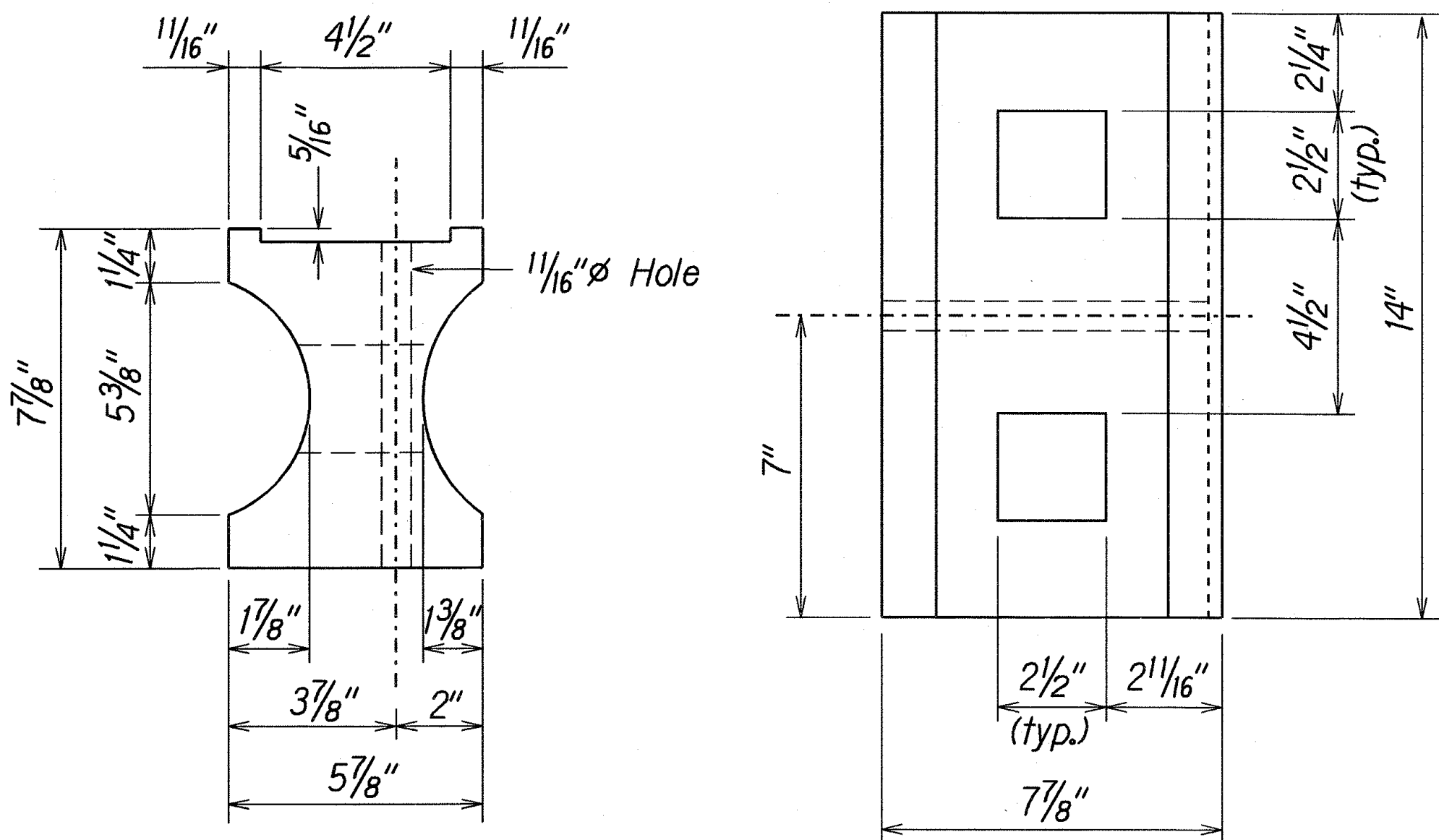


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-06	2006	8	14

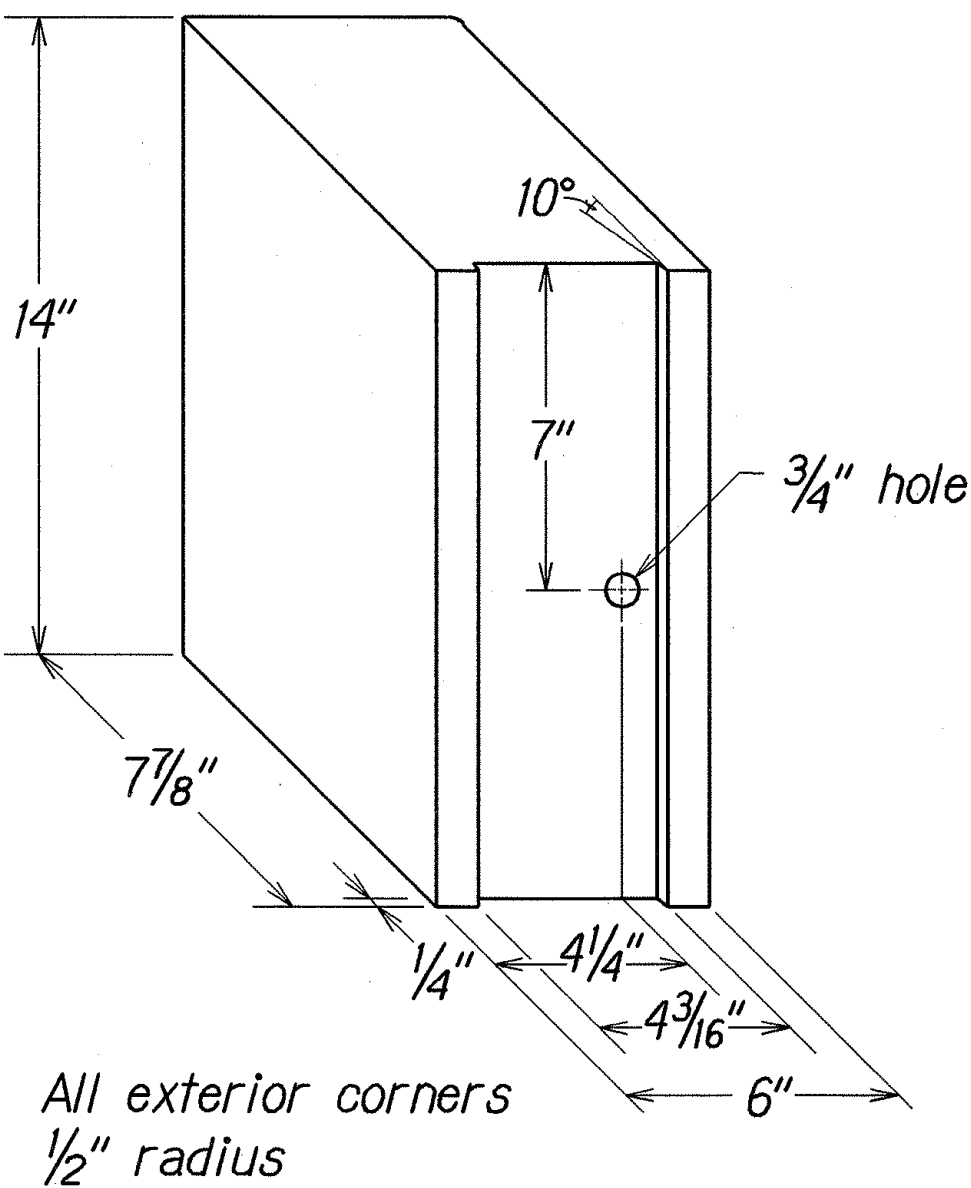
GENERAL NOTES

- 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 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.
- 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. RM-5's shall not be installed on Terminal Sections. Furnishing and installing of each RM-5 shall be considered incidental to the guardrail contract items.

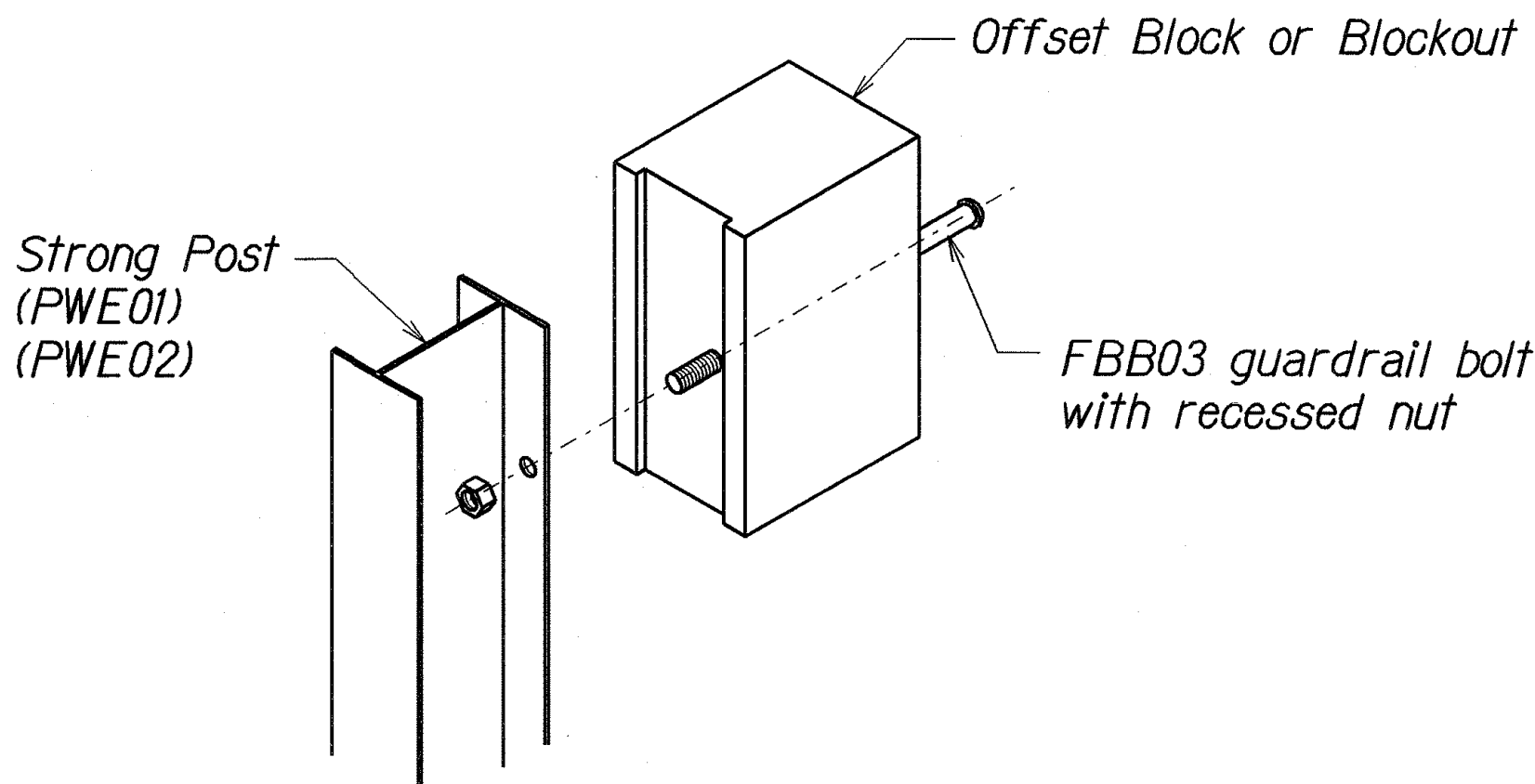
GUARDRAIL TYPE	DIMENSION	
	H	A
Strong Post W-Beam	1'-9 ⁵ / ₈ "	1'-6"
Strong Post Rubrail (W-Beam)	2'-0"	1'-6"
Modified or Strong Post Thrie Beam	2'-0"	2'-0"



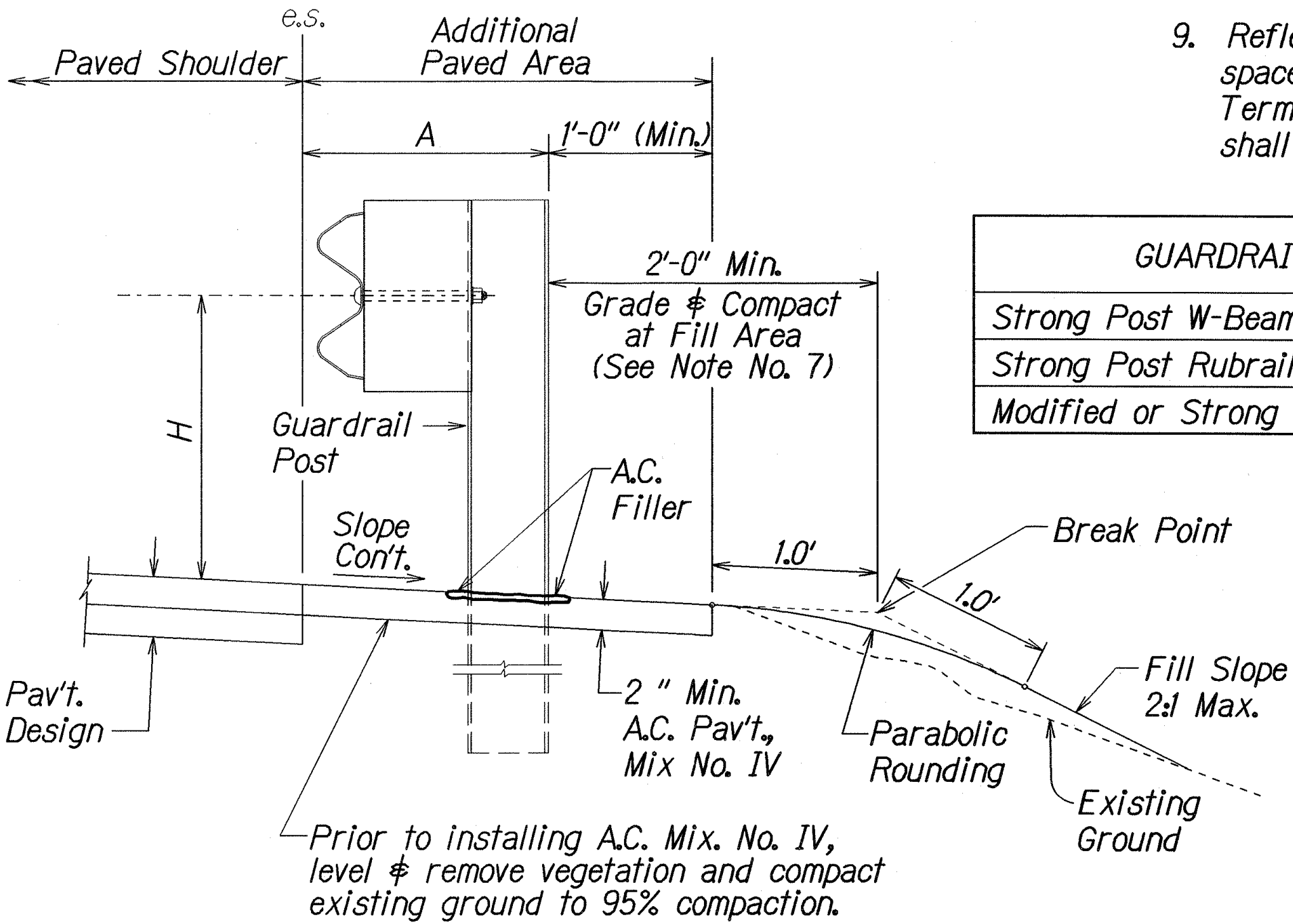
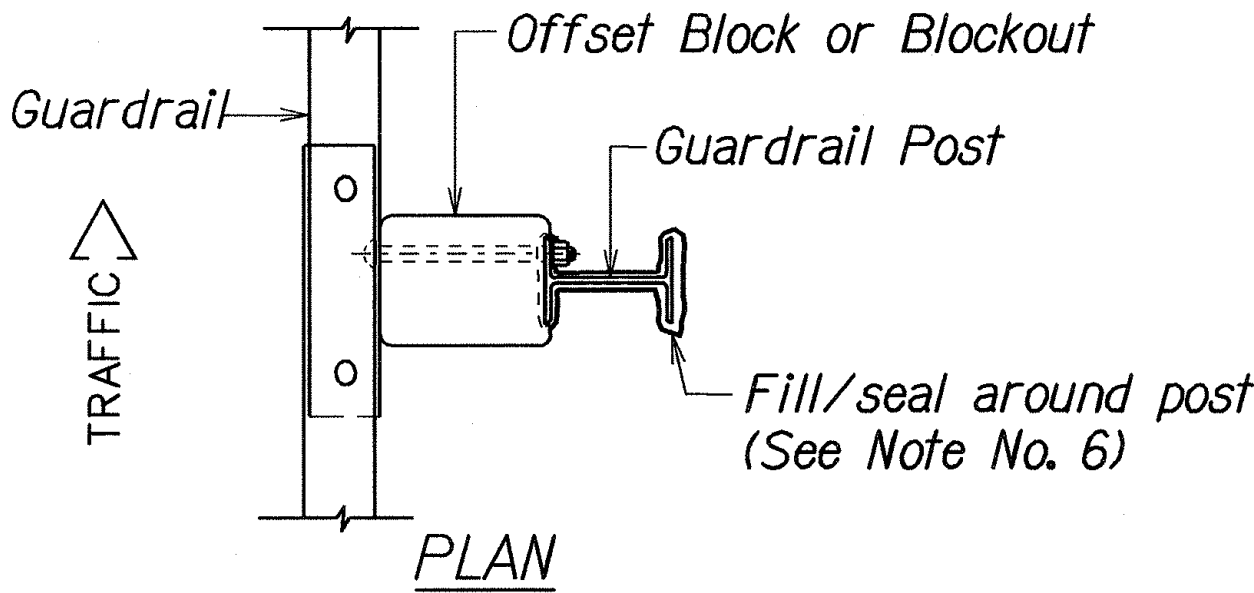
TOP
RECYCLED PLASTIC BLOCKOUT (TYPE I)



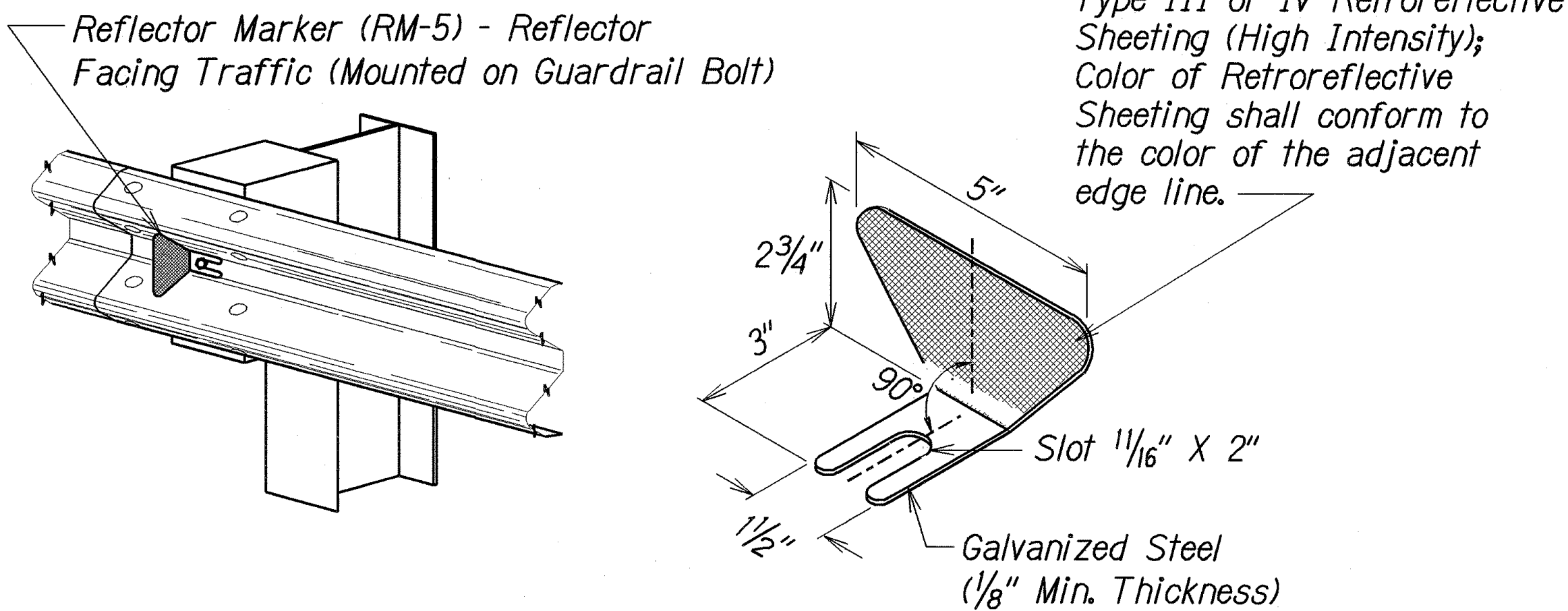
RECYCLED POLYETHYLENE
OFFSET BLOCK (TYPE II)



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



ELEVATION
TYPICAL GUARDRAIL INSTALLATION



REFLECTOR MARKER (RM-5) DETAIL AND TYPICAL INSTALLATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

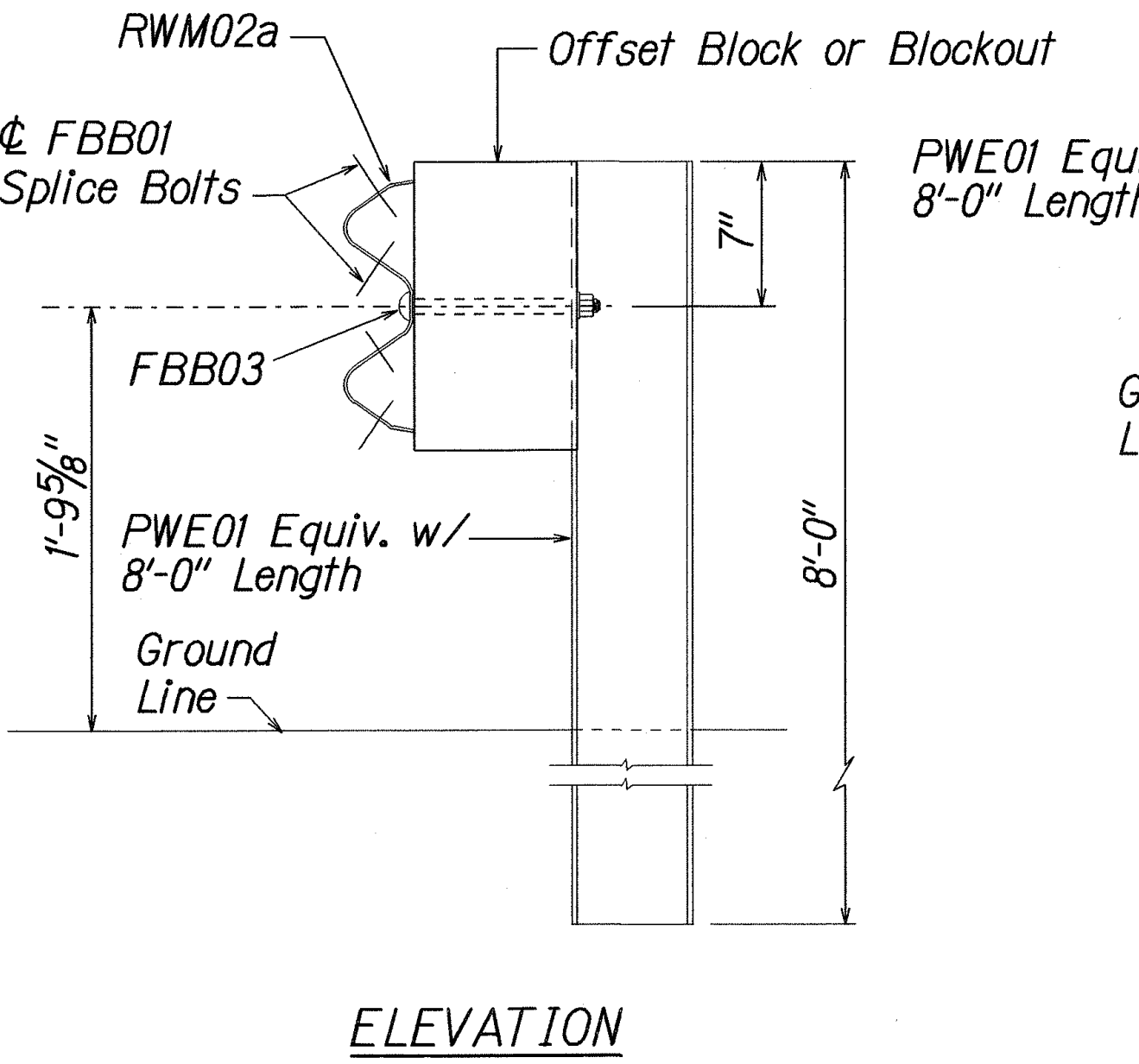
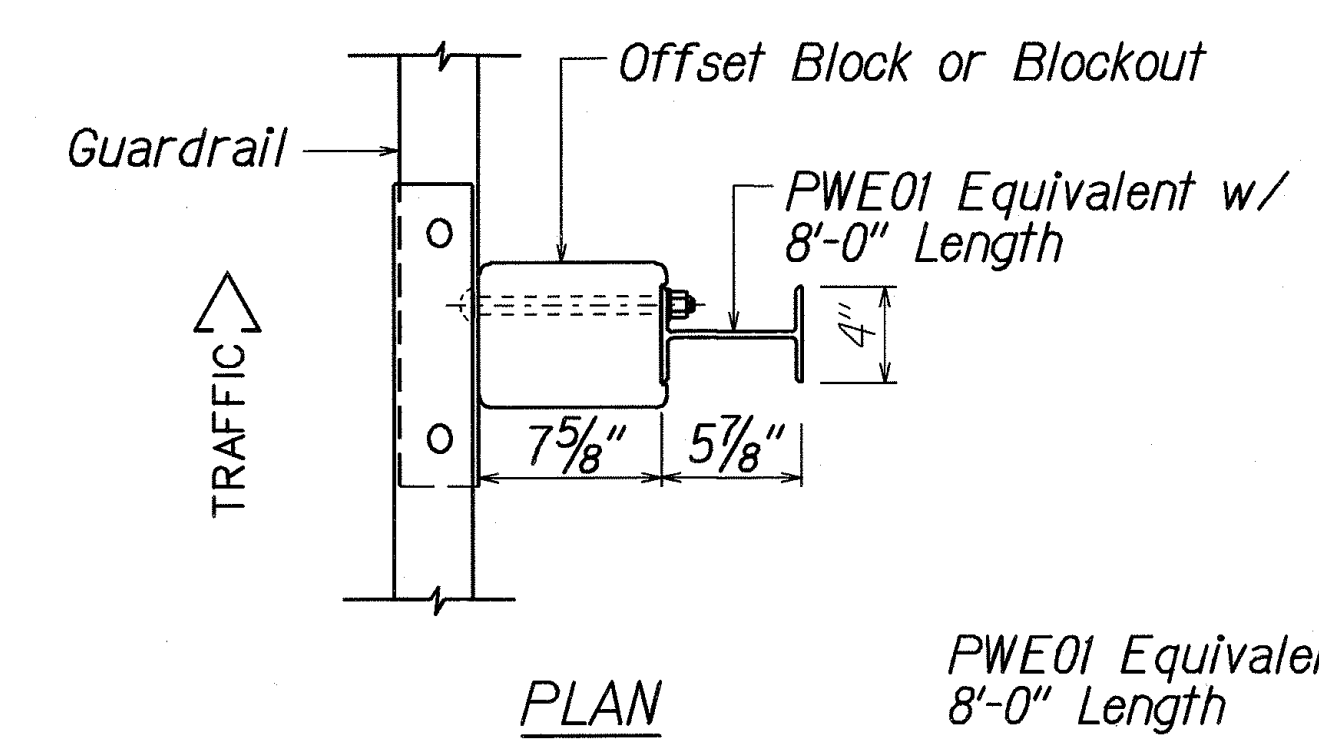
GUARDRAIL DETAILS & NOTES
KALANIANA'OLE HIGHWAY DRAINAGE IMPROVEMENTS
Vicinity of Poalima Street
Project No. 72A-01-06
Scale: NTS
Date: May, 2005

SHEET No. 1 OF 1 SHEETS

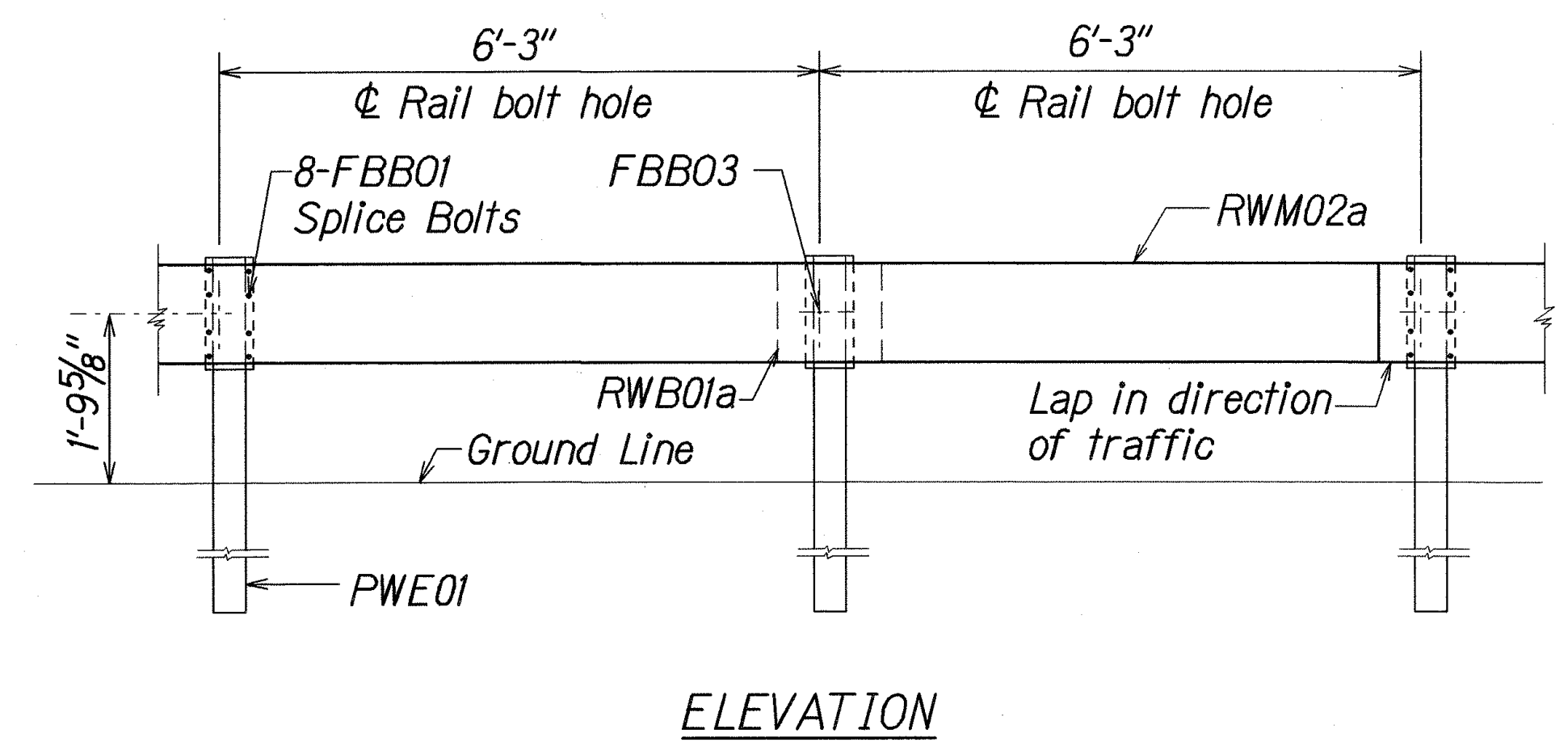
SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	
No.	

12/31/03 K:\rudy\guardrail\reflnew.dgn Standard plan TE-50 03-01-00

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-06	2006	9	14

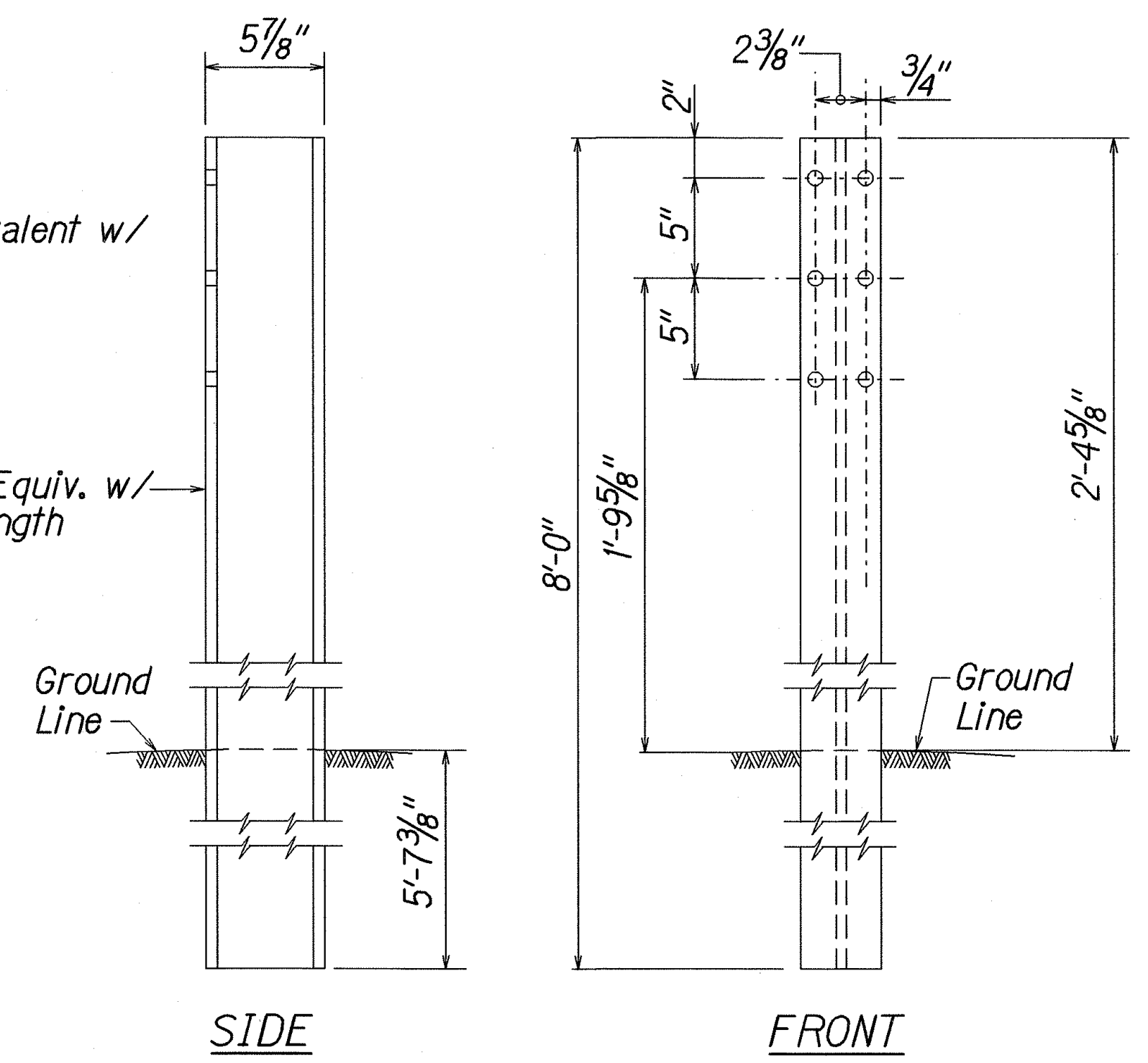


STRONG POST W-BEAM GUARDRAIL (SGR04a)

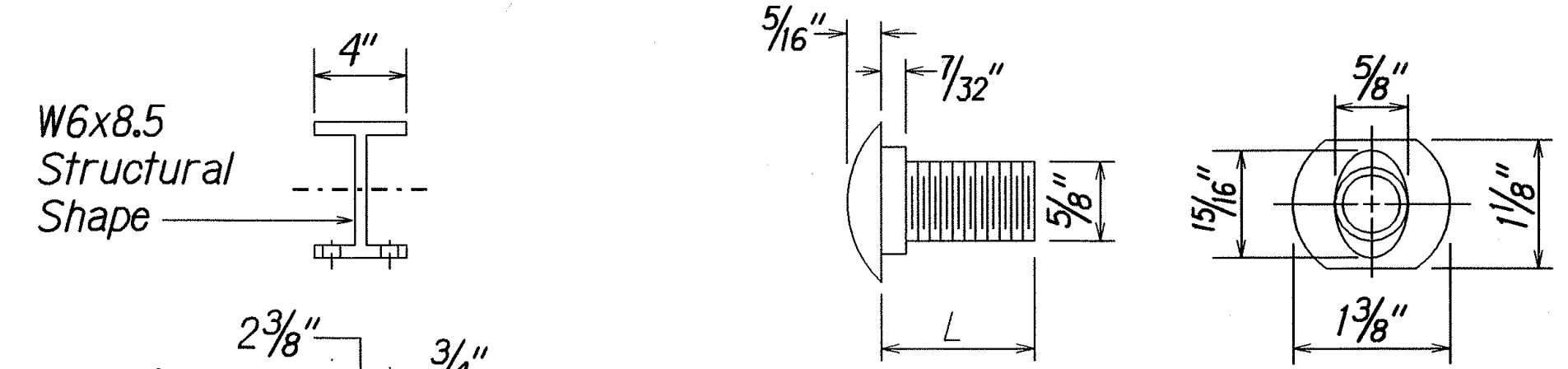


STRONG POST W-BEAM GUARDRAIL WITH RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT

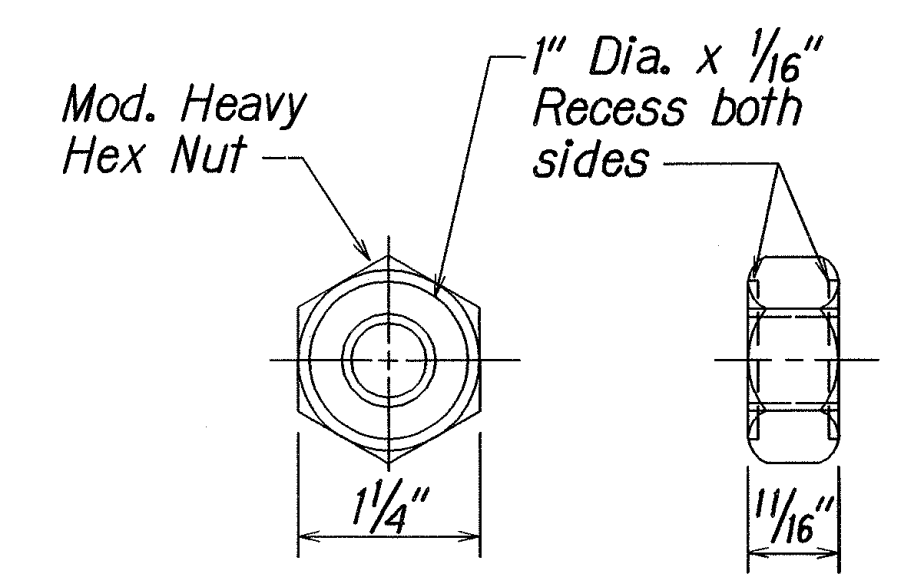
NOTE:
All Holes are 3/4" Dia.



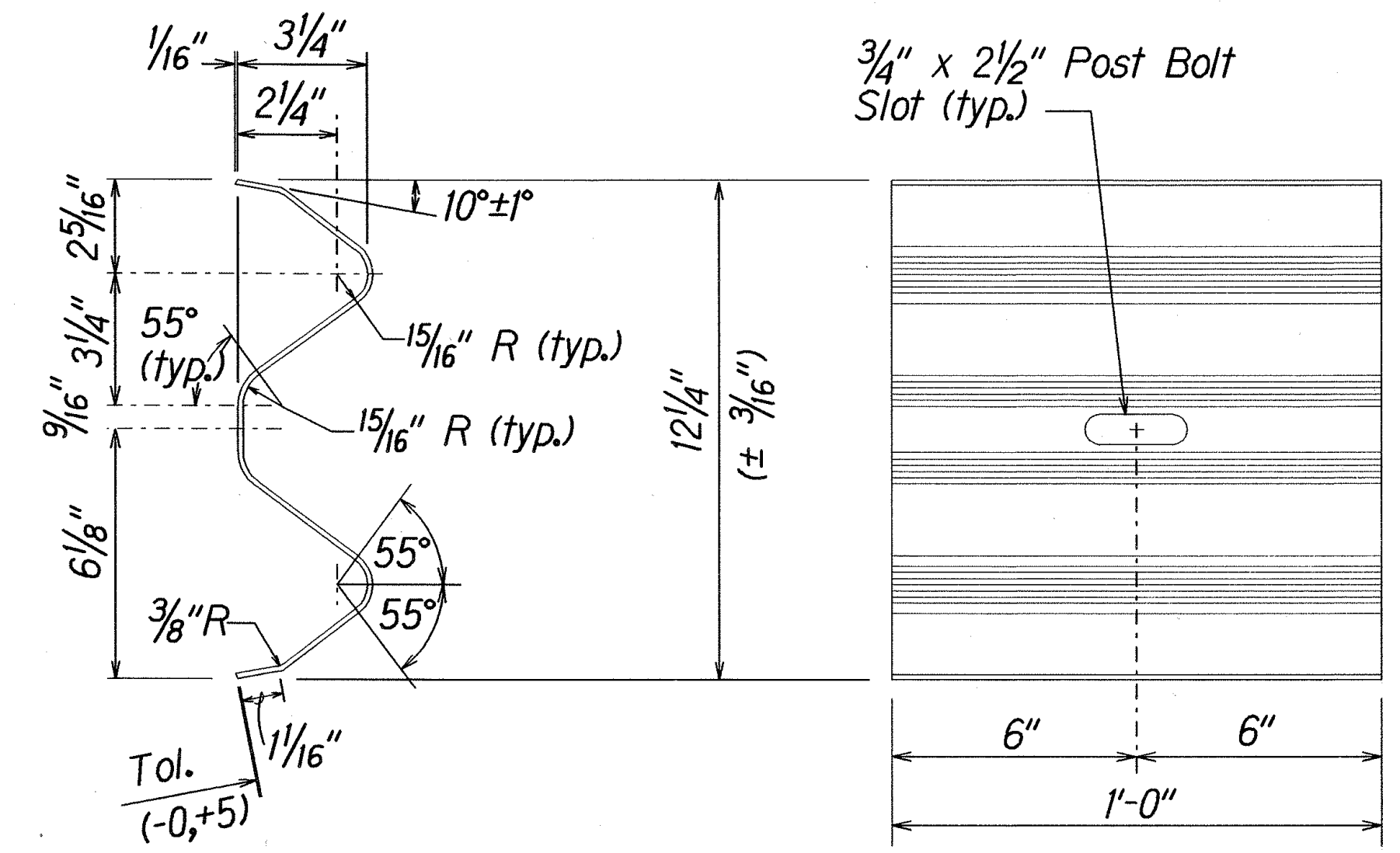
W-BEAM STRONG POST (PWE01)



DESIGNATOR	L
FBB01	13 3/8"
FBB02	2"
FBB03	10"

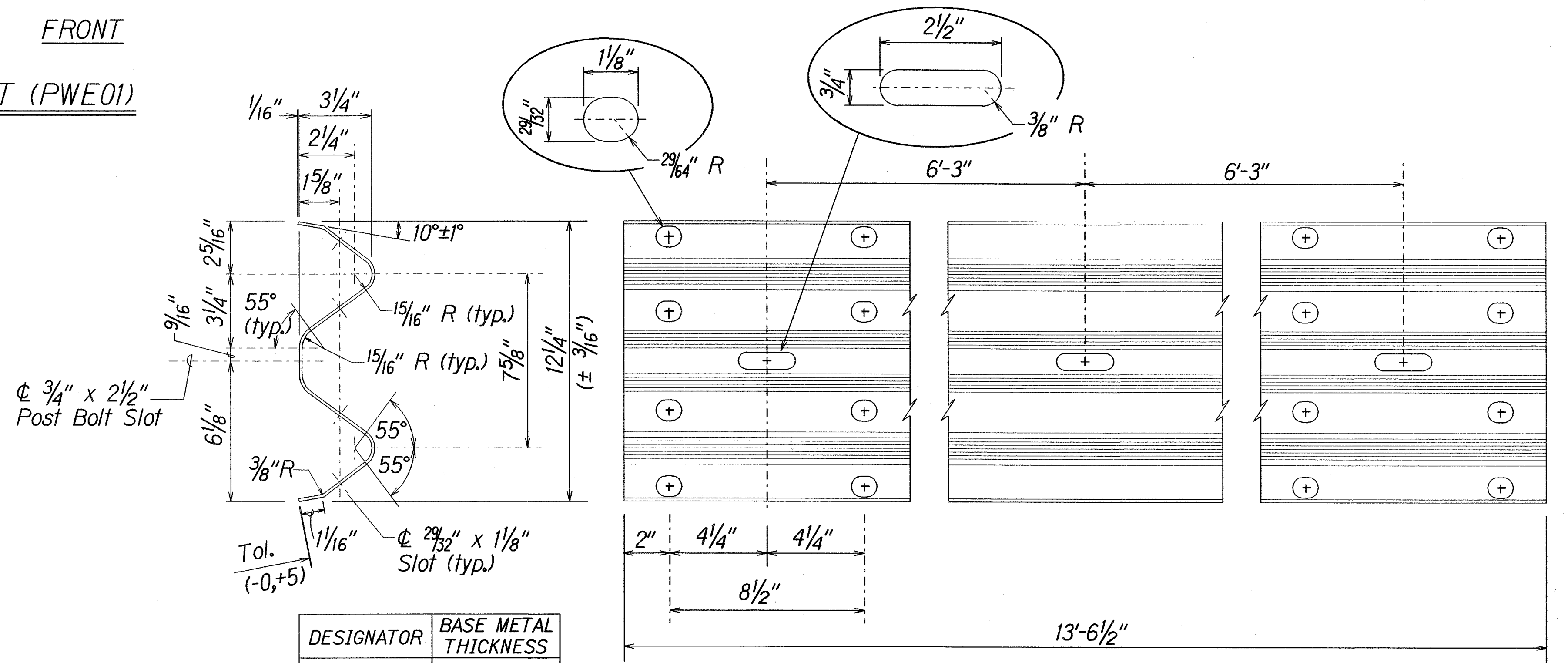


GUARDRAIL BOLTS AND RECESSED NUT



DESIGNATOR	BASE METAL THICKNESS
RWB01a	12 Gauge

W-BEAM BACK-UP-PLATE (RWB01a)



DESIGNATOR	BASE METAL THICKNESS
RWM02a	12 Gauge

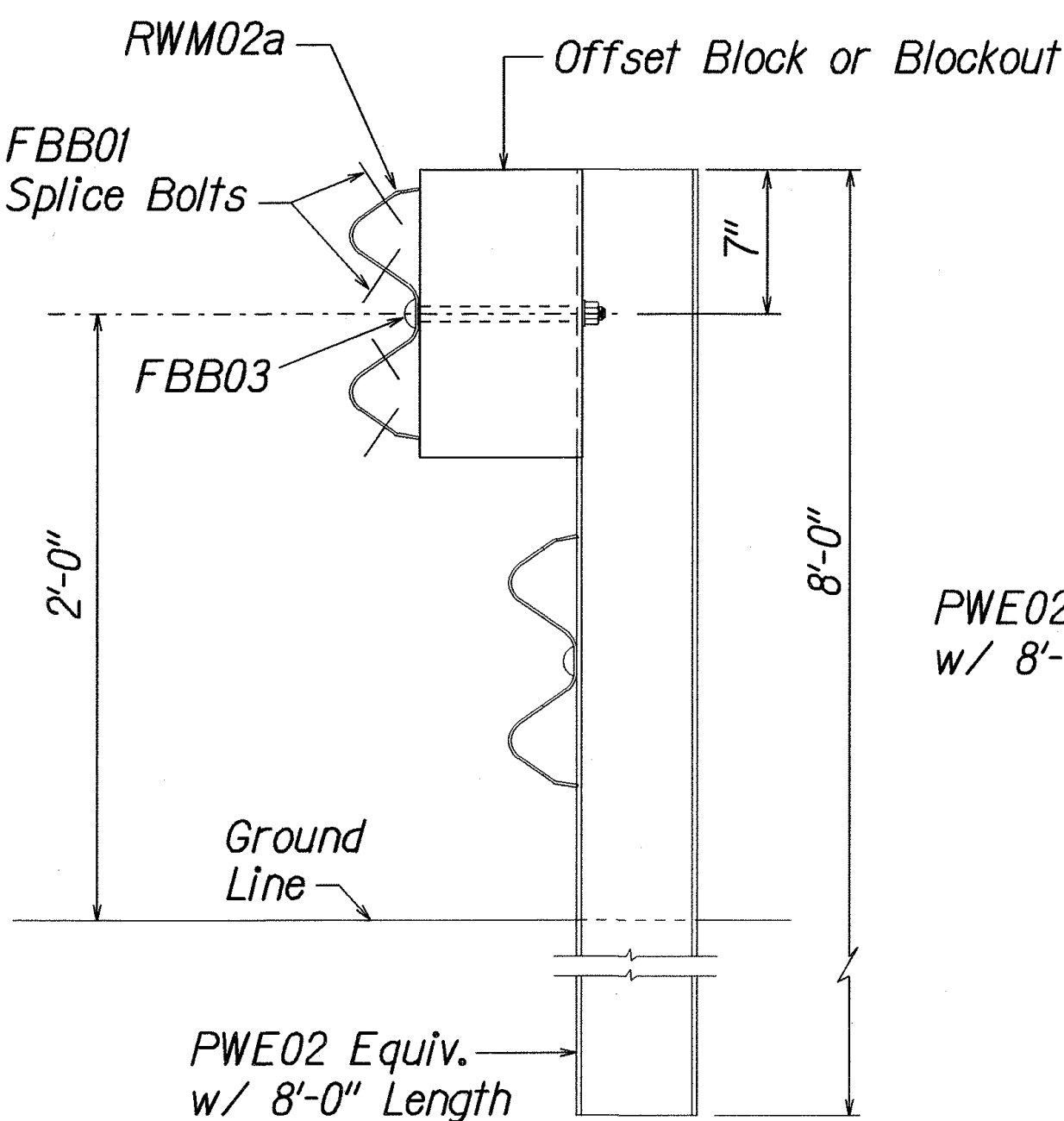
2 SPACE W-BEAM GUARDRAIL (RWM02a)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

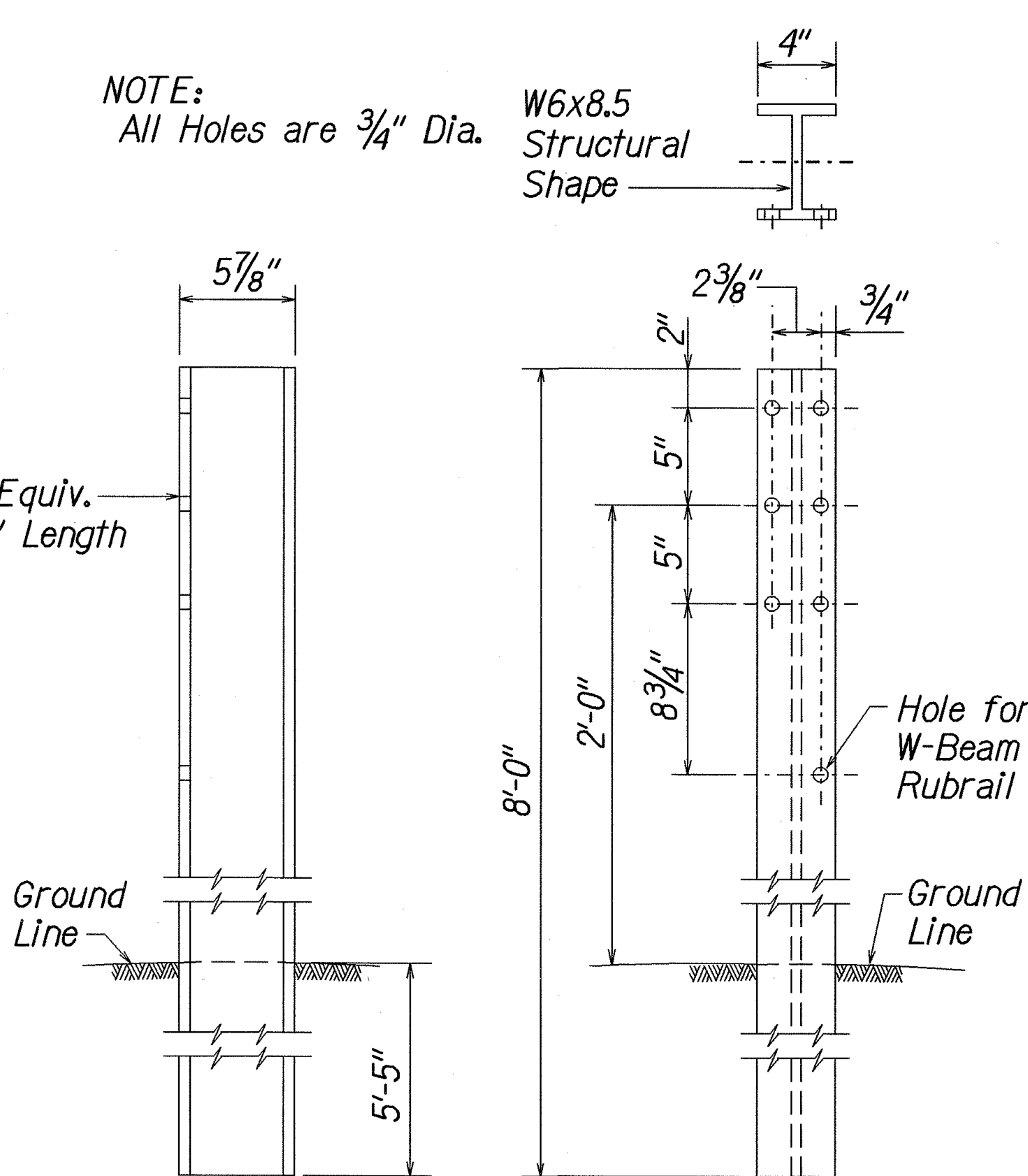
STRONG POST W-BEAM GUARDRAIL
KALANIANA'OLE HIGHWAY DRAINAGE IMPROVEMENTS
Vicinity of Poalima Street
Project No. 72A-01-06
Scale: NTS
Date: May, 2005

SHEET No. 1 OF 1 SHEETS

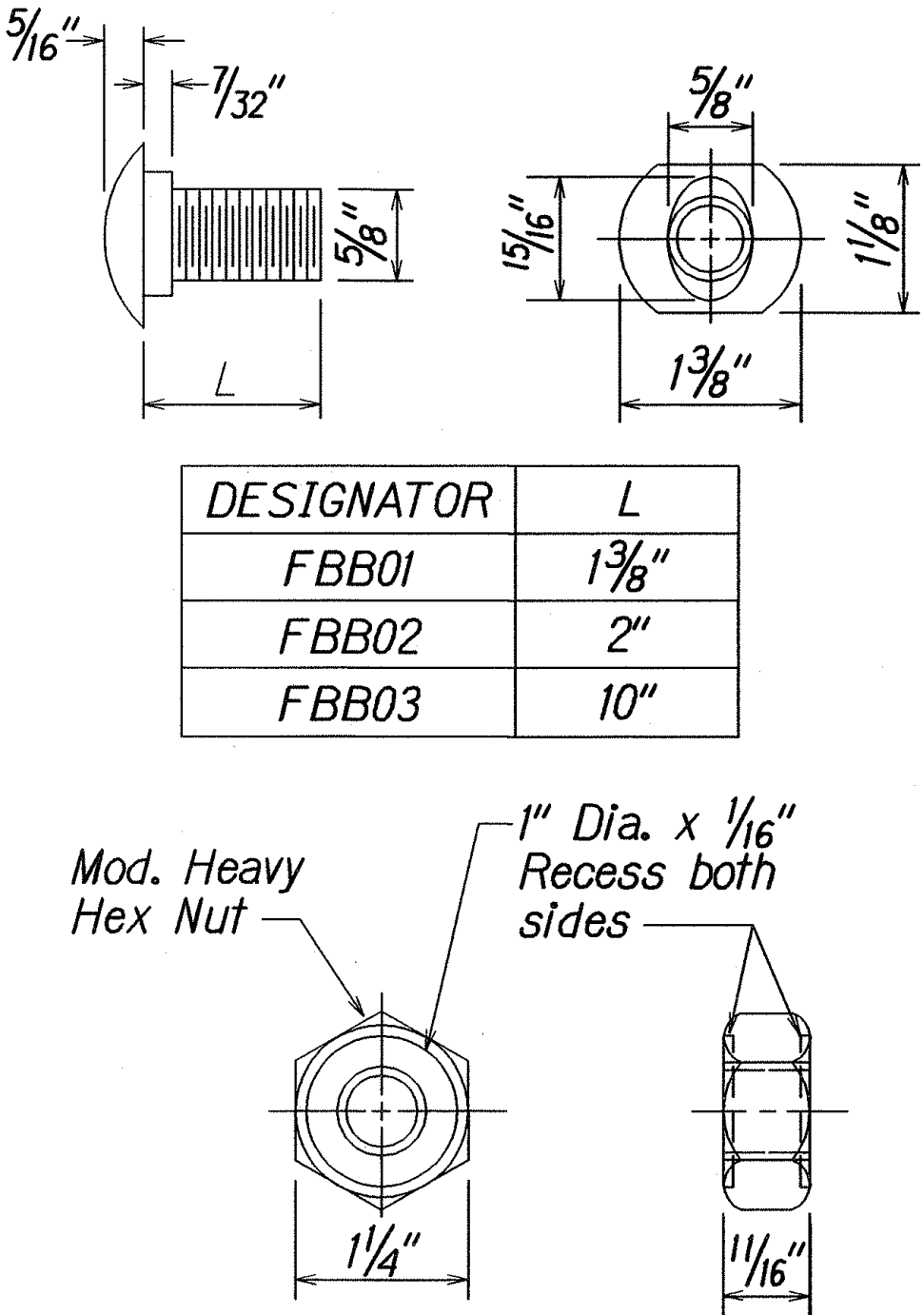
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HAWAII	HAW.	72A-01-06	2006	10	14



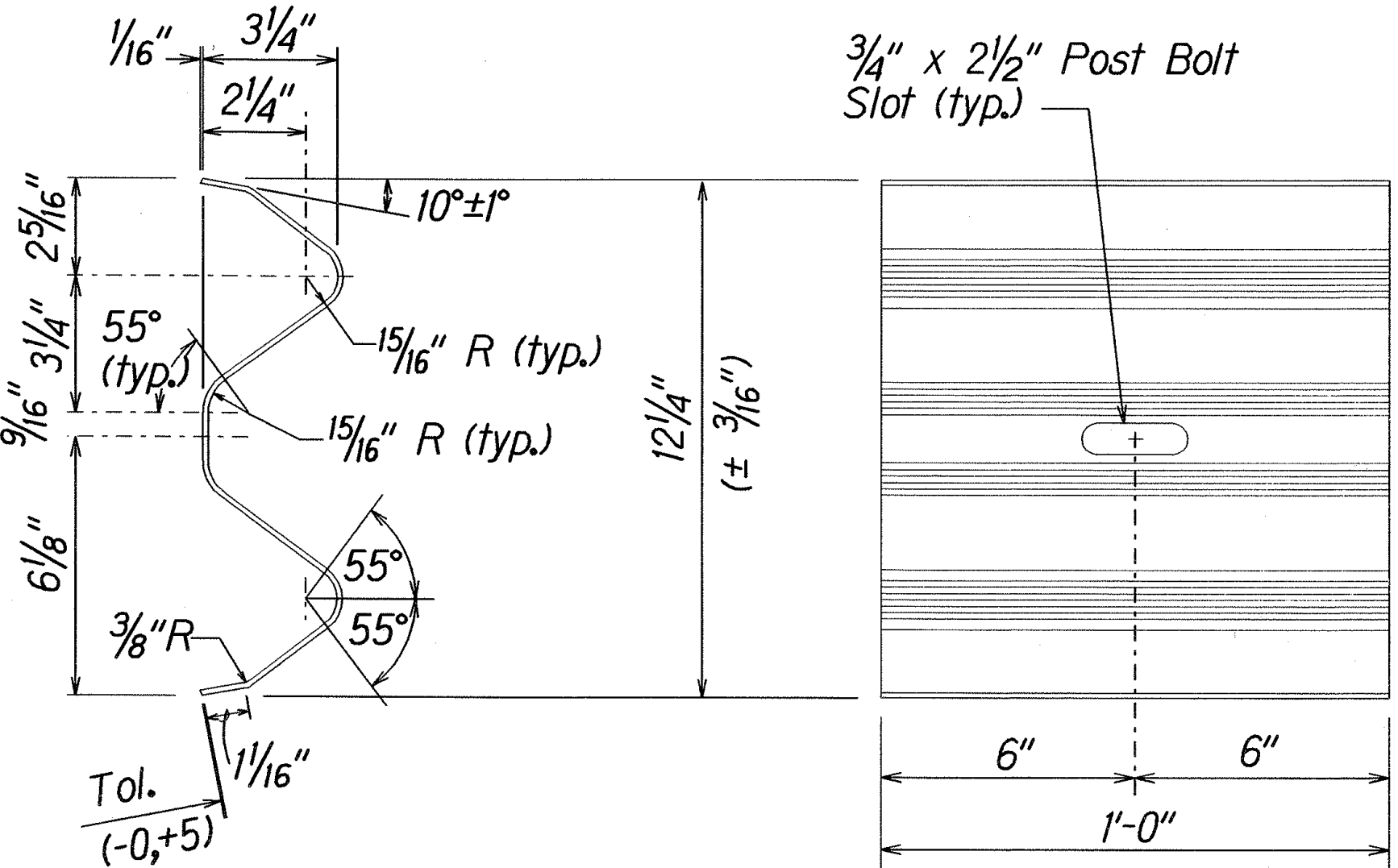
ELEVATION
STRONG POST RUBRAIL
(W-BEAM) GUARDRAIL



SIDE
W-BEAM STRONG POST (PWE02)

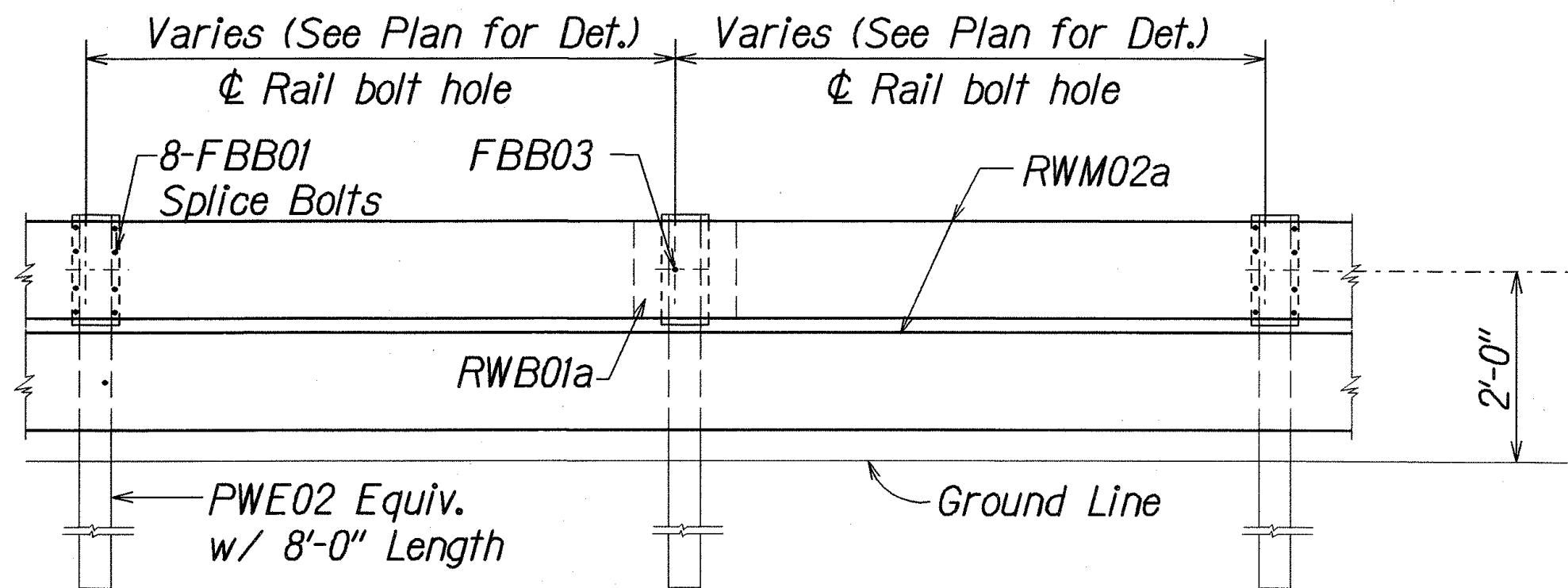


GUARDRAIL BOLTS AND
RECESSED NUT

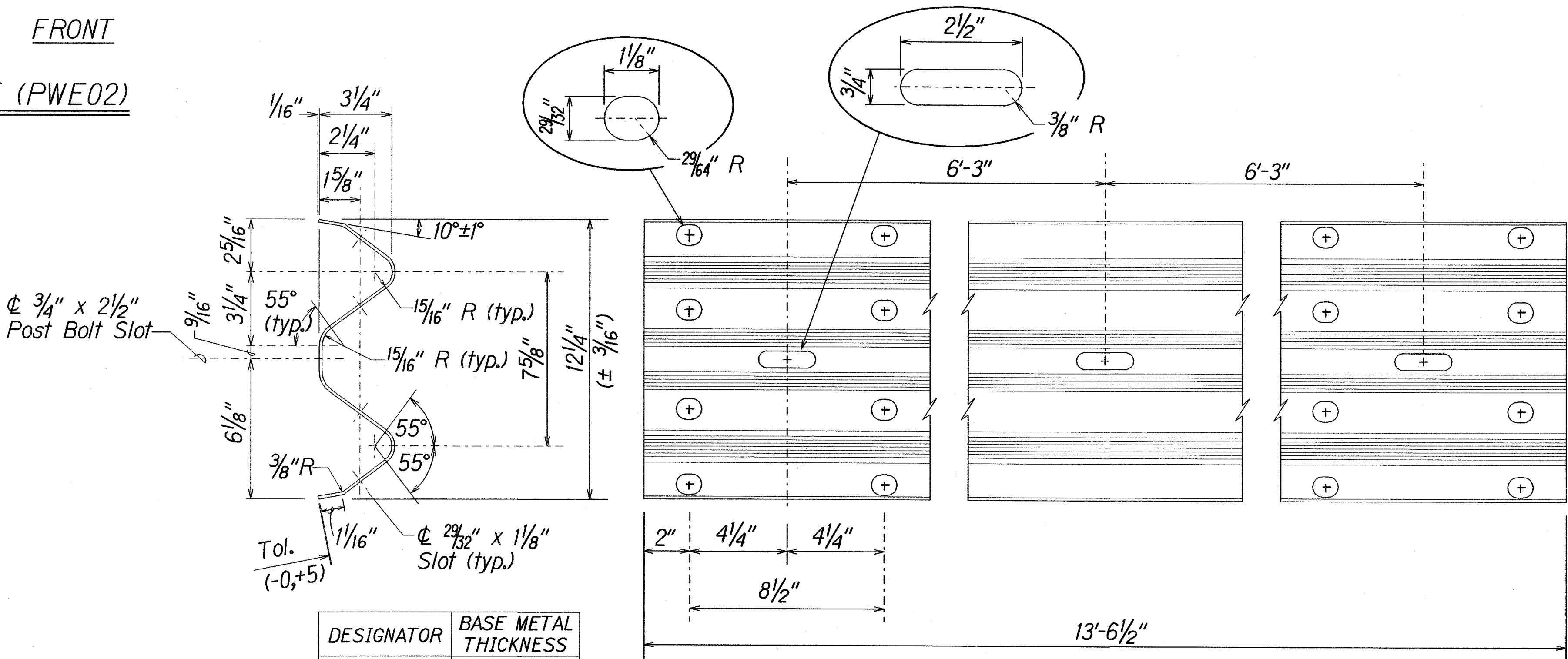


DESIGNATOR	BASE METAL THICKNESS
RWB01a	12 Gauge

W-BEAM BACK-UP-PLATE (RWB01a)

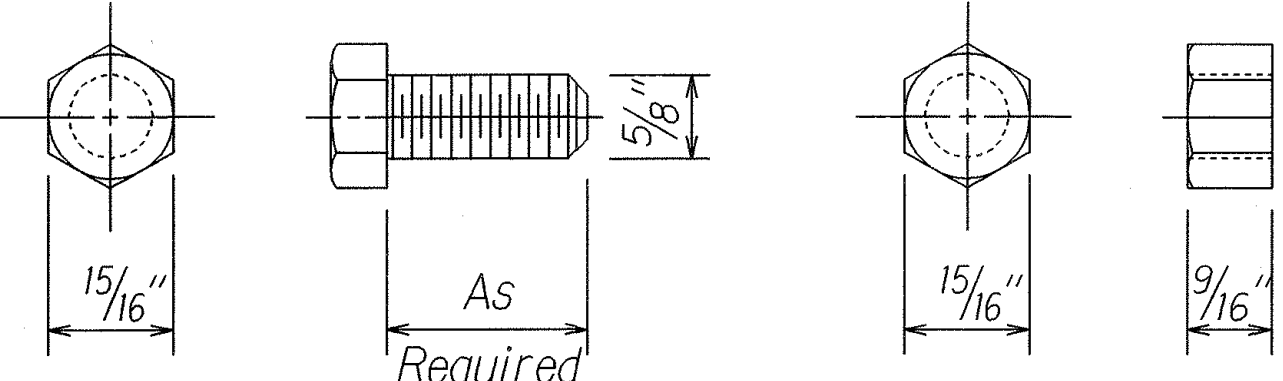


ELEVATION
STRONG POST RUBRAIL (W-BEAM) GUARDRAIL WITH
RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT



DESIGNATOR	BASE METAL THICKNESS
RWM02a	12 Gauge

2 SPACE W-BEAM GUARDRAIL (RWM02a)

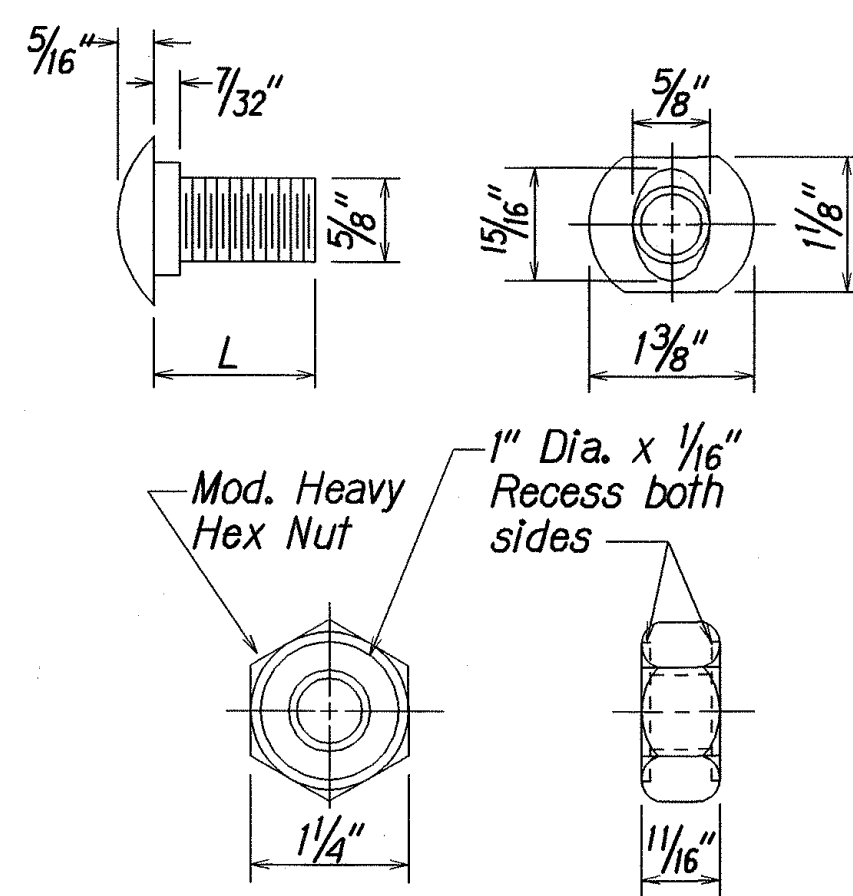
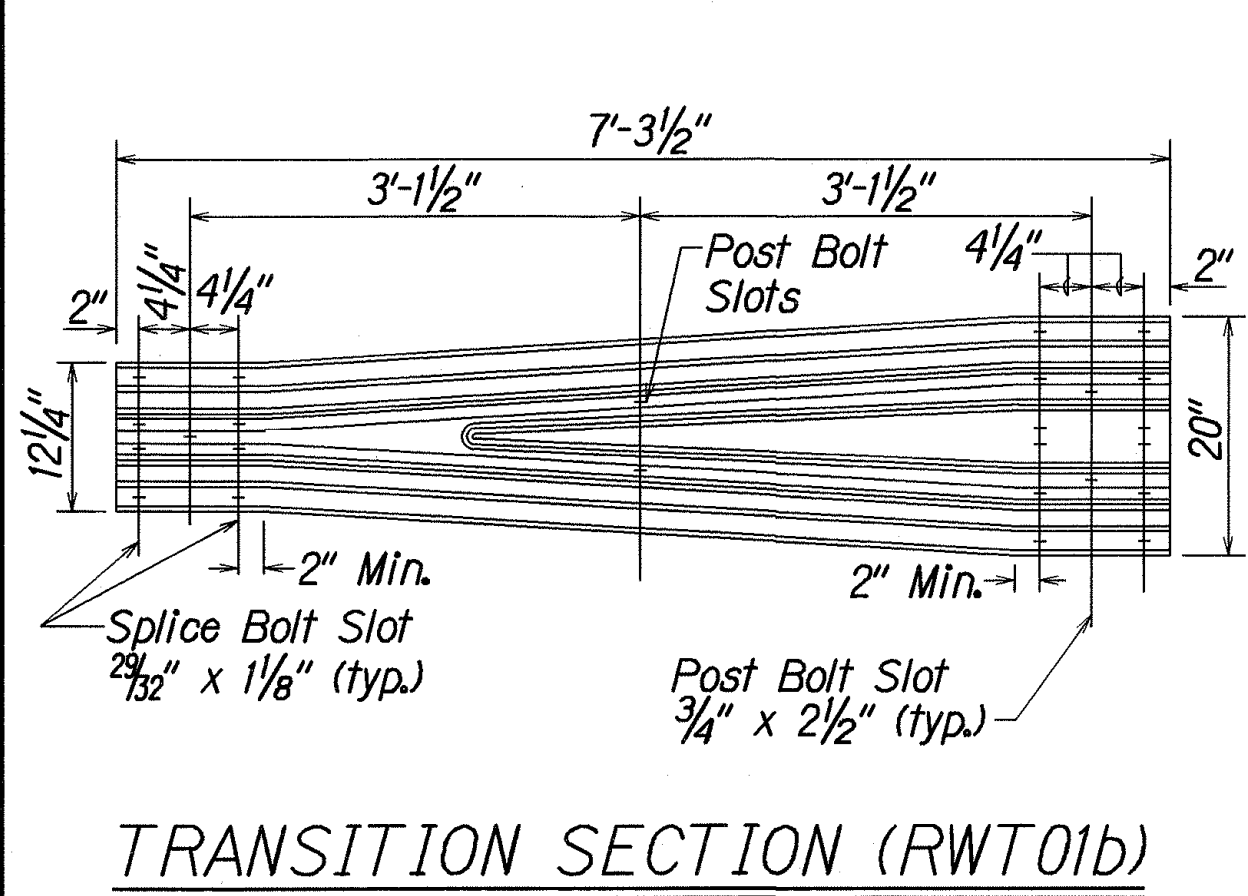
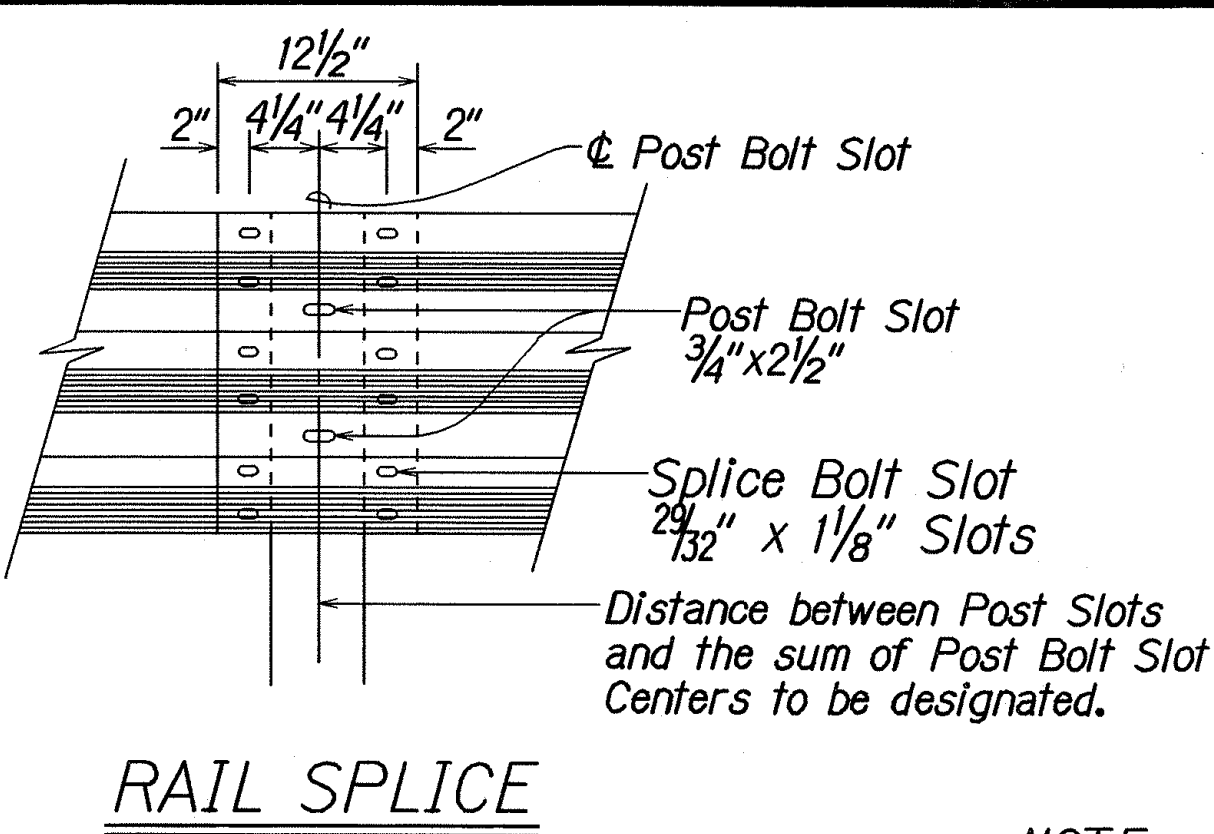
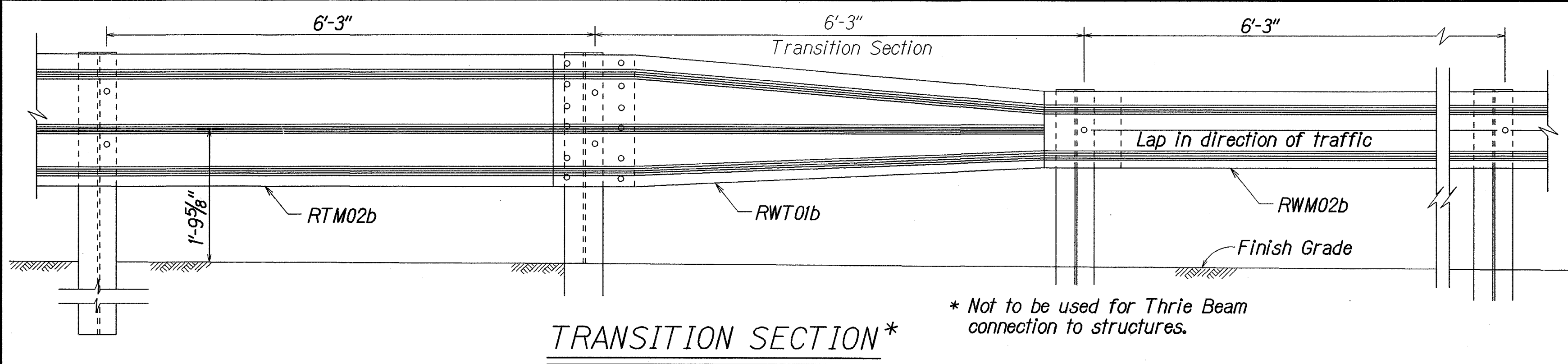


HEX BOLT & NUT (FBX16a)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

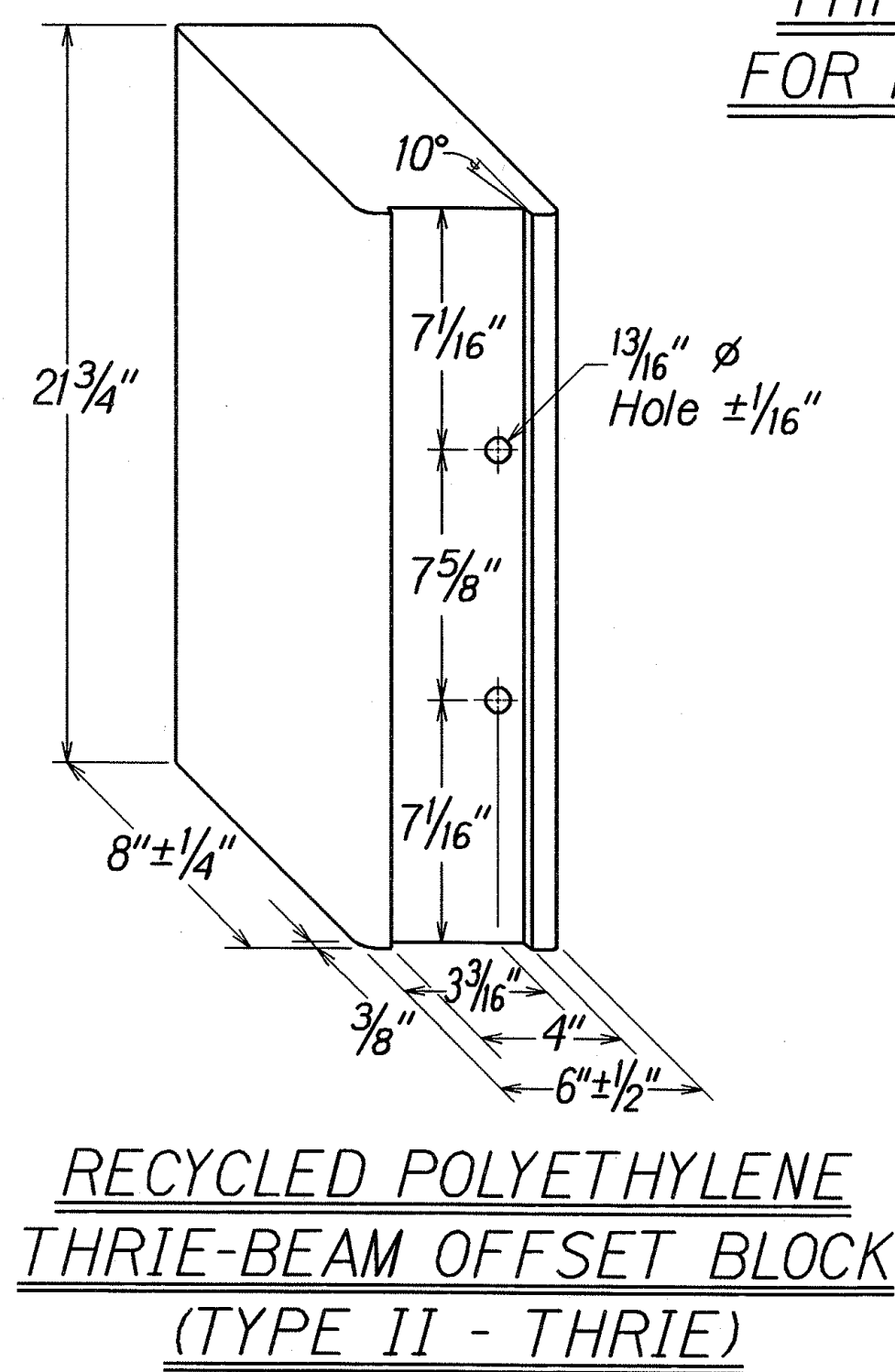
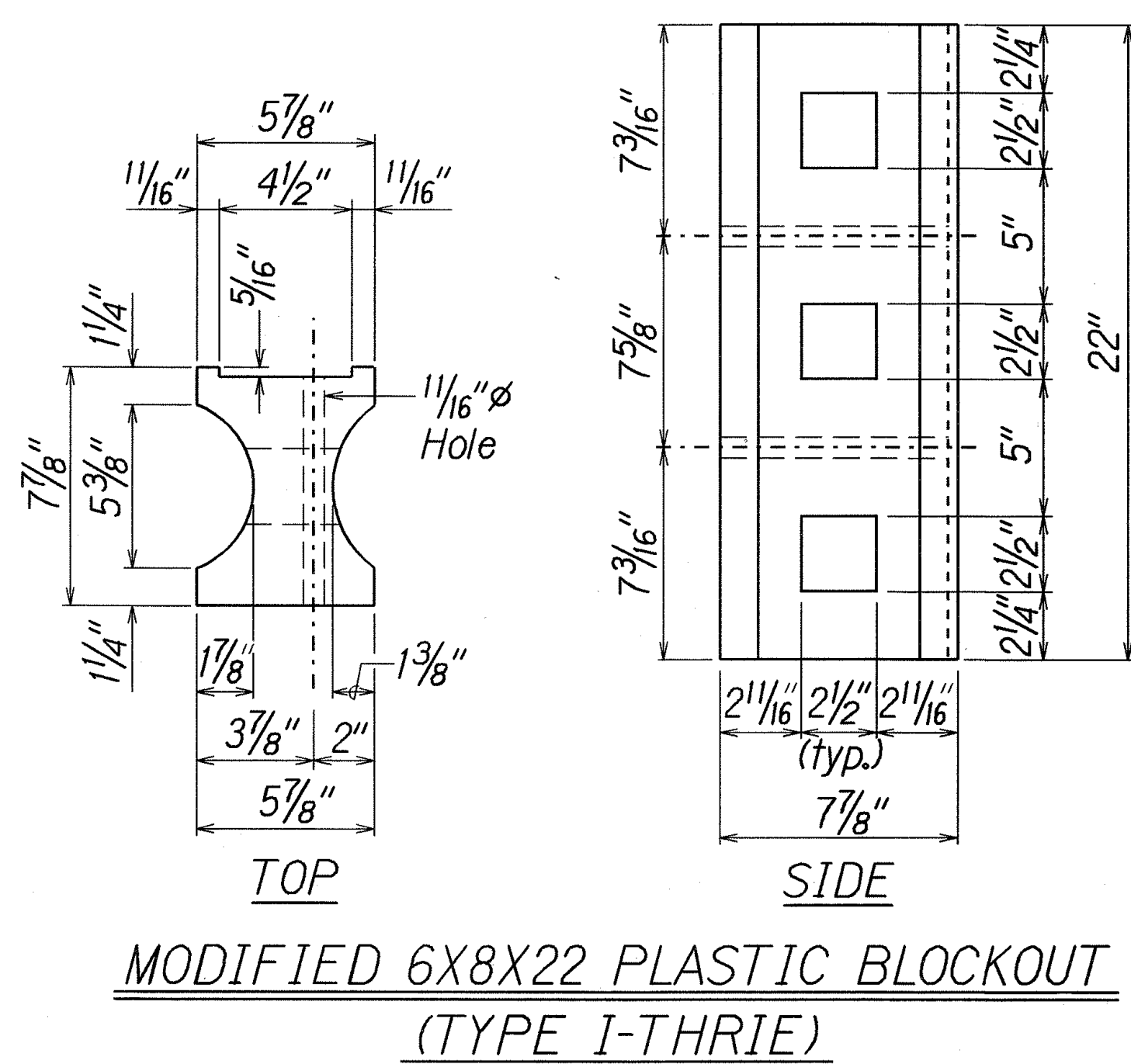
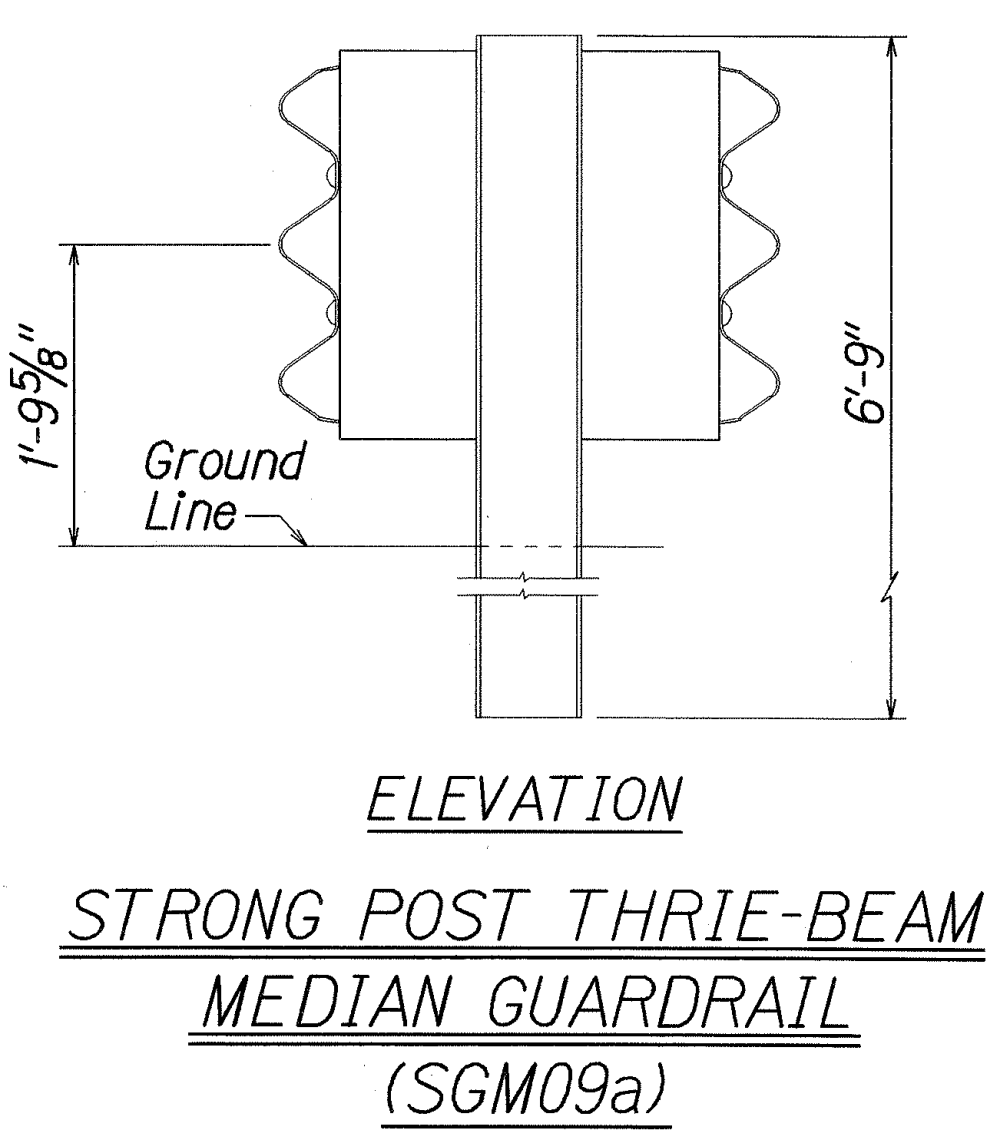
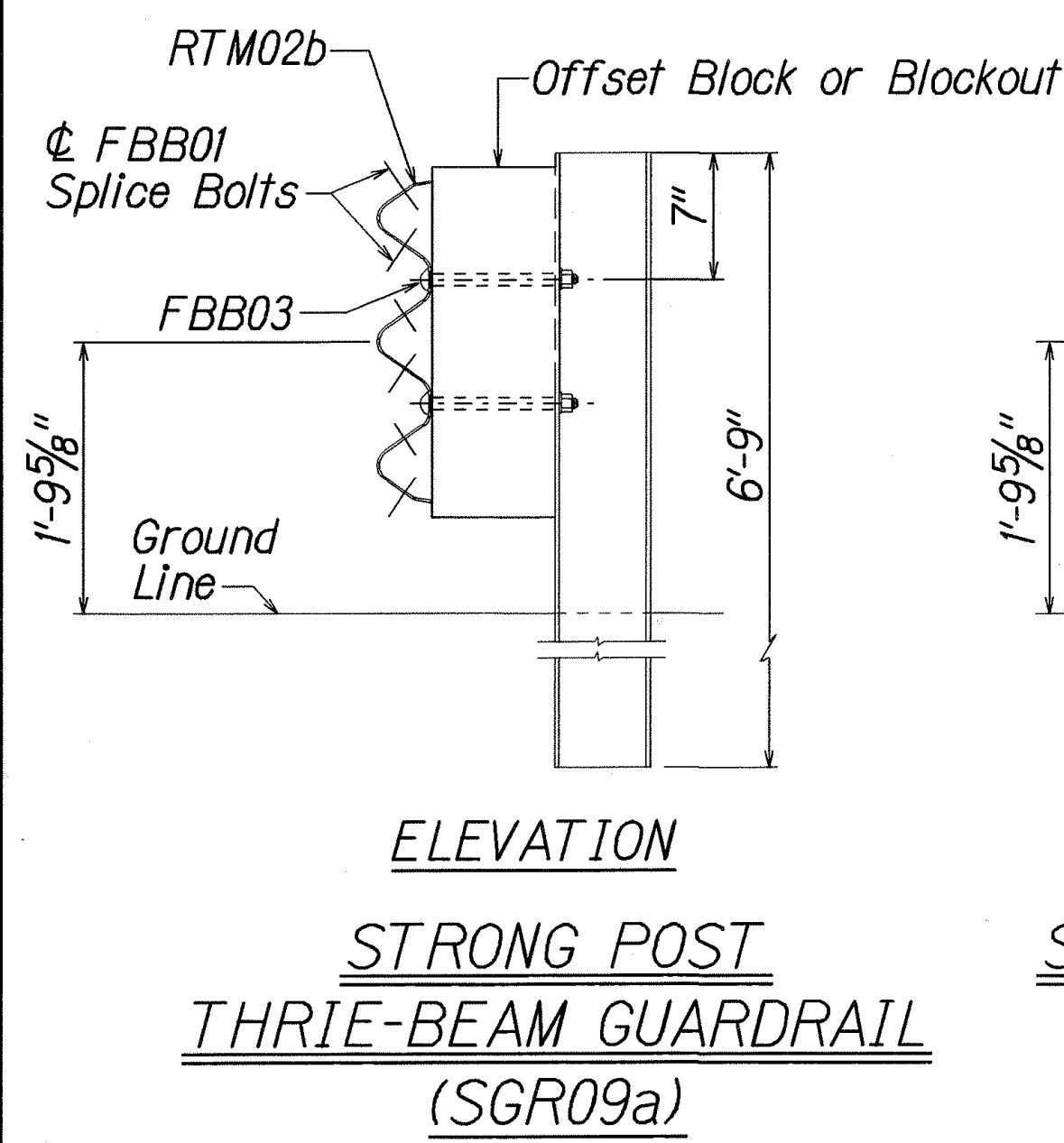
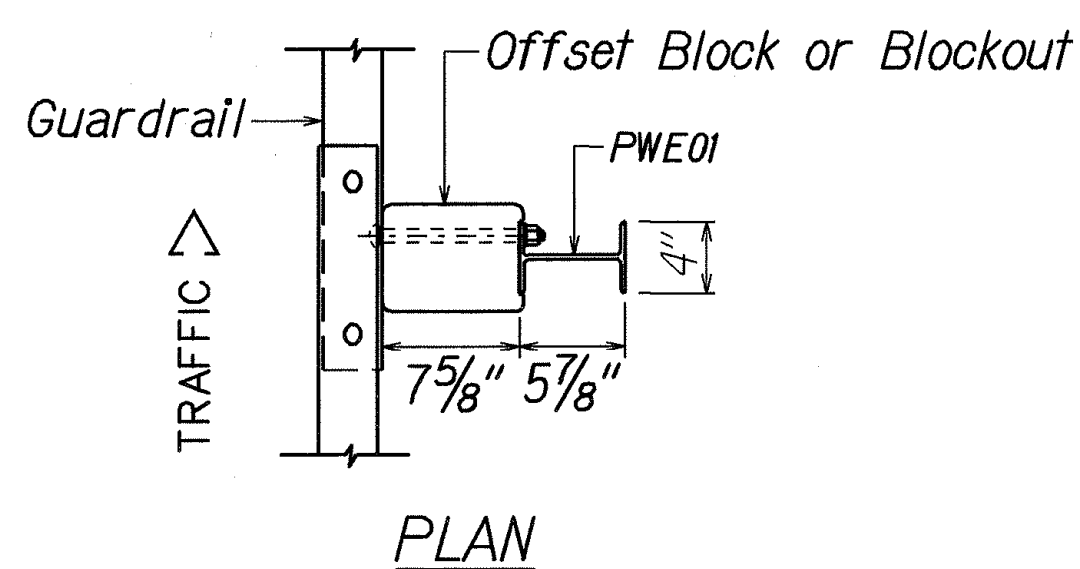
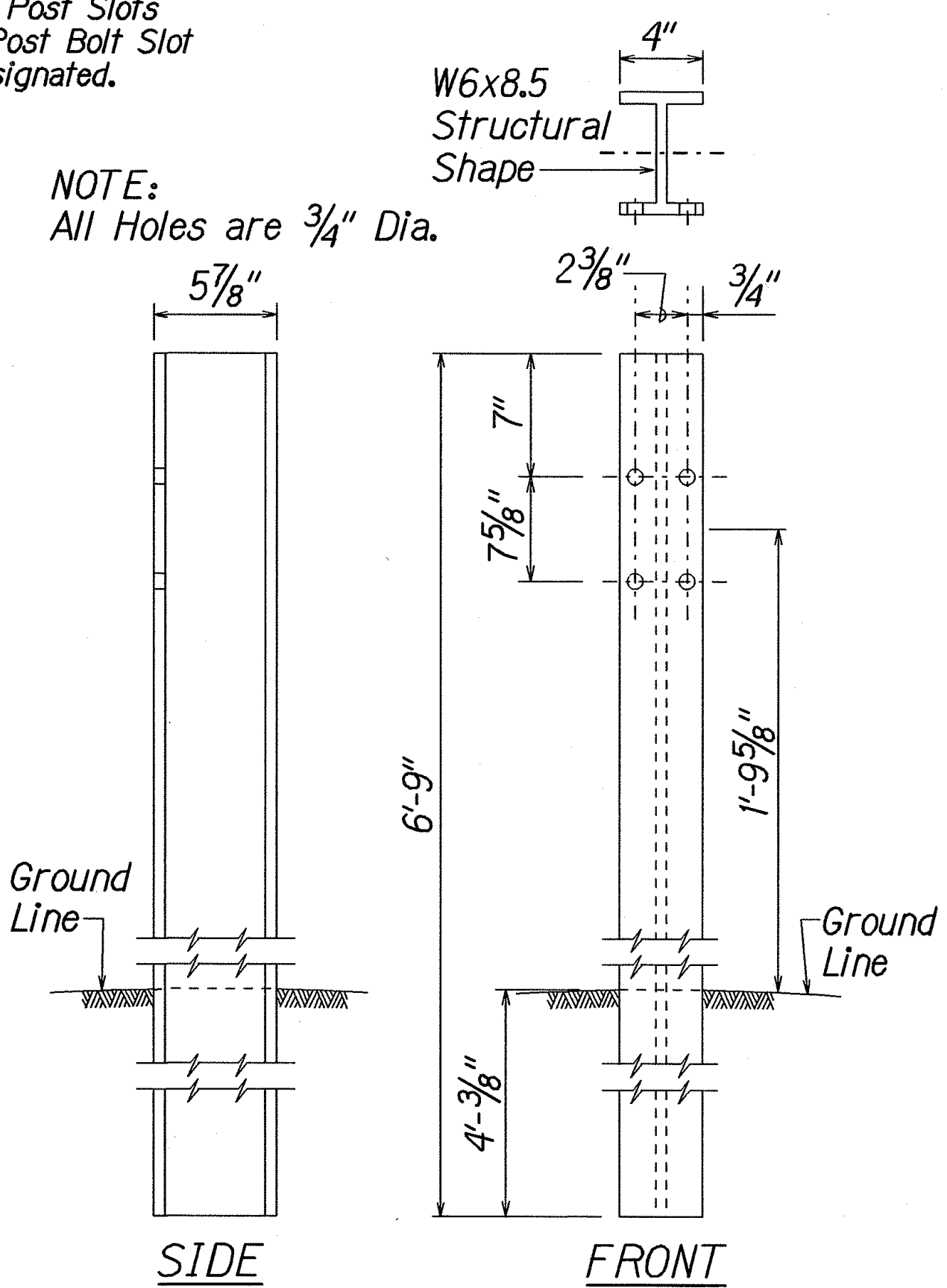
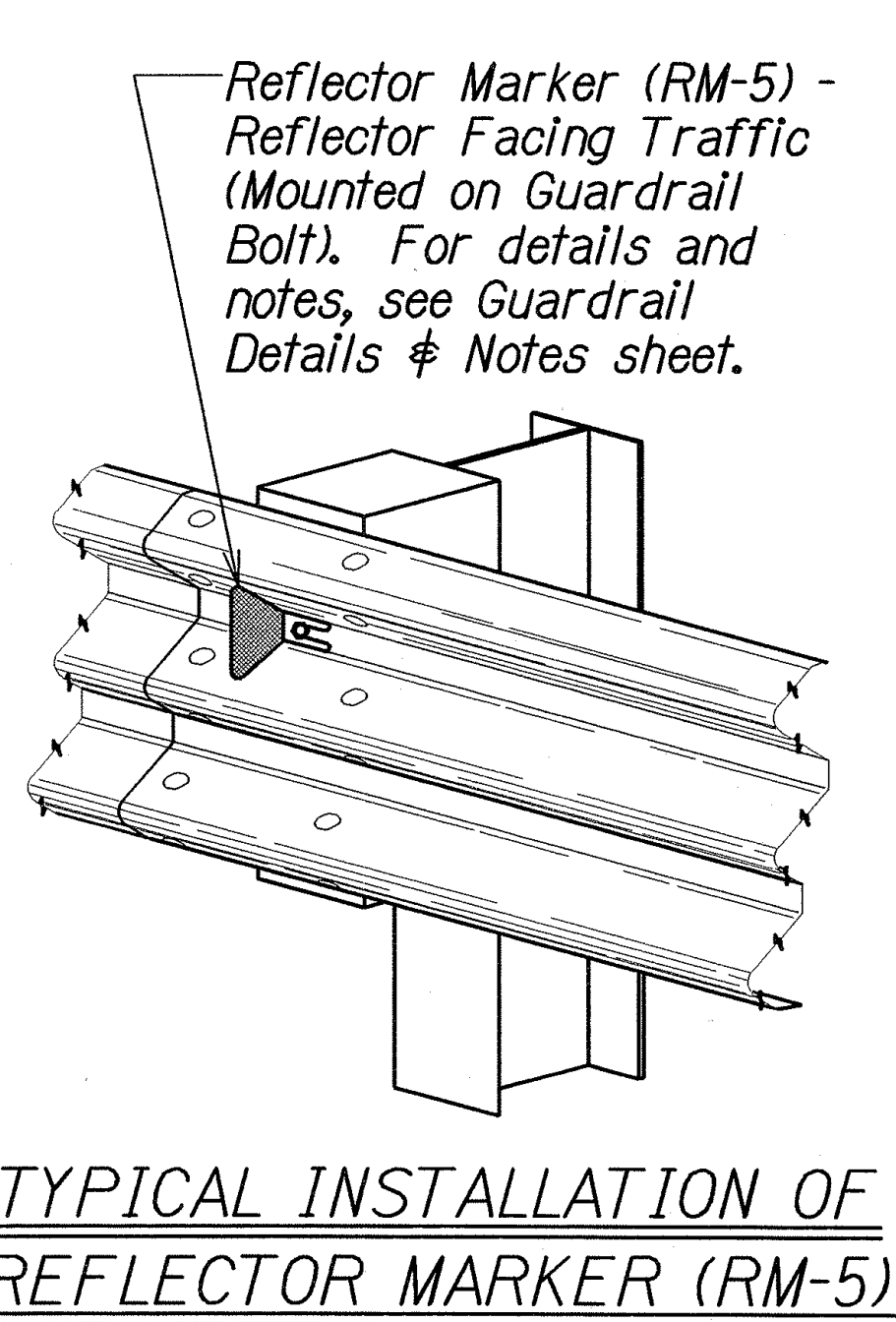
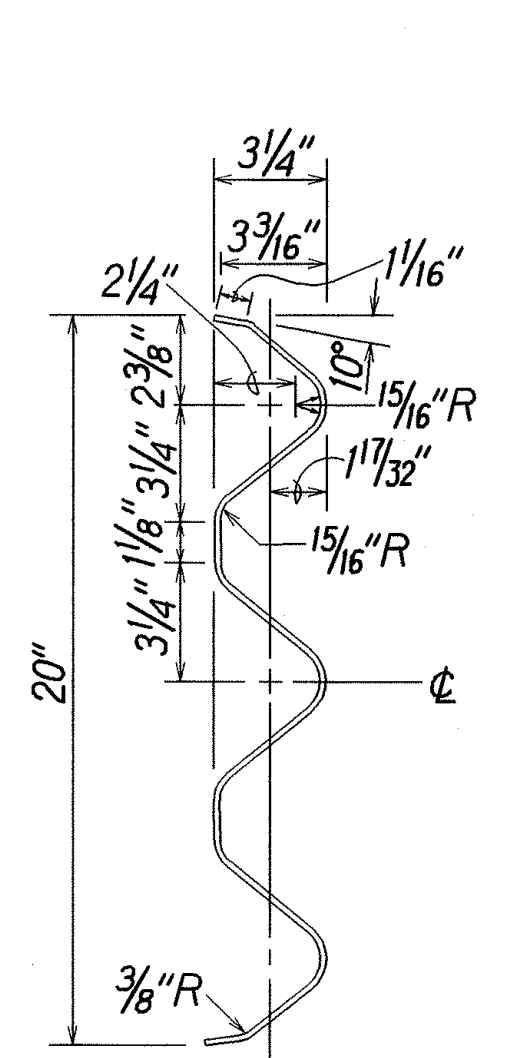
STRONG POST RUBRAIL
(W-BEAM) GUARDRAIL
KALANIANA'OLE HIGHWAY DRAINAGE IMPROVEMENTS
Vicinity of Poalima Street
Project No. 72A-01-06
Scale: NTS Date: May, 2005

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-06	2006	C.O. 10 S-1	14



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

GUARDRAIL BOLTS AND RECESSED NUT



DATE	REVISION
9/06	Added Detail
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION STRONG POST THRIE-BEAM GUARDRAIL KALANIANA'OLE HIGHWAY DRAINAGE IMPROVEMENTS Vicinity of Poalima Street Project No. 72A-01-06 Scale: NTS Date: Aug., 2006 SHEET No. 1 OF 1 SHEETS	

Extend Rubrail or Modified Thrie-Beam 25'-0" Beyond Obstruction

12'-6" Double Nest W-Beam

Extend Rubrail or Modified Thrie-Beam 25'-0" Beyond Obstruction

12'-6" Double Nest W-Beam

25' Transition

25' Transition

Normal Installation (Strong Post W-Beam)

Attach rubrail to rear of post w/Rail bolt-Galv. (hot-dip zinc coated) 5/8"ø x 4" long bolt and nut

Attach rail to rear of post w/Rail bolt-Galv. (hot-dip zinc coated) 5/8"ø x 4" long bolt and nut (Rubrail only)

Edge of Paved Area

Edge of Shoulder

Edge of Pavement

Obstruction

Direction of Traffic

See Note No. 3

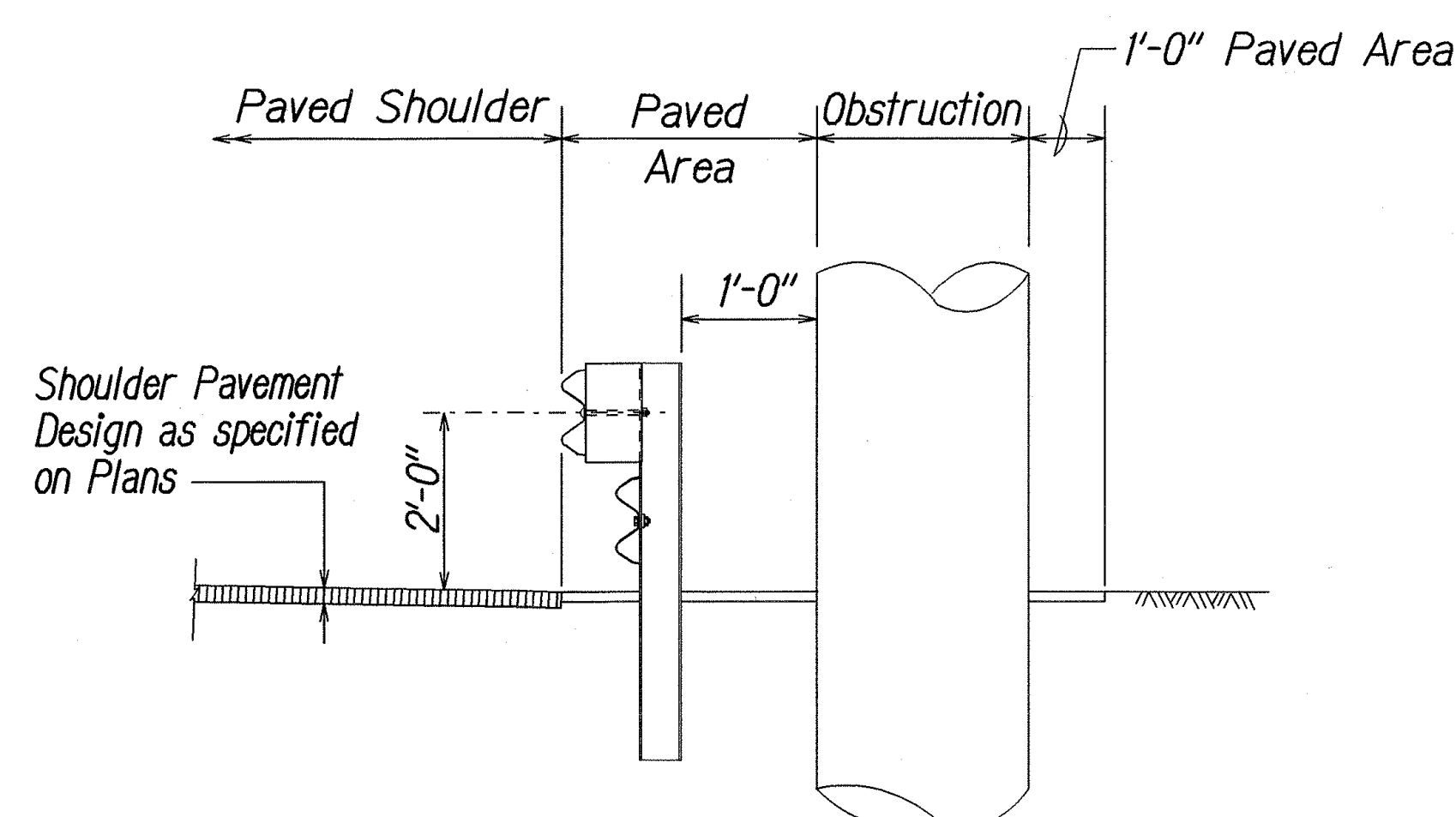
PLAN

The diagram illustrates the elevation of a guardrail system. Key features include:

- Normal Installation (Strong Post W-Beam):** Located at both ends of the section.
- 25' Transition:** Zones where the guardrail transitions from the normal installation to the extended section.
- Extend Rubrail or Modified Thrie-Beam 25'-0" Beyond Obstruction:** The central section of the guardrail, extending 25 feet beyond any obstruction.
- Obstruction:** A curved shape representing a barrier or object that the guardrail must clear.
- Double Nest W-Beam:** Two 12'-6" sections of W-beam that overlap to clear the obstruction.
- Metal Guardrail Element:** The standard section of the guardrail.
- Metal Rubrail or Modified Thrie-Beam Transition:** A section used for transitions.
- Finish Ground:** The ground level on the right side of the diagram.
- Dimensions:**
 - 1'-9 5/8" (height of the normal installation)
 - 2'-0" (height of the transition zone)
 - 12'-6" (length of the double nest W-beam sections)

ELEVATION

1. All Guardrail and Concrete Barrier Designs at Obstructions shall be approved by the Engineer.
2. If $X < 2'-0"$, Concrete Barrier or special guardrail design;
 $2'-0" \leq X < 3'-0"$, Strong Post Rubrail or Strong Post Thrie-Beam
with reduced post spacing;
 $3'-0" \leq X$, Strong Post W-Beam with 6'-3" post spacing
(Normal Installation).
3. If a pedestrian walkway or bicycle route is located behind the guardrail, the Engineer should install the Modified Thrie-Beam System. The Rubrail terminal may become a hazard to pedestrians & bicyclists.

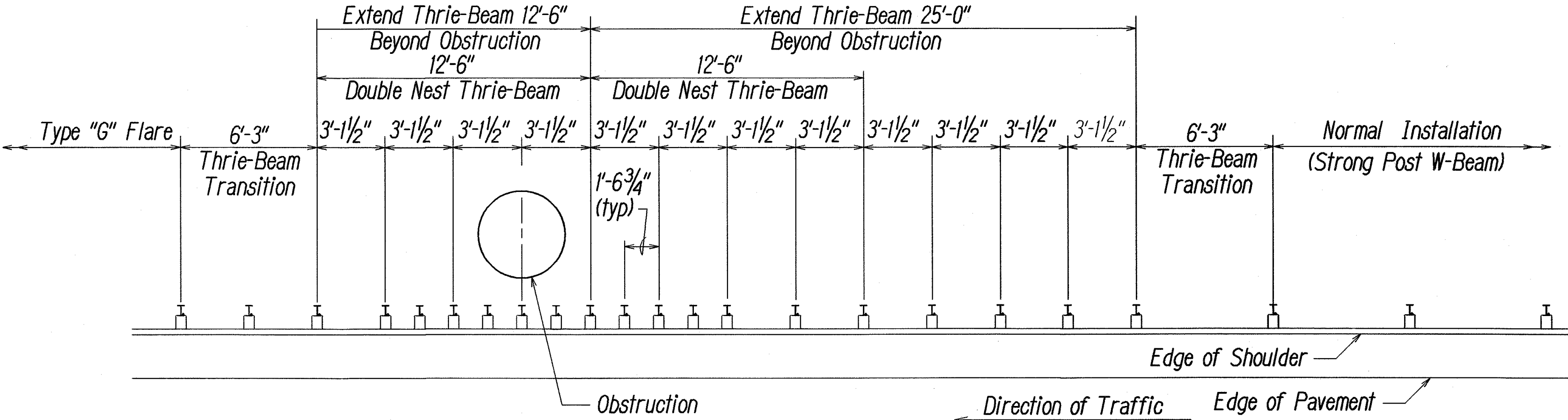


DETAIL OF GUARDRAIL INSTALLATION AT OBSTRUCTION STA. 31+25 TO STA. 32+25

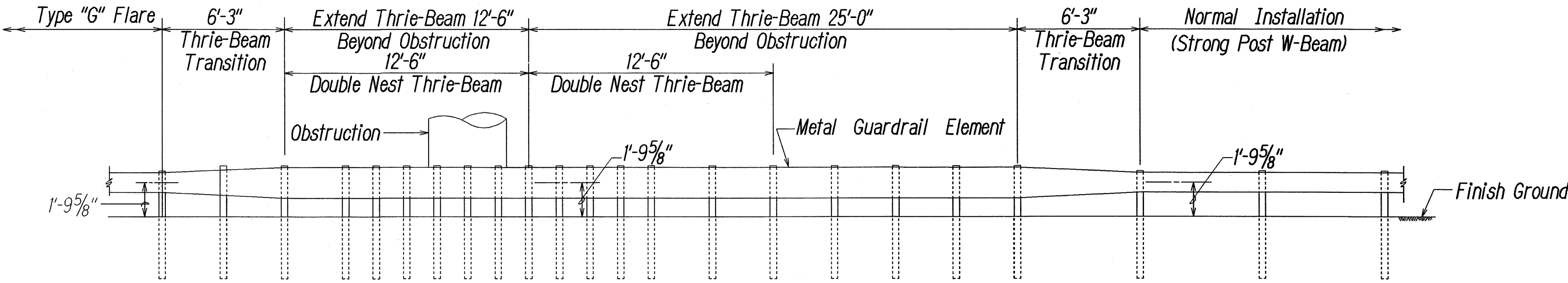
DATE	REVISION
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Scale: NTS Date: May, 2005

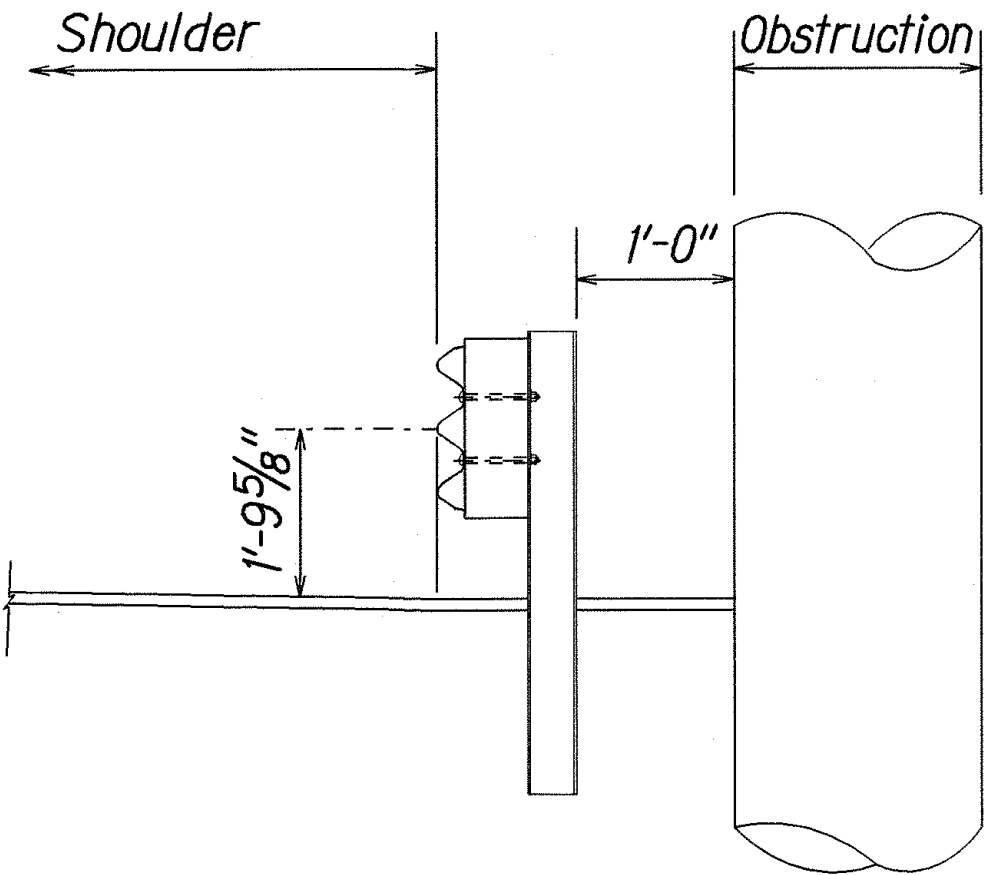
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-06	2006	11	14



PLAN



ELEVATION



TYPICAL SECTION AT OBSTRUCTION

DETAIL OF GUARDRAIL INSTALLATION AT STA. 32+87 TO 33+37 RT.



9/06	Added Detail
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION GUARDRAIL DETAILS (AT OBSTRUCTION) KALANIANA'OLE HIGHWAY DRAINAGE IMPROVEMENTS Vicinity of Poalima Street Project No. 72A-01-06 Scale: NTS Date: May, 2005	
SHEET No. 1 OF 1 SHEETS	