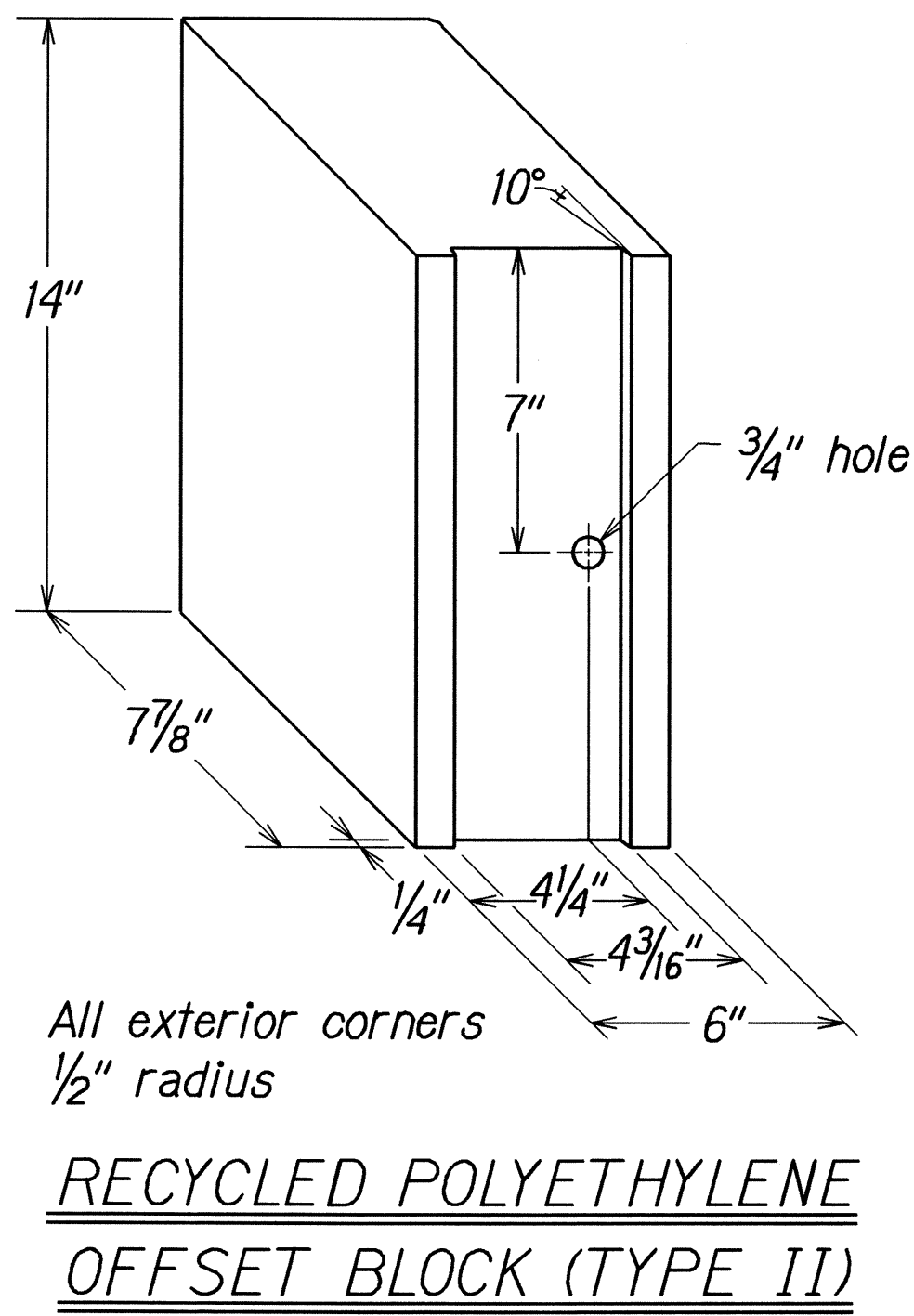
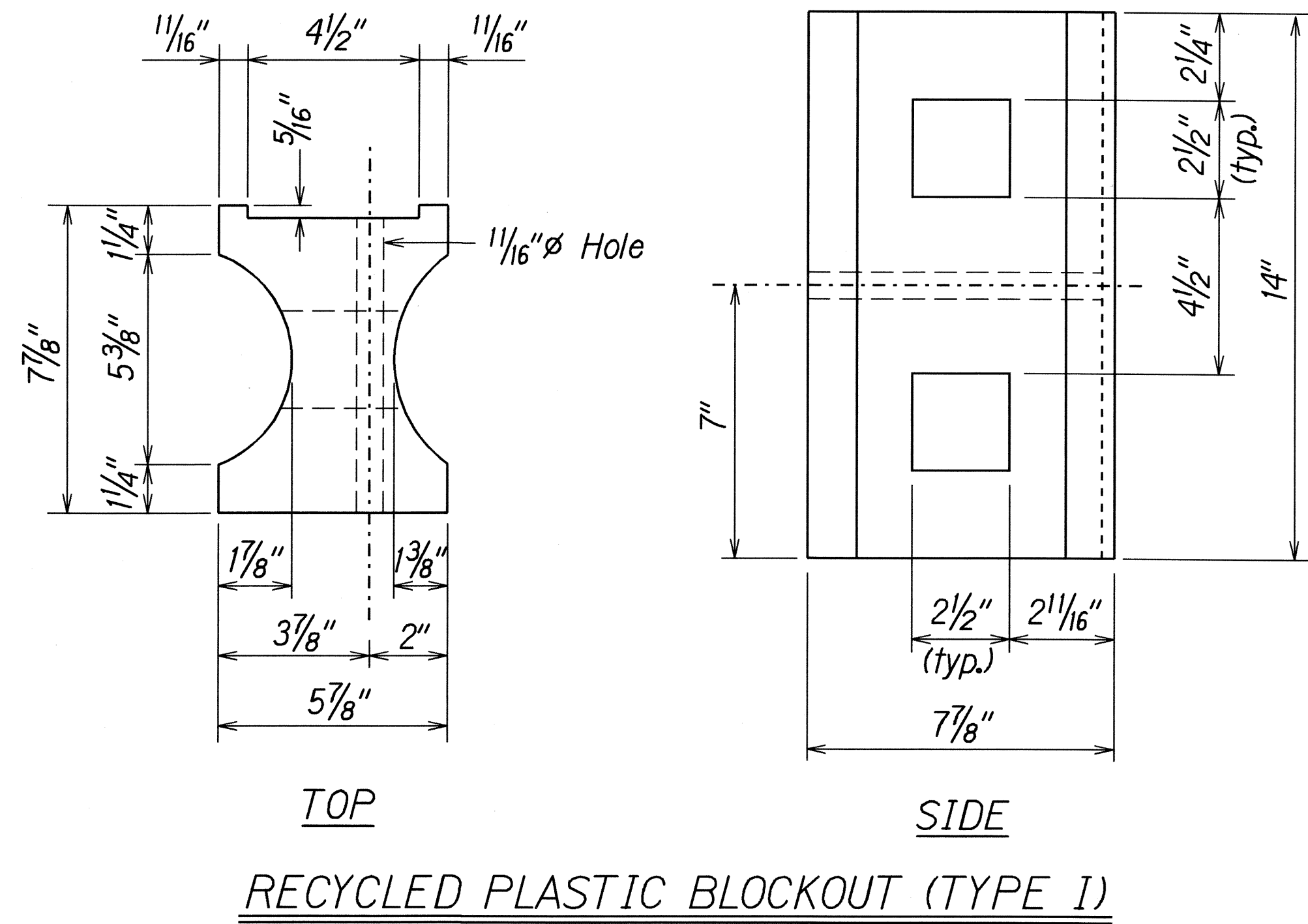
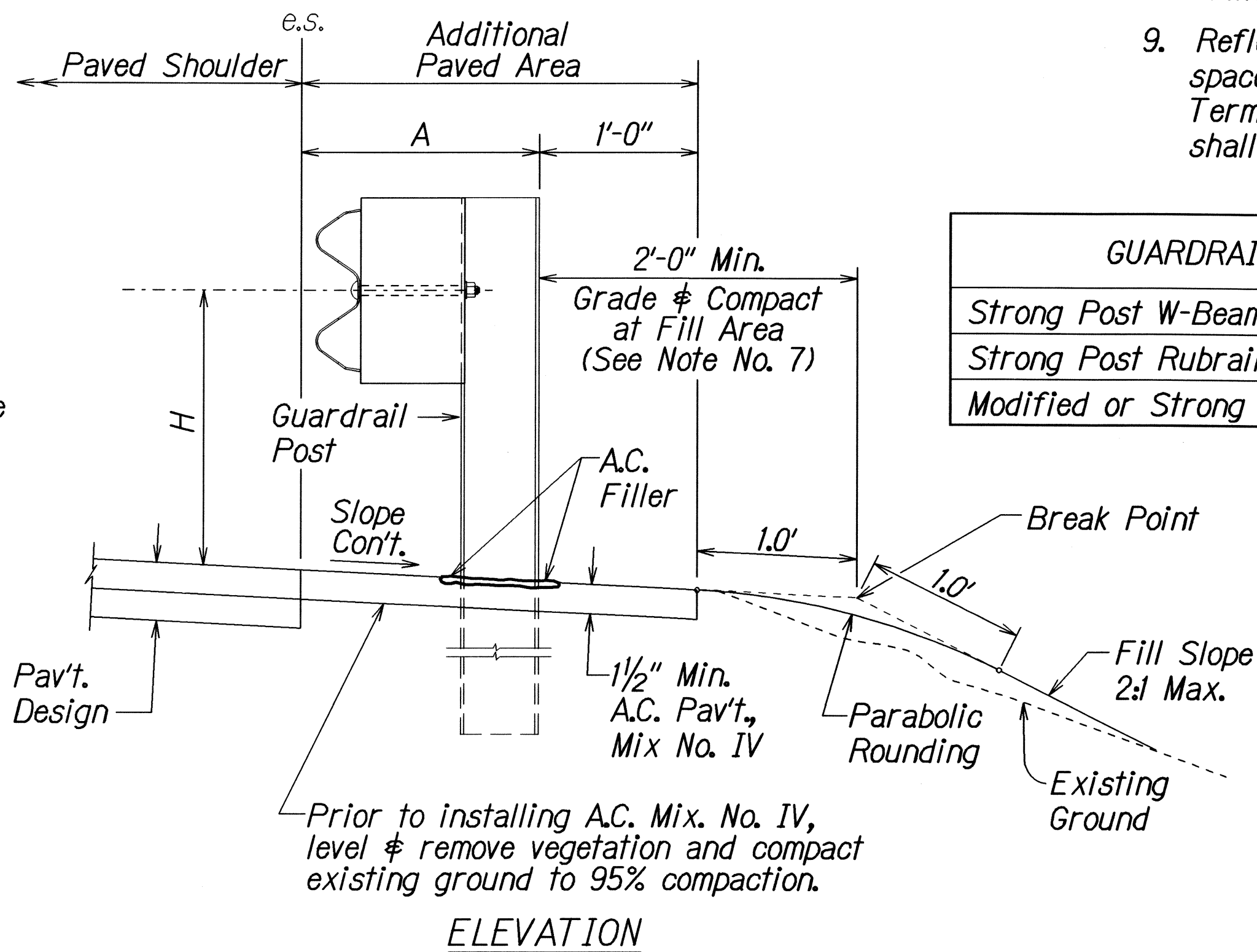
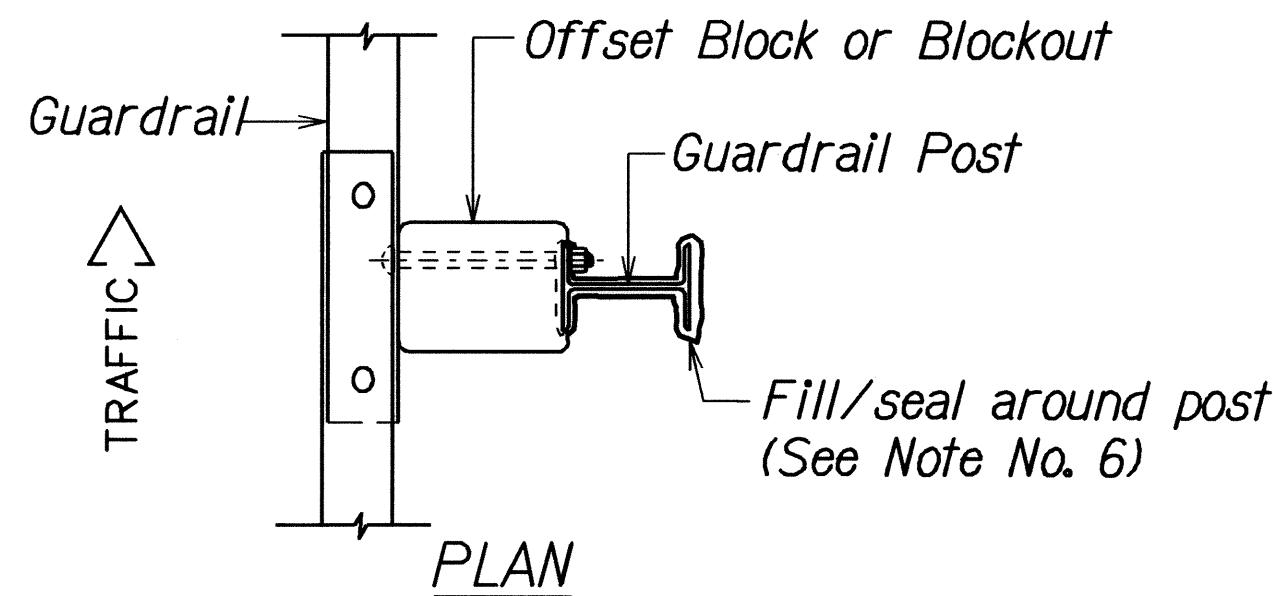
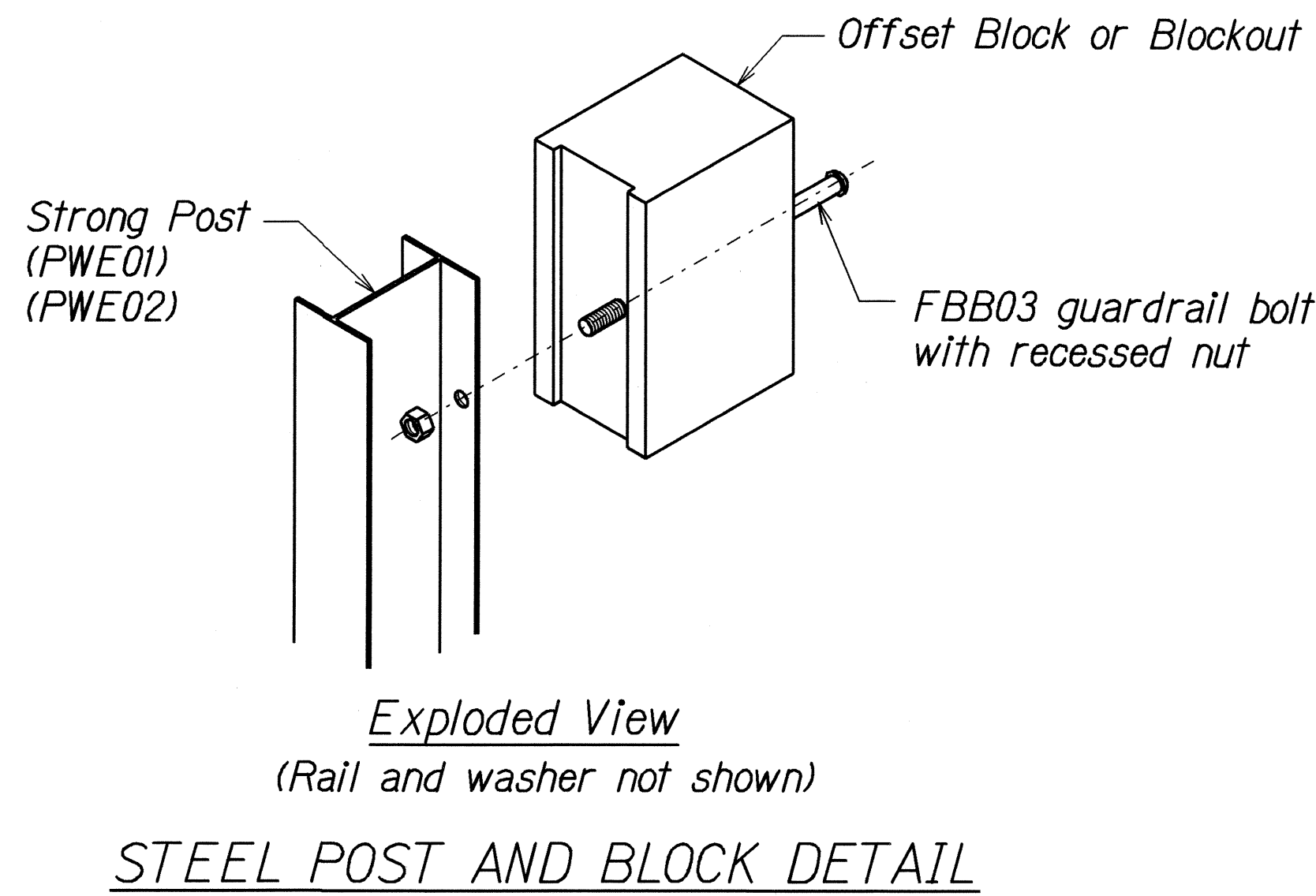


| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | 37CDE-01-08M | 2008 | 12 | 30 |

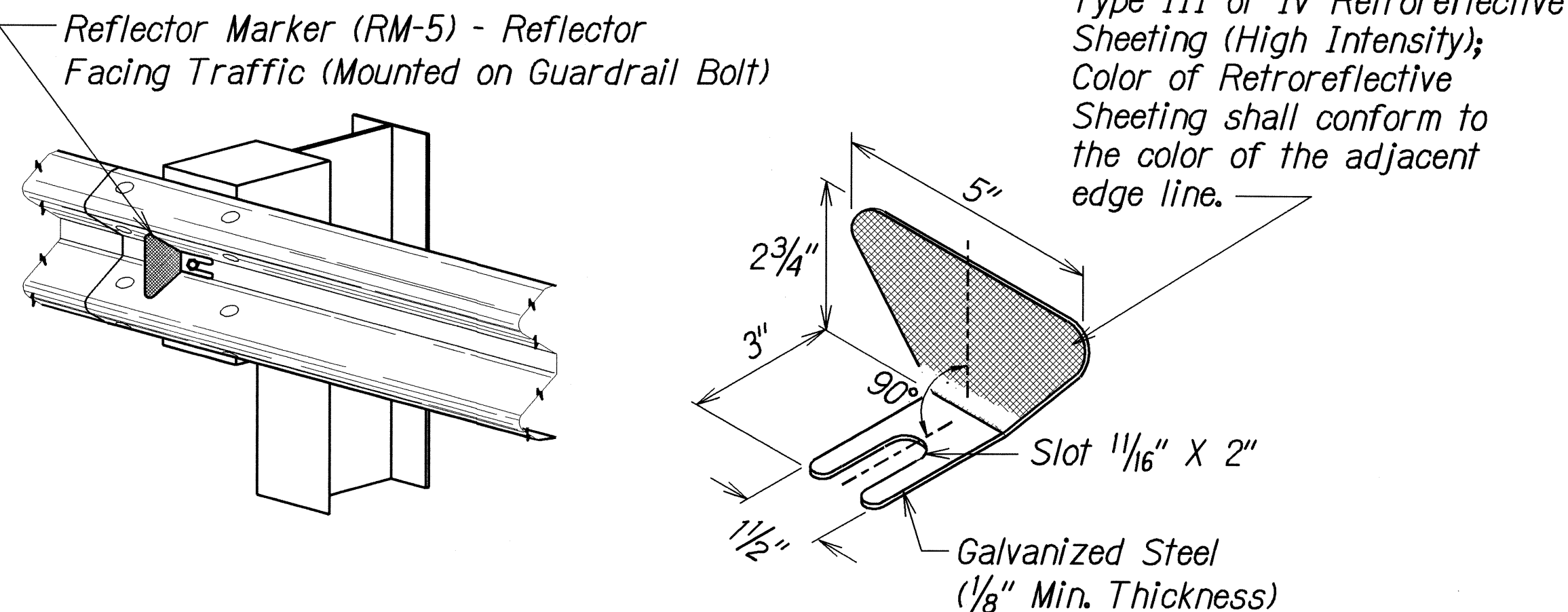


GENERAL NOTES

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.



| 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

KULA HIGHWAY FLOOD DAMAGE REPAIRS

AT VARIOUS LOCATIONS

Project No. 37CDE-01-08M

Scale: None

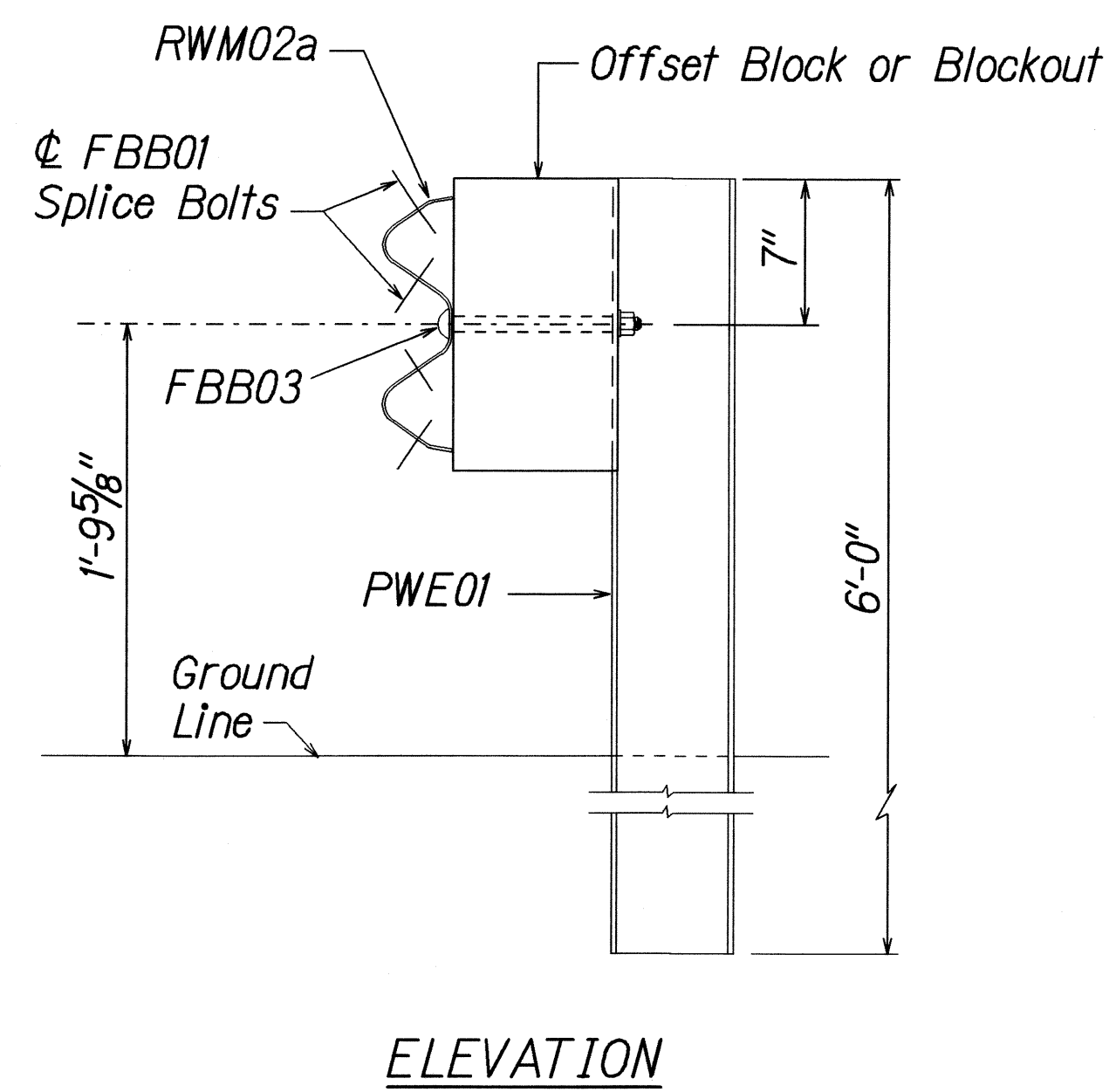
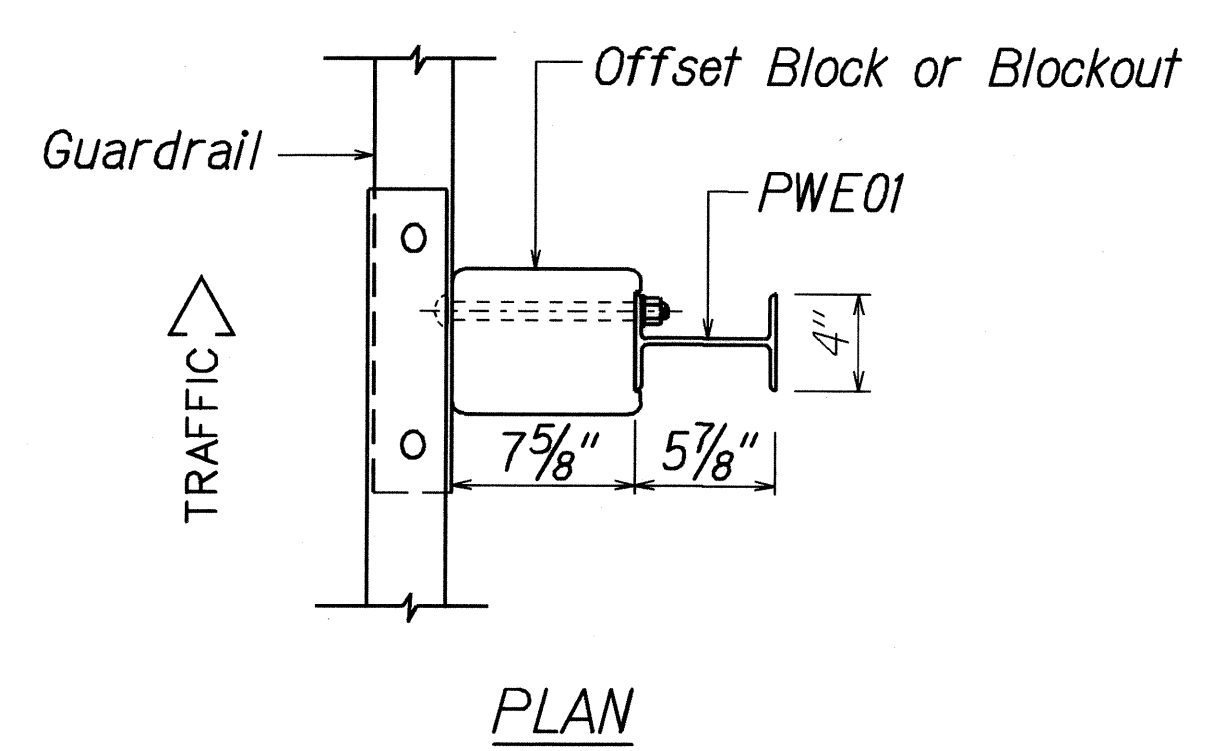
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SHEET No. 1 OF 6 SHEETS

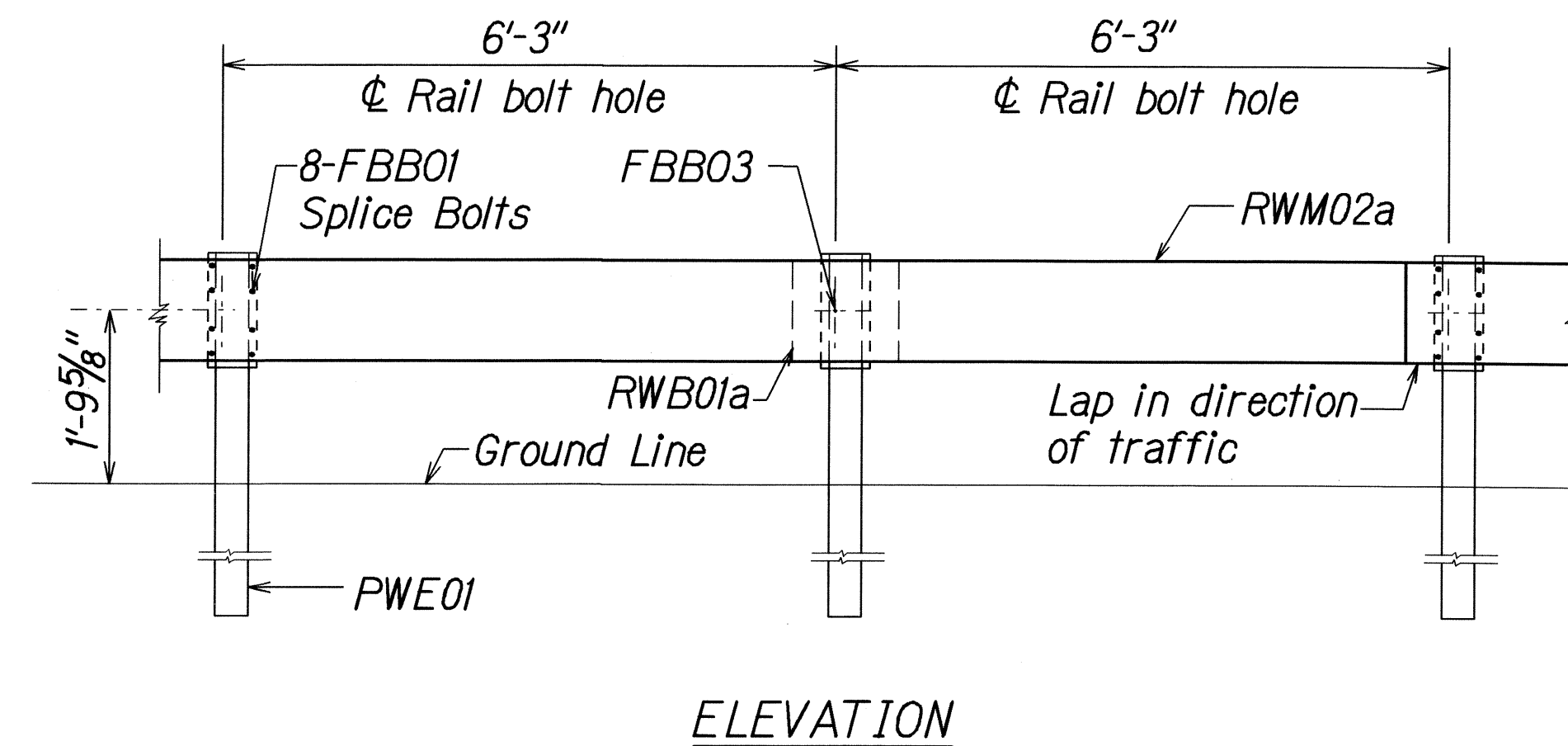
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| SURVEY PLOTTED BY | DATE |
| DESIGNED BY | |
| NOTED BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |

12/21/03 141404y/guardrail/1450/revdgn (standard plan TE-50 09/01/00)

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | 37CDE-01-08M | 2008 | 13 | 30 |

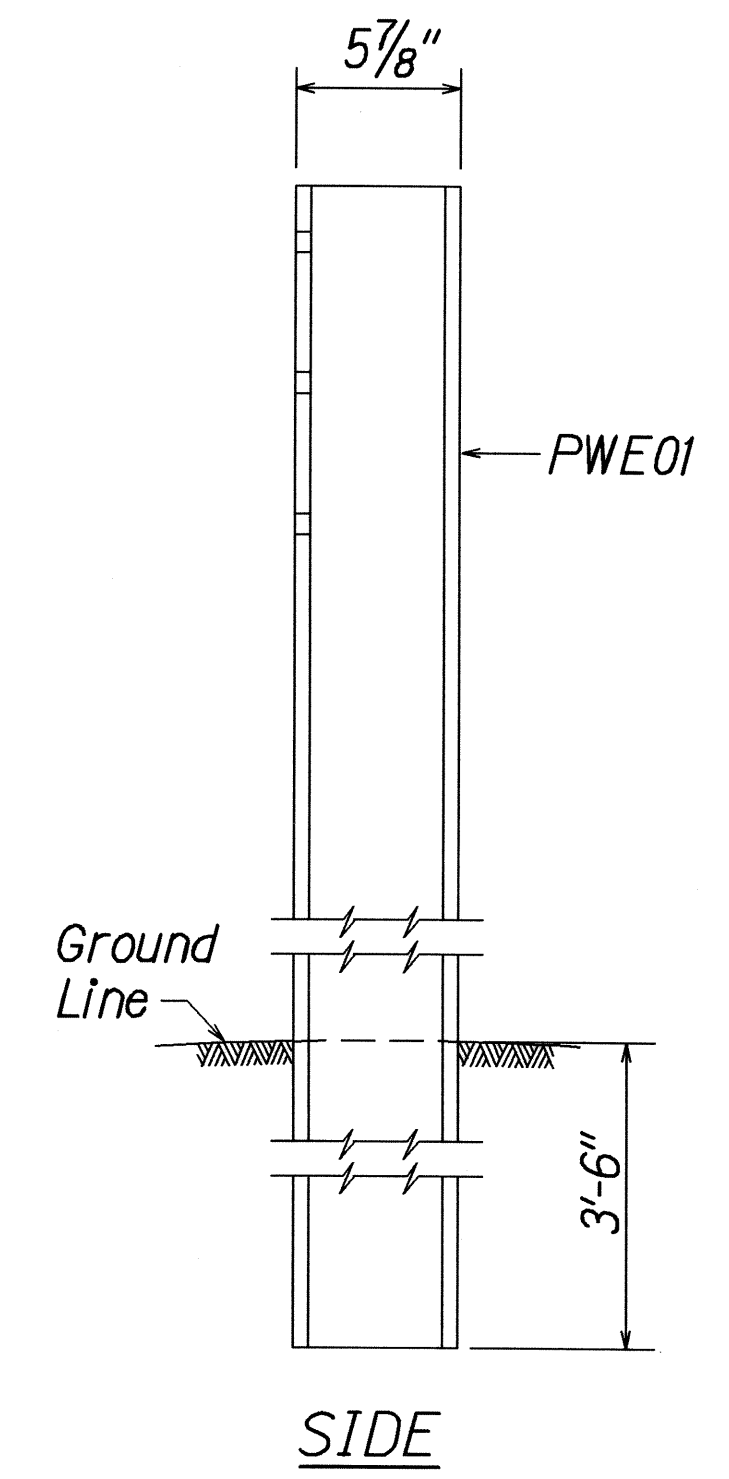


STRONG POST W-BEAM GUARDRAIL
(SGR04a)

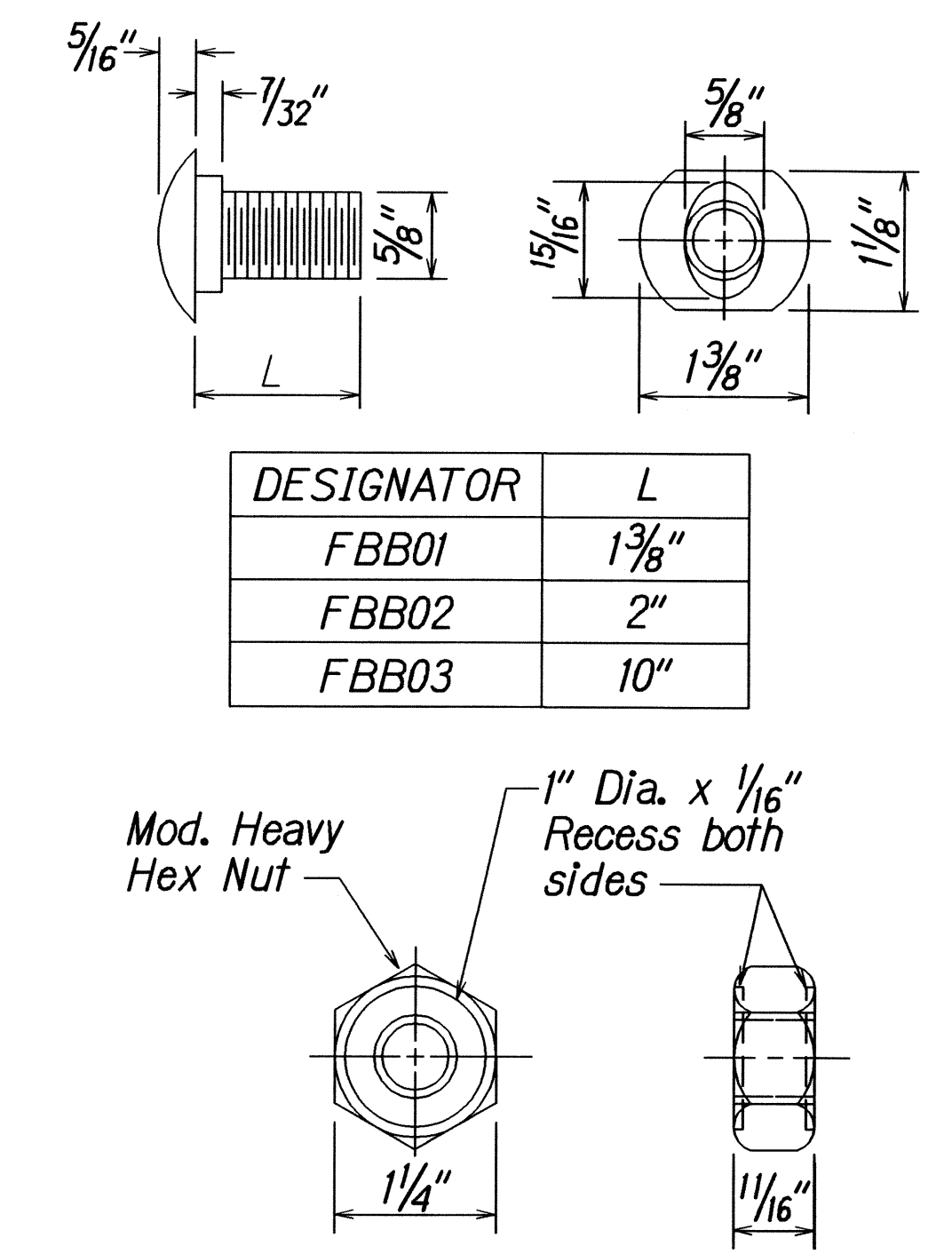
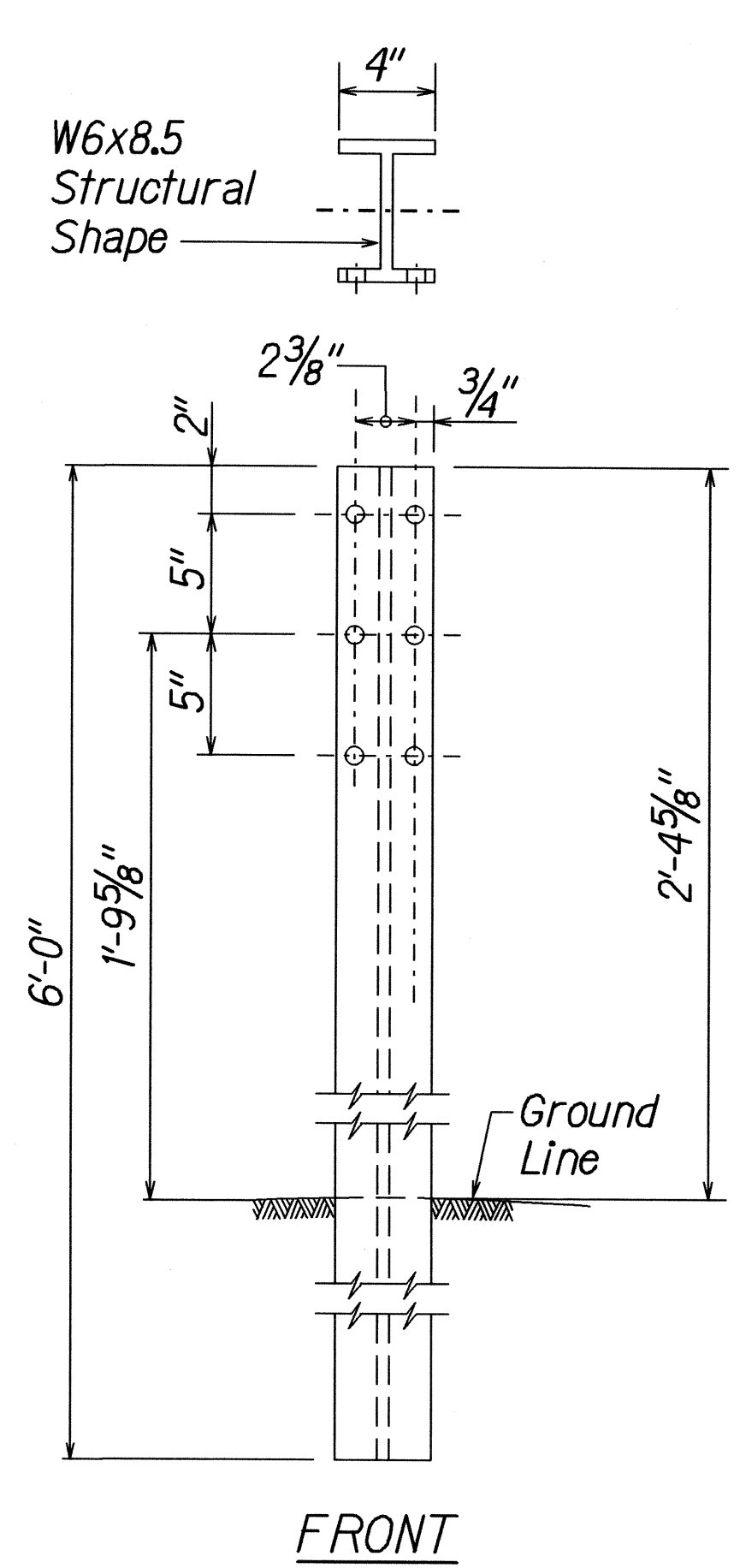


STRONG POST W-BEAM GUARDRAIL WITH
RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT

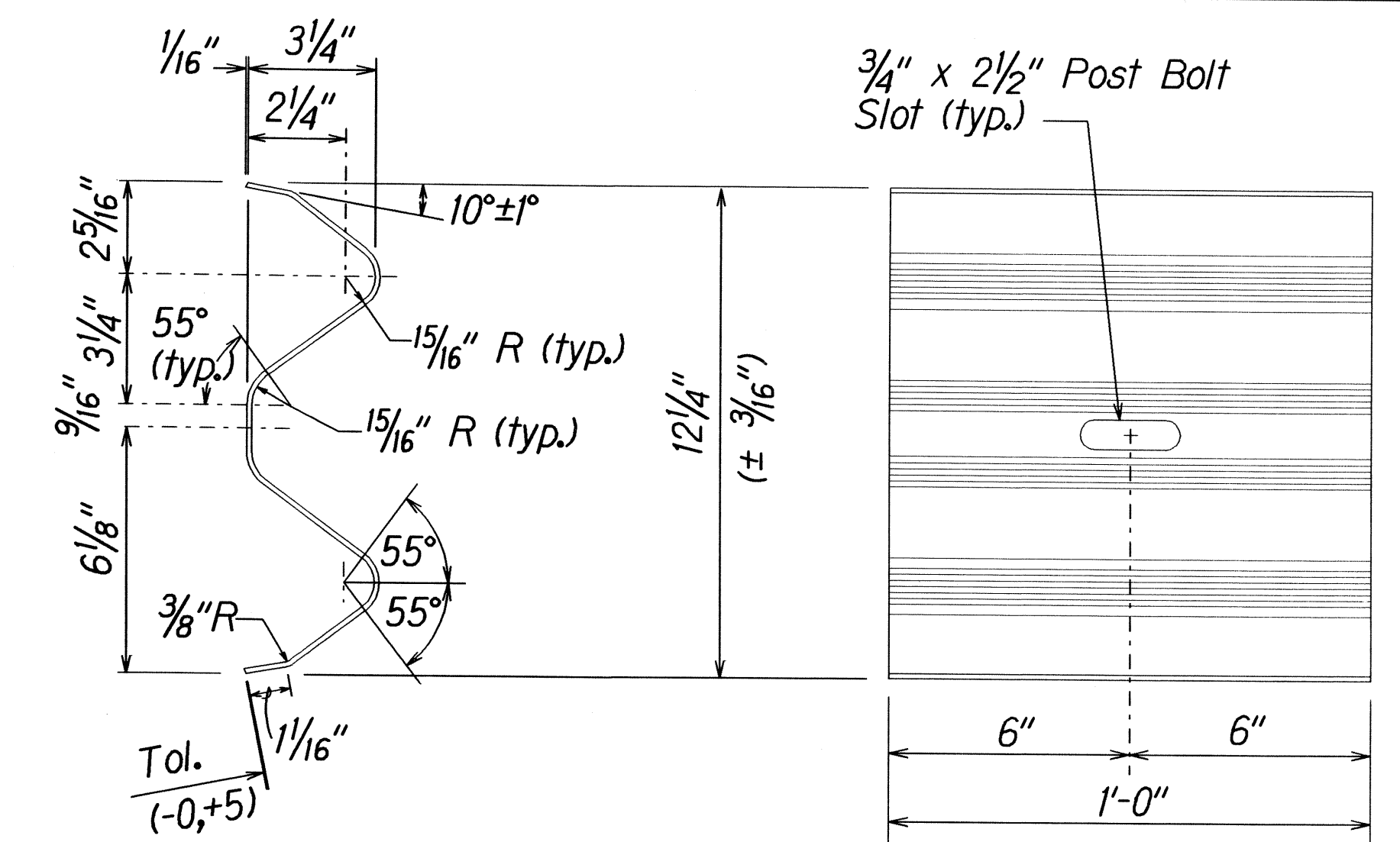
NOTE:
All Holes are
3/4" Dia.



W-BEAM STRONG POST (PWE01)

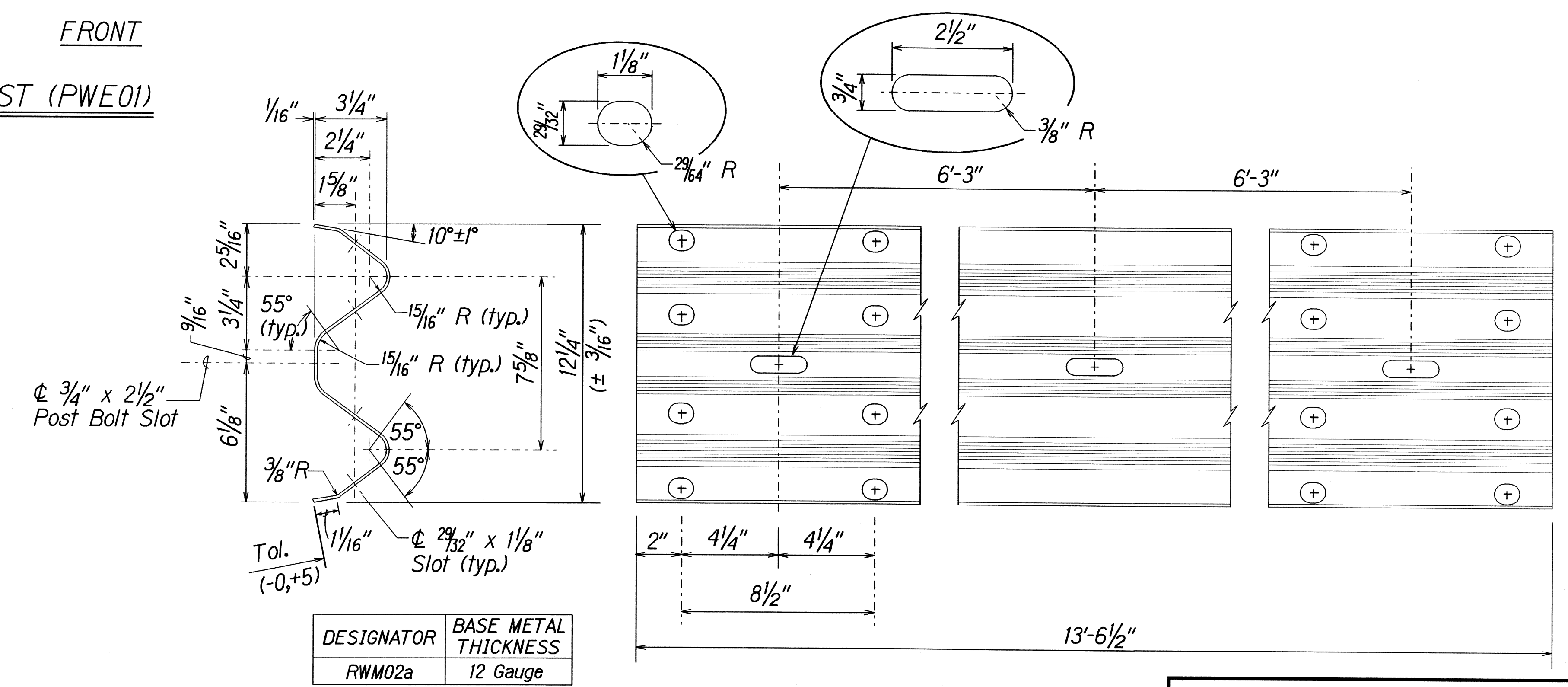


GUARDRAIL BOLTS AND
RECESSED NUT



| DESIGNATOR | BASE METAL THICKNESS |
|------------|----------------------|
| RWB01a | 12 Gauge |

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

KULA HIGHWAY FLOOD DAMAGE REPAIRS

AT VARIOUS LOCATIONS

Project No. 37CDE-01-08M

Scale: None

Date: April, 2008

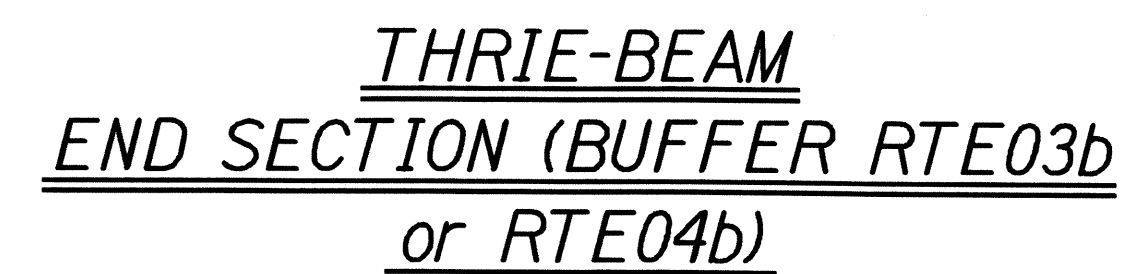
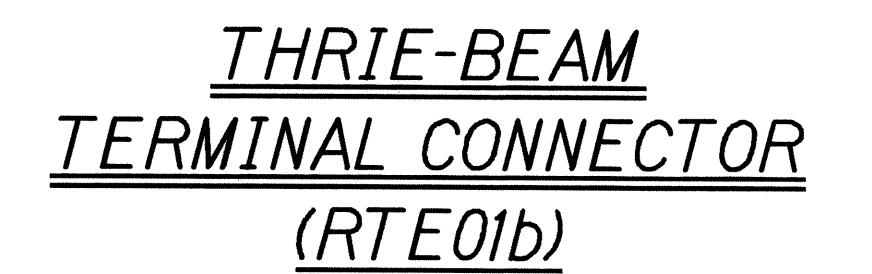
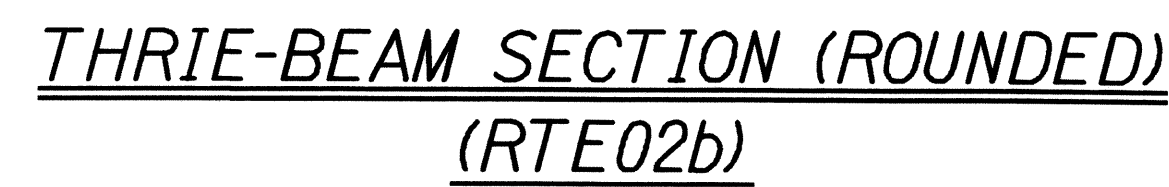
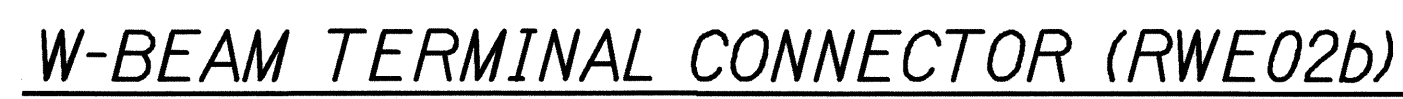
SHEET No. 2 OF 6 SHEETS

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| | DESIGNED BY | |
| | TRACED BY | |
| | NOTE BOOK | |
| QUANTITIES BY | CHECKED BY | |
| | | |
| | | |
| | | |

13/24/03 1410by/guardrail/wbansuagun (standard plan TE-50 r03/06/07)

Technical drawing of a metal plate with dimensions and labels:

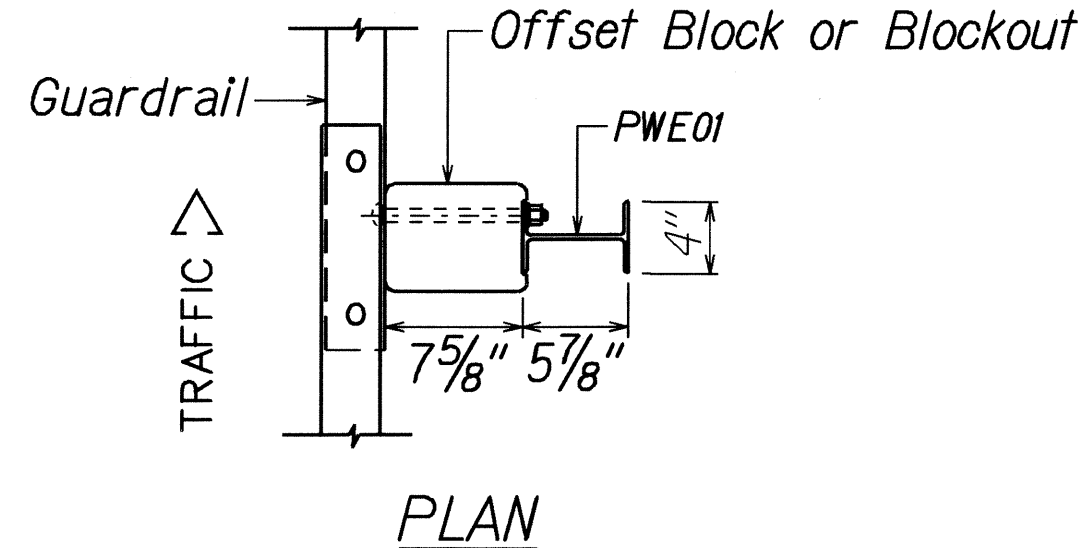
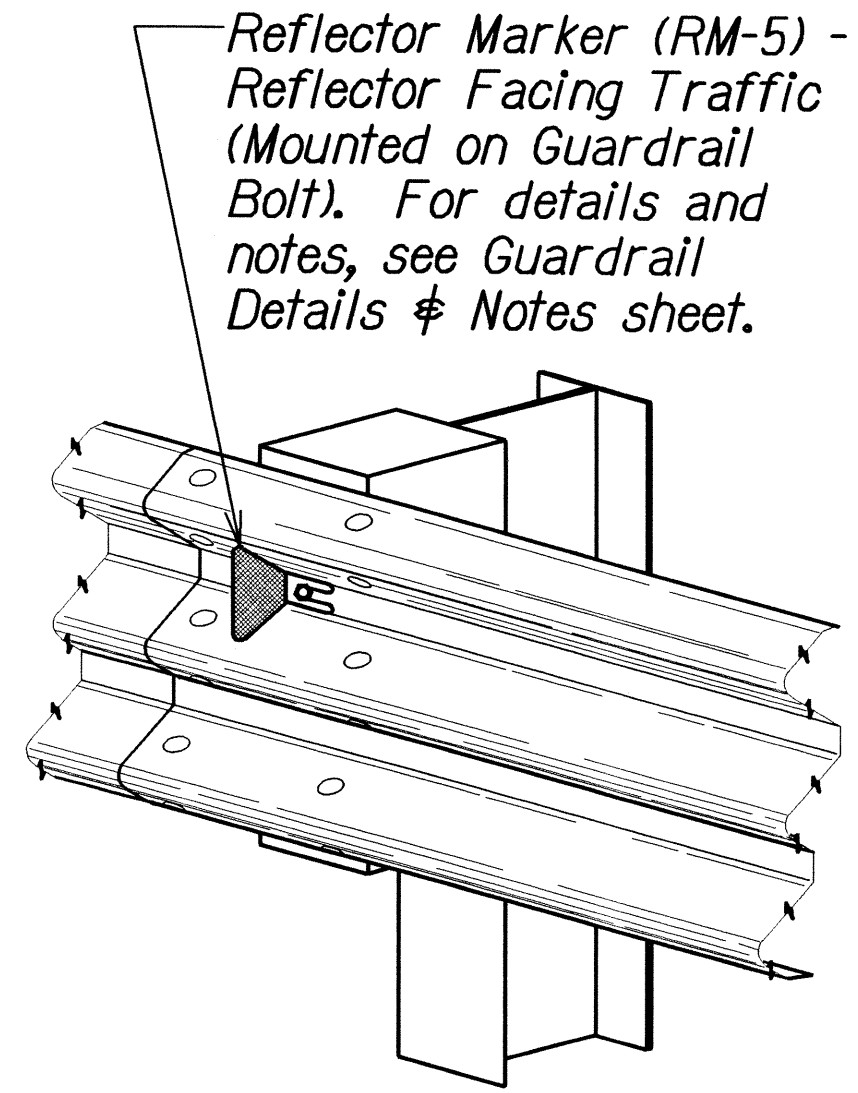
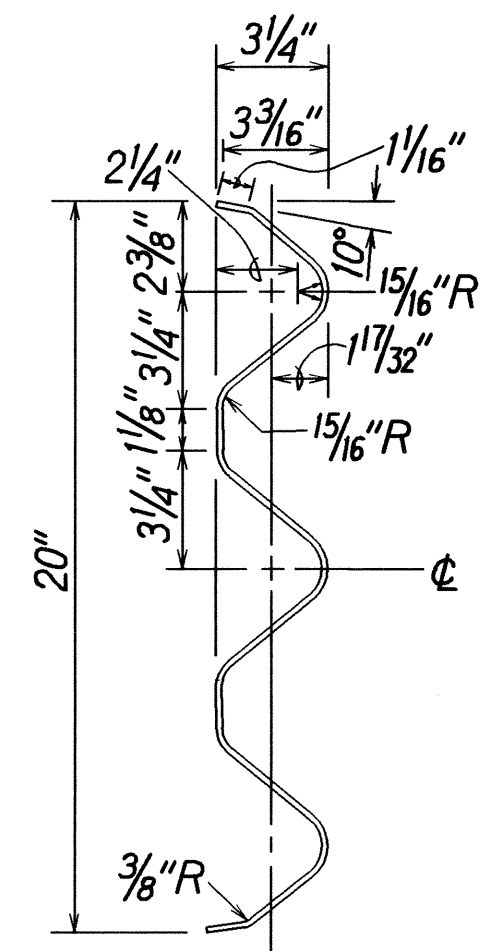
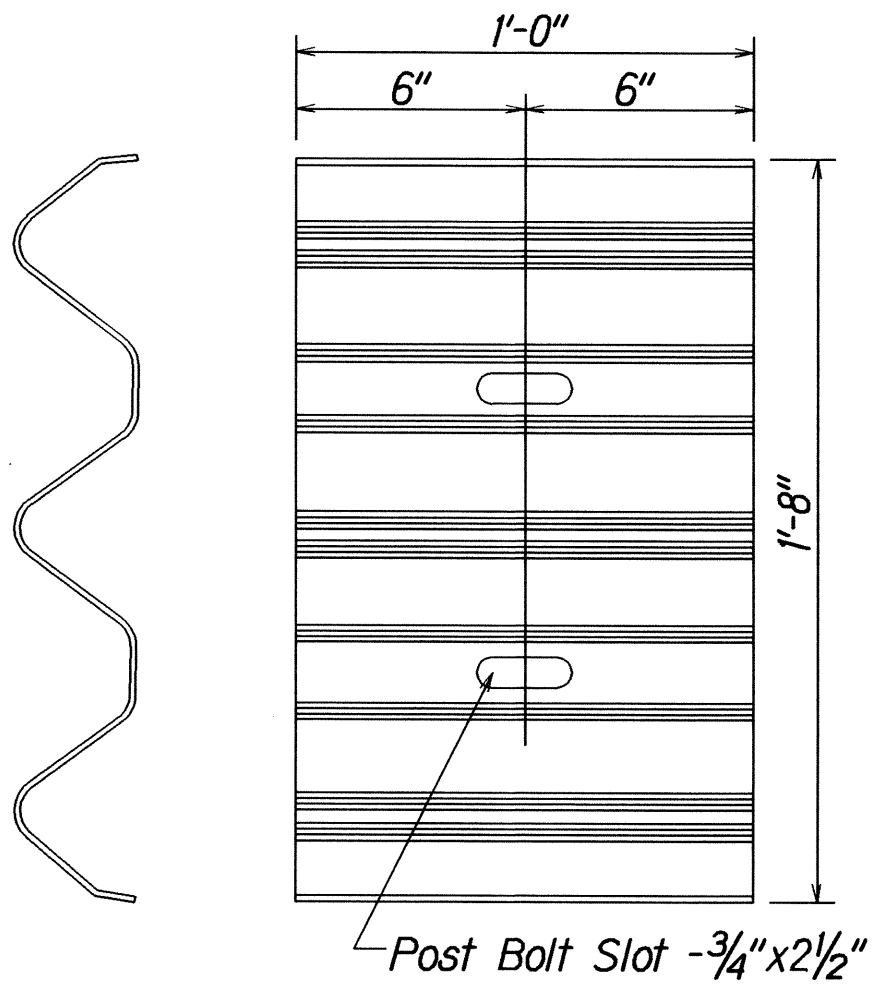
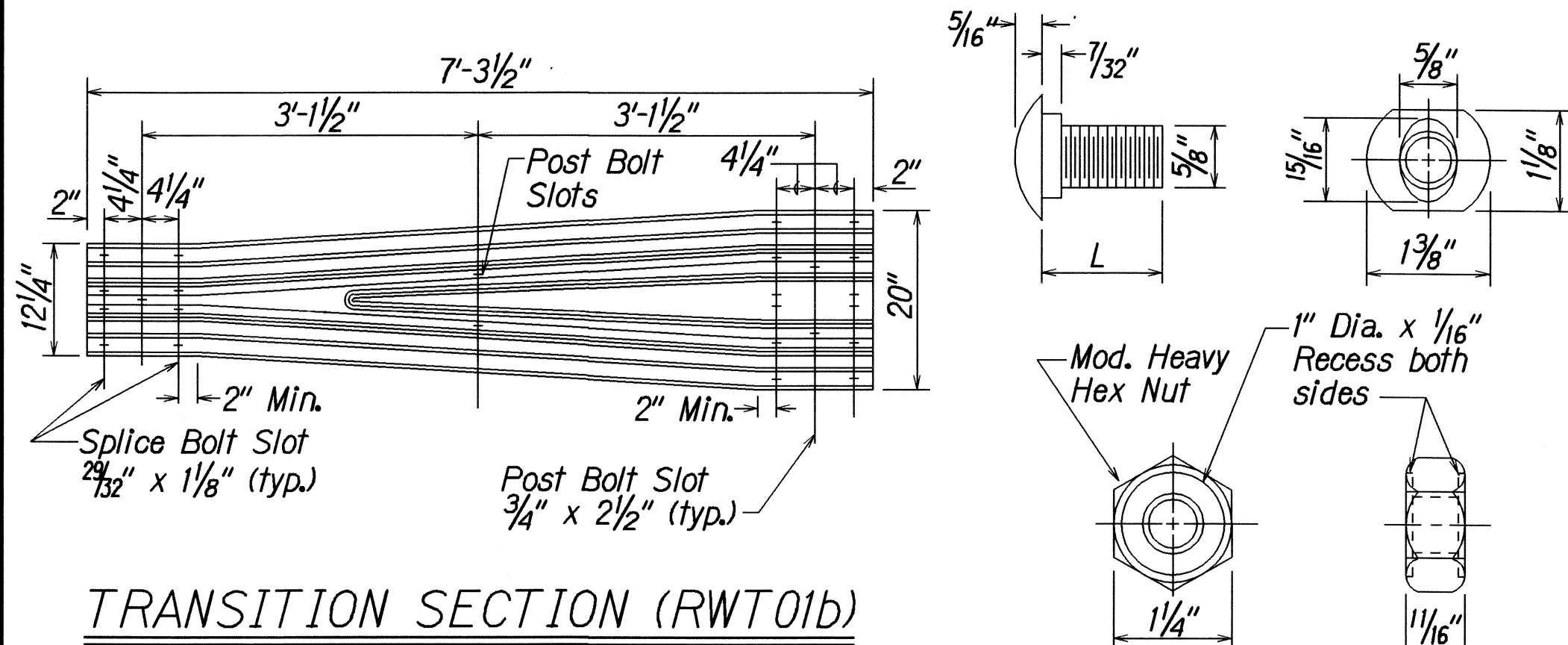
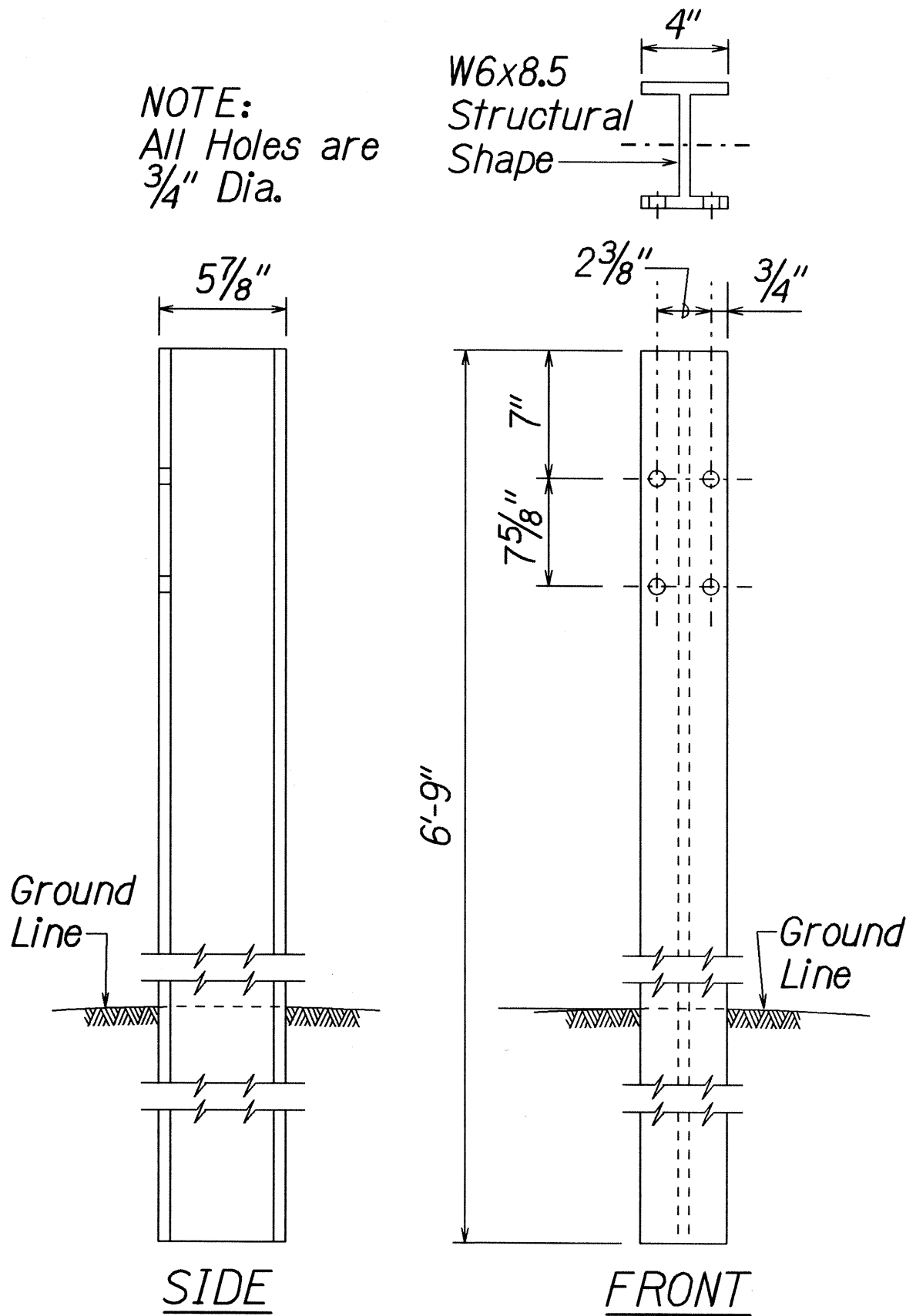
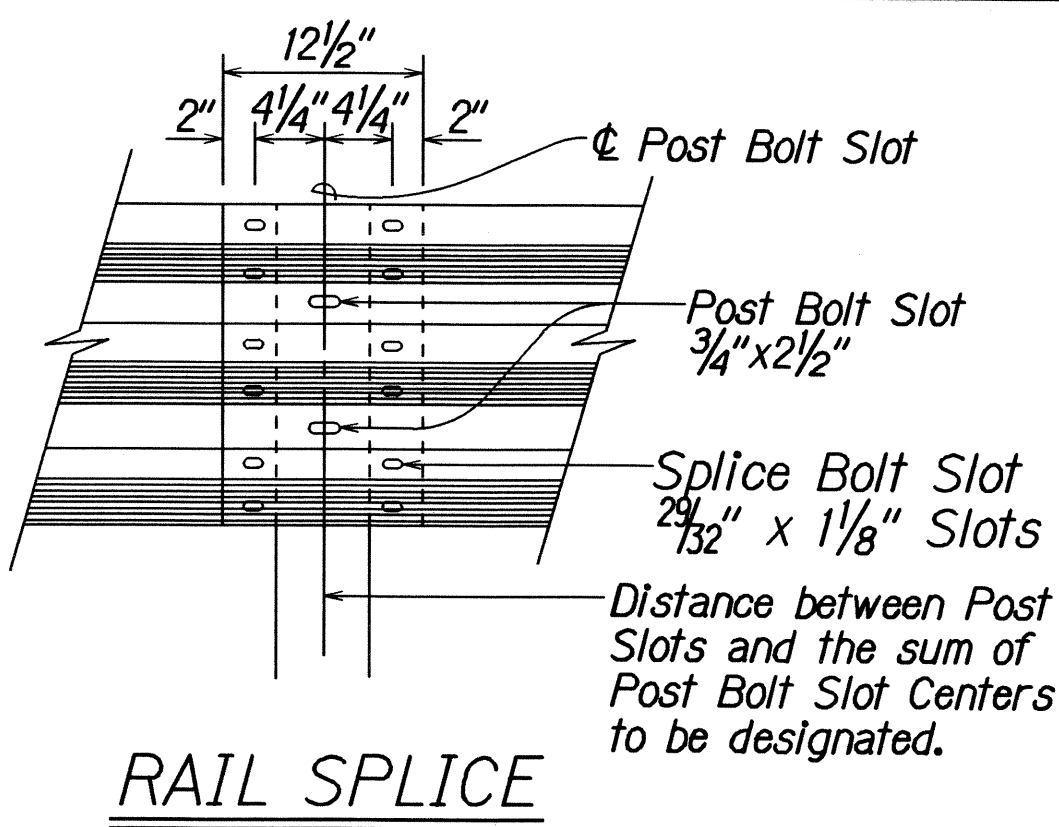
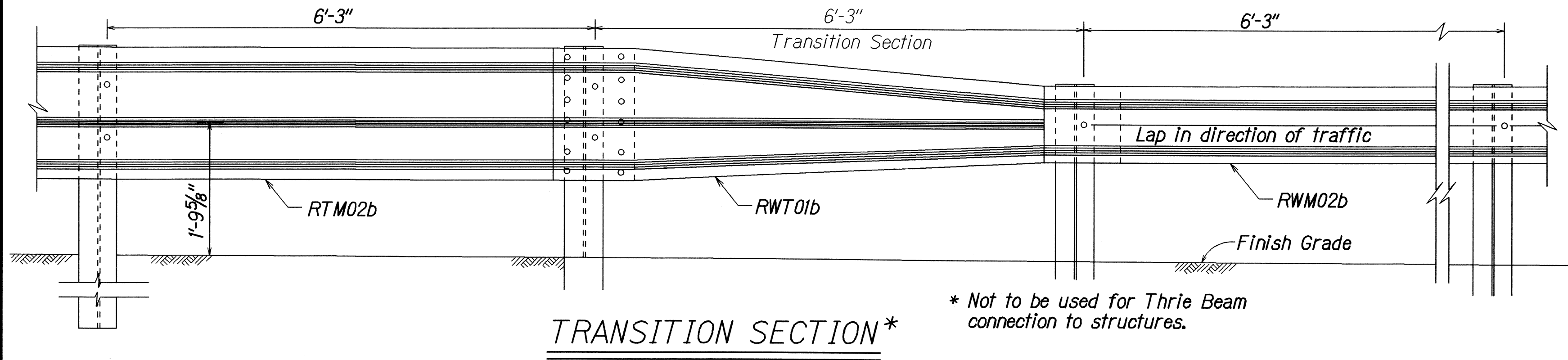
- Overall length: 2'-6"
- Overall width: 20"
- Top edge thickness: $3\frac{3}{8}"$
- Bottom edge thickness: $2\frac{1}{8}"$
- Left edge thickness: 3"
- Top edge holes: 1" \varnothing Holes (typ.)
- Top edge slot: $\frac{3}{4}" \times 2\frac{1}{2}"$ Post Bolt Slot
- Top edge slot width: $7\frac{1}{4}"$
- Top edge slot depth: $6\frac{3}{16}"$
- Top edge slot width: $7\frac{5}{8}"$
- Top edge slot depth: $6\frac{3}{16}"$
- Top edge slot width: $6\frac{3}{16}"$
- Top edge slot depth: $29\frac{7}{32}" \times 1\frac{1}{8}"$ Slots
- Top edge slot width: 3"
- Top edge slot depth: $4\frac{1}{4}"$
- Top edge slot depth: $4\frac{1}{4}"$
- Top edge slot depth: 3"
- Top edge slot width: 8"
- Top edge slot depth: 2"
- Overall length: 2'-6"



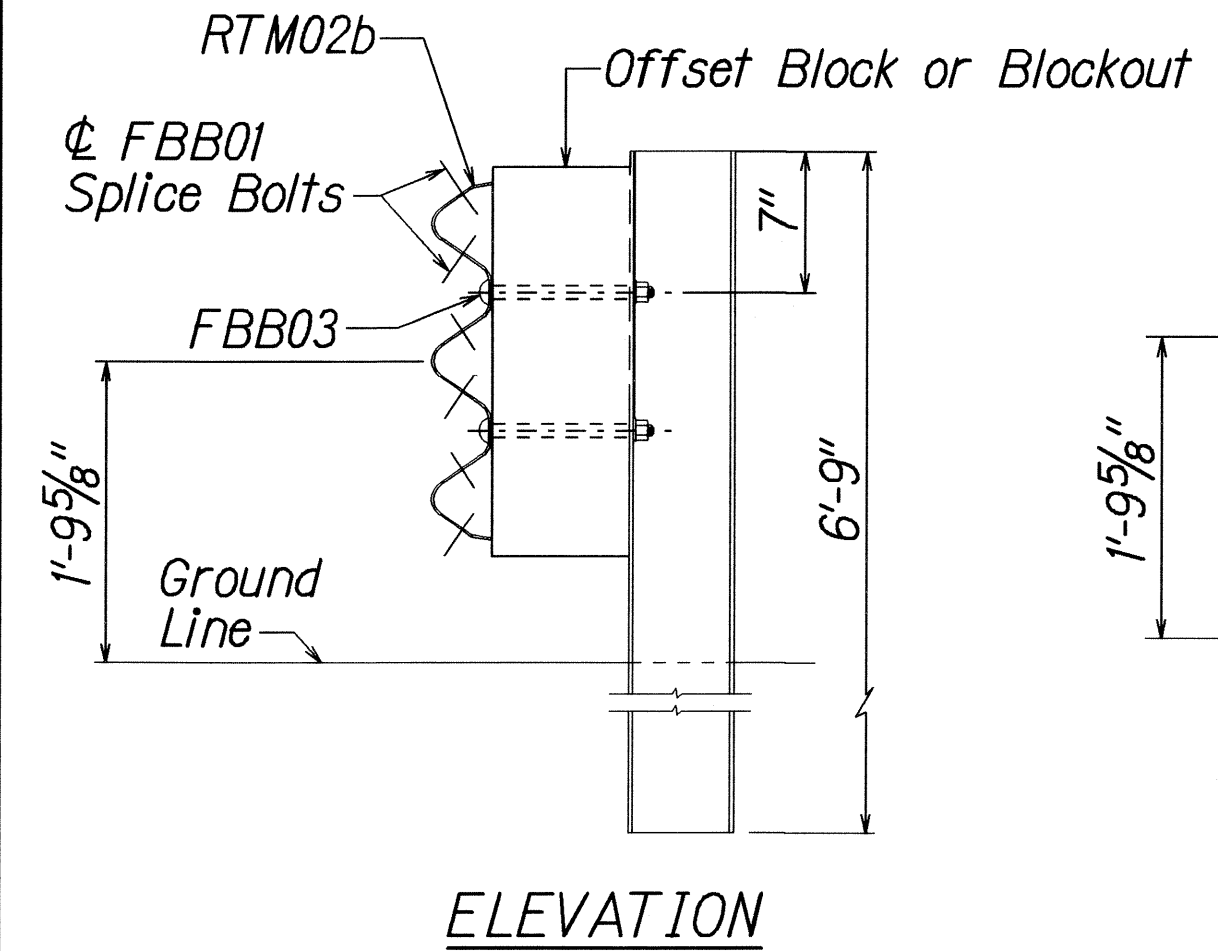
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| 6/21/01 | tdl.ruby/guardrail/te51rev.dgn | (standard plan TE-51 r09/01/87) |
|---------|--|---------------------------------|

14

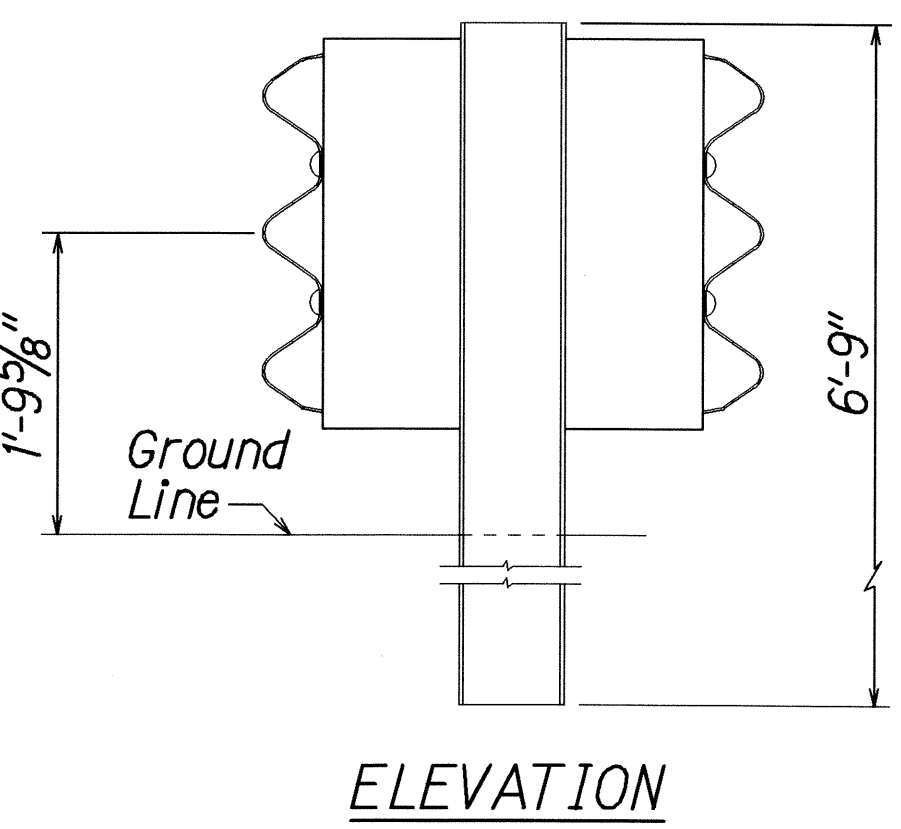
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|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | 37CDE-01-08M | 2008 | 15 | 30 |



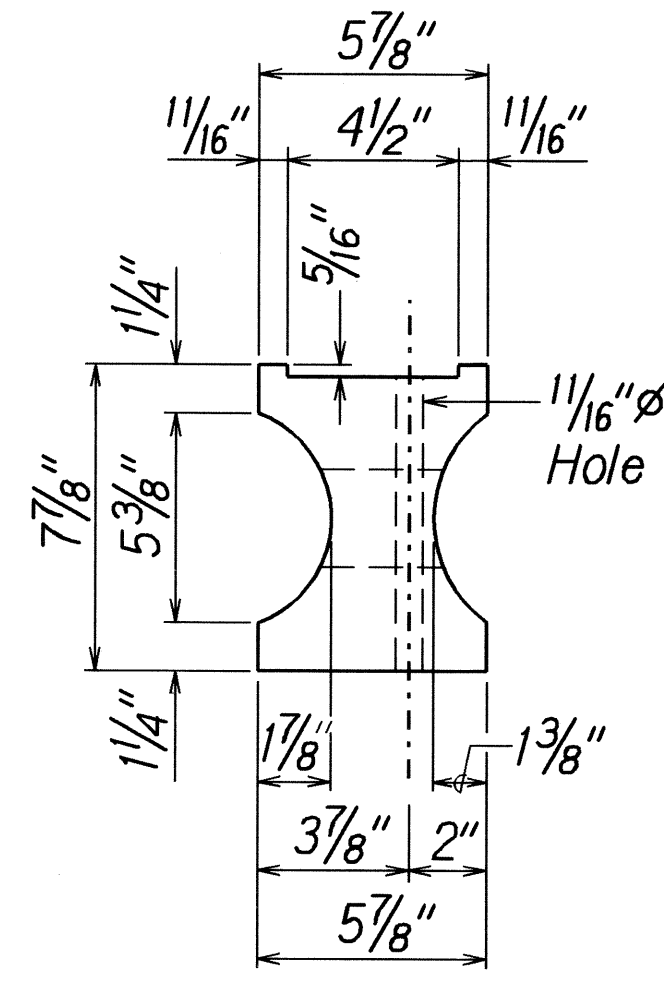
GUARDRAIL BOLTS AND RECESSED NUT



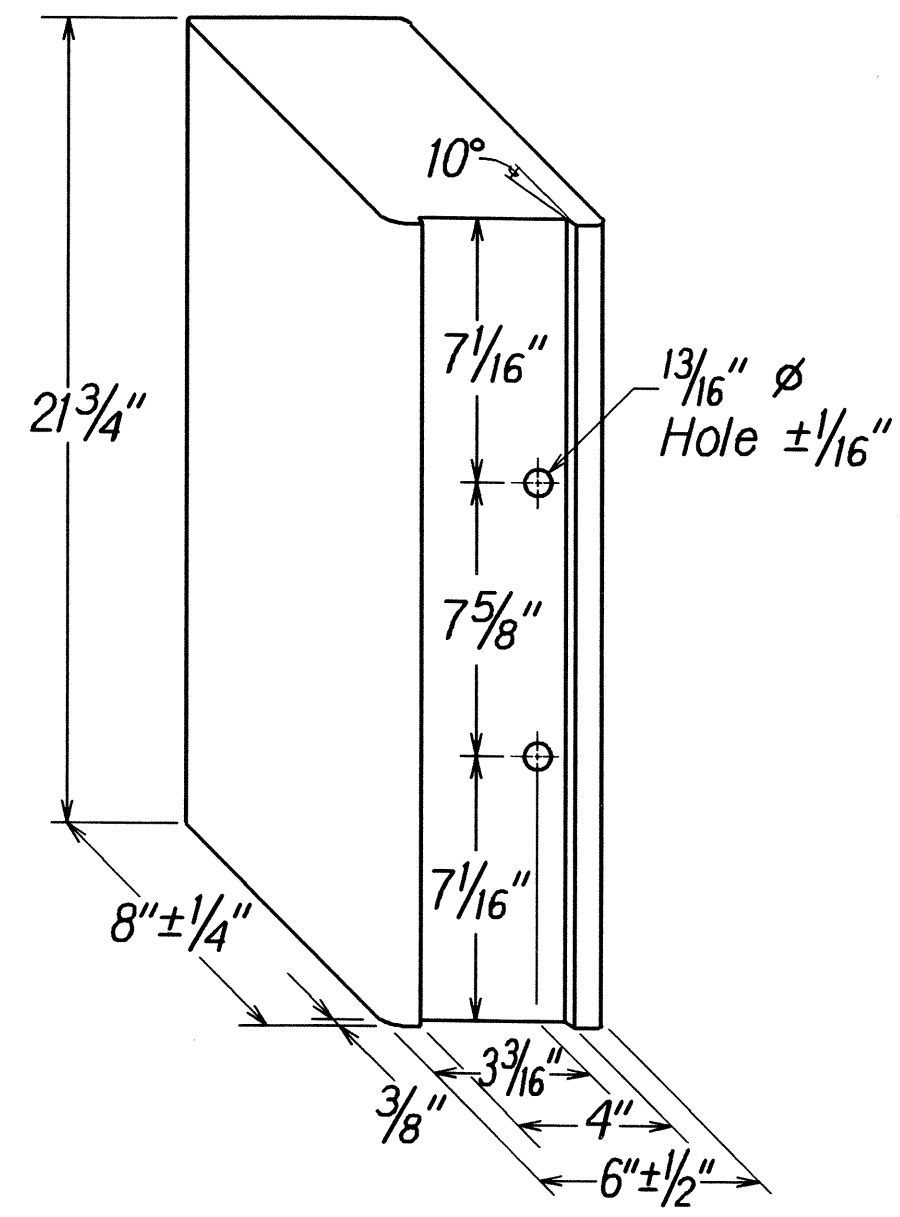
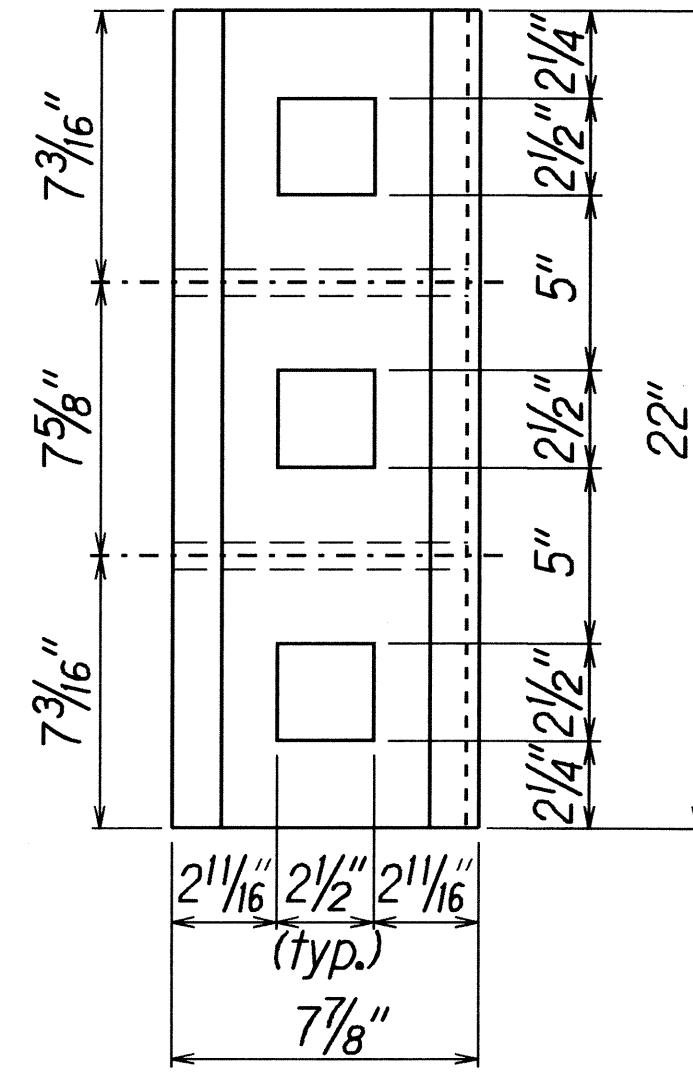
STRONG POST THRIE-BEAM GUARDRAIL (SGR09a)



STRONG POST THRIE-BEAM MEDIAN GUARDRAIL (SGM09a)



MODIFIED 6X8X22 PLASTIC BLOCKOUT (TYPE I-THRIE)



RECYCLED POLYETHYLENE THRIE-BEAM OFFSET BLOCK (TYPE II - THRIE)

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

STRONG POST

THRIE-BEAM GUARDRAIL

KULA HIGHWAY FLOOD DAMAGE REPAIRS

AT VARIOUS LOCATIONS

Project No. 37CDE-01-08M

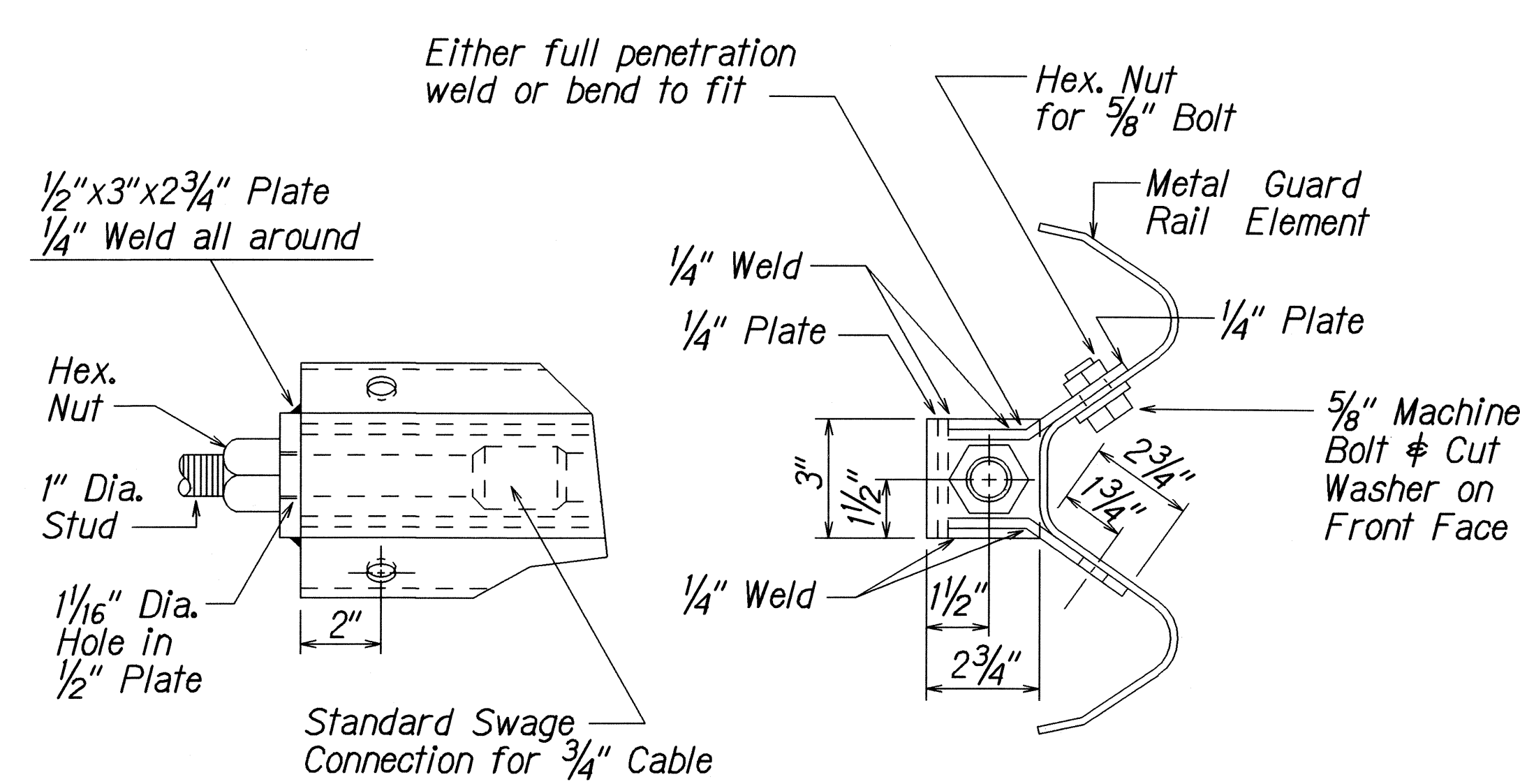
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Date: April, 2008

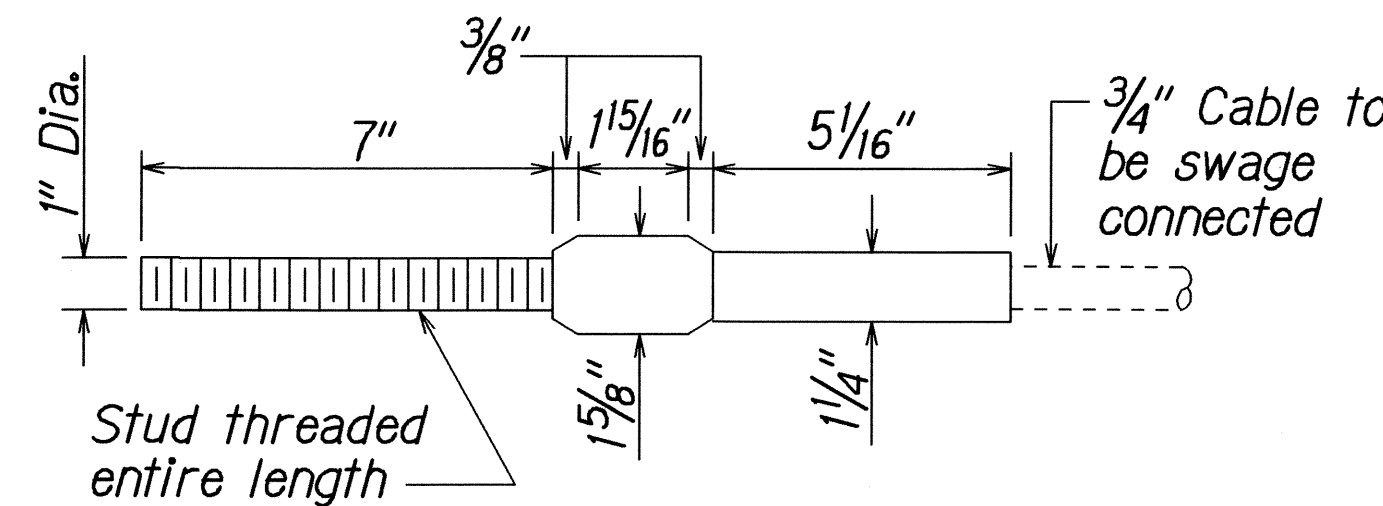
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| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| NOTED BY | |
| CHECKED BY | |
| QUANTITIES BY | |
| DESIGNED BY | |
| NOTED BY | |
| CHECKED BY | |
| QUANTITIES BY | |

19-17-03 tddub/guardrail/11/11/2008 (Standard Plan TE-57 r11/03/08 & TE-57a r11/03/08)

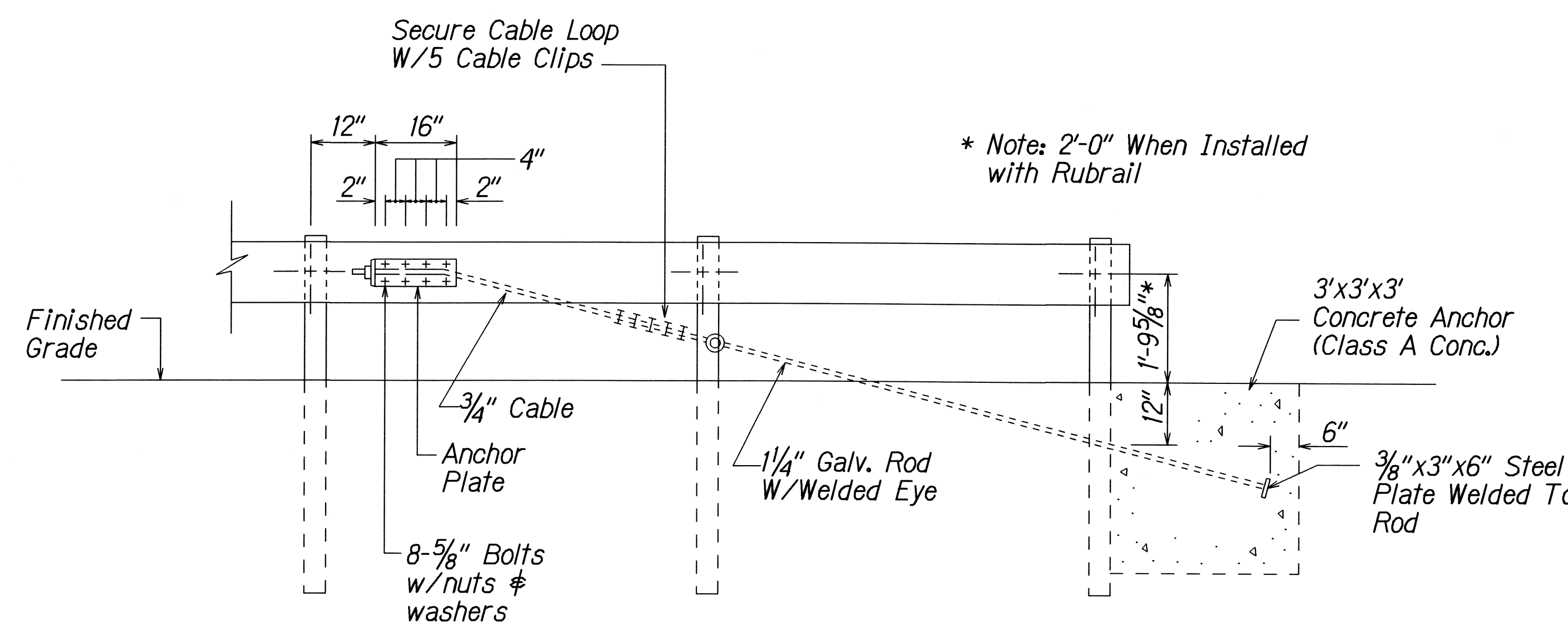
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|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | 37CDE-01-08M | 2008 | 16 | 30 |



ANCHOR PLATE DETAILS

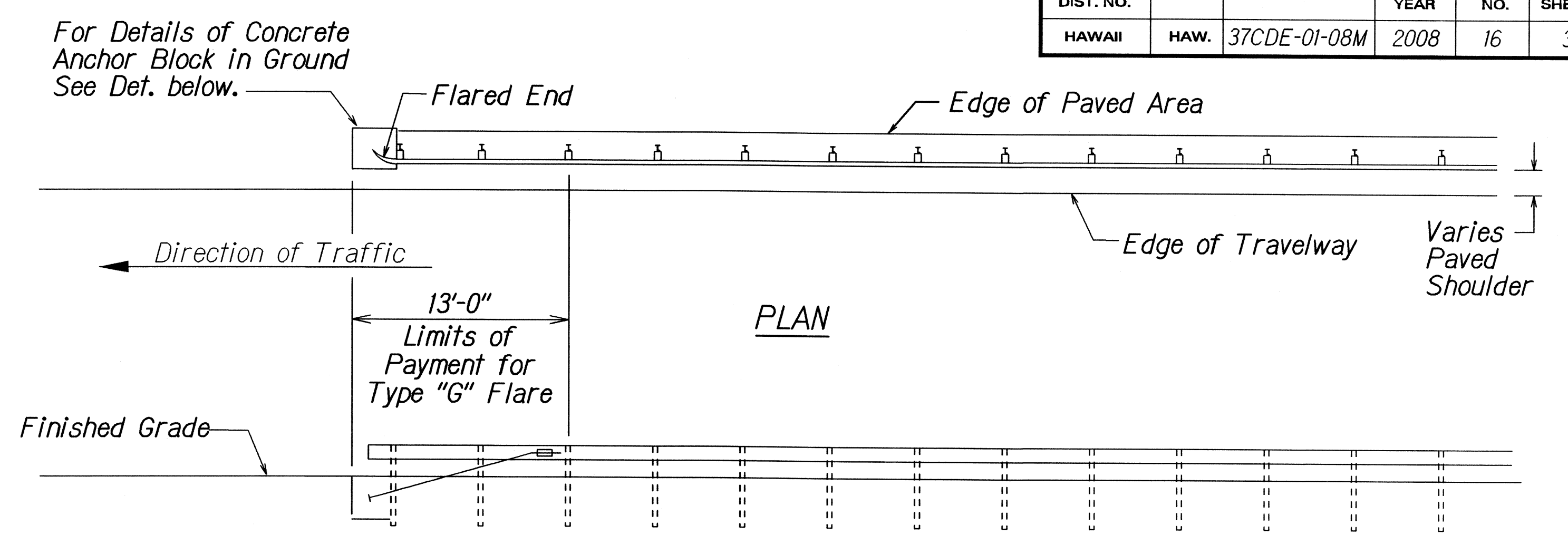


STANDARD SWAGED FITTING
AND STUD



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 5.7 - Suggested Flare Rate for Barrier Design, page 5-32, 2006 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.

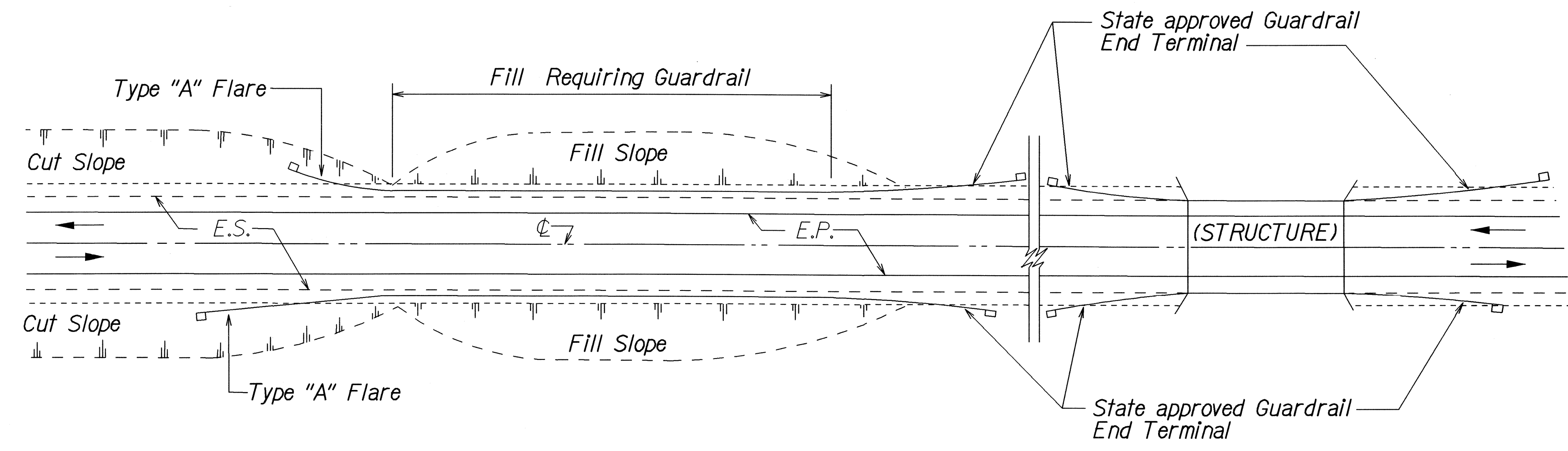
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| SURVEY PLOTTED BY | DATE |
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| CHECKED BY | |

13/13/02 tdl:ubj/guardrail/1e59radgn (standard plan TE-59 r1/03/89)

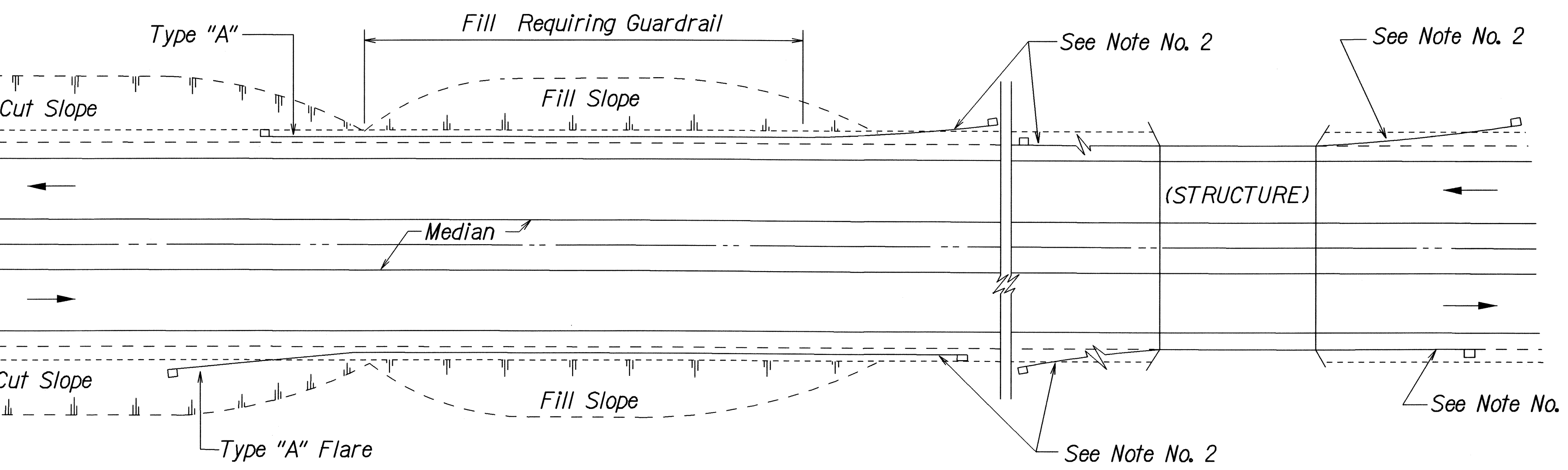
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARDRAIL DETAILS
KULA HIGHWAY FLOOD DAMAGE REPAIRS
AT VARIOUS LOCATIONS
Project No. 37CDE-01-08M
Scale: None Date: April, 2008
SHEET No. 5 OF 6 SHEETS

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | 37CDE-01-08M | 2008 | 17 | 30 |



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 | DATE |
| DESIGNED BY | |
| TRACED BY | |
| NOTE BOOK | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |

13/01/29 tdl:uby/guardrail/1653radgn (Standard Plan TE-58 rd/01/88)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARDRAIL DETAILS
KULA HIGHWAY FLOOD DAMAGE REPAIRS
AT VARIOUS LOCATIONS
Project No. 37CDE-01-08M

Scale: None
Date: April, 2008

SHEET No. 6 OF 6 SHEETS