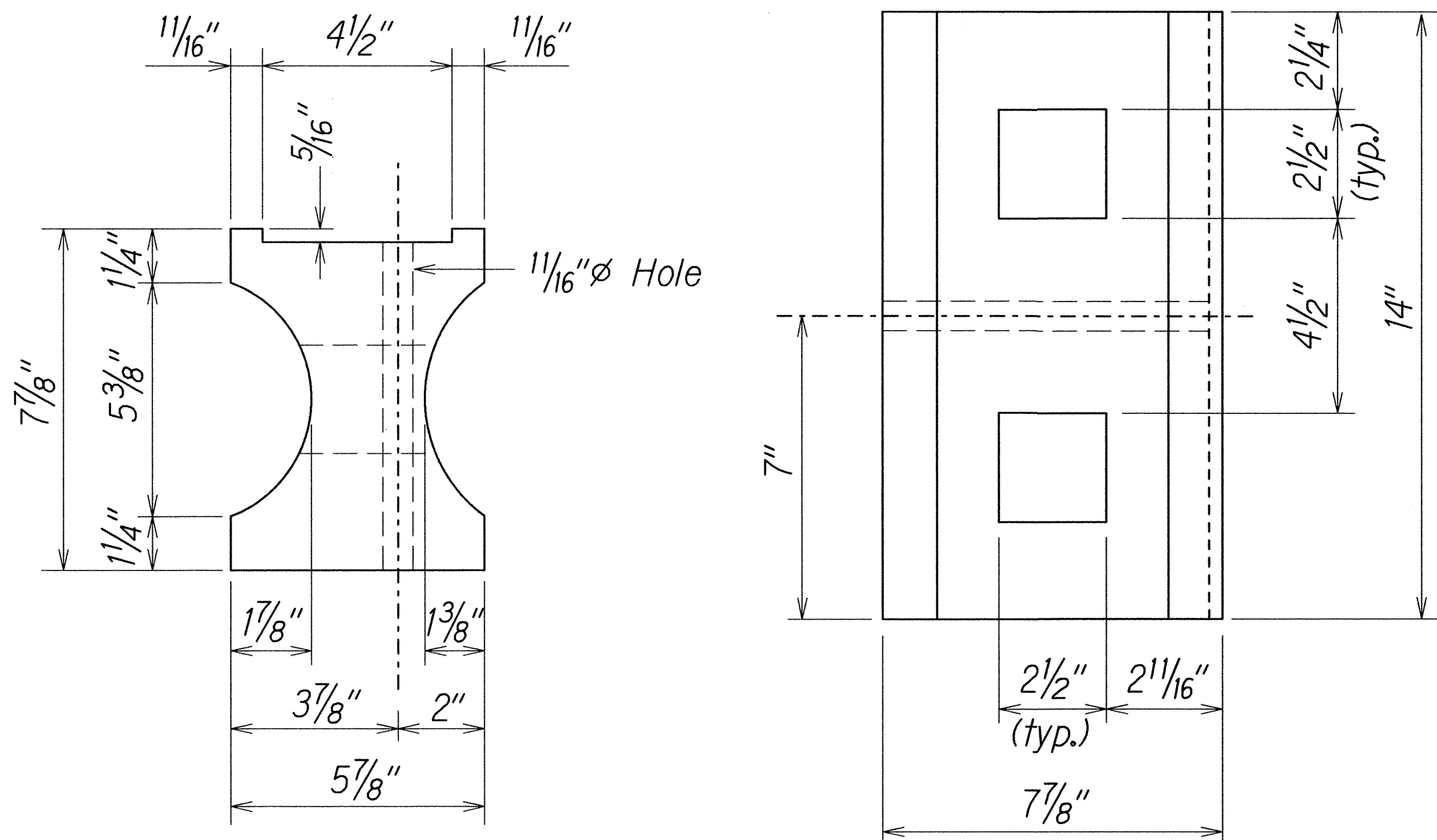


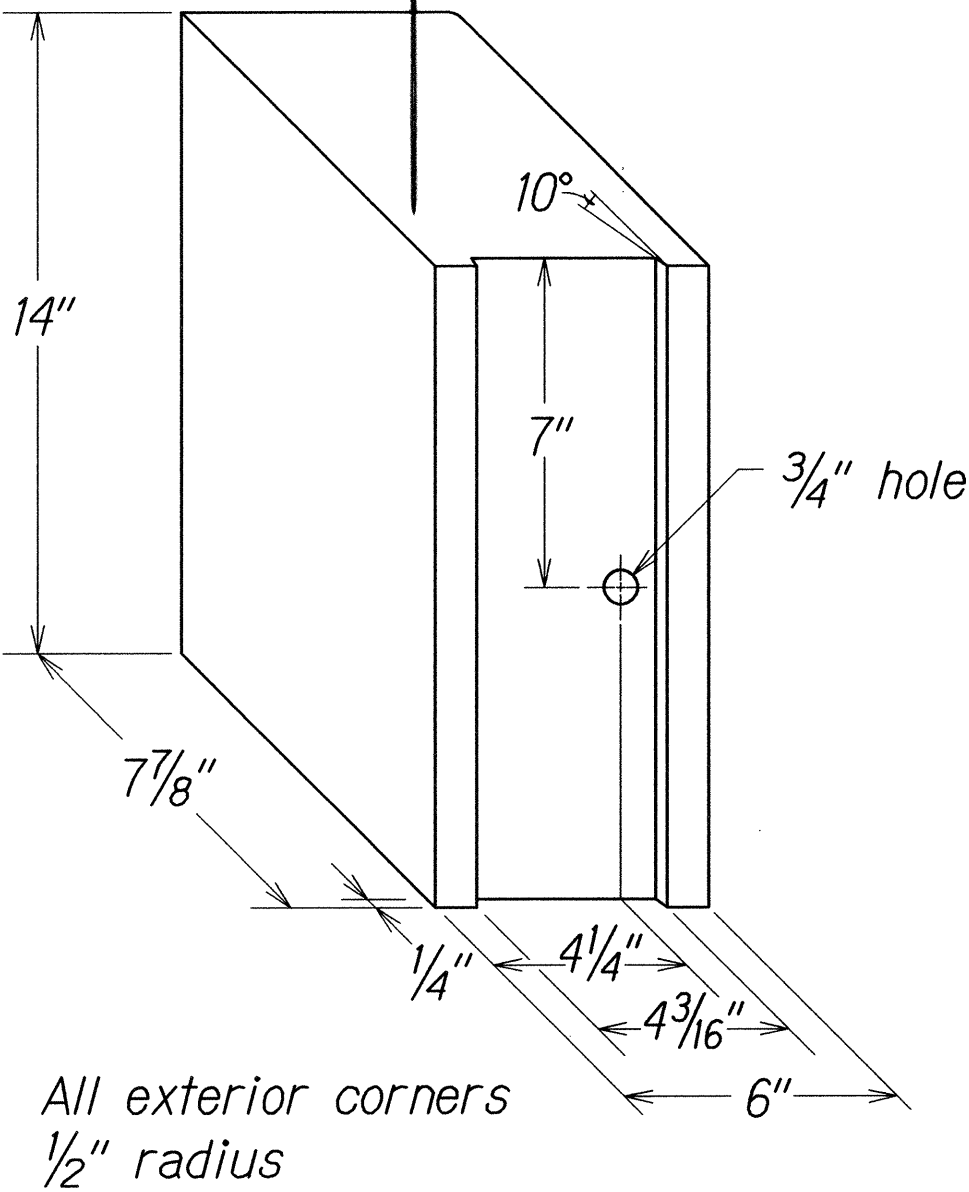
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7413A-01-04M	2014	23	62

GENERAL NOTES

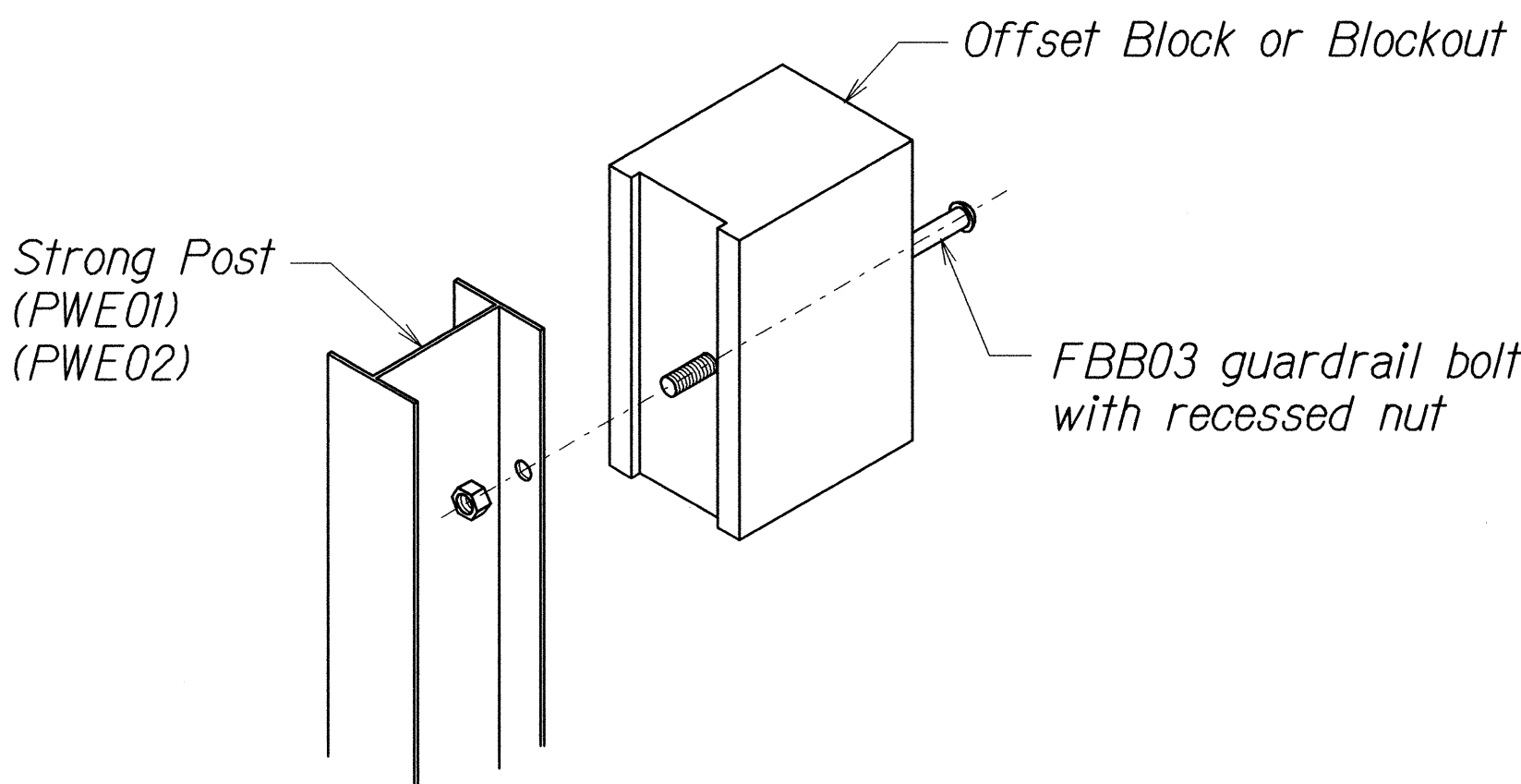
1. All hardware, posts and fasteners shall be hot-dip zinc coated galvanized after fabrication. No punching, drilling or cutting will be permitted after galvanizing.
2. Where conditions require, special post lengths in increments of 6 inches may be specified.
3. All fasteners, posts, and rail elements (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. All new guardrail systems (system consists of total length of guardrail including both end treatments) shall include the Additional Paved Area.
6. 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.
7. When standards for the fill slope area cannot be met, a site specific, engineer approved design may be used.
8. New A.C. pavement at guardrails shall extend 6 feet longitudinally beyond terminal ends.
9. 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.



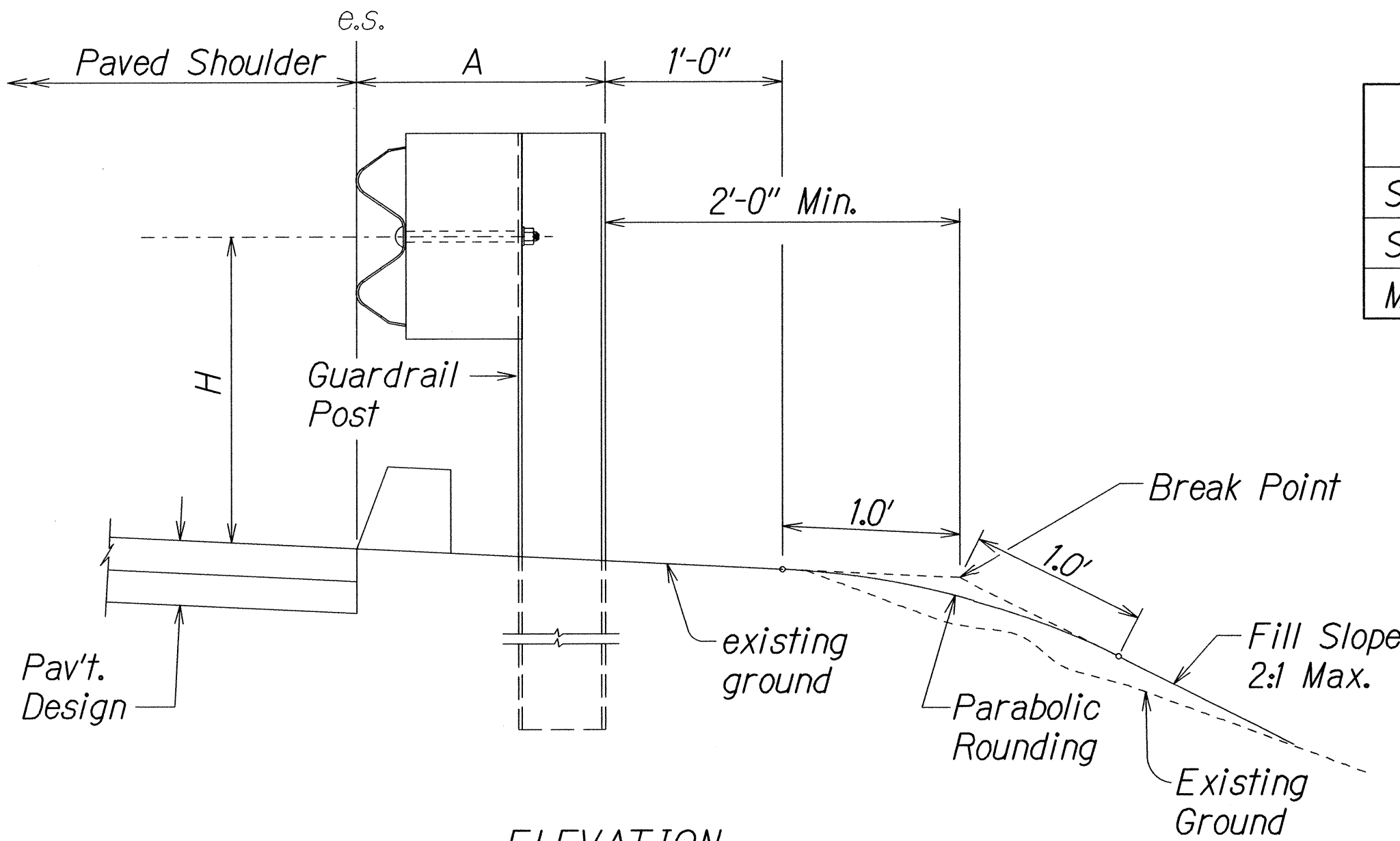
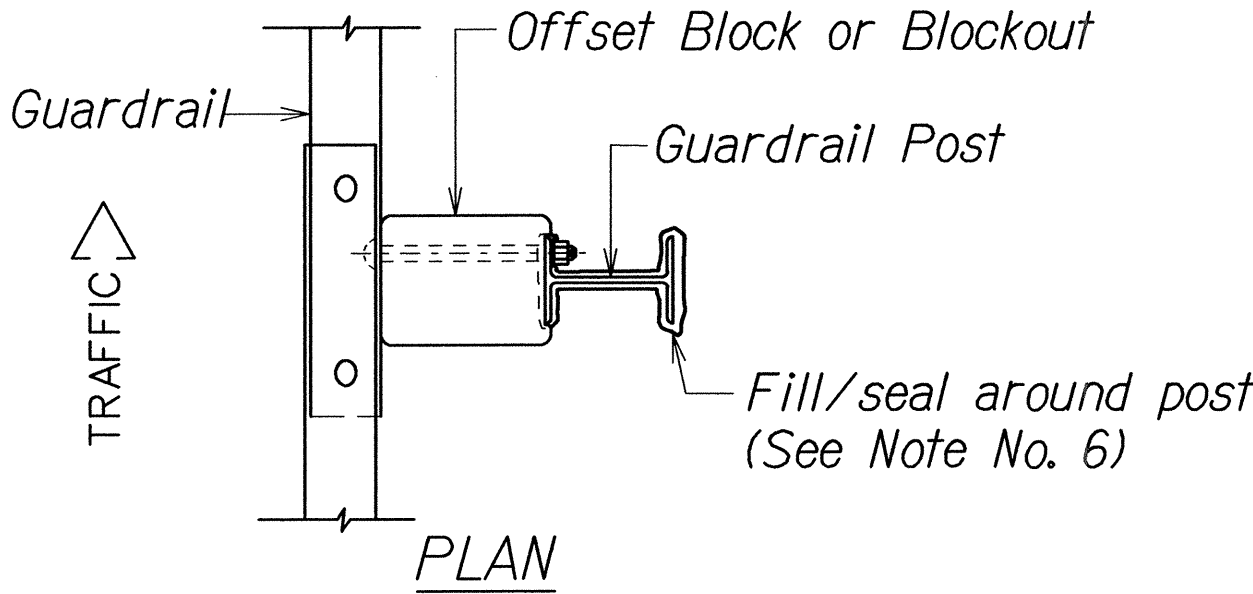
TOP  
SIDE  
RECYCLED PLASTIC BLOCKOUT (TYPE I)



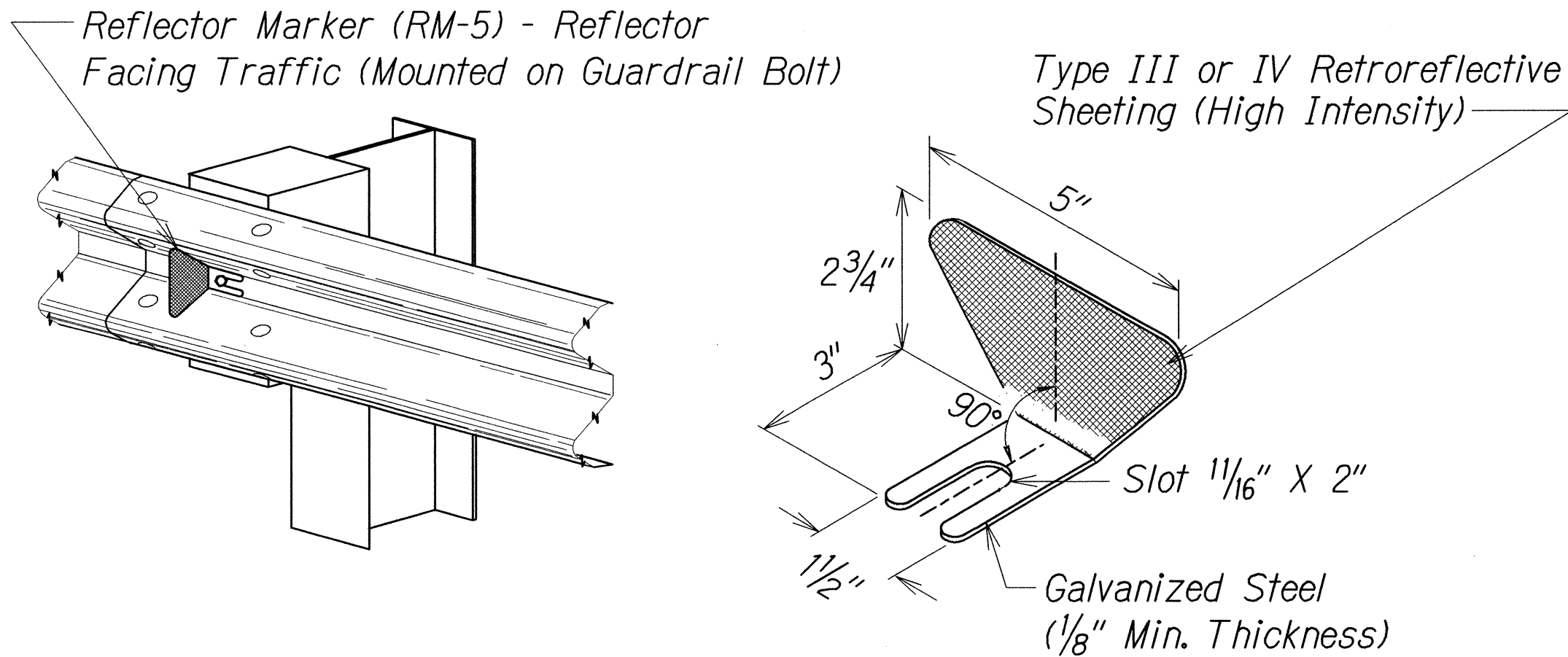
RECYCLED POLYETHYLENE  
OFFSET BLOCK (TYPE II)



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



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

TYPICAL GUARDRAIL INSTALLATION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

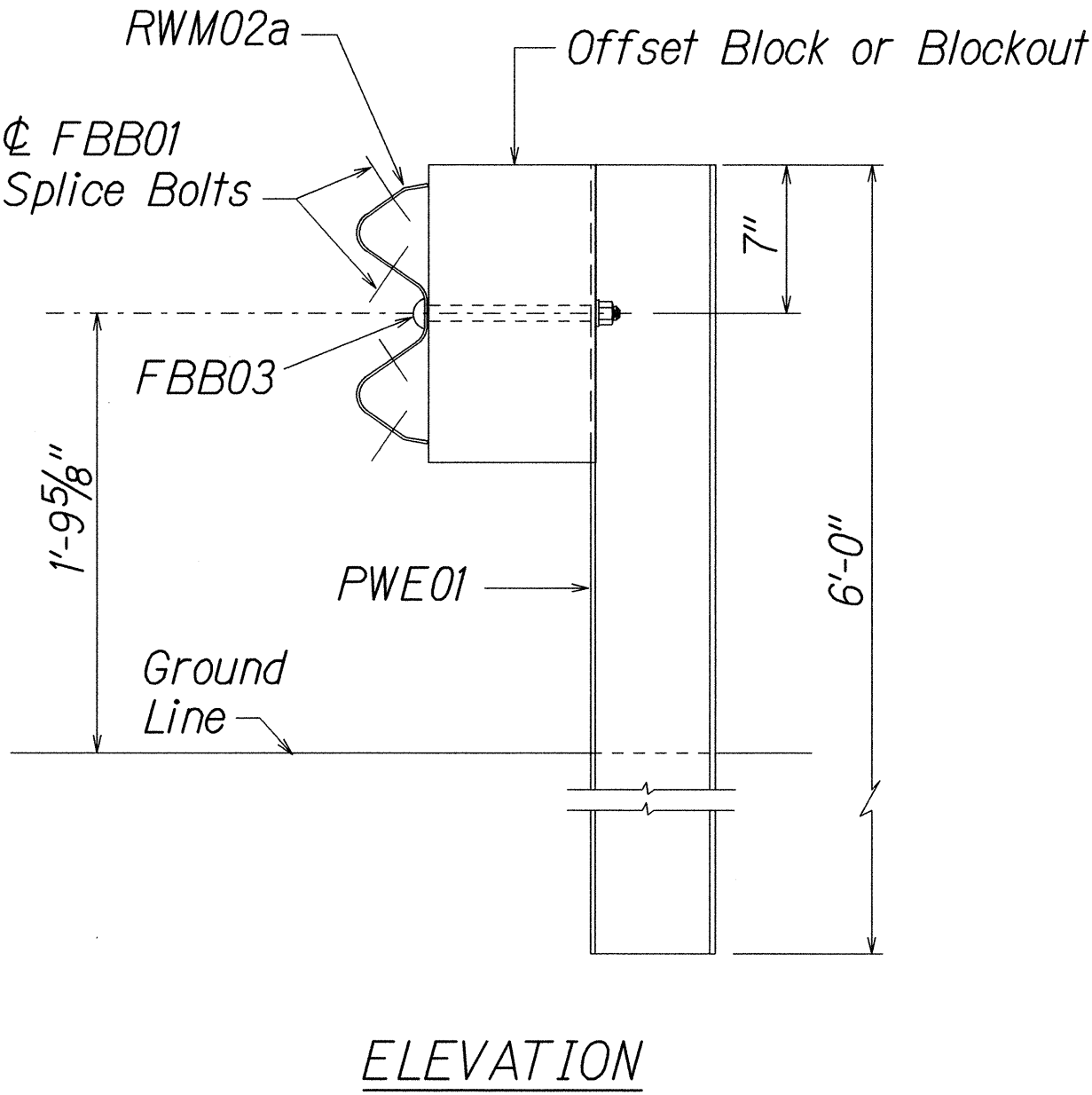
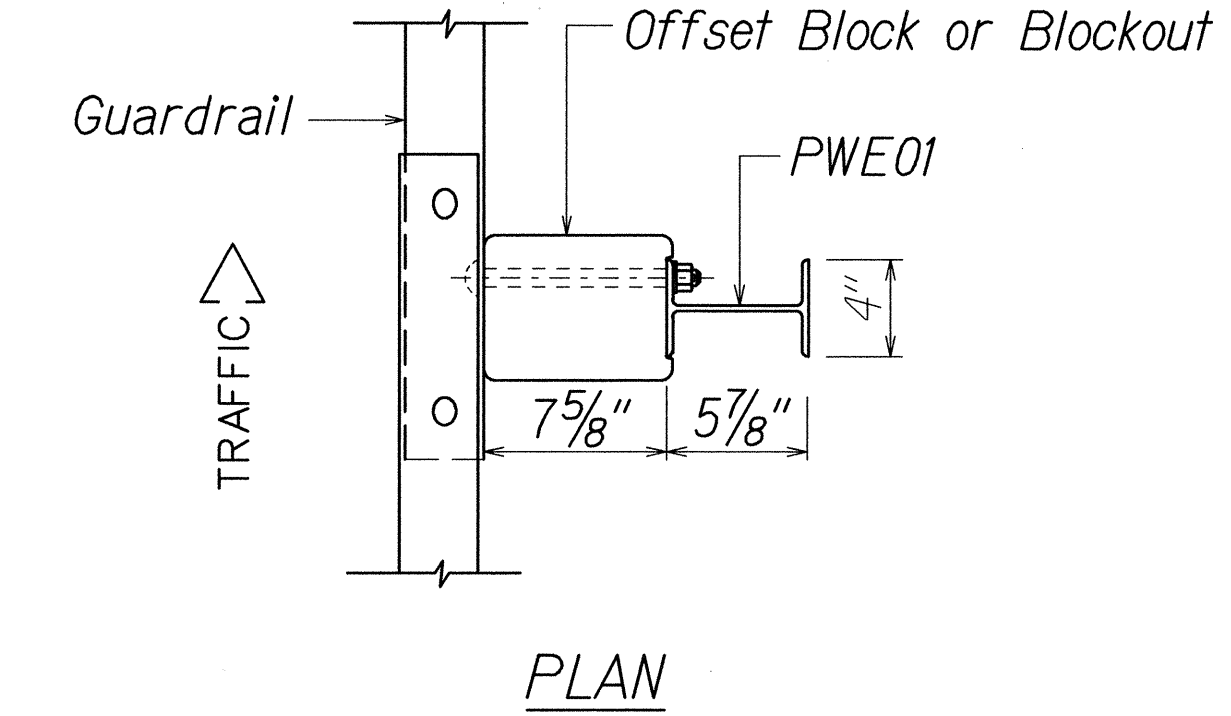
**GUARDRAIL DETAILS**  
LILIHA STREET REHABILITATION  
North King Street to School Street  
Project No. 7413A-01-04M

Scale: NTS  
SHEET No. 1 OF 6 SHEETS

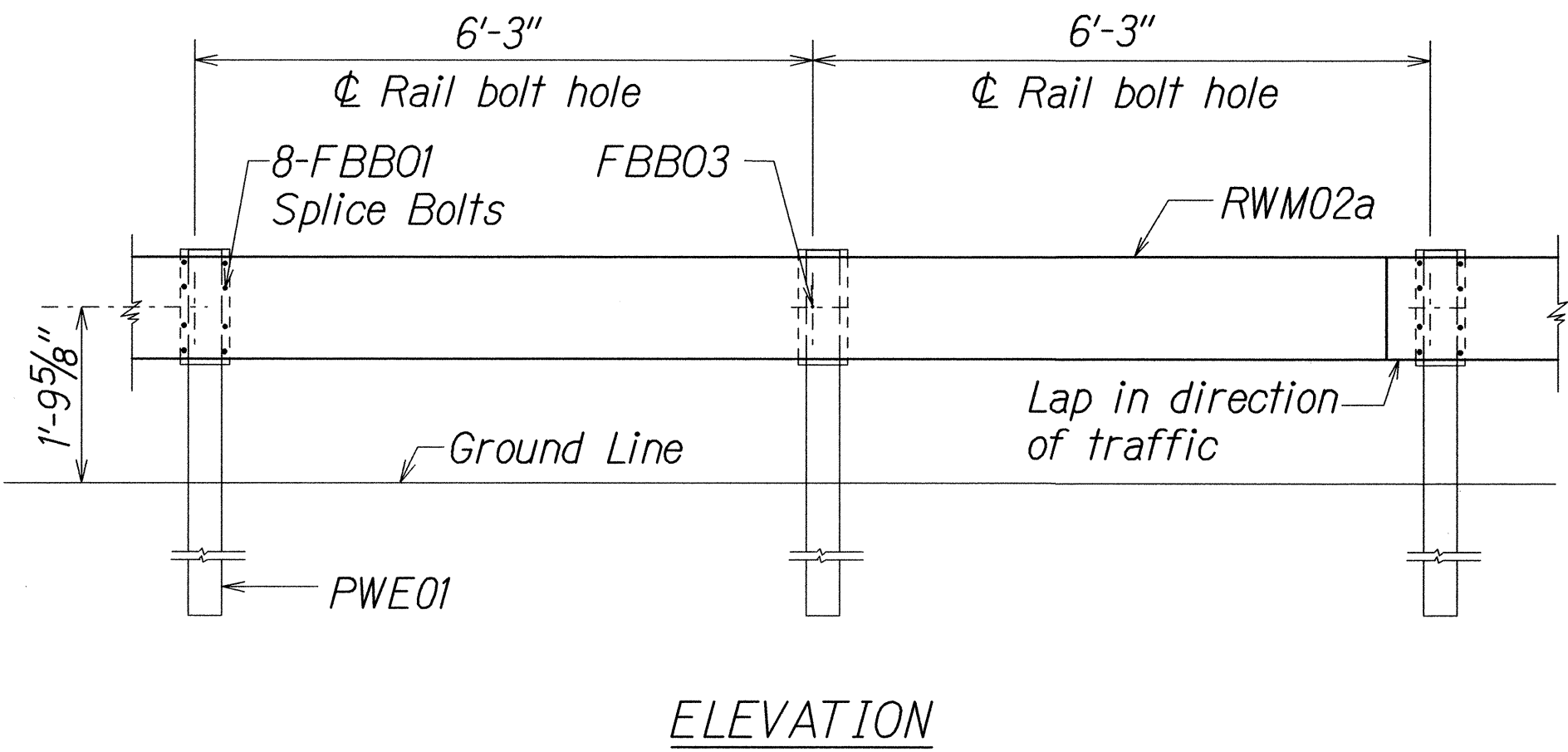
Date: April, 2014

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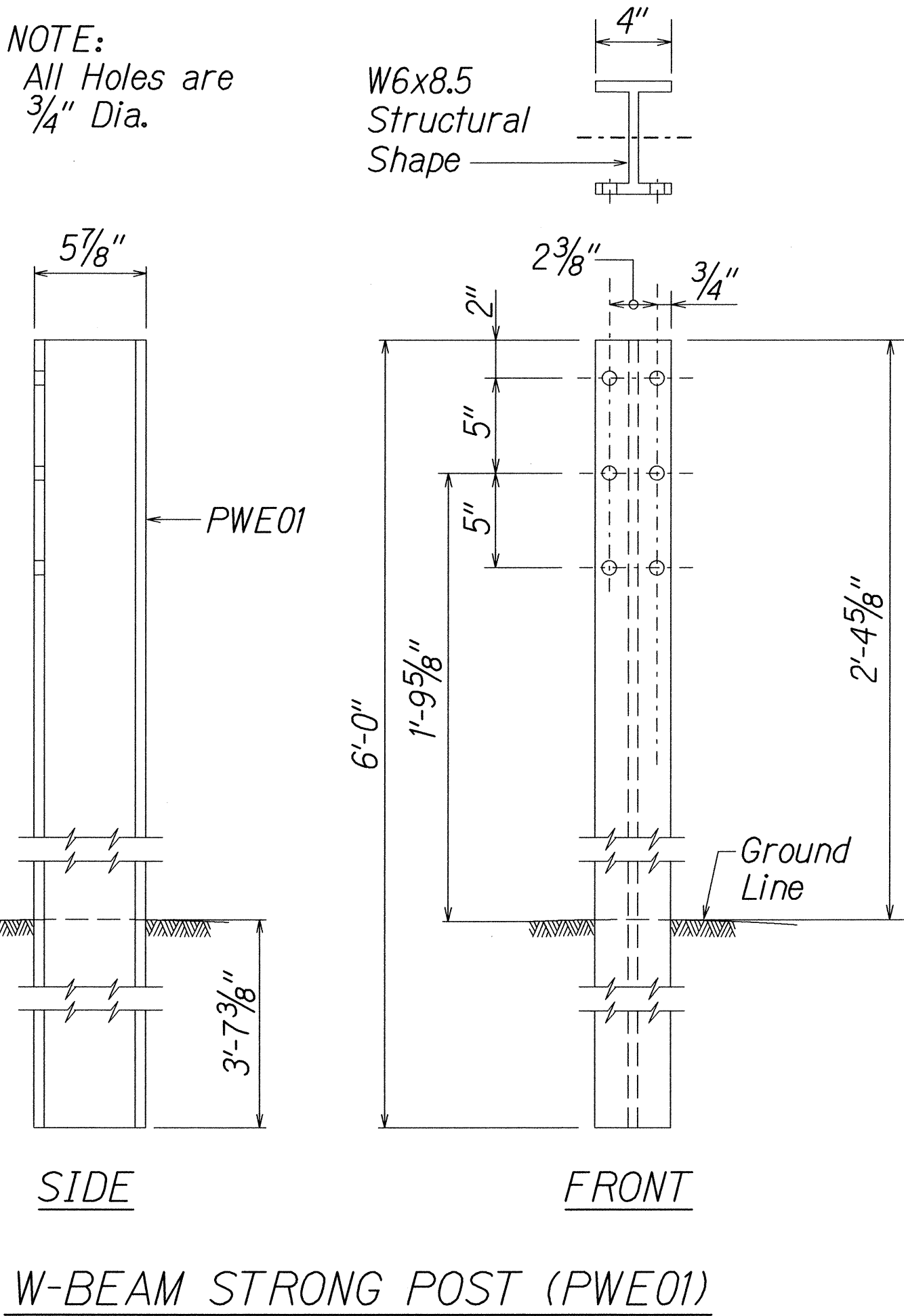
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7413A-01-04M	2014	24	62



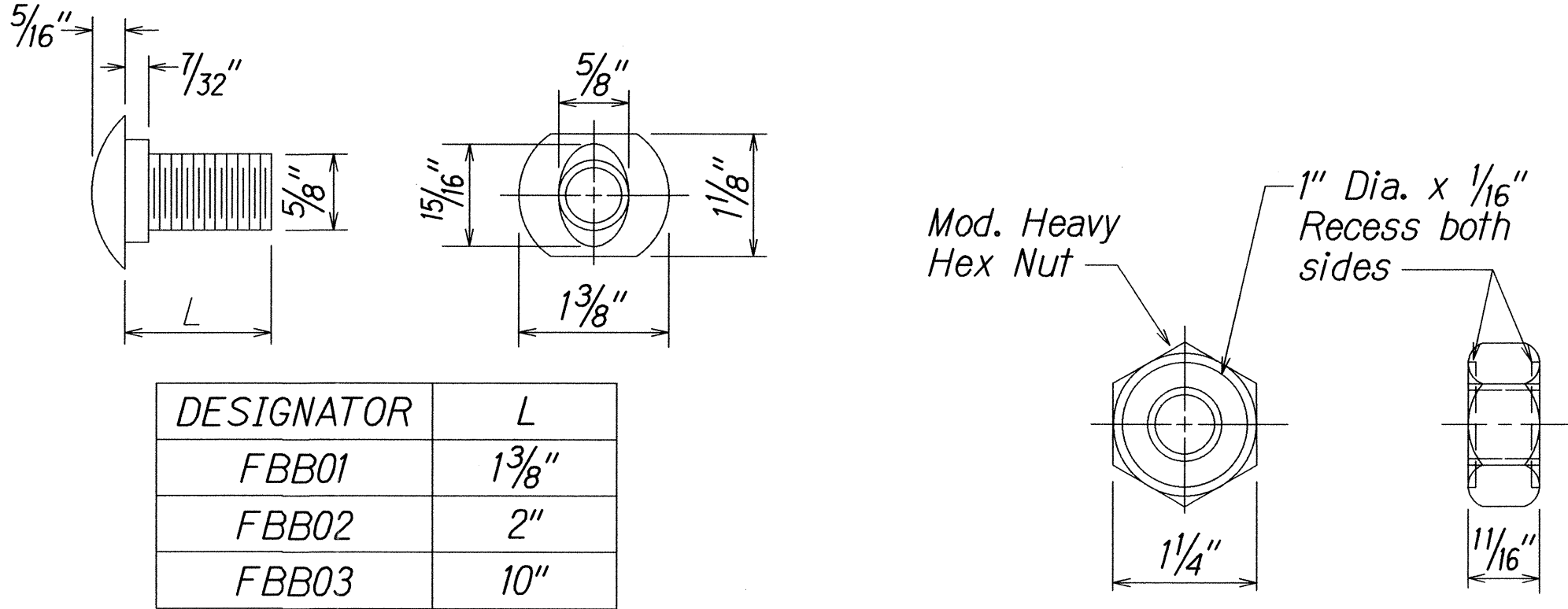
STRONG POST W-BEAM GUARDRAIL  
(SGR04a)



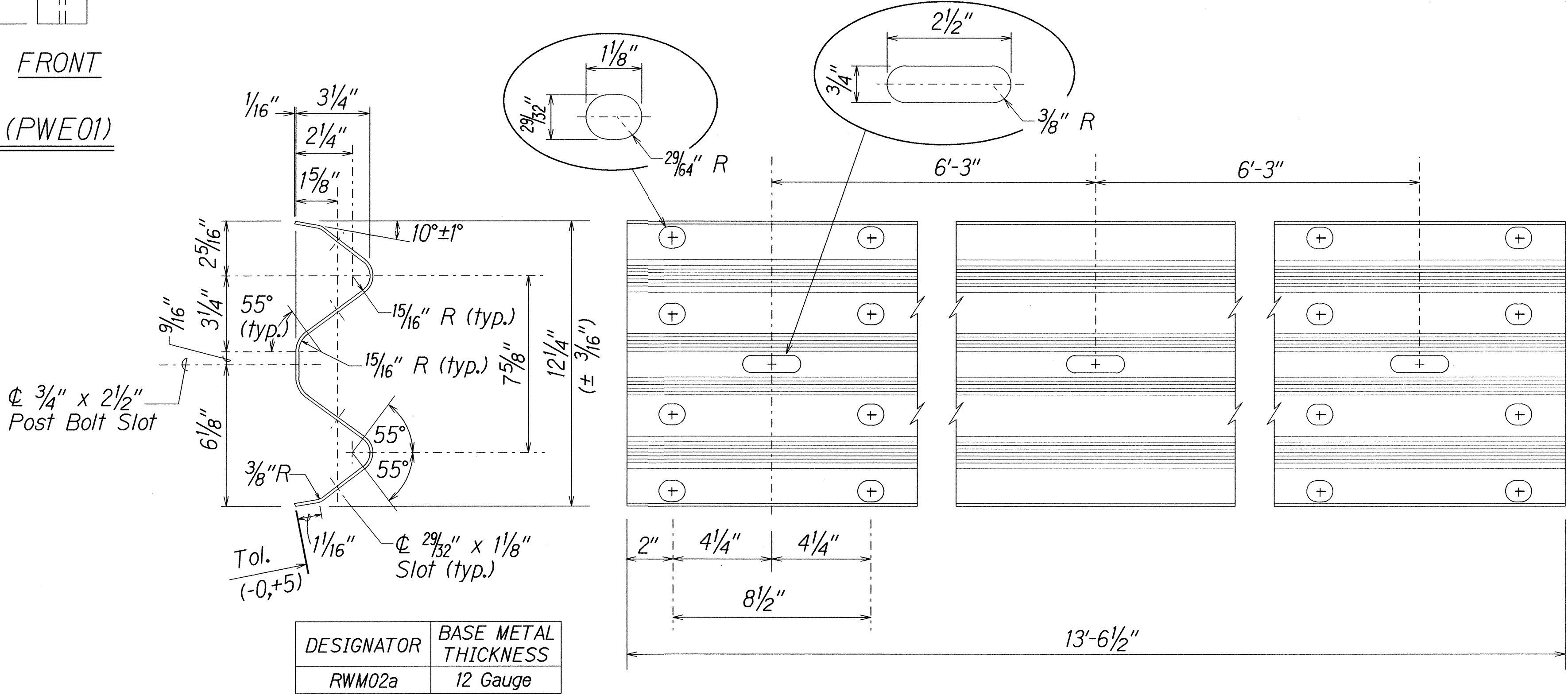
STRONG POST W-BEAM GUARDRAIL WITH  
RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT



W-BEAM STRONG POST (PWE01)



GUARDRAIL BOLTS AND RECESSED NUT



2 SPACE W-BEAM GUARDRAIL (RWM02a)

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

STRONG POST W-BEAM GUARDRAIL  
LILIHA STREET REHABILITATION  
North King Street to School Street  
Project No. 7413A-01-04M

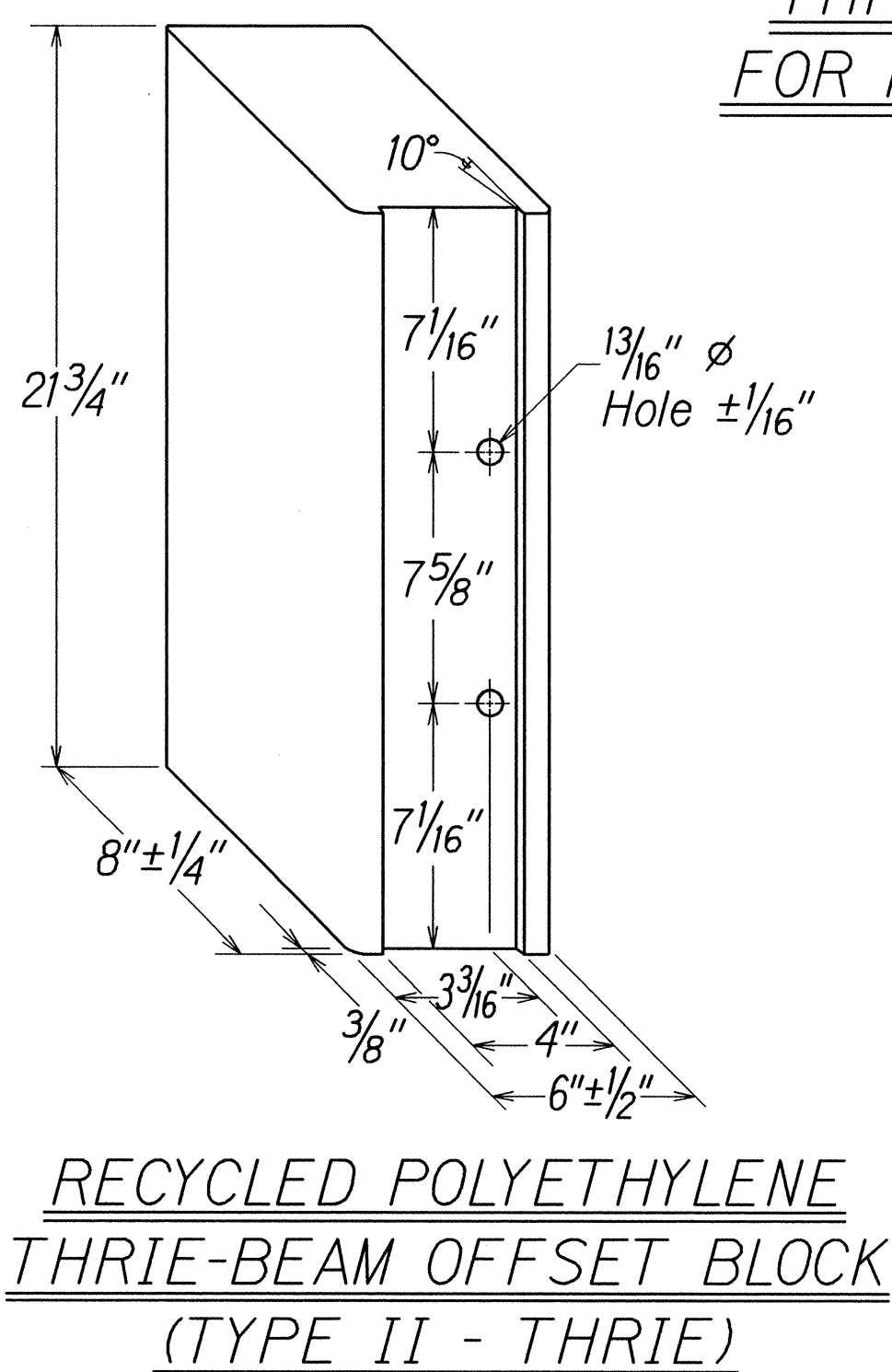
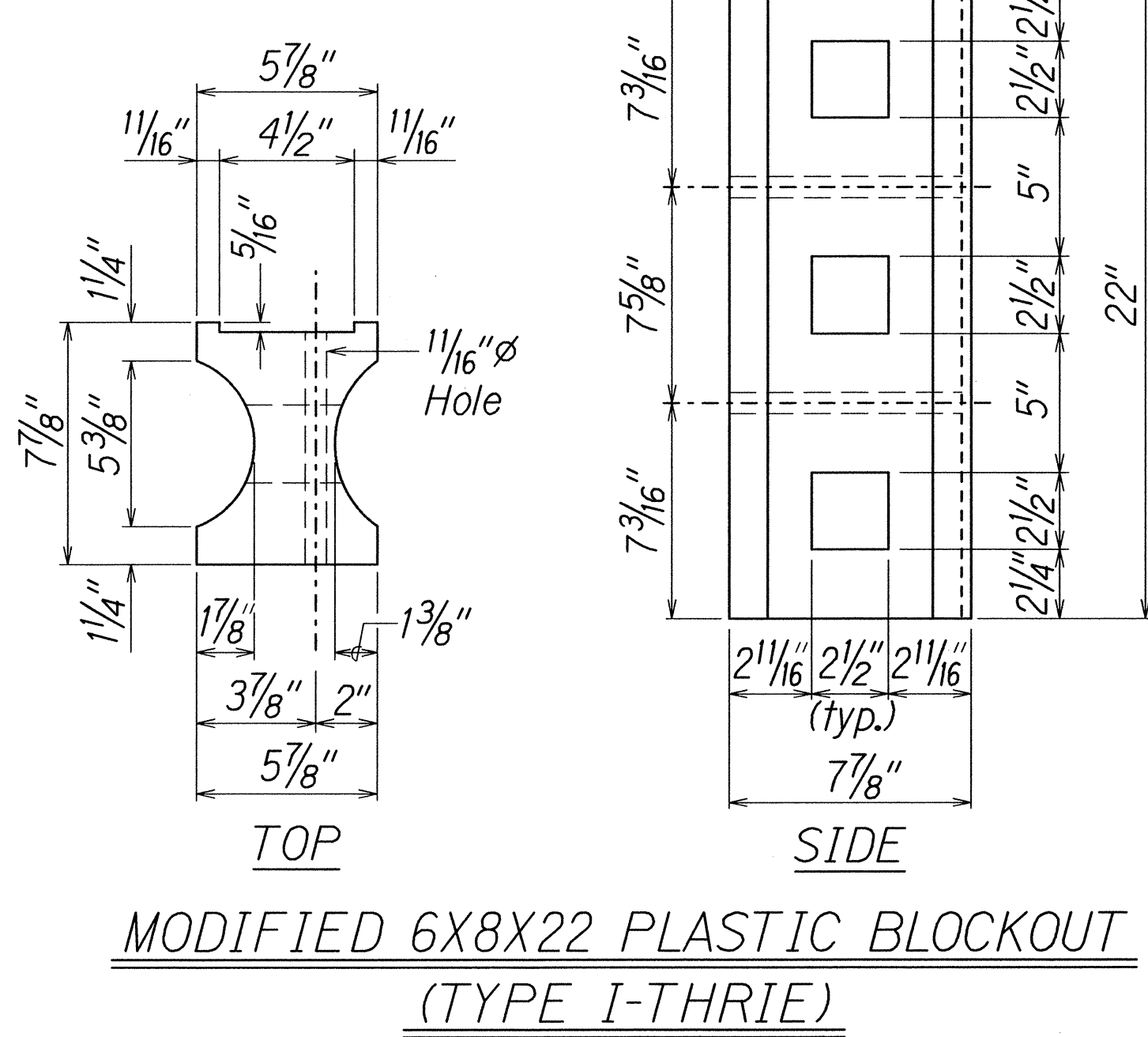
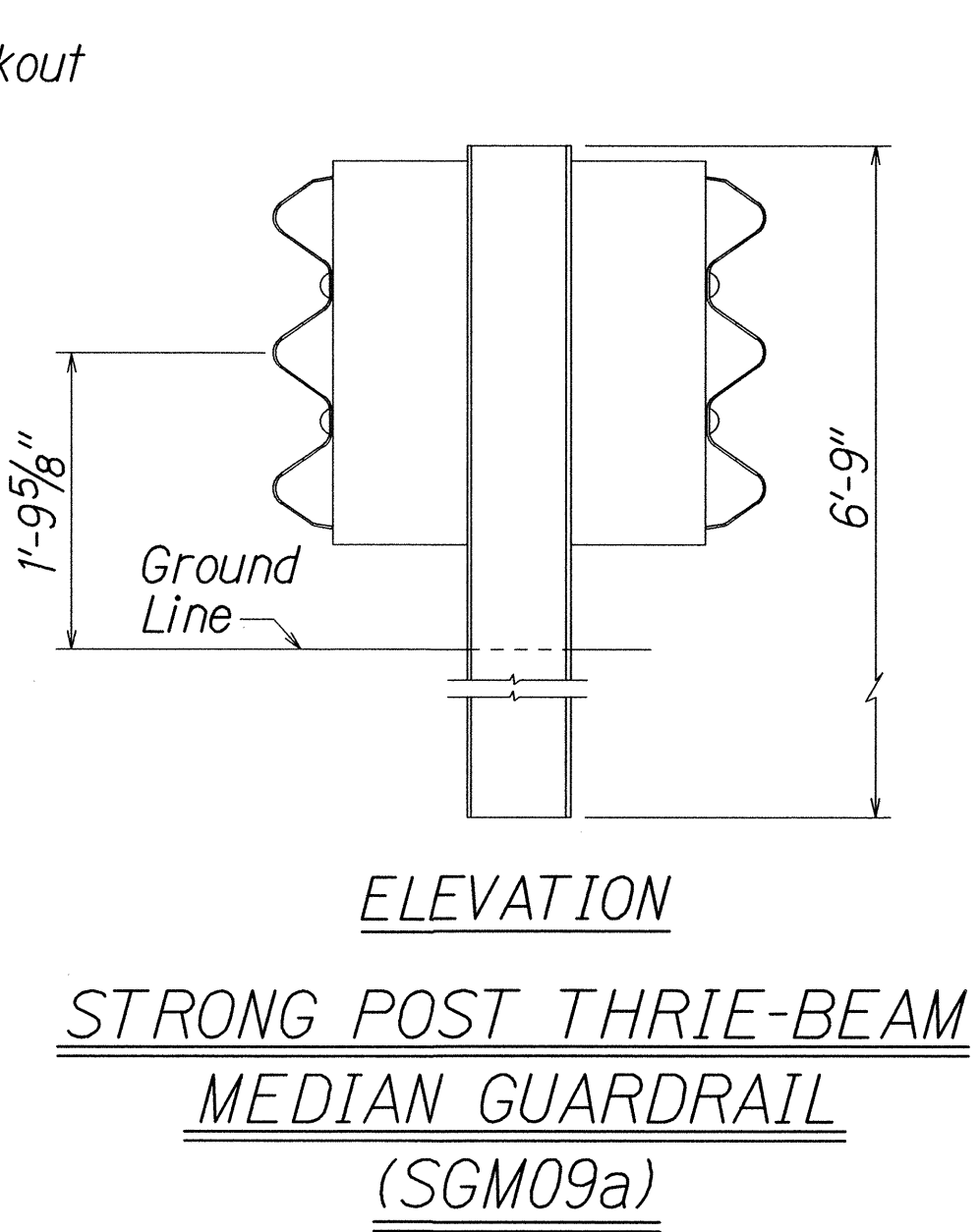
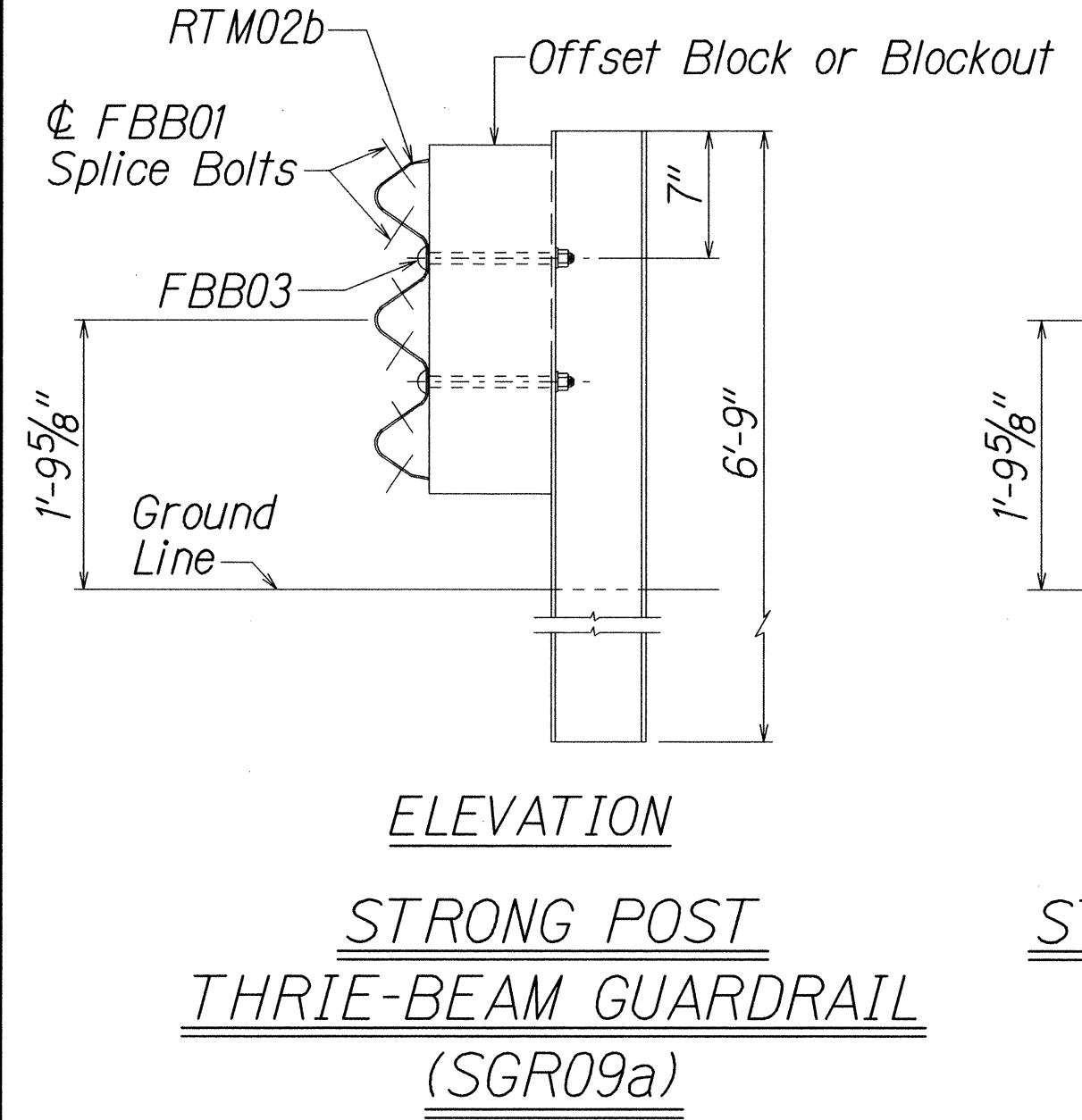
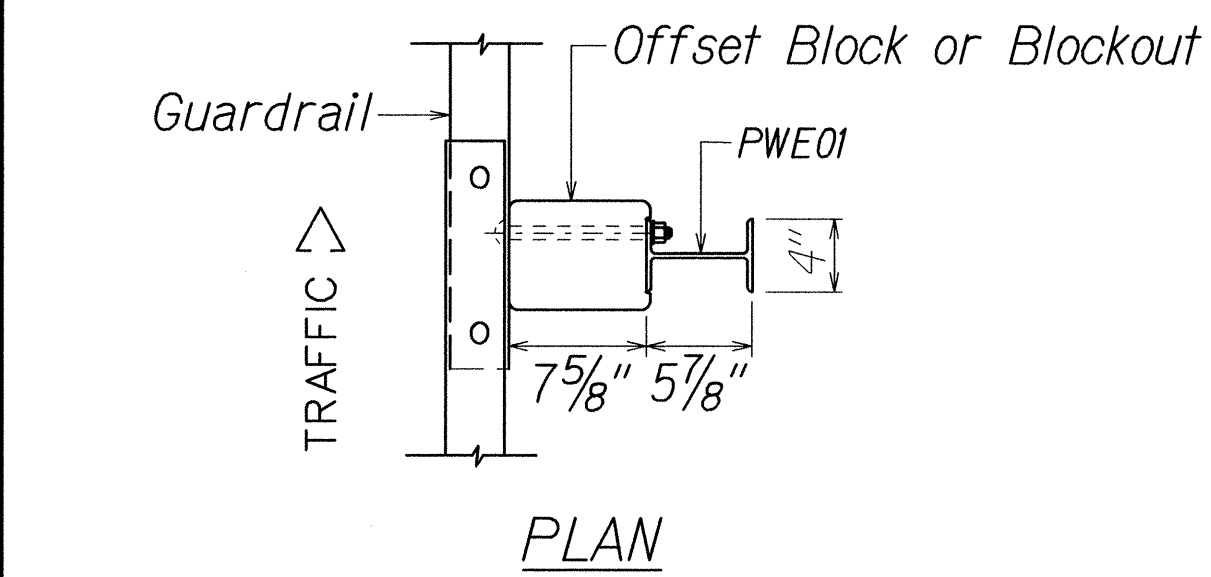
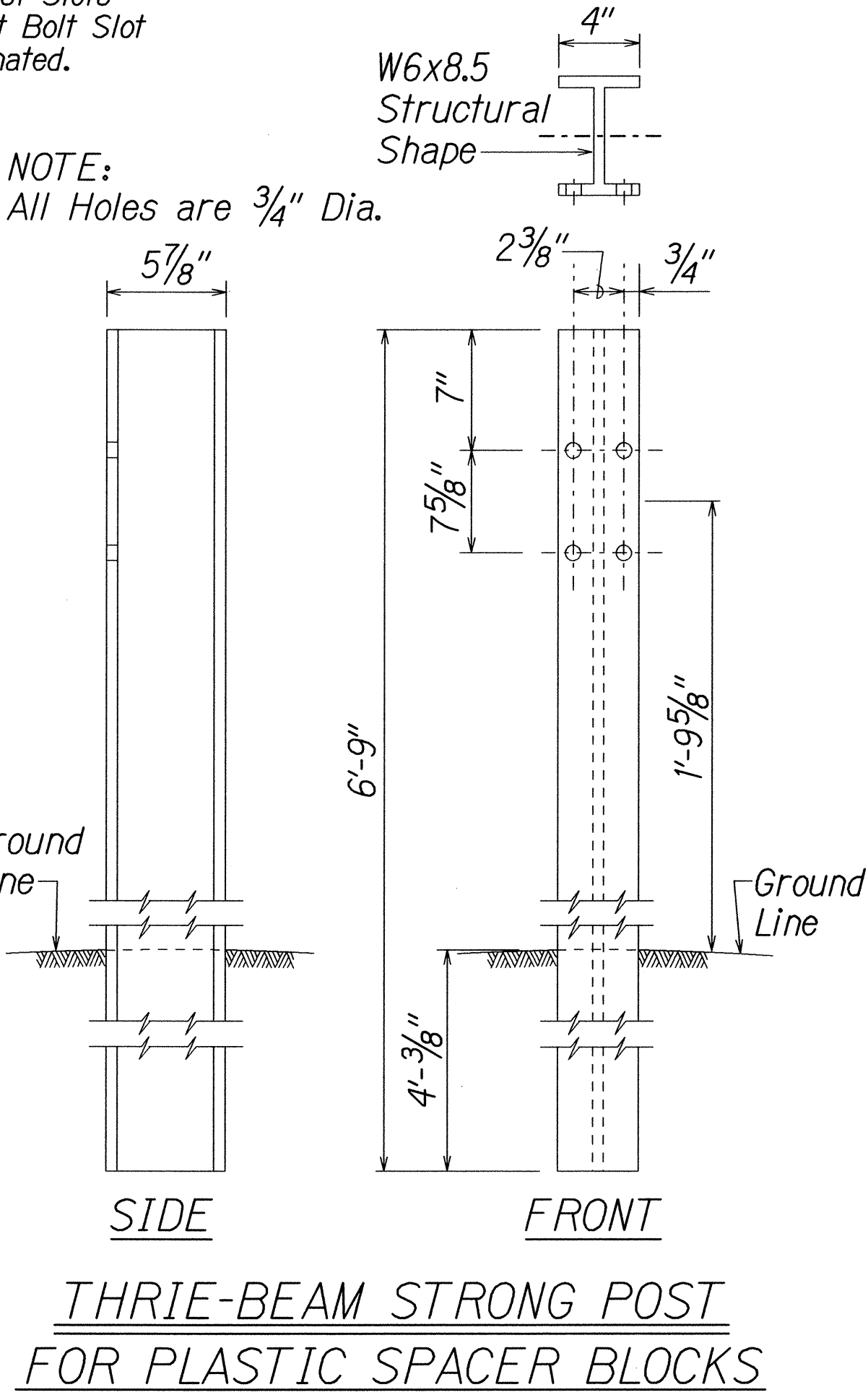
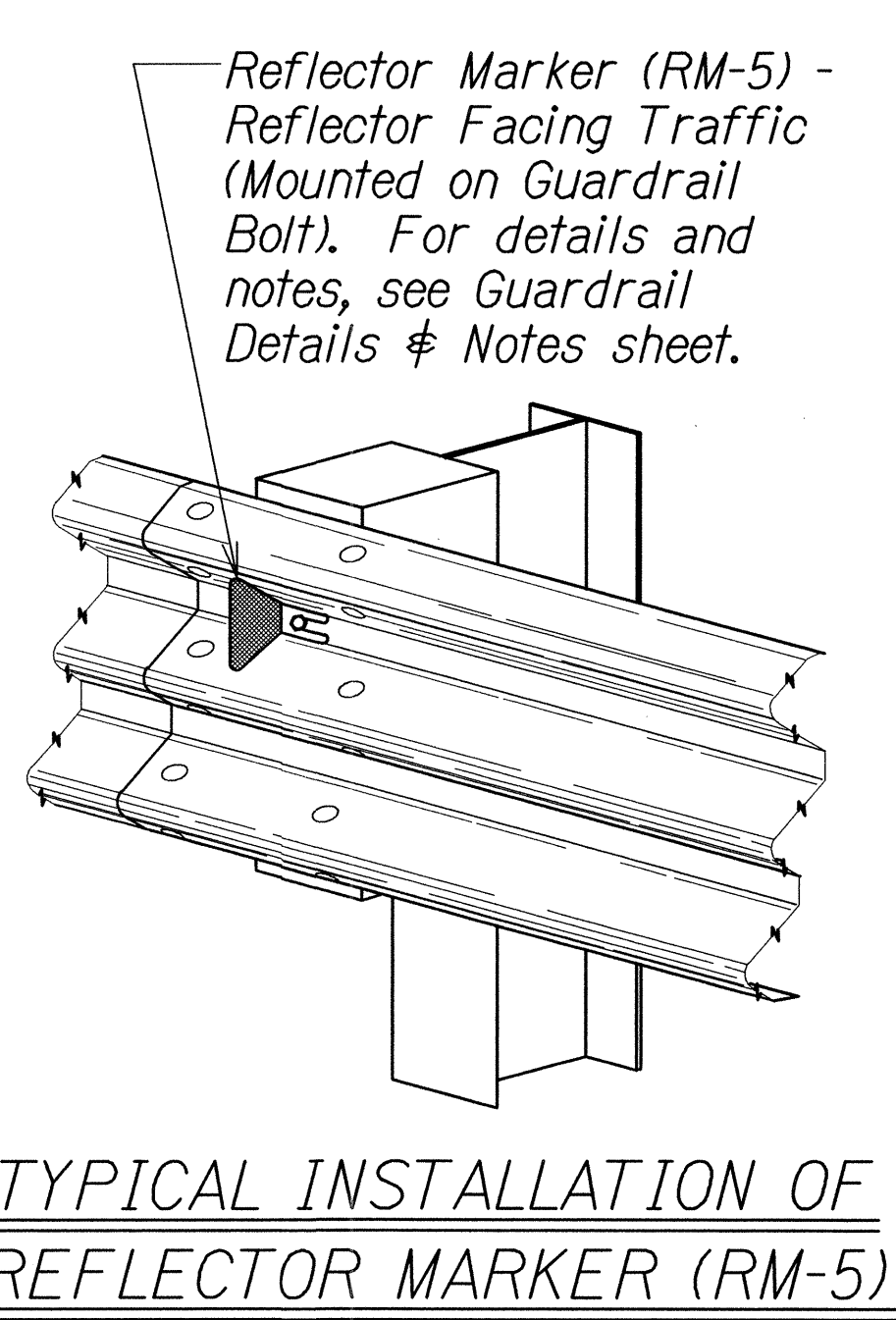
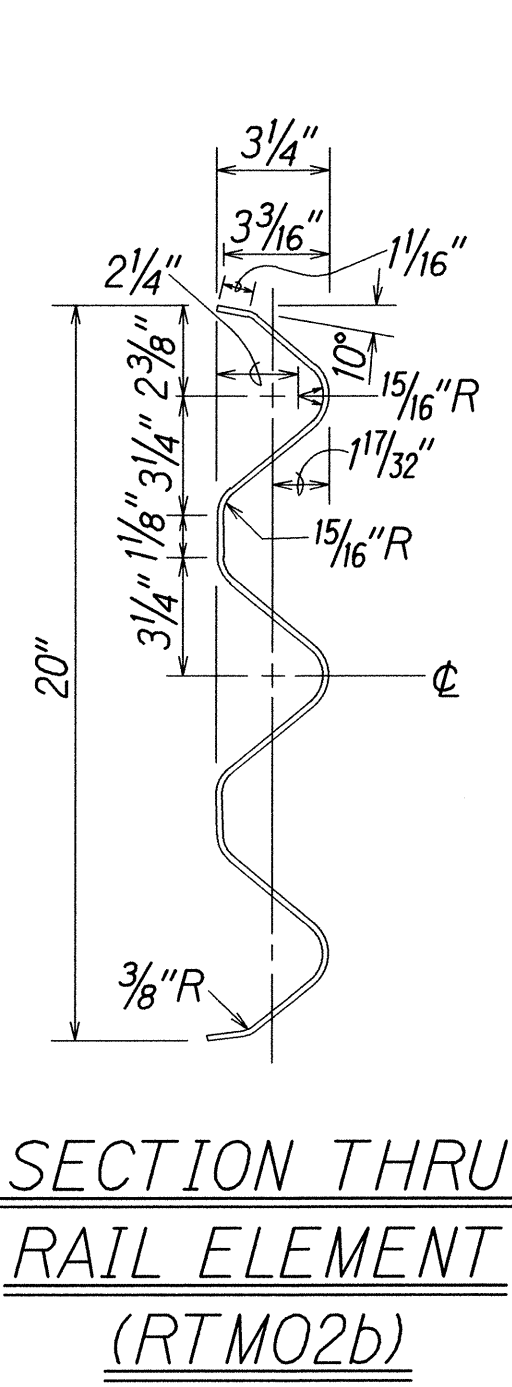
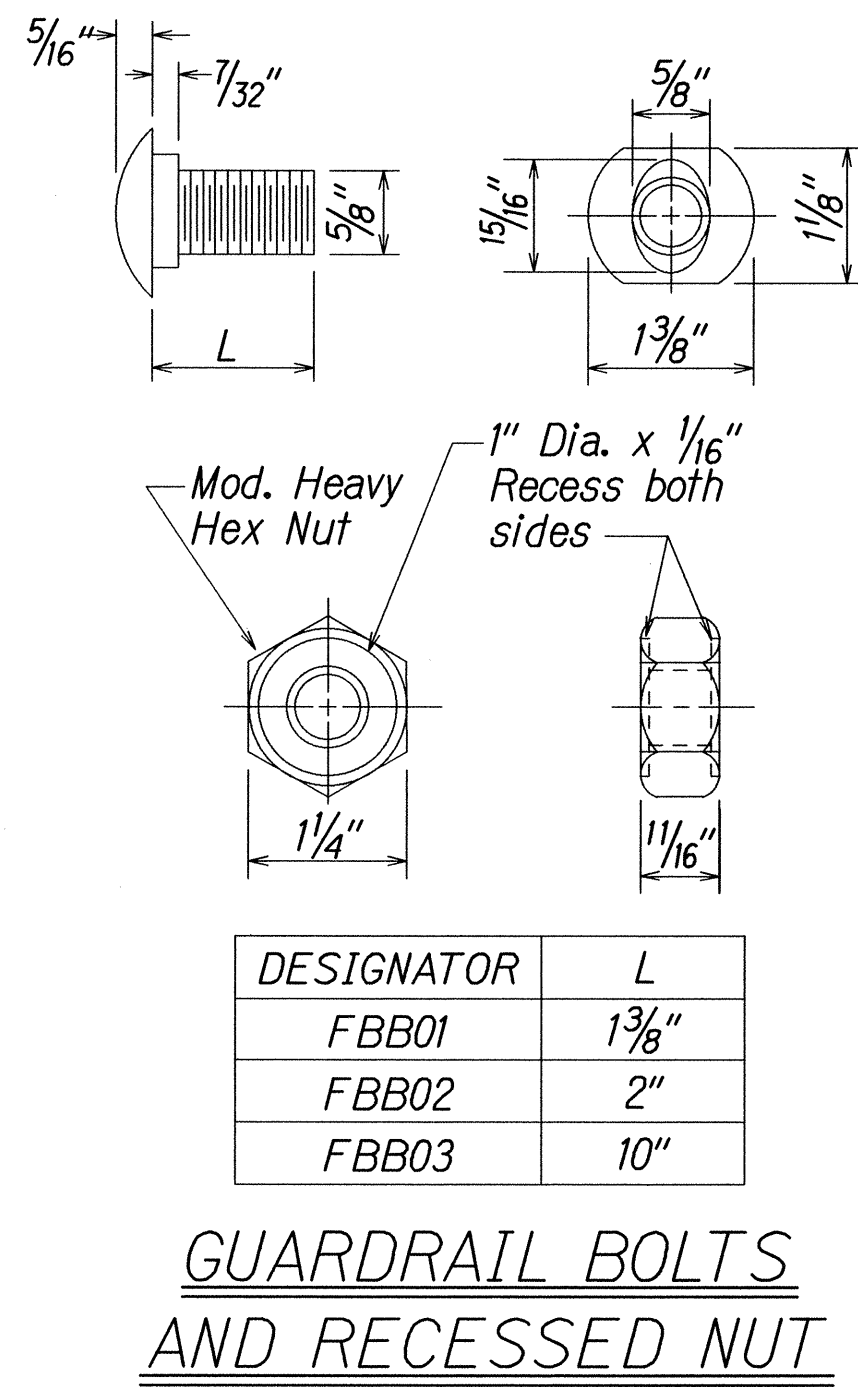
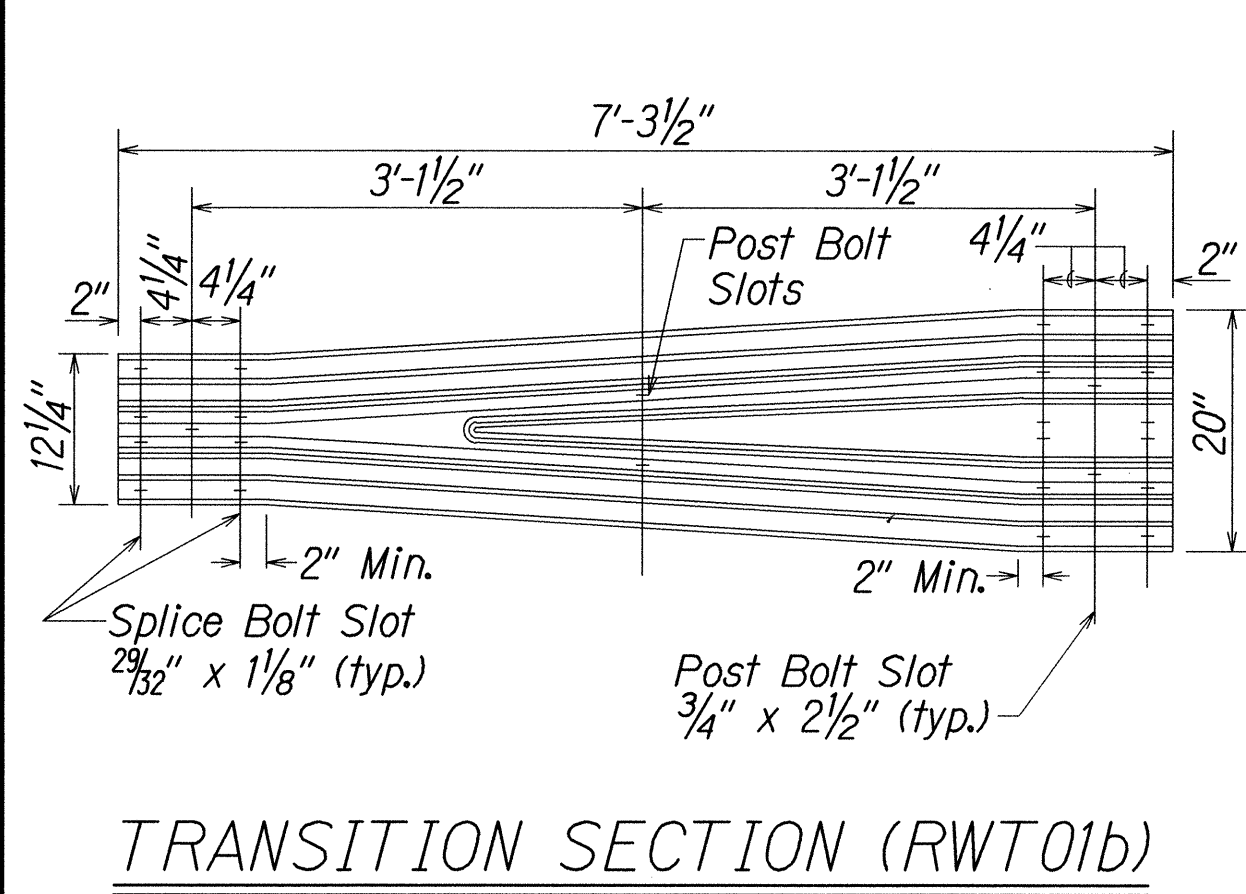
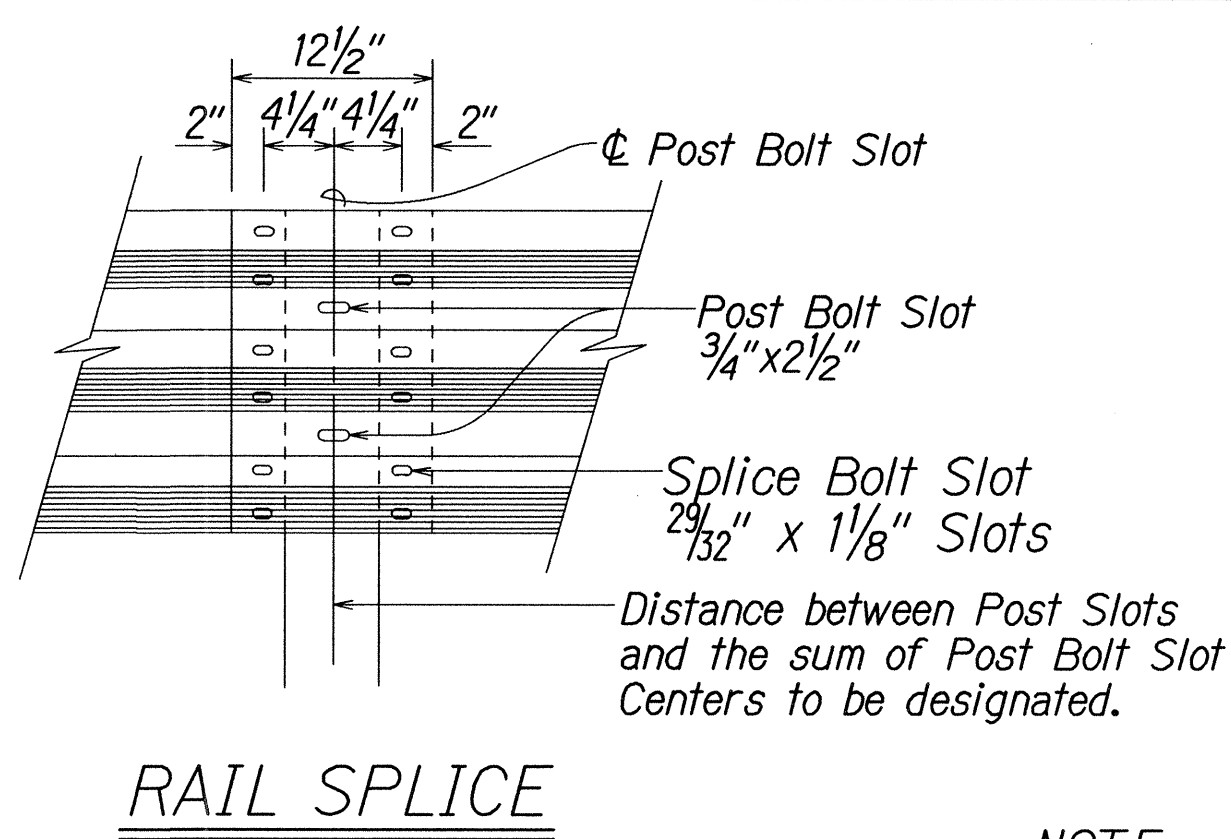
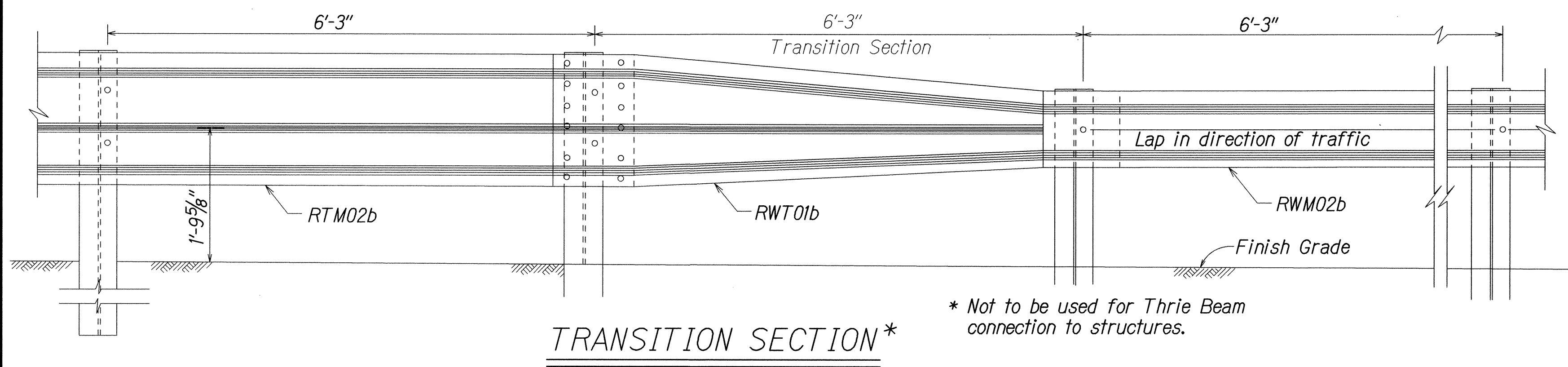
Scale: NTS  
Date: April, 2014

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ORIGINAL PLAN	

Standard Plan TE-50 (03/06/07)



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7413A-01-04M	2014	26	62



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

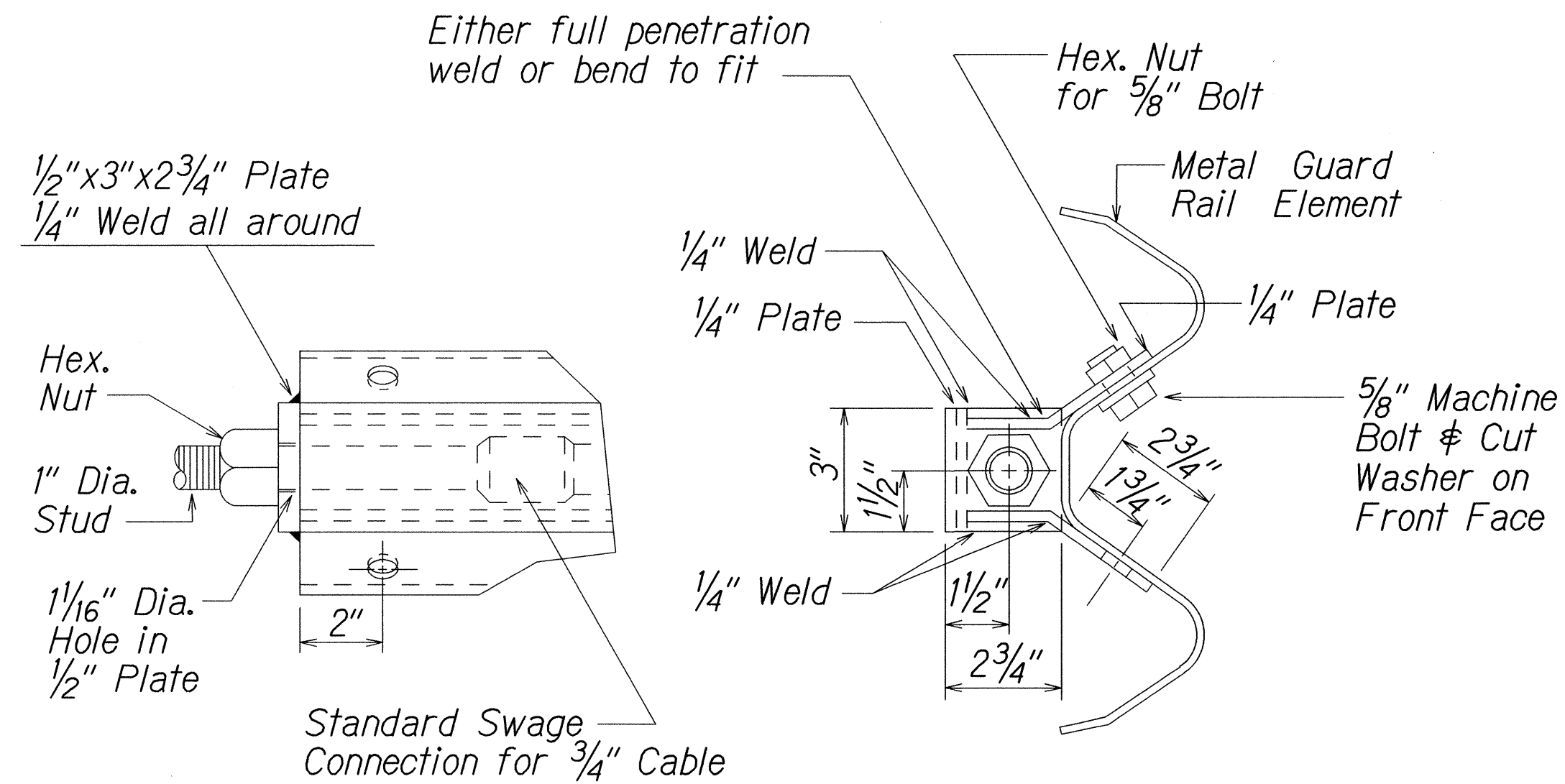
STRONG POST  
THRIE-BEAM GUARDRAIL  
LILIHA STREET REHABILITATION  
North King Street to School Street  
Project No. 7413A-01-04M  
Scale: Not to Scale      Date: April, 2014

SHEET No. 4 OF 6 SHEETS

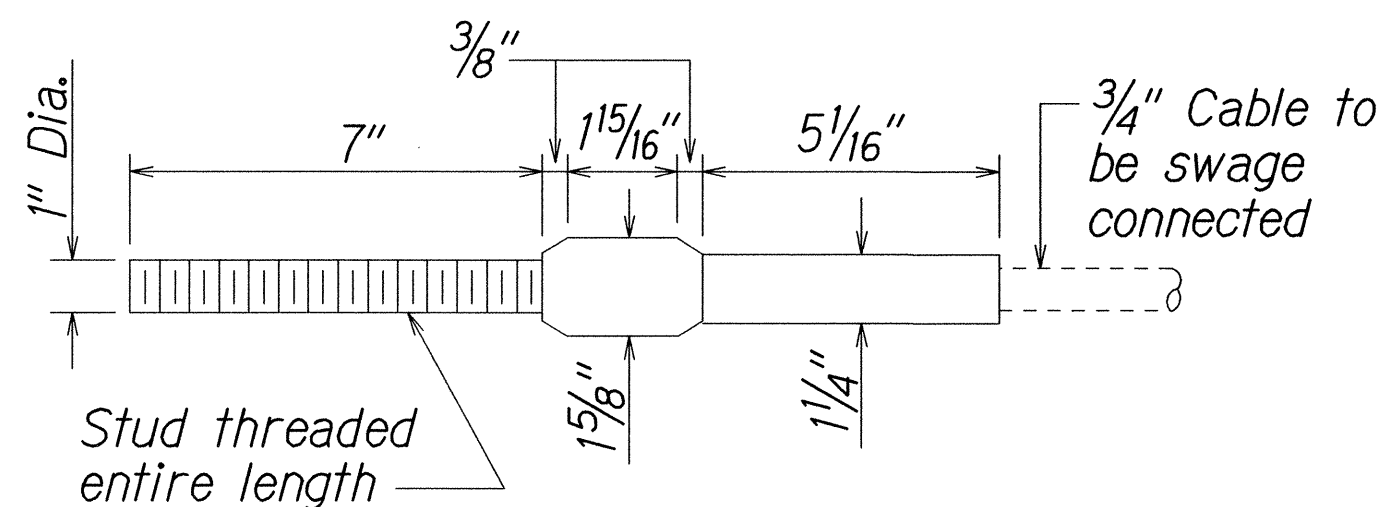
DESIGNED BY	DATE
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CHECKED BY	
IN CHARGE	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

7/10/05 telcub/guardrail/thriebeam.dgn (Standard Plan TE-57 r1/03/89 # TE-57a r1/03/89)

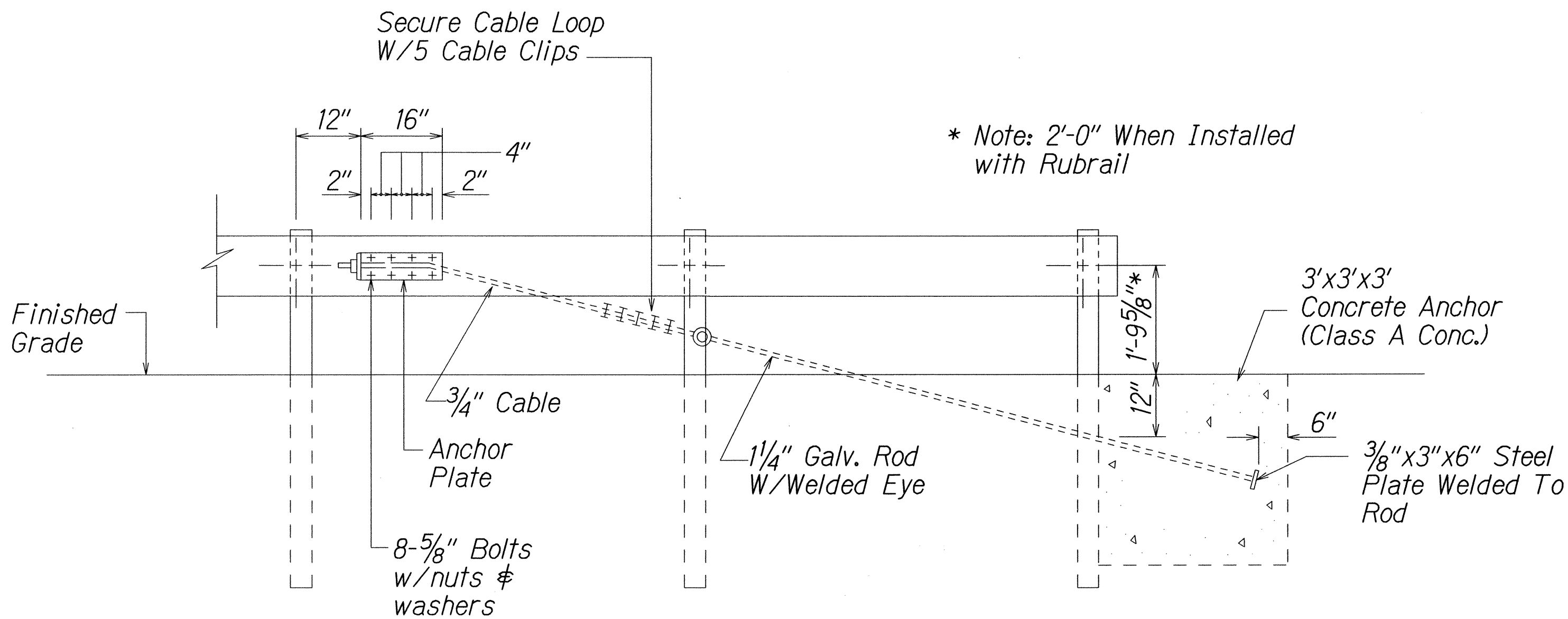
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7413A-01-04M	2014	27	62



ANCHOR PLATE DETAILS

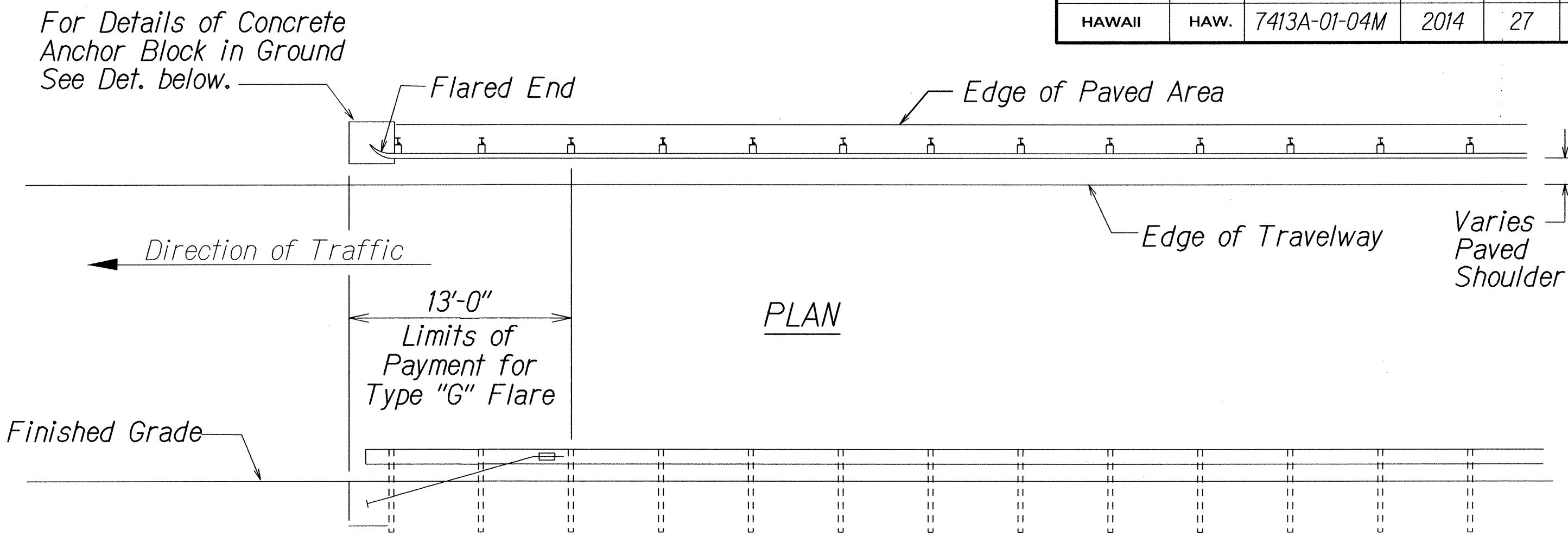


STANDARD SWAGED FITTING  
AND STUD



ANCHOR BLOCK DETAIL

- Concrete, G.R.P., excavation, anchor rod and miscellaneous appurtenances necessary to anchor the guardrail ends shall be incidental to metal guardrail.



ELEVATION

TYPE "G" FLARE END TERMINAL

NOTE:

Type "G" Modified End Terminal is a site specific end terminal with a taper and radial termini. A site specific detailed drawing is required for all Type "G" Modified End Terminal and must receive Engineer's approval.

The taper (flare rate) of the guardrail shall follow the latest edition of AASHTO'S Roadside Design Guide (currently, Table 5.6 - Suggested Flare Rate for Barrier Design, page 5-21, Jan. 1996 edition).

The radius of the radial termini is an Engineer's judgement based on the site evaluation. The Engineer shall consider safety (minimize the spearing & blunt end situation); degree and potential seriousness of the hazard; bicycle and pedestrian accessibility; maintenance equipment accessibility; Right-of-Way availability; the smallest radii the metal w-beam/thrie-beam railing can be constructed (check with supplier/contractor); posted speed limit; angle of vehicle impact; and aesthetics when designing the Type "G" Modified End Terminal.

During construction, the Contractor shall layout the proposed Type "G" Modified End Terminal and receive approval from the Construction Engineer prior to installation.

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13/13/02 tdl:cub/guardrail/1659rev.dgn Standard Plan TE-59 r11/03/89

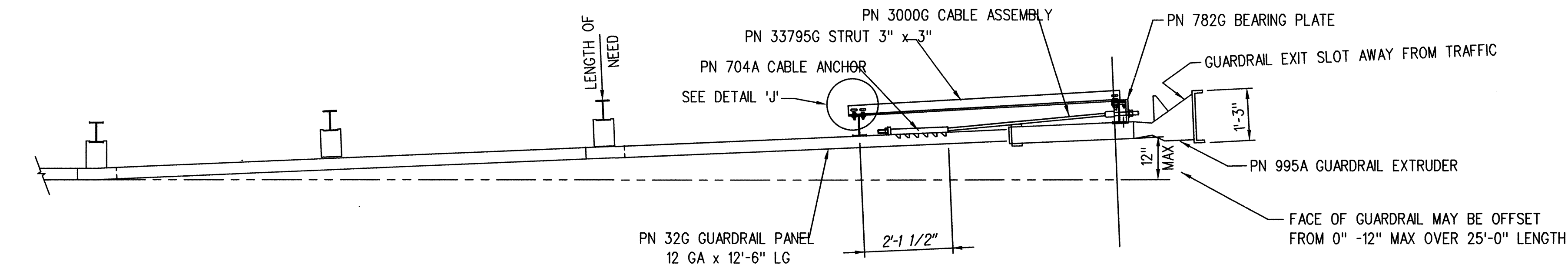
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**GUARDRAIL DETAILS**  
LILIHA STREET REHABILITATION  
North King Street to School Street  
Project No. 7413A-01-04M

Scale: NTS  
Date: April, 2014

SHEET No. 5 OF 6 SHEETS

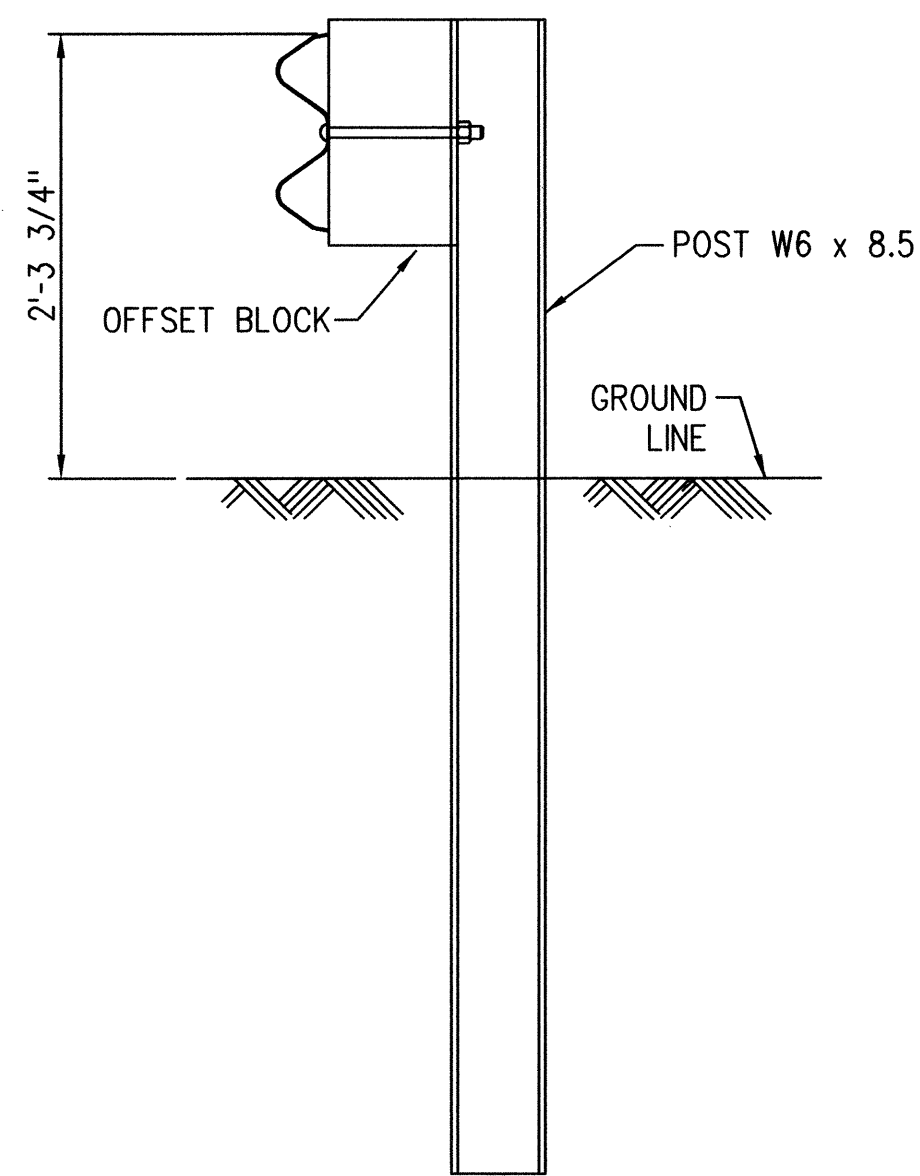
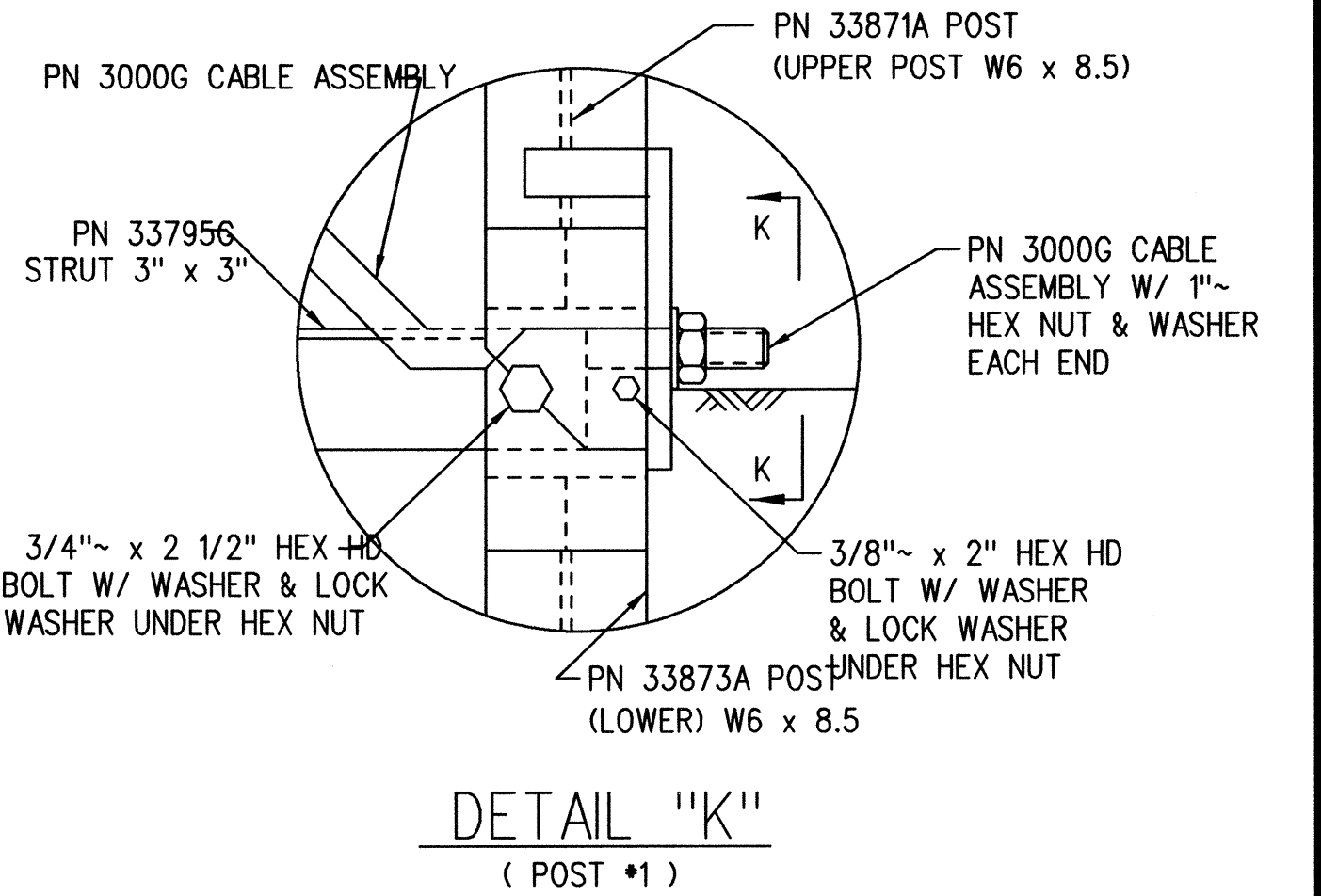
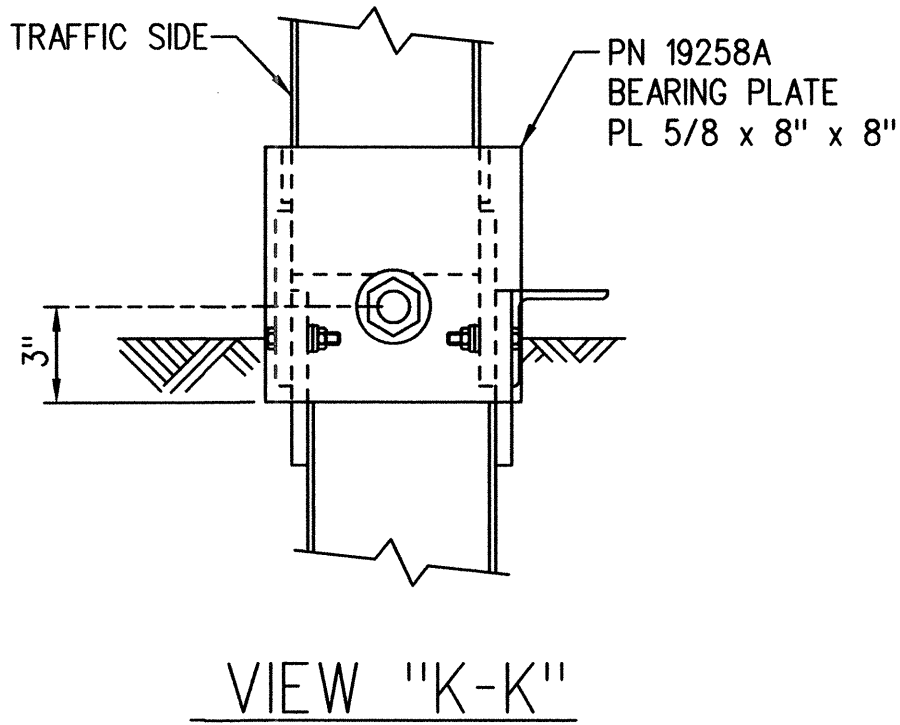
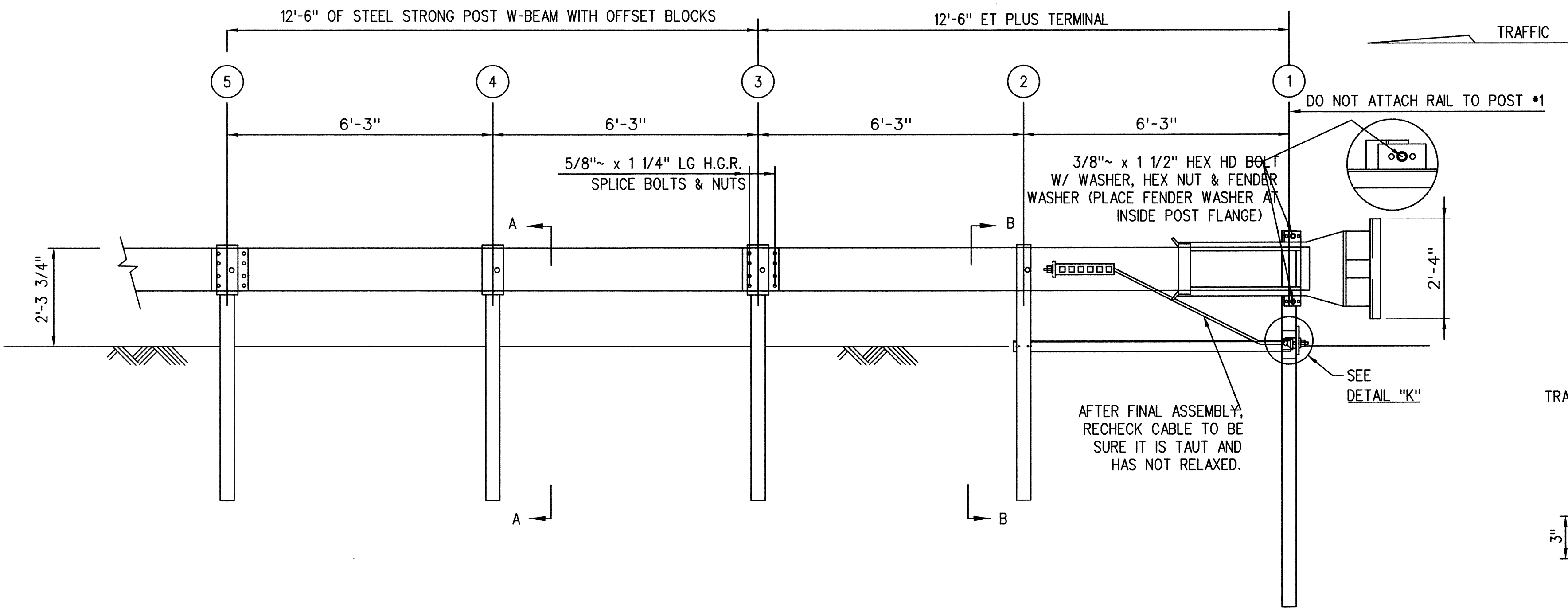
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7413A-01-04M	2014	28	62



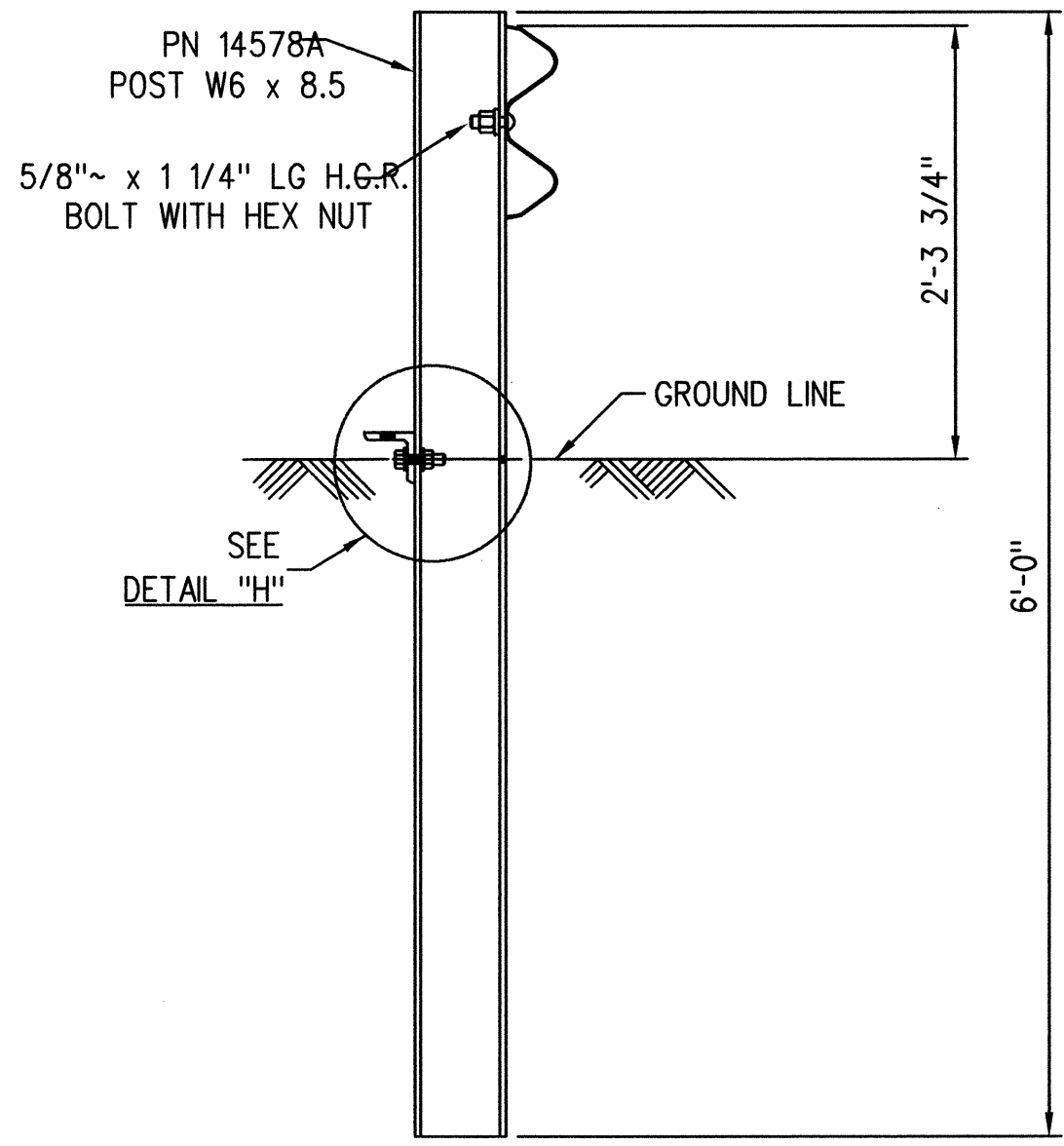
NOTE: Do not attach guardrail to Post #1.

Object Marker Note:  
The stripes for Object Marker shall slope downward at an angle of 45° towards the sides of the extruder head where traffic is to pass.

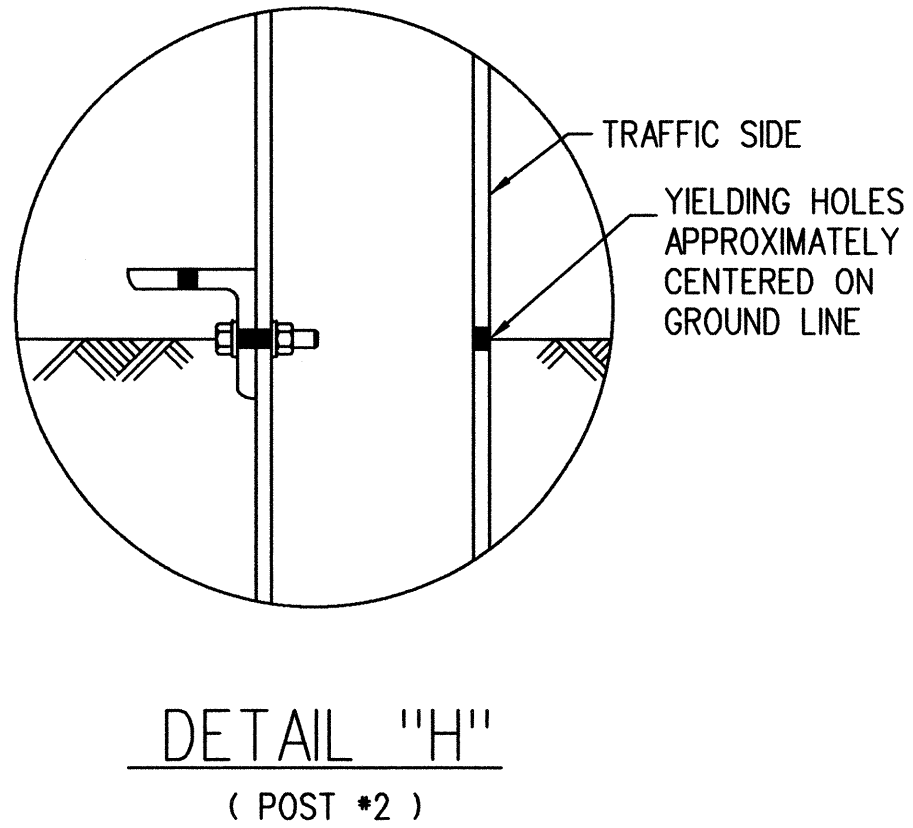
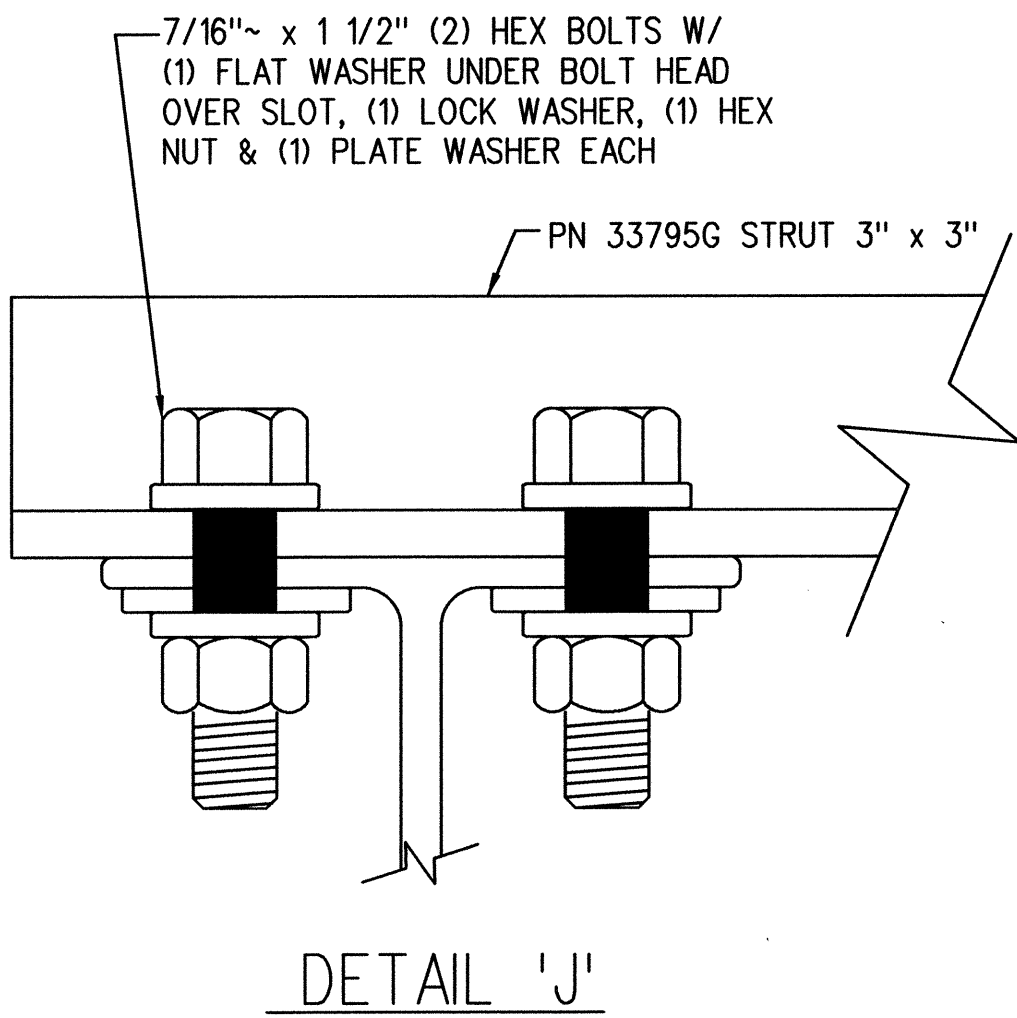
BILL OF MATERIAL		
PN	QTY	DESCRIPTION
32G	1	12/12'-6/6'3/S ANC (GUARDRAIL)
704A	1	CABLE ANCHOR BRACKET
995A	1	ET-PLUS EXTRUDER
3000G	1	CABLE 3/4 x 6'6
3340G	9	5/8" HEX NUT
3360G	9	5/8" x 1 1/4" SPLICE BOLT
3701G	2	3/4" FLAT WASHER
3704G	2	3/4" HEX NUT
3717G	2	3/4" x 2 1/2" HEX HD BOLT
3900G	2	1" FLAT WASHER
3910G	2	1" HEX NUT
4254G	4	3/8" FLAT WASHER
4255G	2	3/8" FENDER WASHER (1 1/2 OD)
4258G	2	3/8" LOCKWASHER
4261G	2	3/8" x 1 1/2" HEX HD BOLT
4389G	2	7/16" FLAT WASHER
4390G	2	7/16" x 1 1/2" HEX HD BOLT
4393G	2	7/16" LOCK WASHER
4396G	2	7/16" HEX NUT
4699G	2	3/4" LOCK WASHER
6321G	2	3/8" x 2" HEX HD BOLT
6405G	4	3/8" HEX NUT
6668B	1	OBJECT MARKER
14578G	1	POST SYT #2
19258A	1	5/8" x 8" x 8" BEARING PLATE
33795G	1	ANGLE STRUT (ET/SYTP/HBA)
33871A	1	POST ET PLUS HBA #1 TOP
33873A	1	POST ET PLUS HBA #1 BOTTOM



SECTION "A-A"  
(TYP @ POSTS # 3 AND BEYOND)



SECTION "B-B"  
(POST #2)



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

ET-PLUS TL-2  
LILIHA STREET REHABILITATION  
North King Street to School Street  
Project No. 7413A-01-04M

Scale: Not to Scale  
Date: April, 2014

SHEET No. 6 OF 6 SHEETS

DESIGNED BY	DATE
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CHECKED BY	
IN CHARGE	
NOTED BY	
QUANTITIES BY	
CHECKED BY	
DATE	

3/22/12 tdr/ruby/guardrail/TL-2-etplus12\_C4.dgn