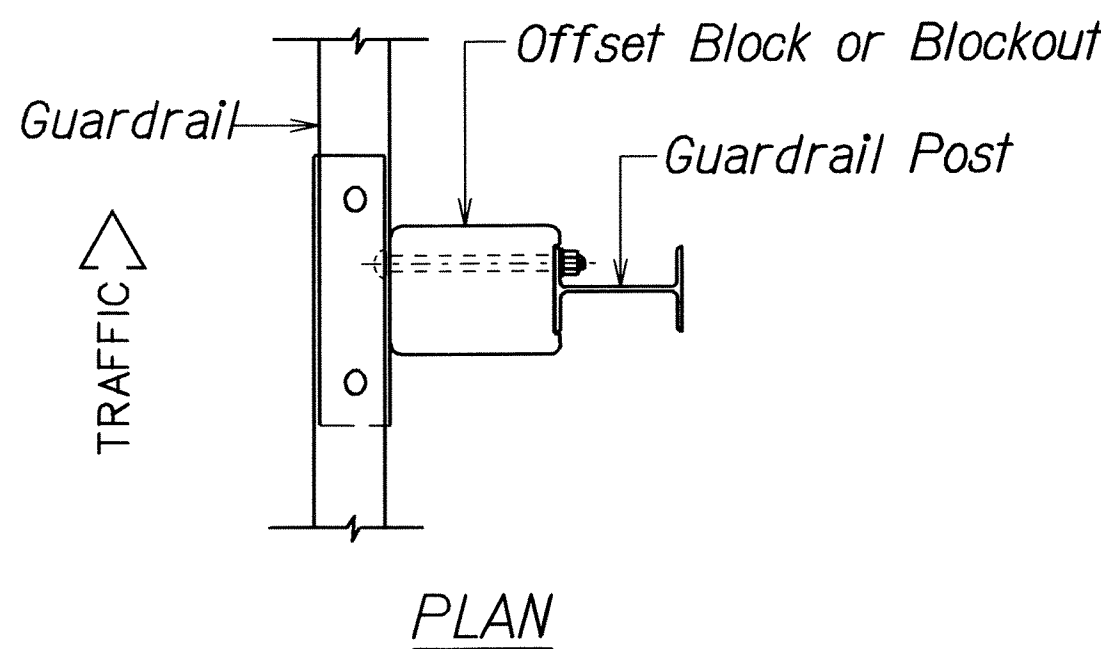


All exterior corners  
1/2" radius  
RECYCLED POLYETHYLENE  
OFFSET BLOCK (TYPE II)

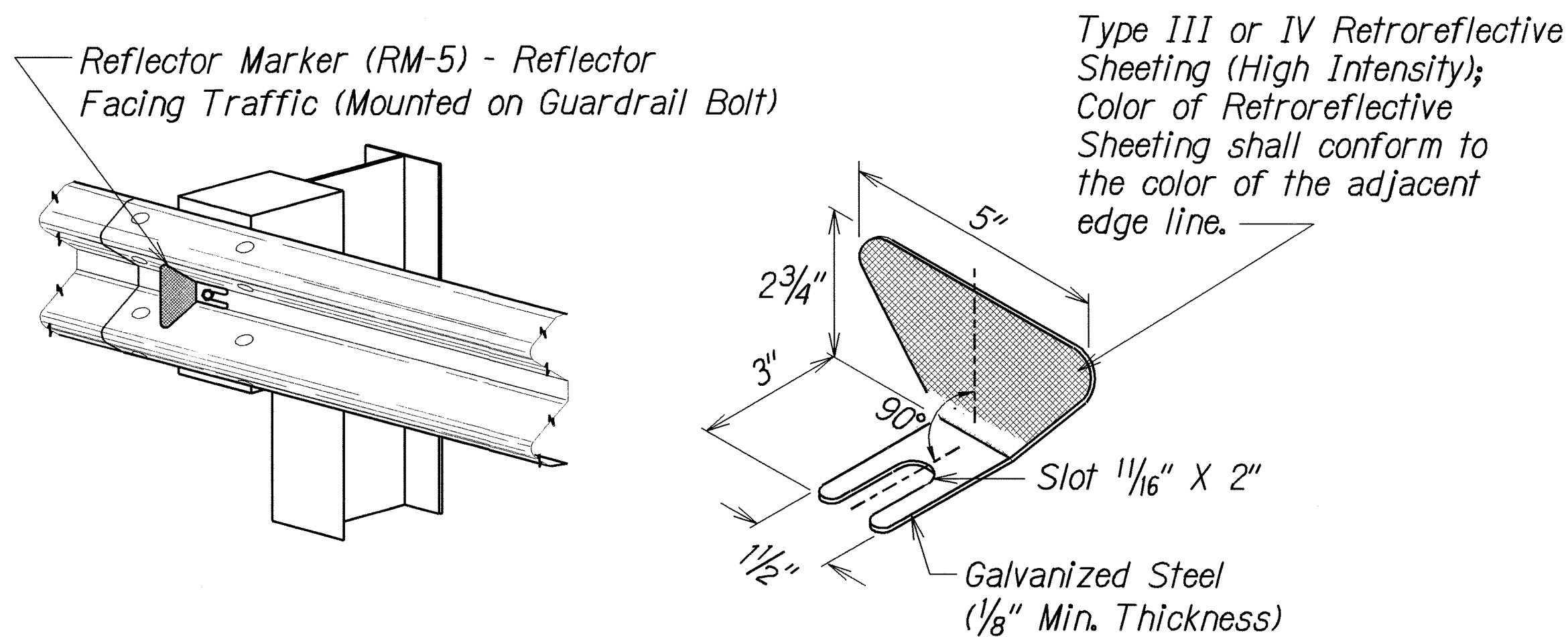
- GENERAL NOTES
1. All hardware, posts and fasteners shall be hot-dip zinc coated galvanized after fabrication. No punching, drilling or cutting will be permitted after galvanizing.
  2. Where conditions require, special post lengths in increments of 6 inches may be specified.
  3. All fasteners, posts, 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 fastners, posts and rail elements have been converted from metric units into their present form.
  4. The Recycled Plastic Block or Offset Block shall be approved by the State.
  5. Reflector Markers (RM-5) mounted on guardrails shall be spaced every 25 feet. RM-5's shall not be installed on Terminal Sections. Furnishing and installing of each RM-5 shall be considered incidental to the adjacent guardrail system.



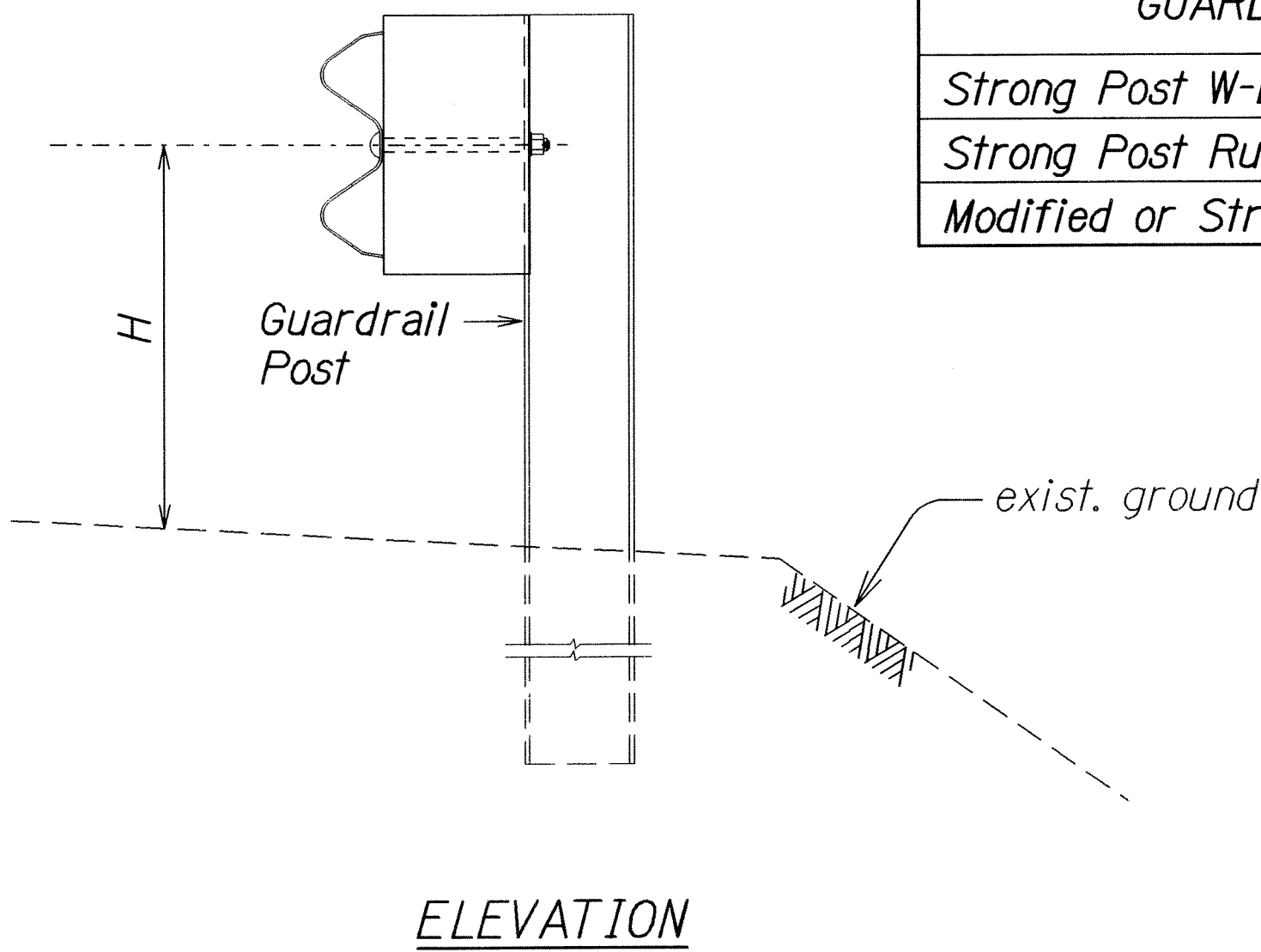
Exploded View  
(Rail and washer not shown)  
STEEL POST AND BLOCK DETAIL



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"



REFLECTOR MARKER (RM-5) DETAIL AND TYPICAL INSTALLATION



ELEVATION  
TYPICAL GUARDRAIL INSTALLATION

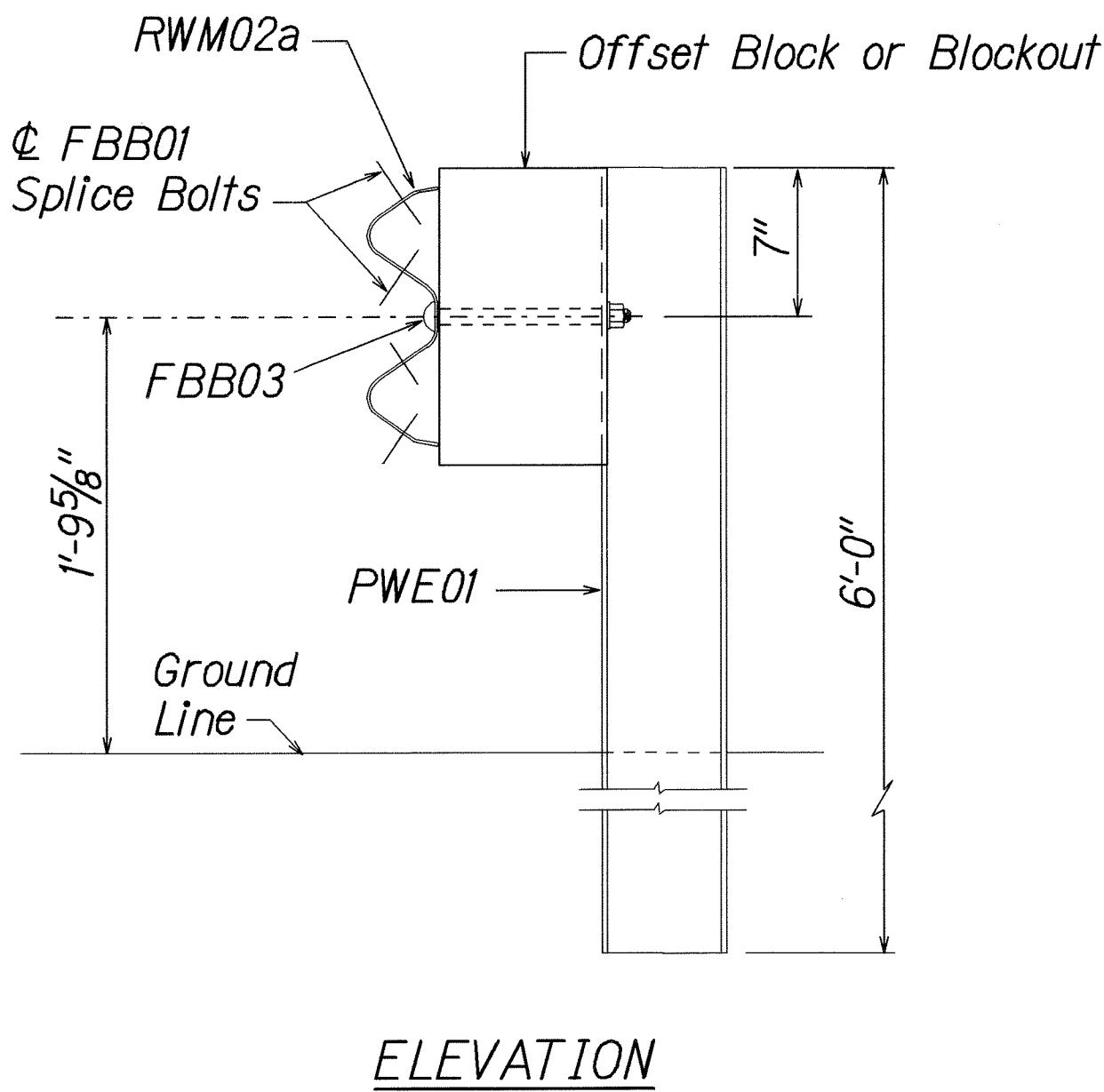
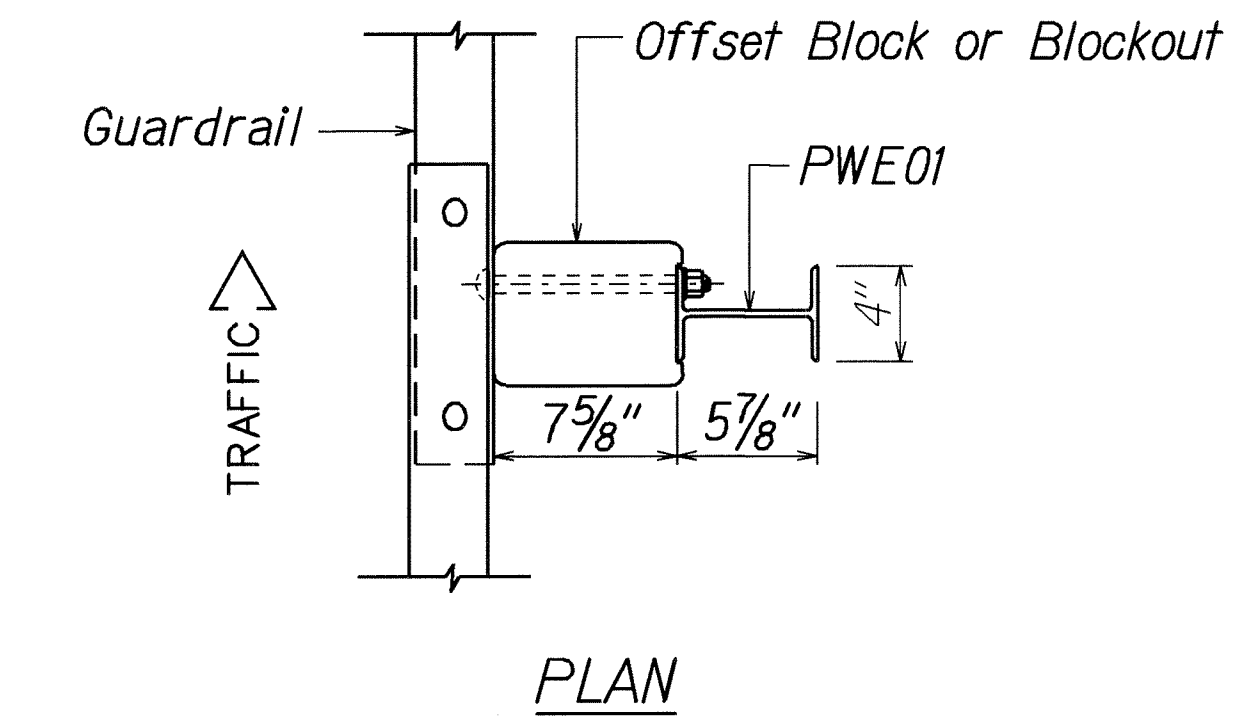
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**GUARDRAIL DETAILS & NOTES**  
  
KUHIO HIGHWAY RESURFACING  
Kawaihau Road to Kapaa Bridge  
Federal-Aid Project No. ARR-056-1(52)  
  
Scale: Not to Scale      Date: March 2009

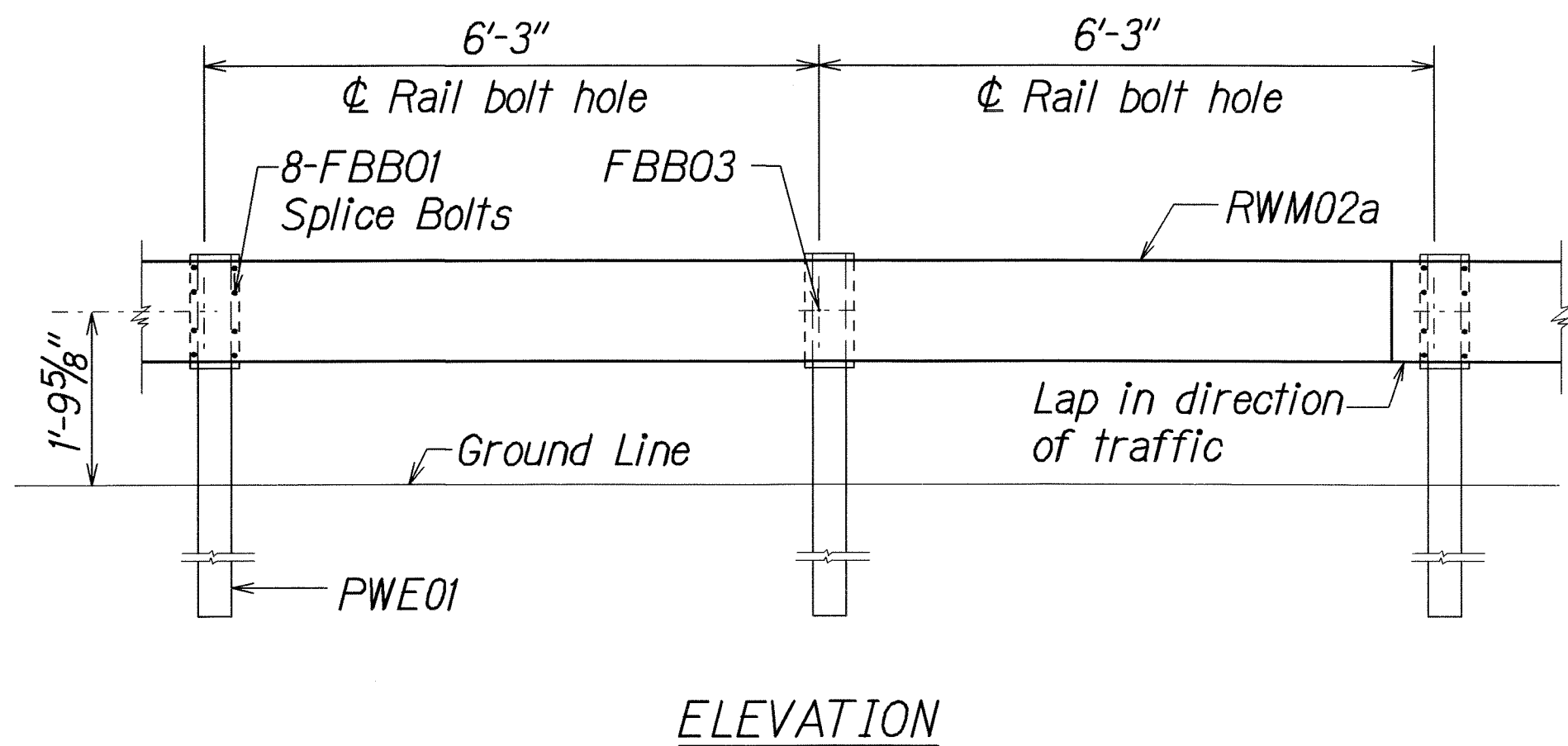
SHEET No. 1 OF 3 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
DESIGNED BY	CHECKED BY	
CHECKED BY		

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ARR-056-1(52)	2009	11	21

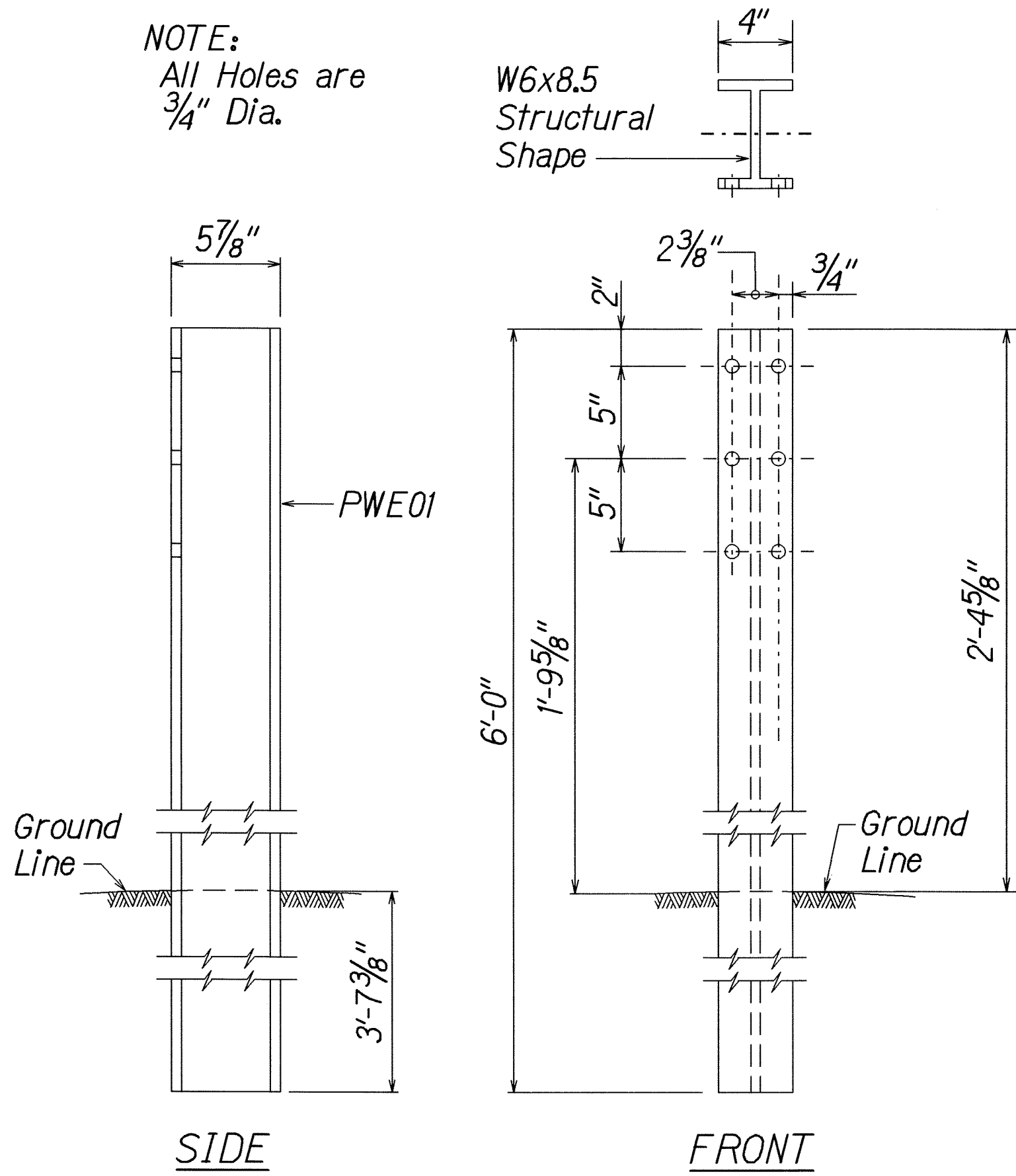


**STRONG POST W-BEAM GUARDRAIL (SGR04a)**

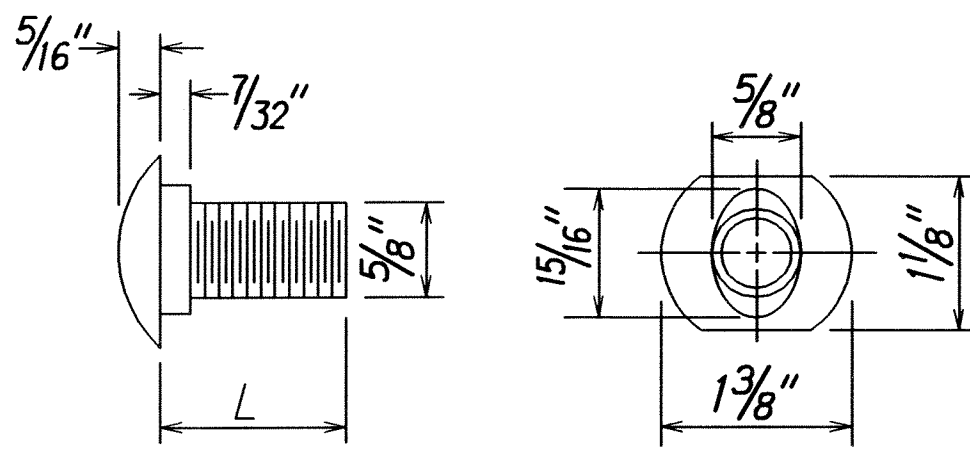


**STRONG POST W-BEAM GUARDRAIL WITH RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT**

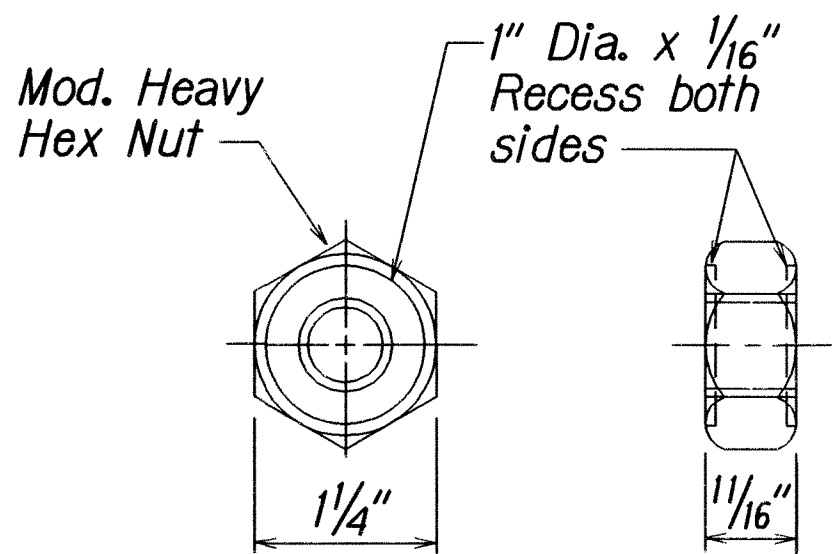
NOTE:  
All Holes are 3/4" Dia.



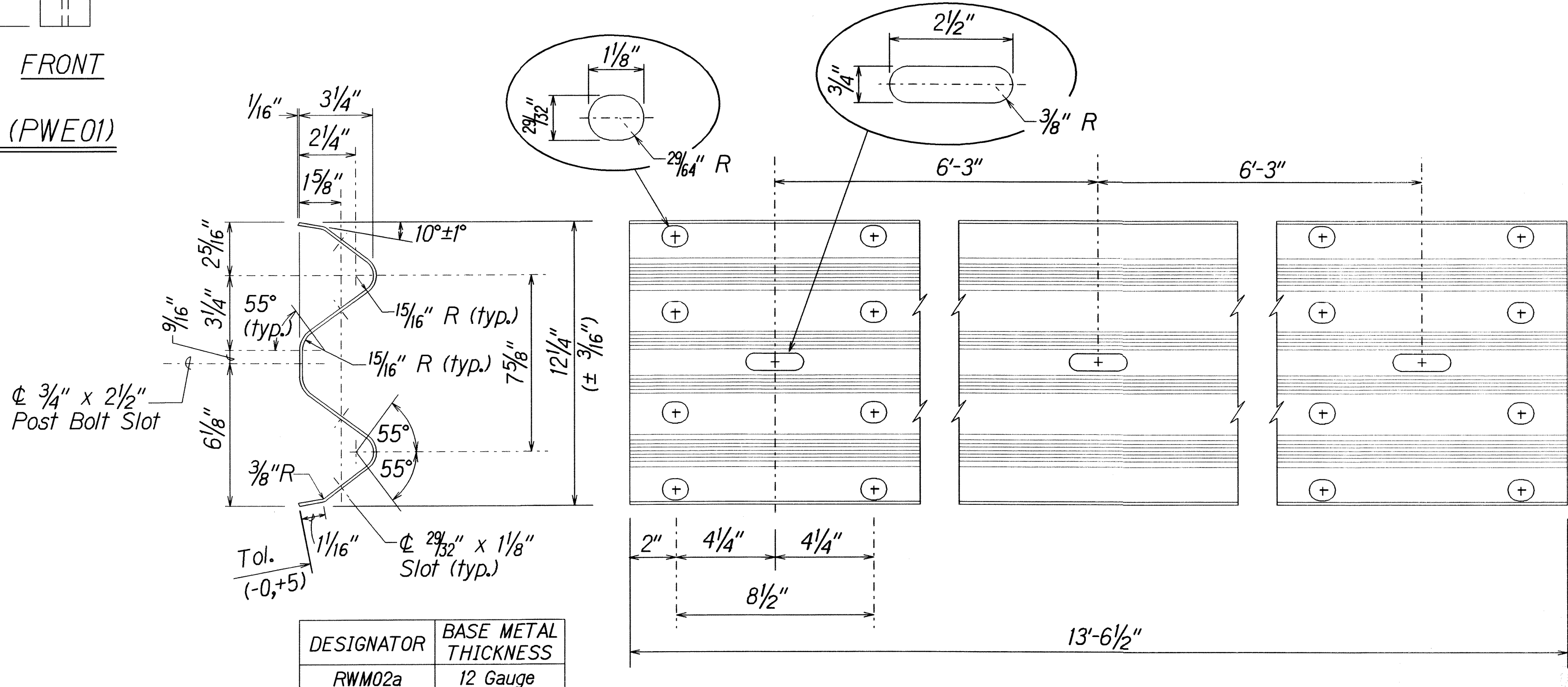
**W-BEAM STRONG POST (PWE01)**



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



**GUARDRAIL BOLTS AND RECESSED NUT**



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

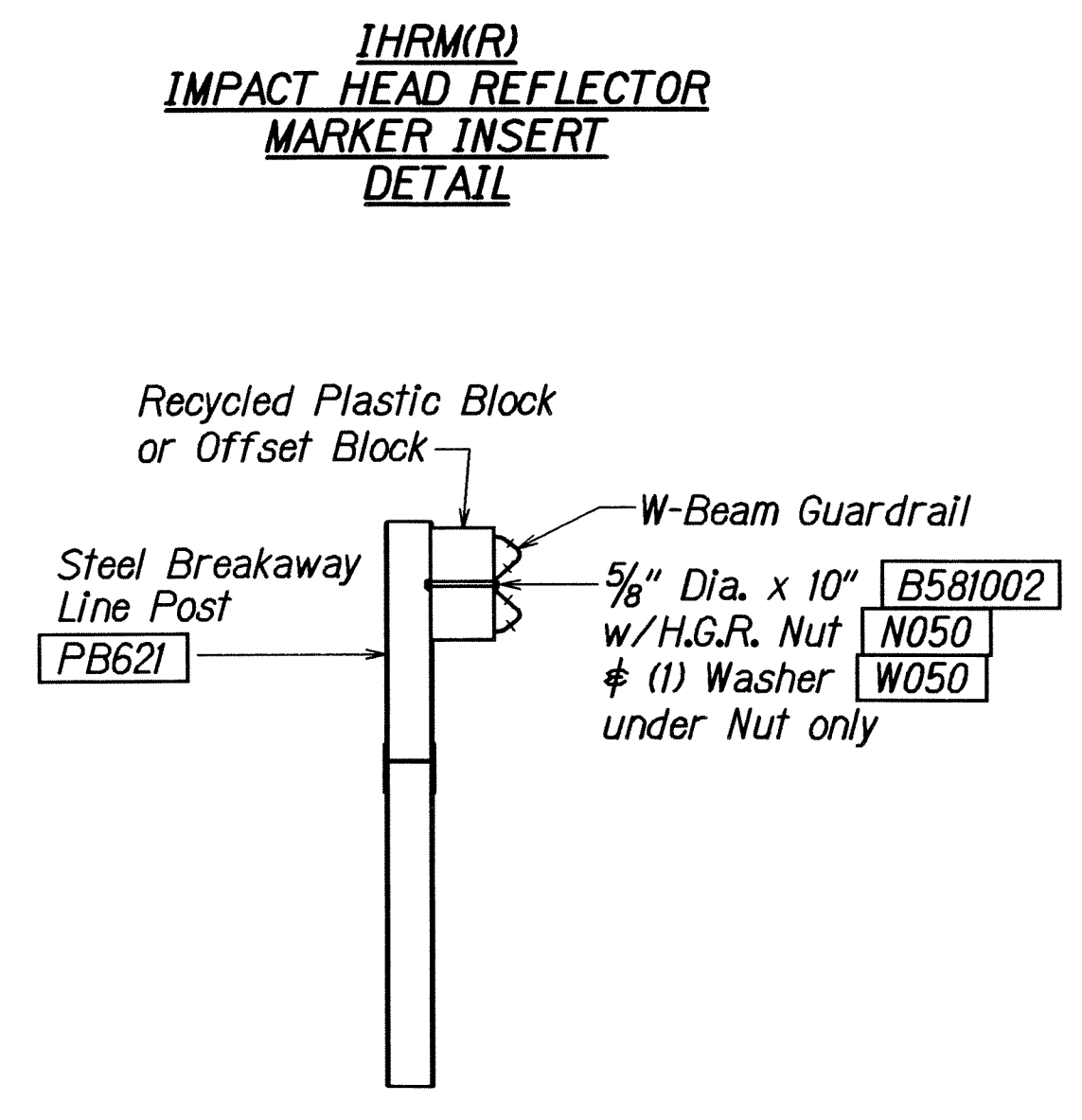
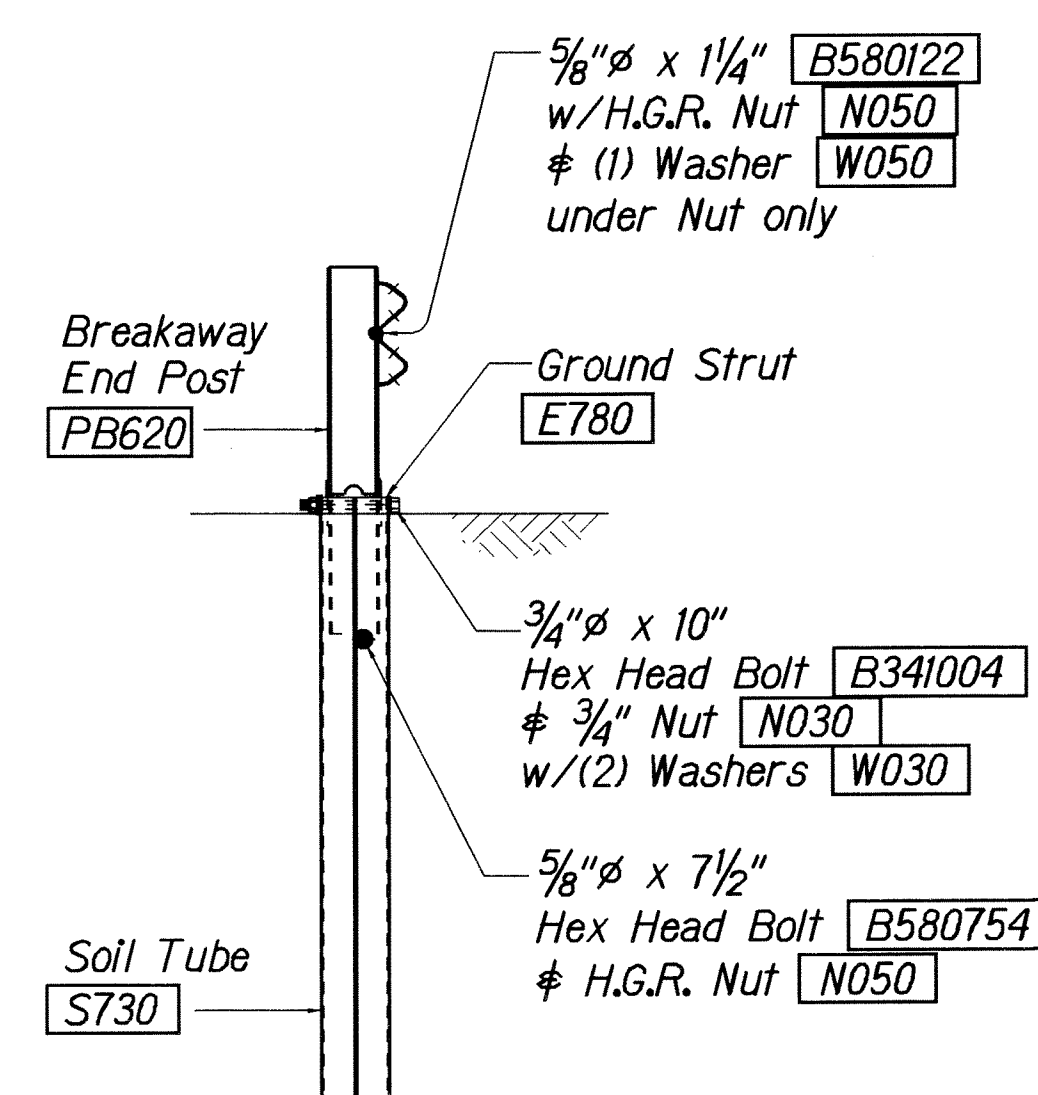
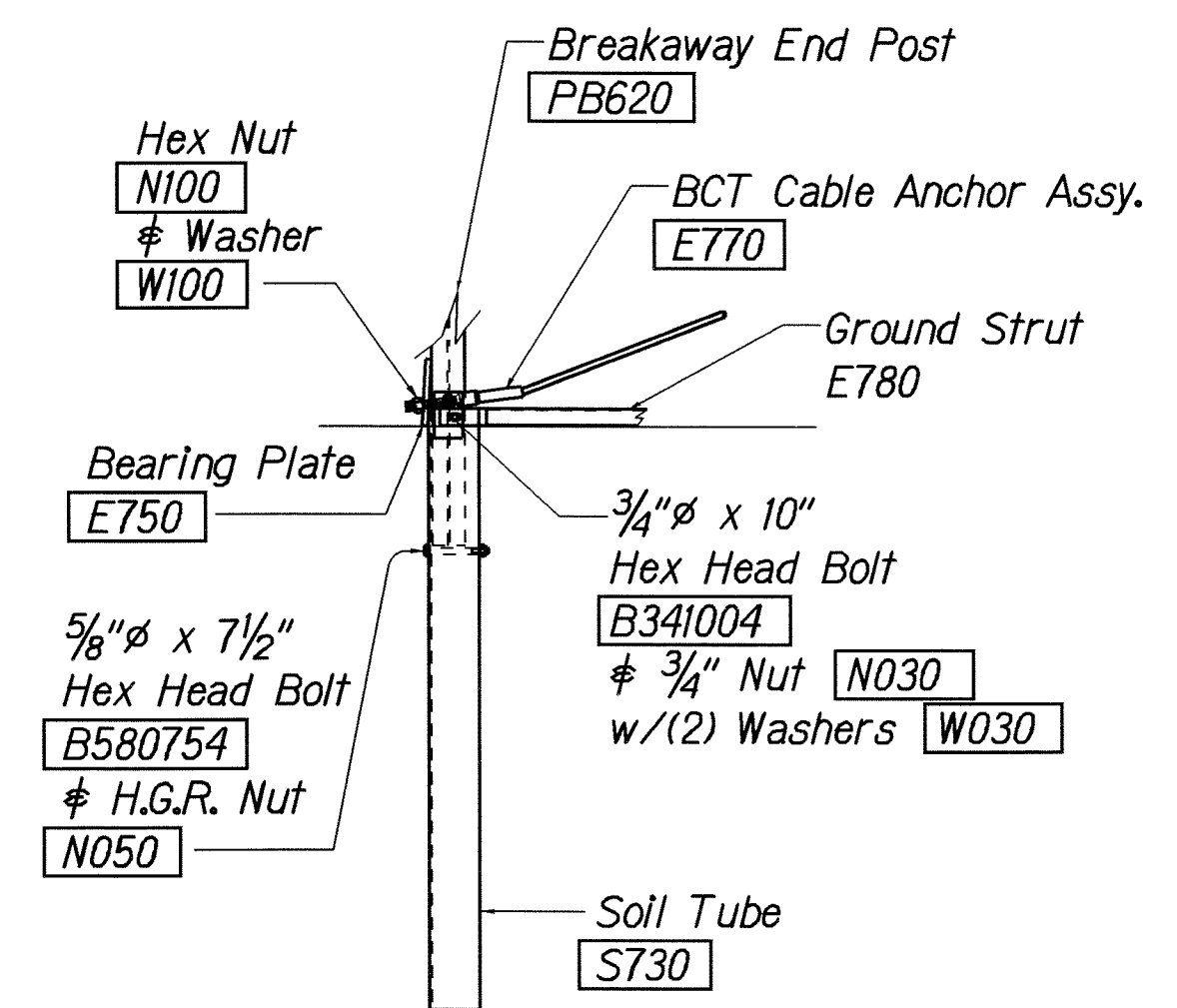
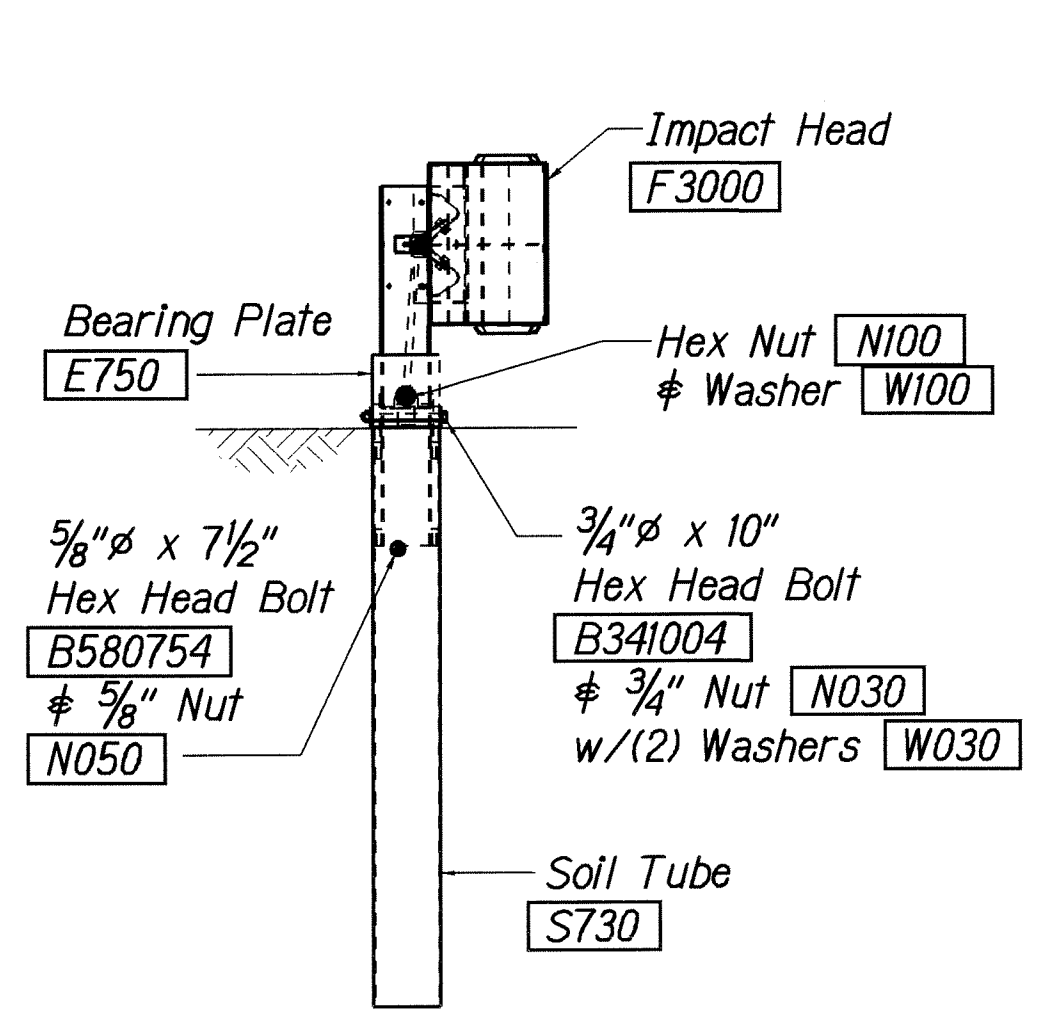
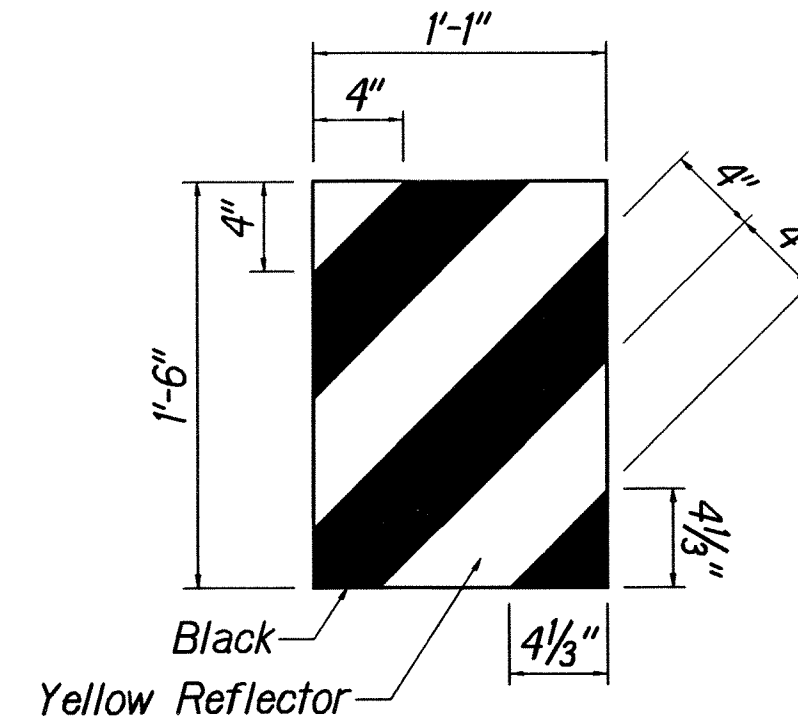
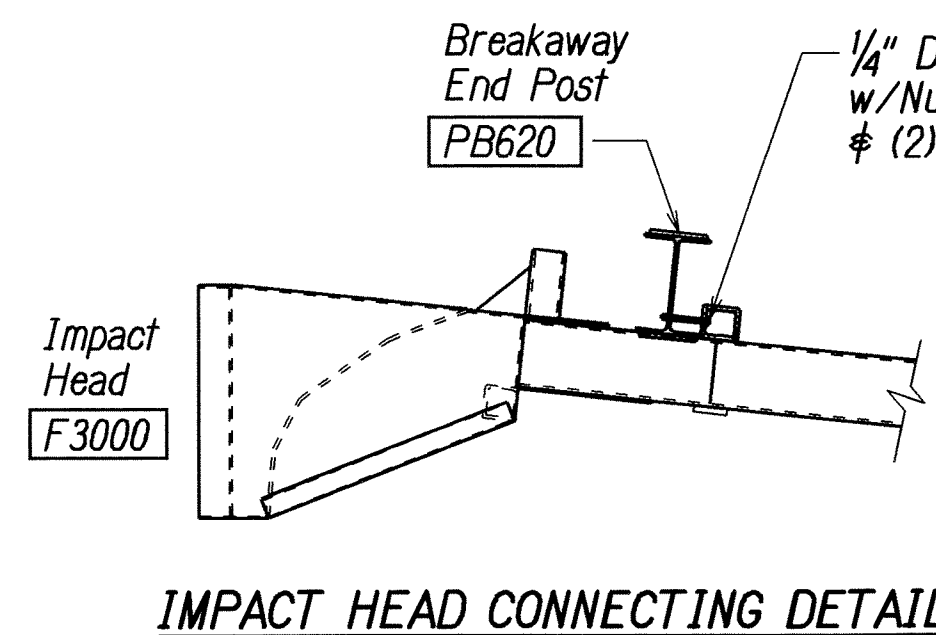
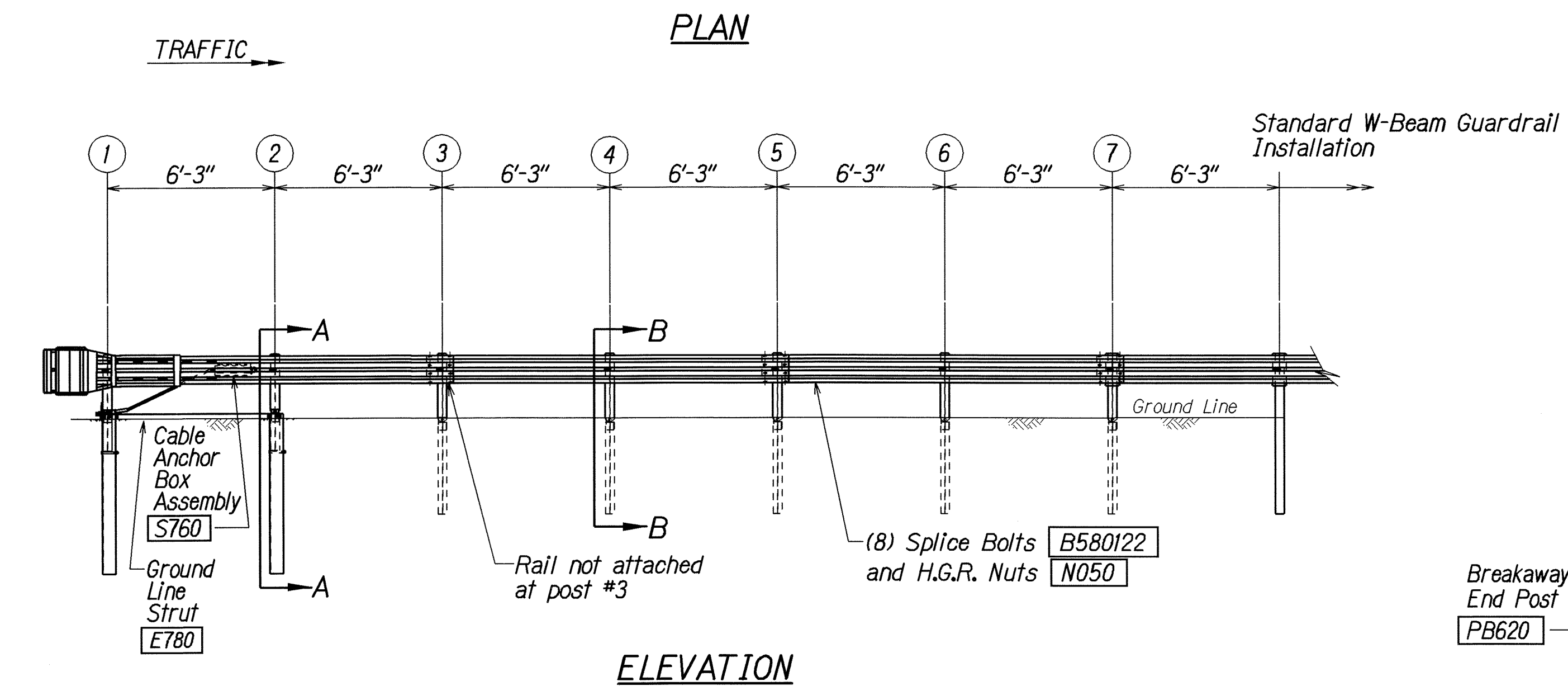
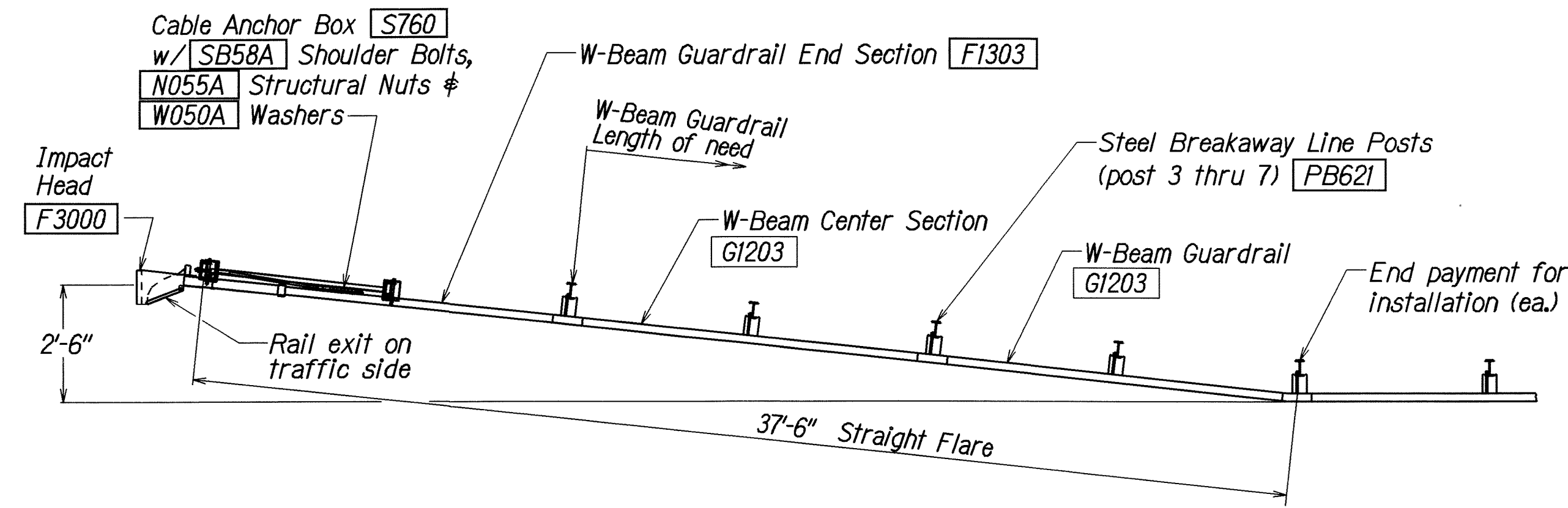
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**STRONG POST W-BEAM GUARDRAIL**  
**KUHIO HIGHWAY RESURFACING**  
**Kawaihau Road to Kapaa Bridge**  
**Federal-Aid Project No. ARR-056-1(52)**  
Scale: Not to Scale      Date: March 2009

ORIGINAL SURVEY PLOTTED BY	DATE
PLAN	
DRAWN BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ARR-056-1(52)	2009	12	21



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

- GENERAL NOTES**
- Breakaway steel posts are required with the FLEAT Terminal.
  - All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
  - 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.
  - The soil tubes may be driven with an approved driving head. Soil tubes shall 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.
  - 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.
  - 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.
  - (R) or (L) indicates right or left Impact Head Reflector Marker (IHRM). Providing and installing of IHRM shall be considered incidental to end treatment.
  - The stripes for IHRM shall slope downward at an angle of 45° towards the side of the end treatment that traffic is to pass.

ITEM NO.	QTY.	BILL OF MATERIALS
F3000	1	IMPACT HEAD
F1303	1	W-BEAM GUARDRAIL END SECTION, 12 GA.
G1203	2	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
	1	IMPACT HEAD REFLECTOR MARKER - IHRM(R) OR (L)
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 & 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

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**FLEAT-350**  
**FLARED ENERGY ABSORBING TERMINAL**

KUHIO HIGHWAY RESURFACING  
Kawaihau Road to Kapaa Bridge  
Federal-Aid Project No. ARR-056-1(52)

Scale: Not to Scale Date: March 2009

SHEET No. 3 OF 3 SHEETS