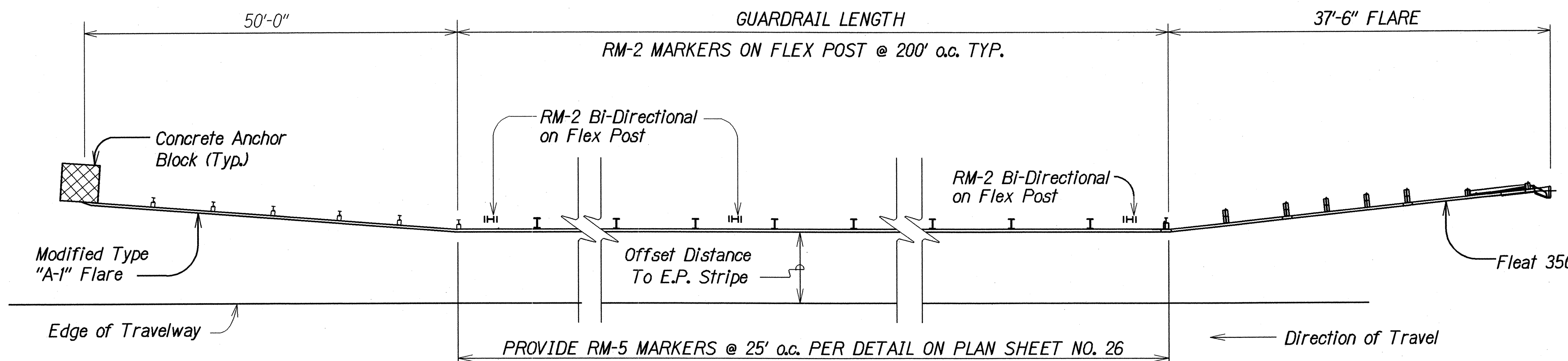


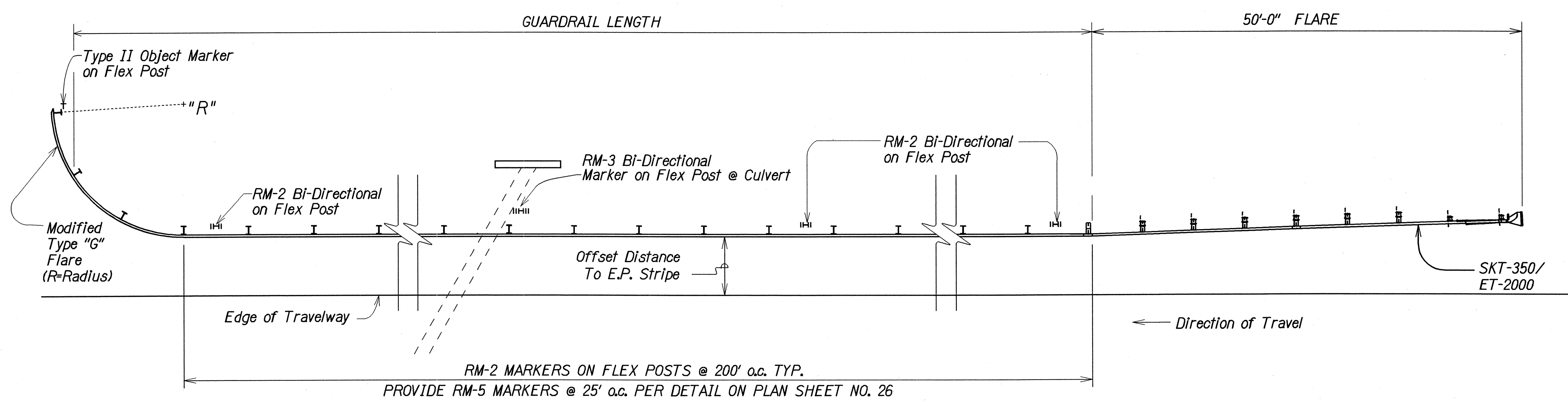
| FED. ROAD DIST. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|-----------------|-------|-----------|-------------|-----------|--------------|
| HAWAII          | HAW.  | 19J-01-02 | 2003        | 25        | 40           |

NOTES:

1. All reflector markers located behind guardrail and other locations shall be installed with flexible delineator posts.
2. Exact location of Reflector Markers shall be determined in the field by the Engineer.
3. Color of flexible delineator posts shall be white except for RM-3, RM-3 bidirectional, and RM-3/RM-2 combinations shall be yellow posts.
4. RM-2 Bi- Directional shall be white in color.
5. RM-5 shall be per Standard Guardrail Details.



TYPICAL @ "MODIFIED A" & "FLEAT 350" END TREATMENT



TYPICAL @ MODIFIED "G" & "SKT-350"/"ET-2000" END TREATMENT

TYPICAL GUARDRAIL REFLECTOR MARKER INSTALLATION

Not To Scale

|               |                   |      |
|---------------|-------------------|------|
| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
| DRAWN BY      |                   |      |
| DESIGNED BY   |                   |      |
| CHECKED BY    |                   |      |
| DATE          |                   |      |

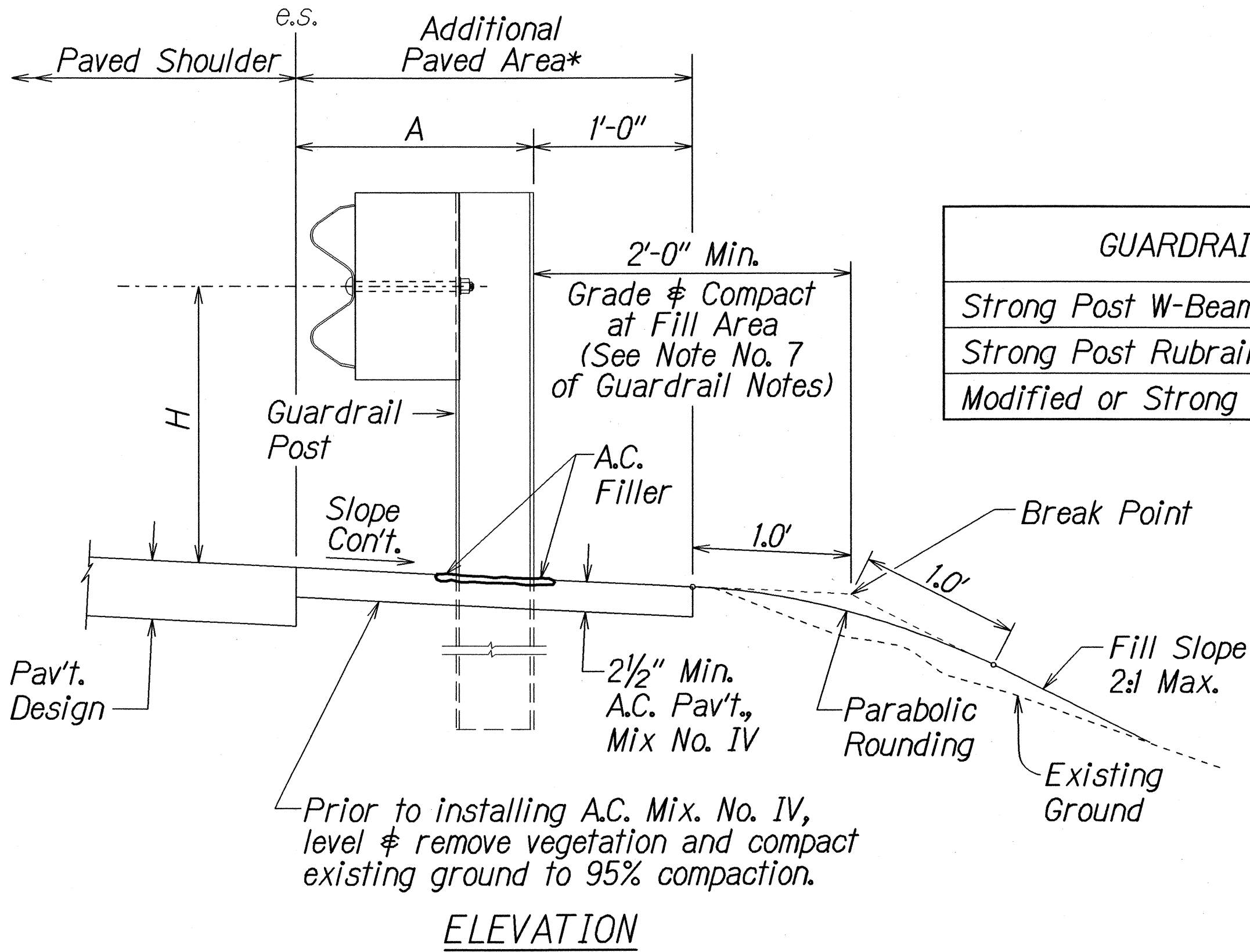
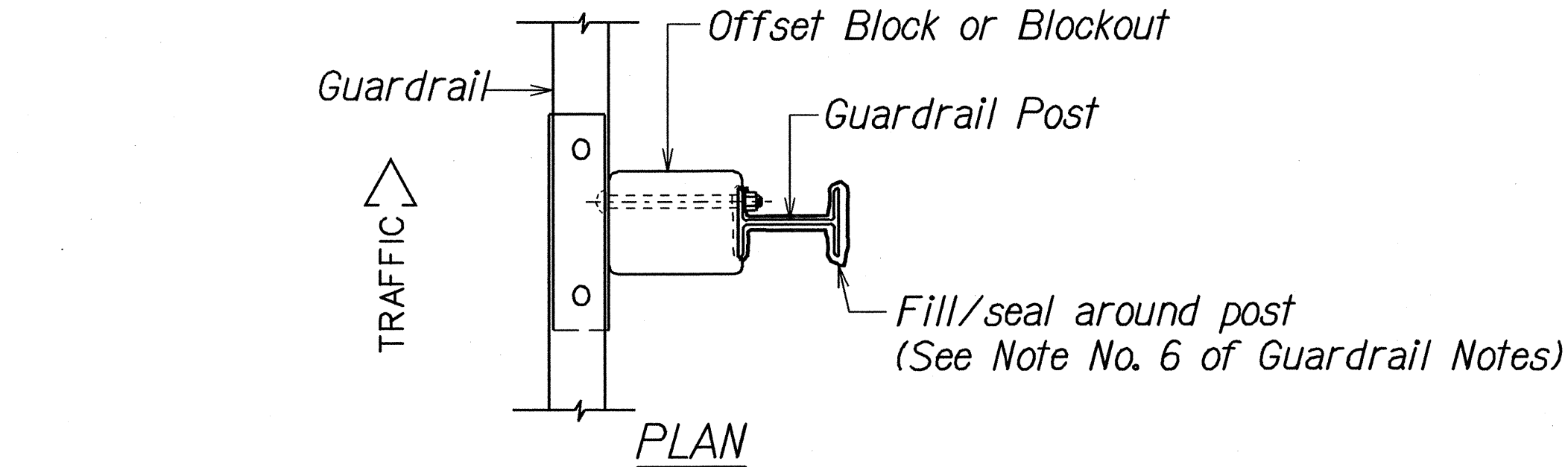
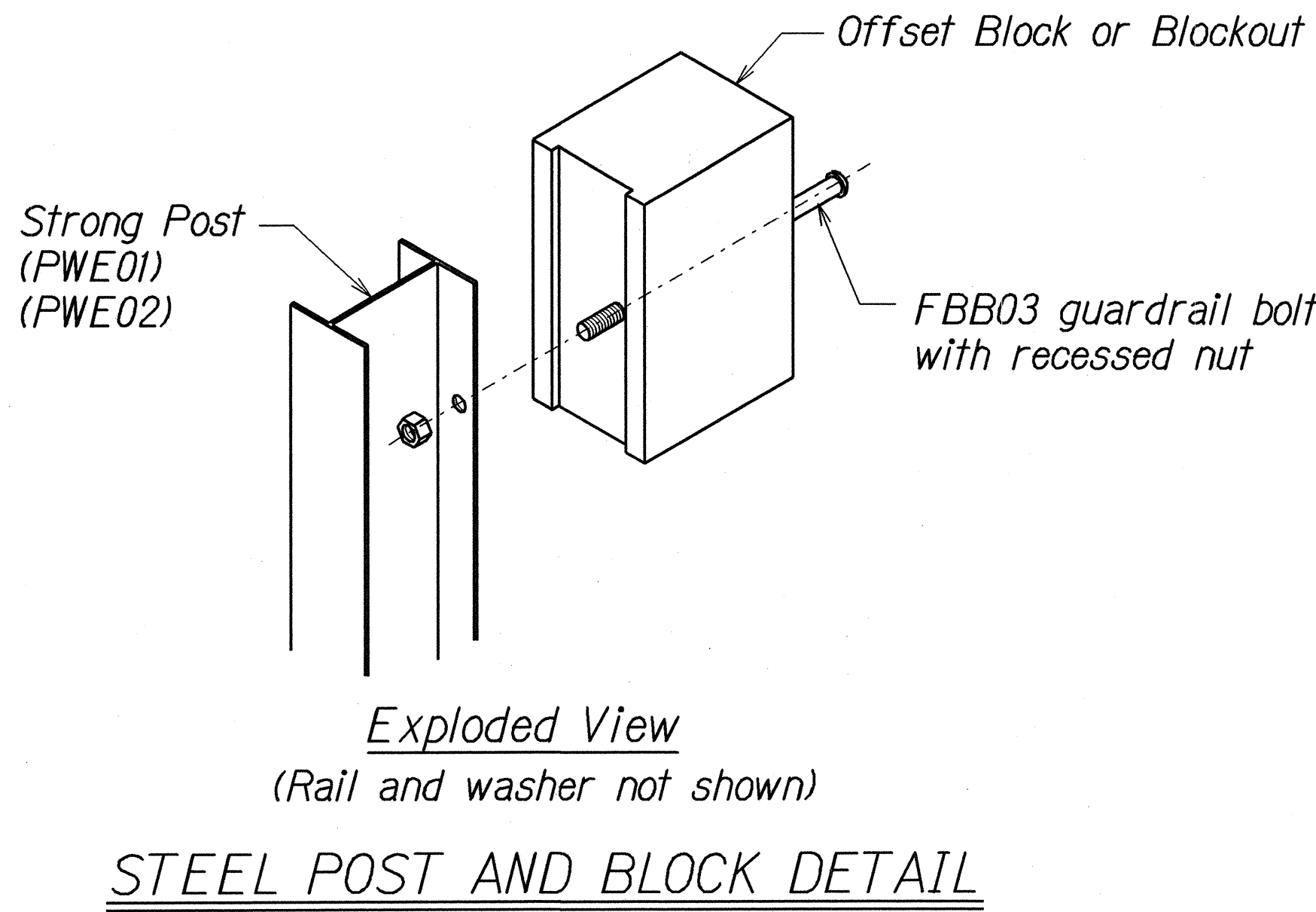
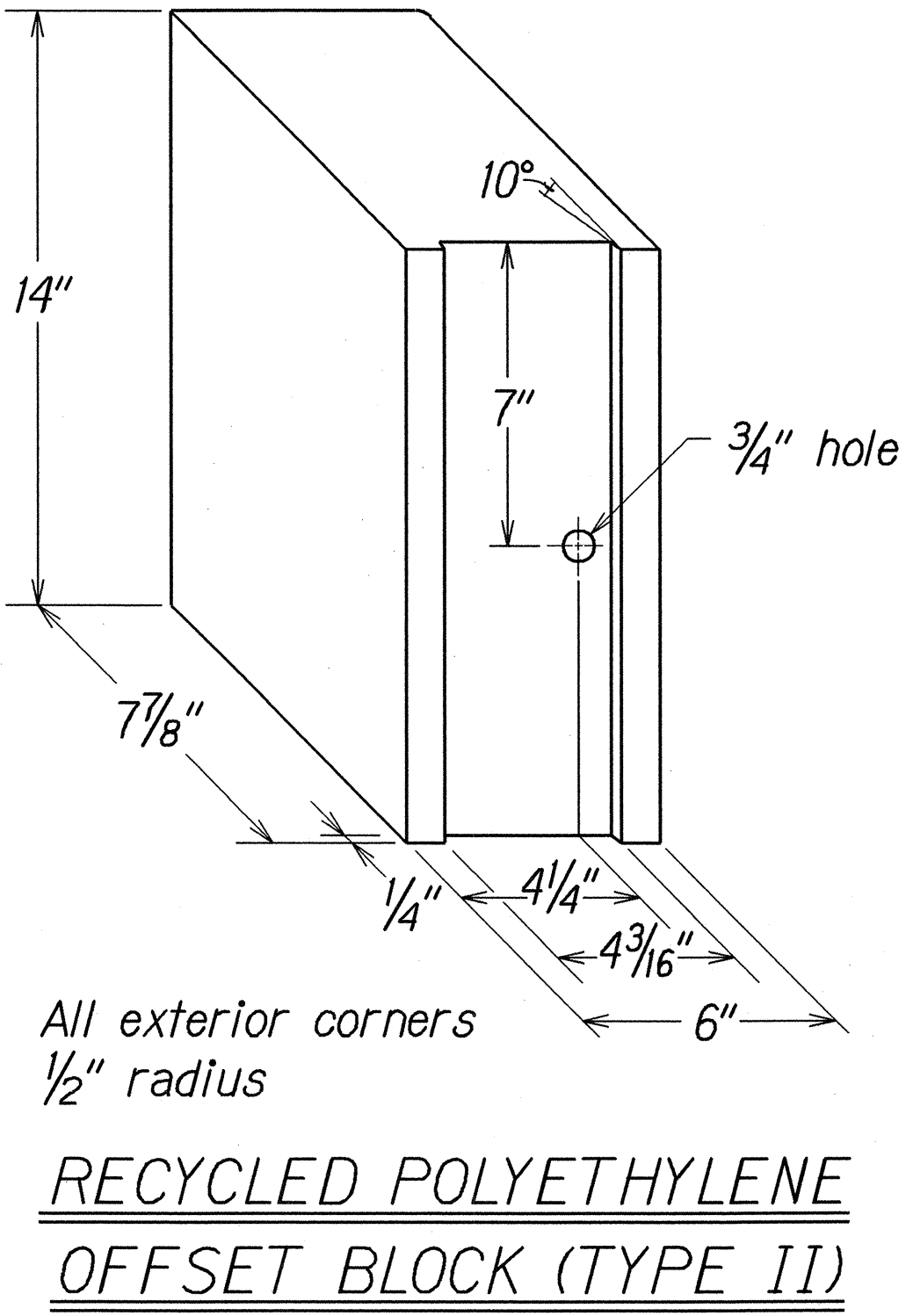
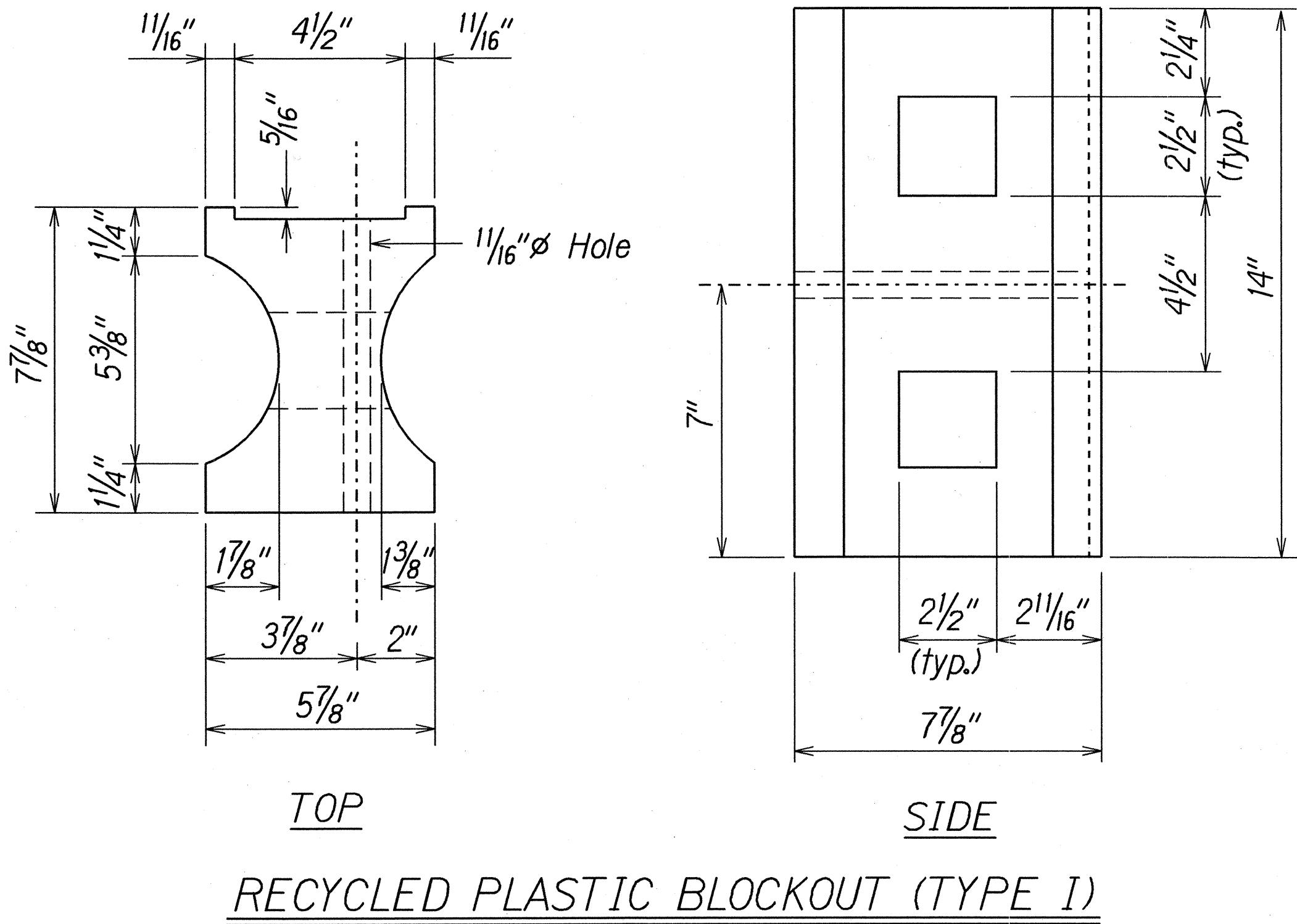
r3/13/02 ne3/usa2/Hawaii District Project Plans/Guardrail Details/bhwh/mkdcn

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

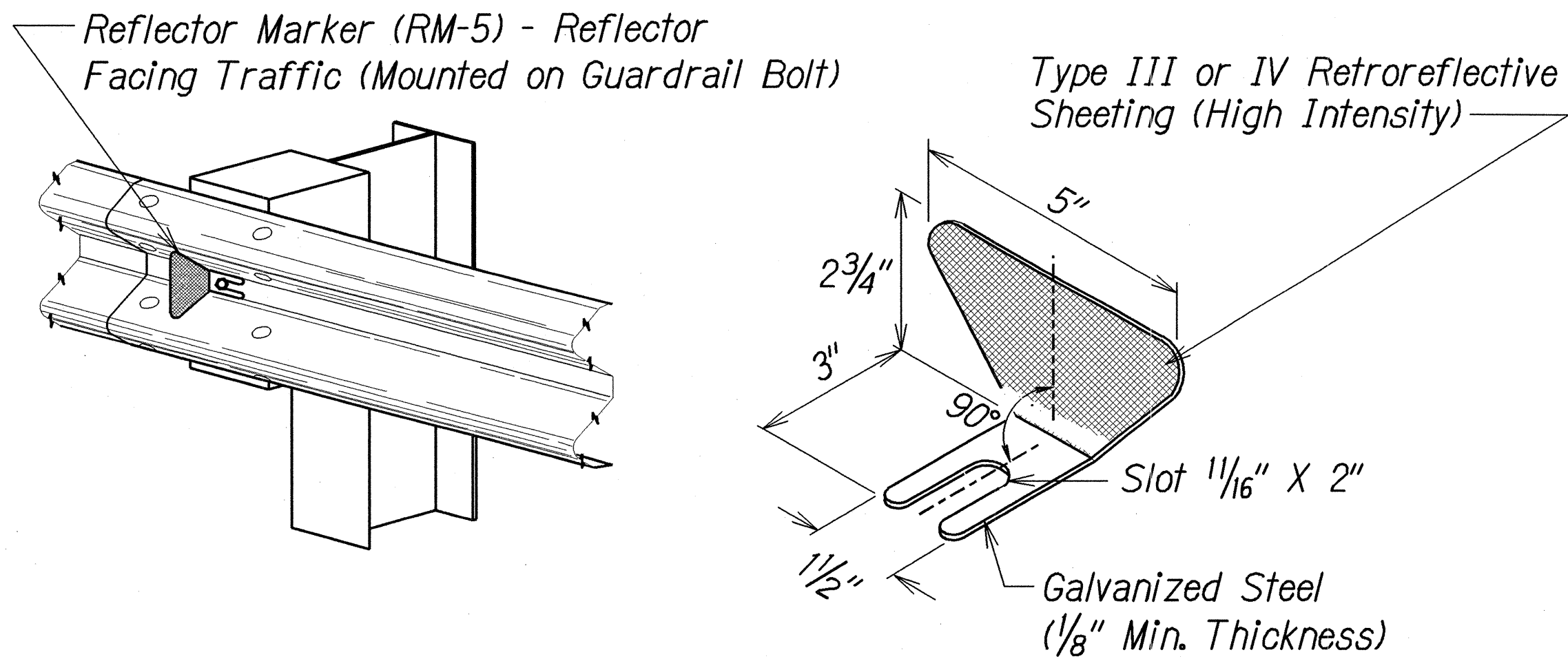
**GUARDRAIL REFLECTOR  
MARKER DETAIL**  
Hawaii Belt Road  
Traffic Operational Improvements  
At Kulaimano Road  
Project No. 19J-01-02  
Not To Scale Date: Nov. 2003

SHEET No. 1 OF 1 SHEETS

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------|-------------|-----------|--------------|
| HAWAII              | HAW.  | 19J-01-02 | 2004        | 26        | 40           |



| 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" |



TYPICAL GUARDRAIL INSTALLATION

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

GUARDRAIL DETAILS

Hawaii Belt Road

Traffic Operational Improvements

At Kulaimano Road

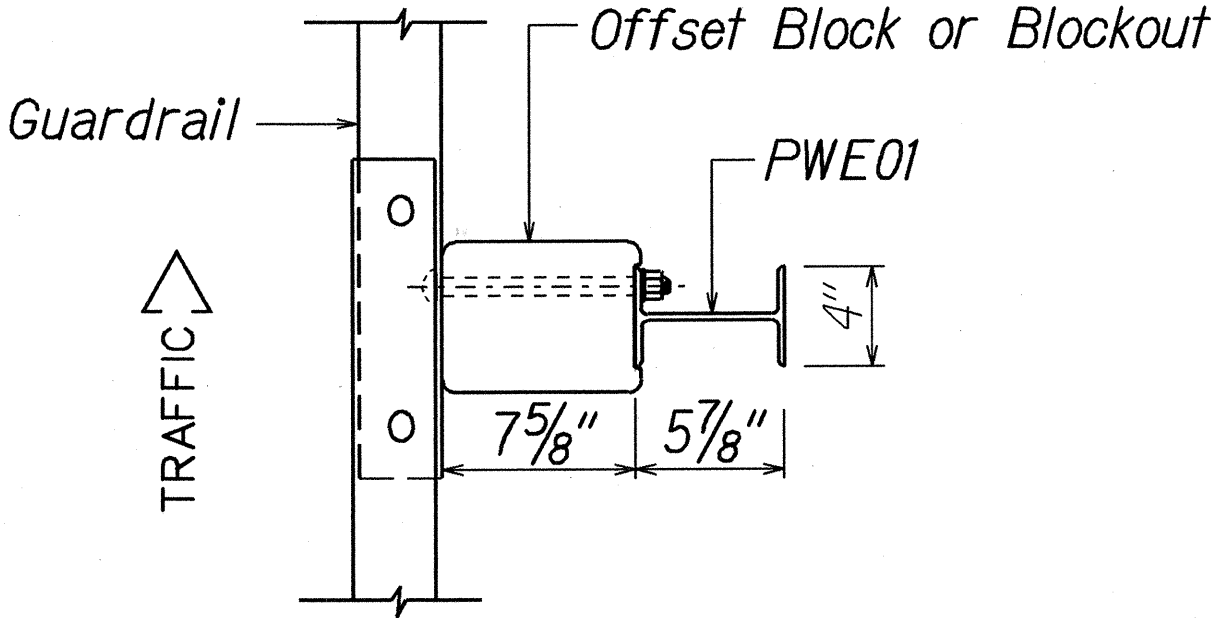
Project No. 19J-01-02

Scale: No Scale

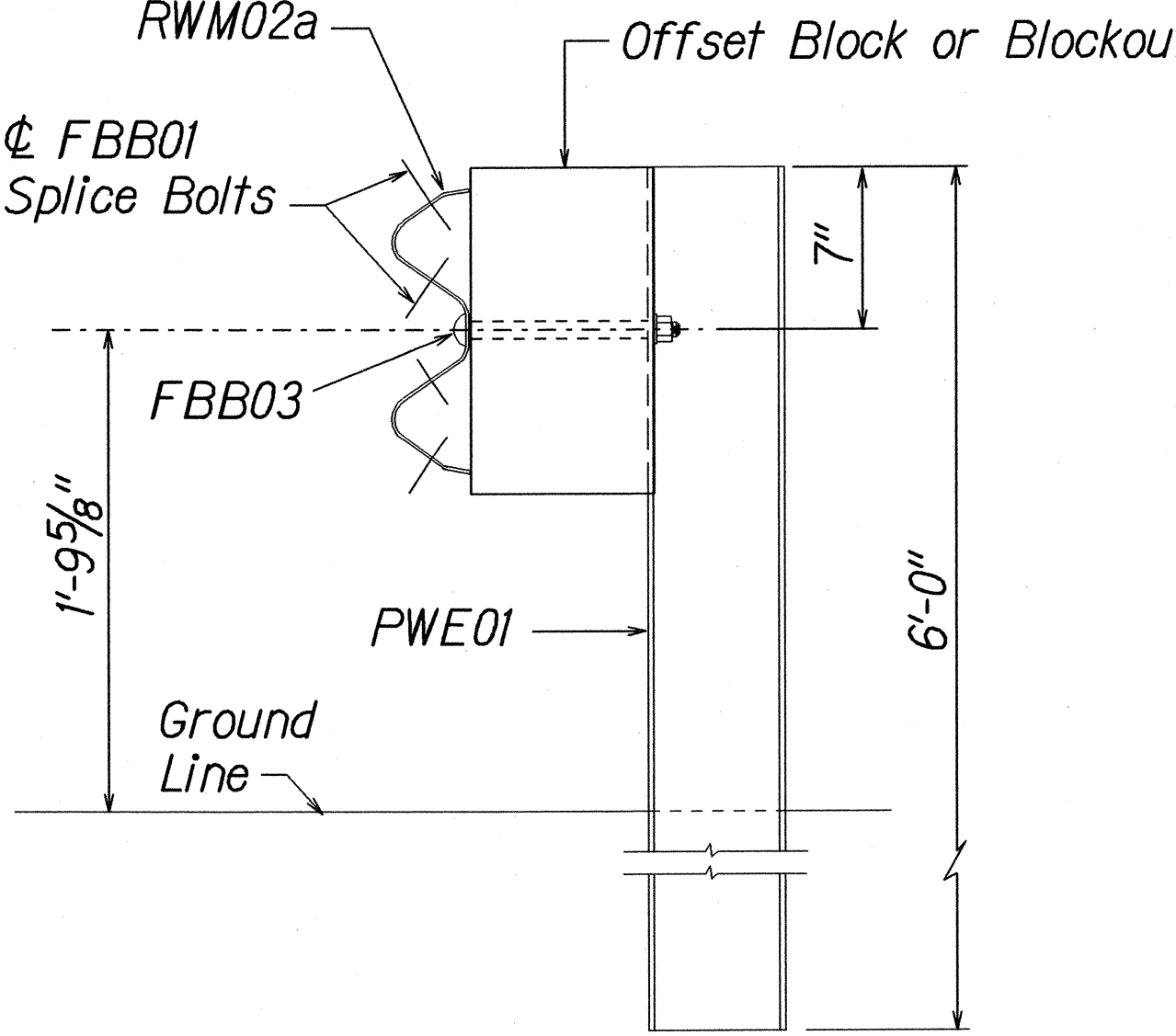
Date: Feb. 2003

SHEET No. 1 OF 4 SHEETS

|             |       |
|-------------|-------|
| DATE        | _____ |
| SURVEY BY   | _____ |
| DRAWN BY    | _____ |
| DESIGNED BY | _____ |
| NOTE BOOK   | _____ |
| CHECKED BY  | _____ |

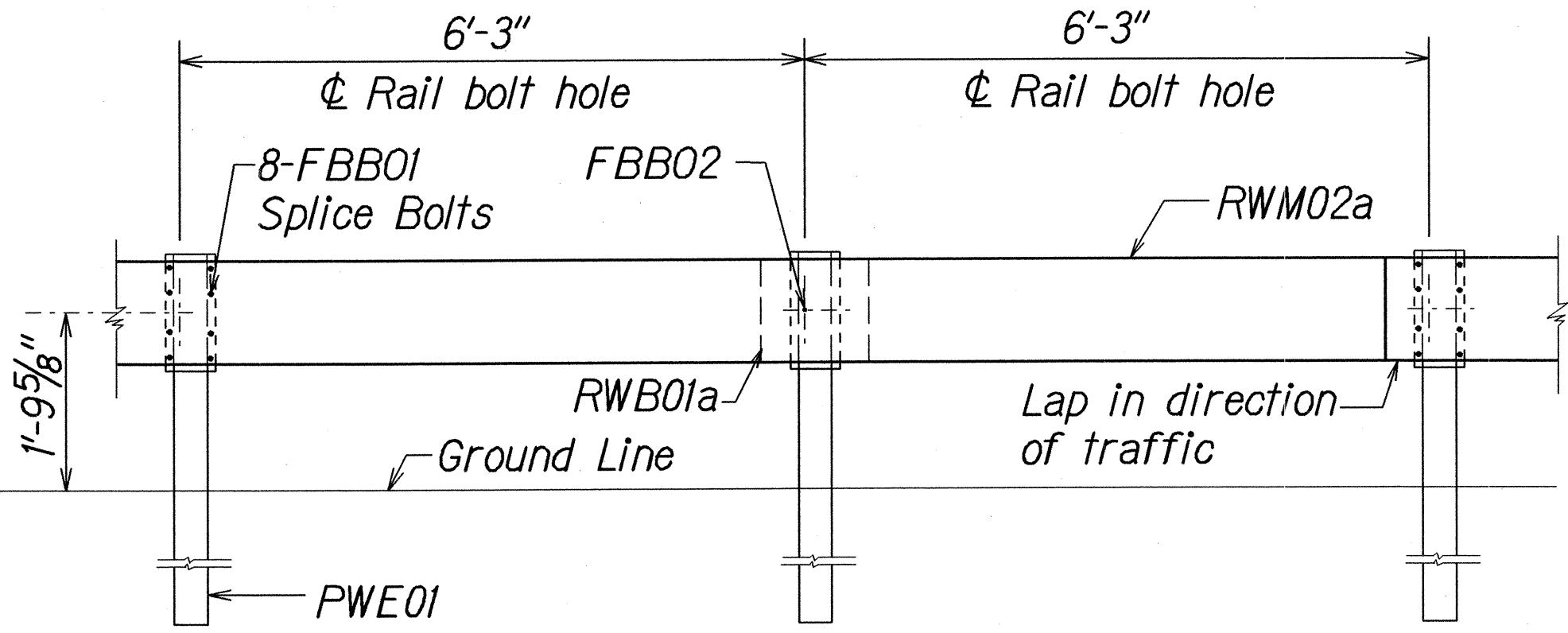


PLAN



ELEVATION

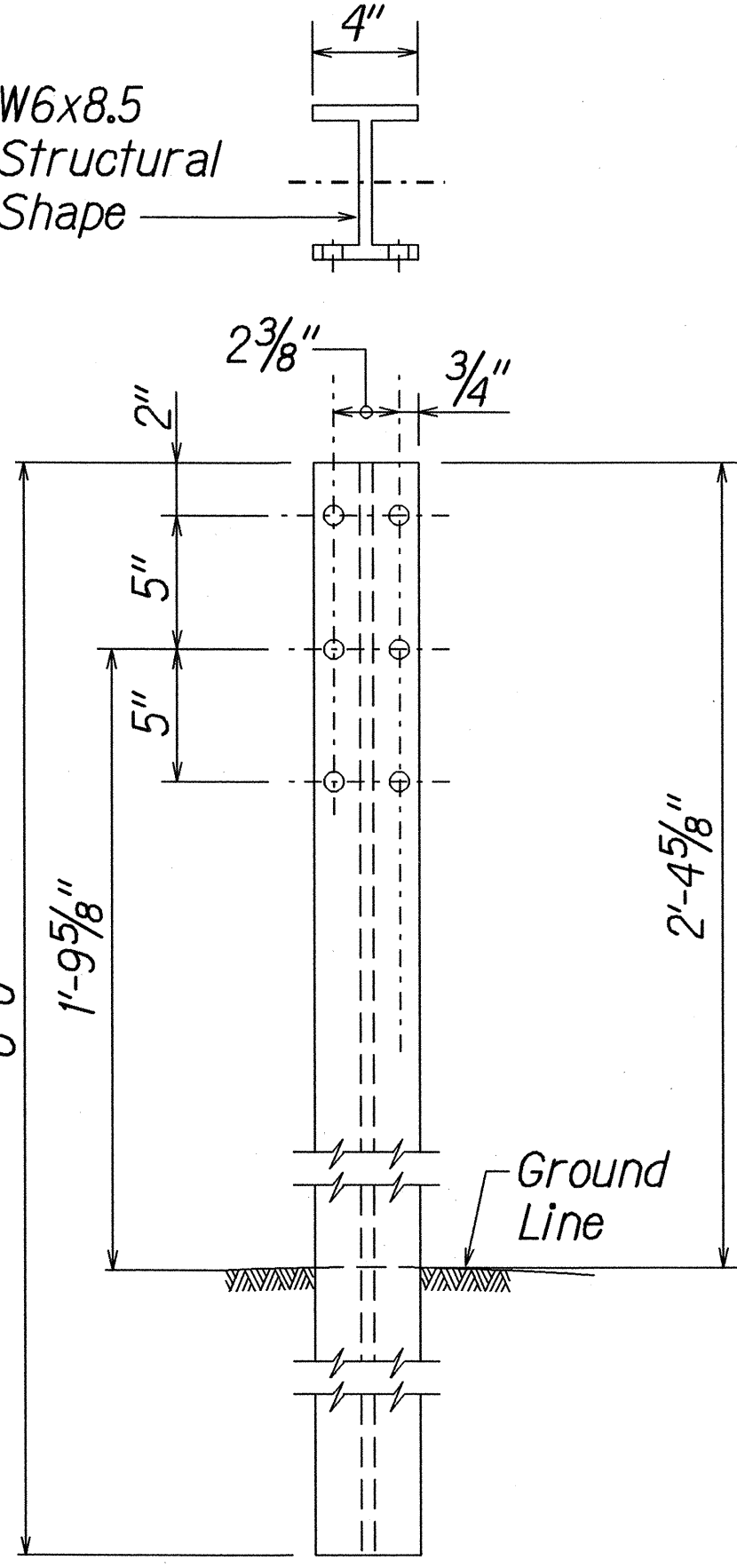
STRONG POST W-BEAM GUARDRAIL  
(SGR04a)



ELEVATION

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

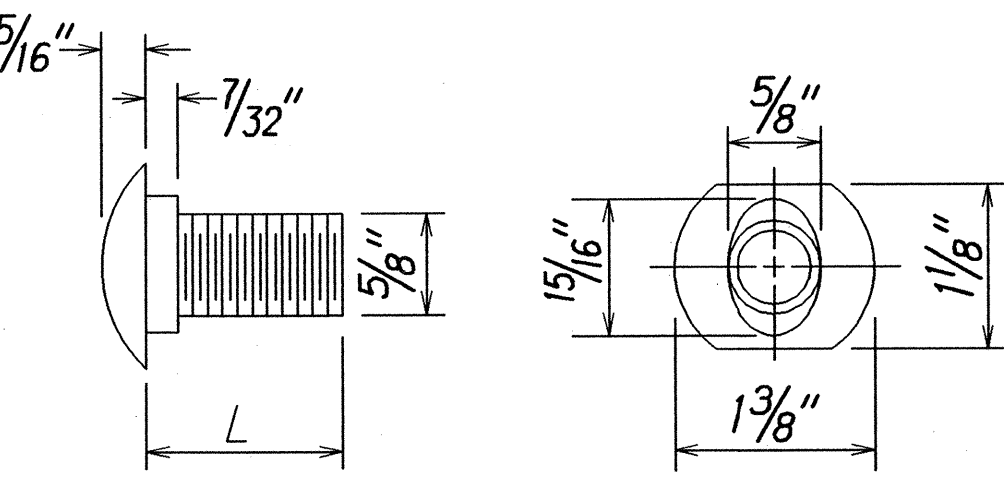
NOTE:  
All Holes are  
3/4" Dia.



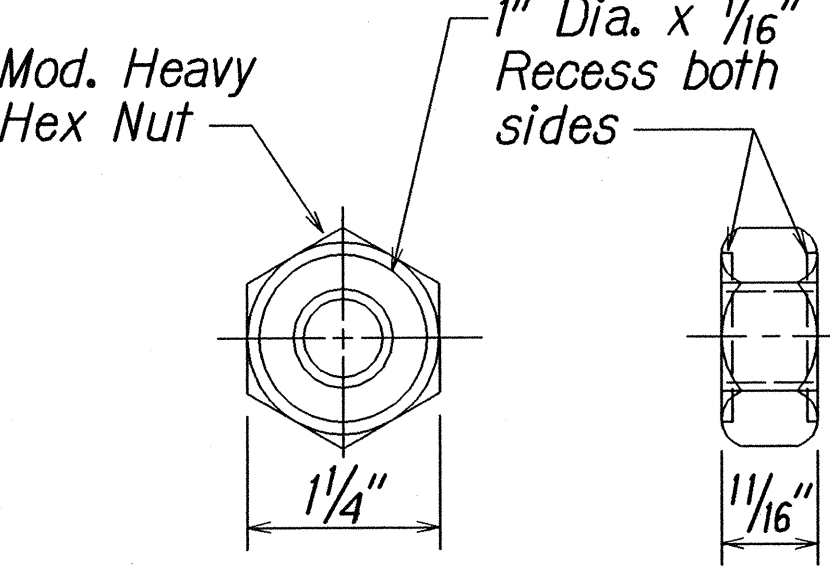
SIDE

FRONT

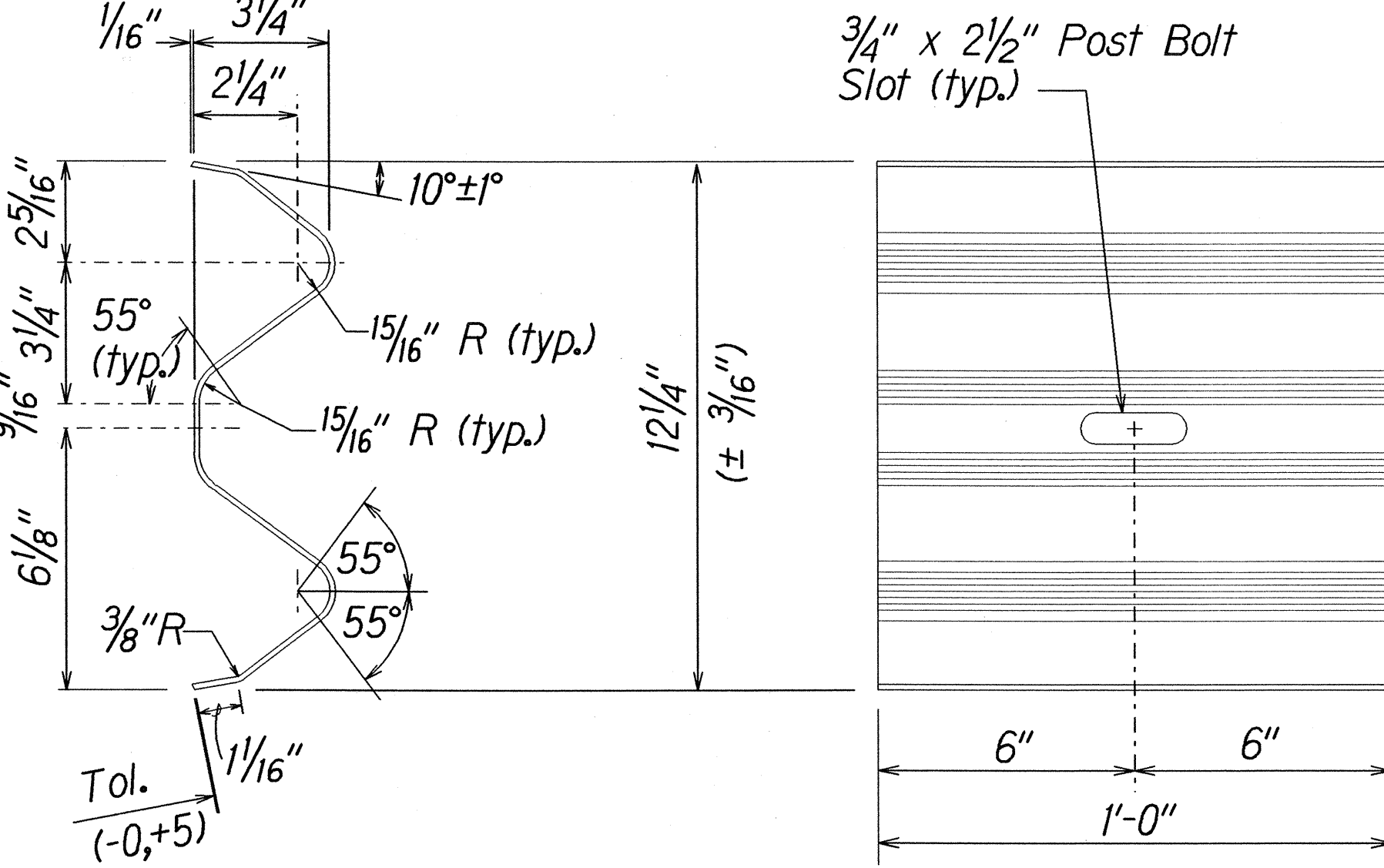
W-BEAM STRONG POST (PWE01)



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

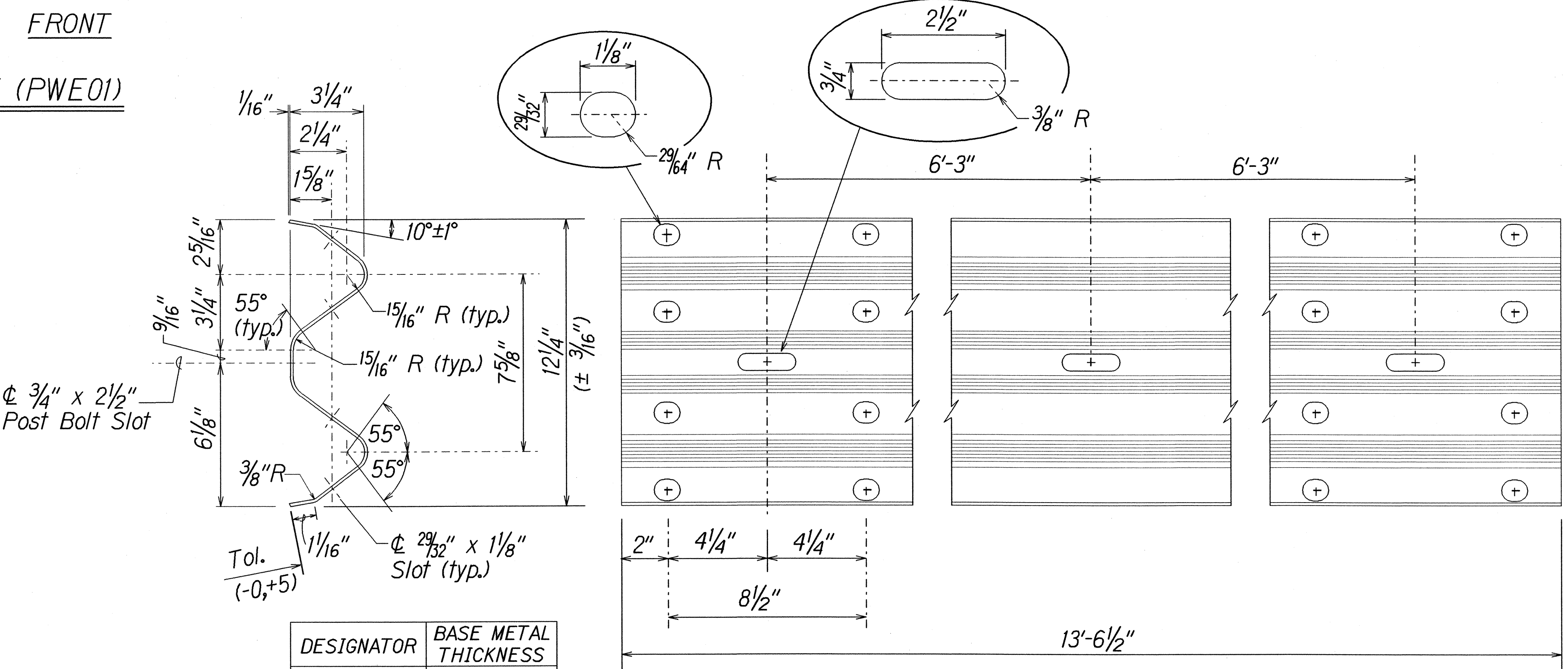


GUARDRAIL BOLTS AND  
RECESSED NUT



| 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

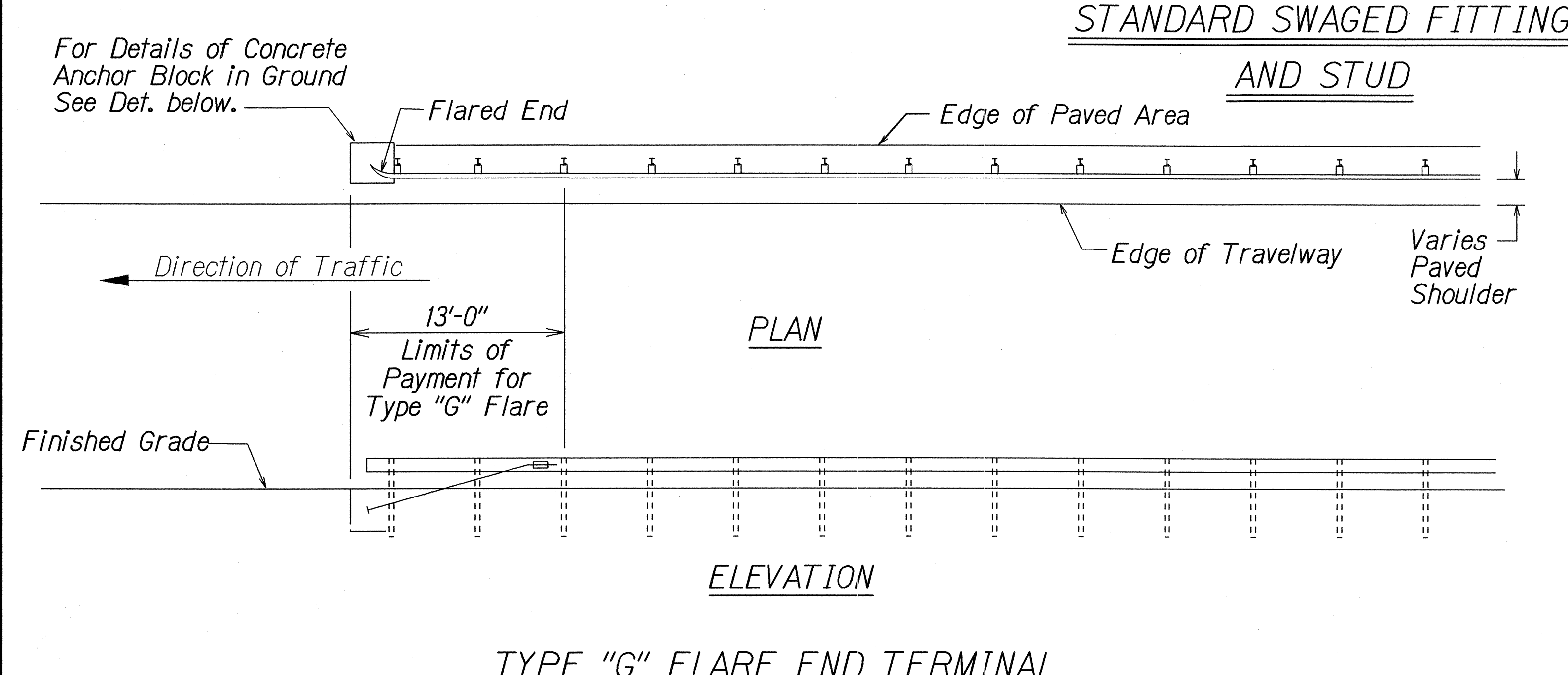
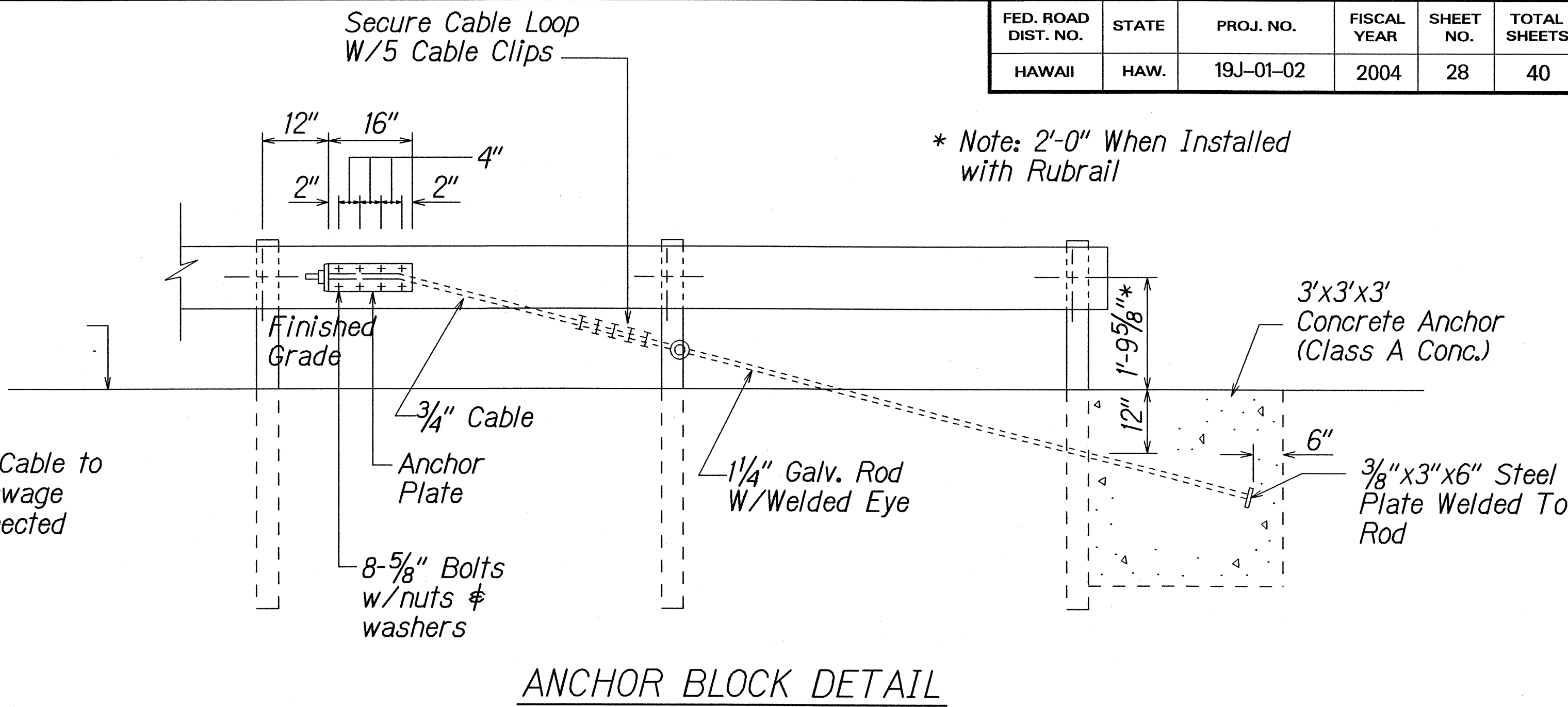
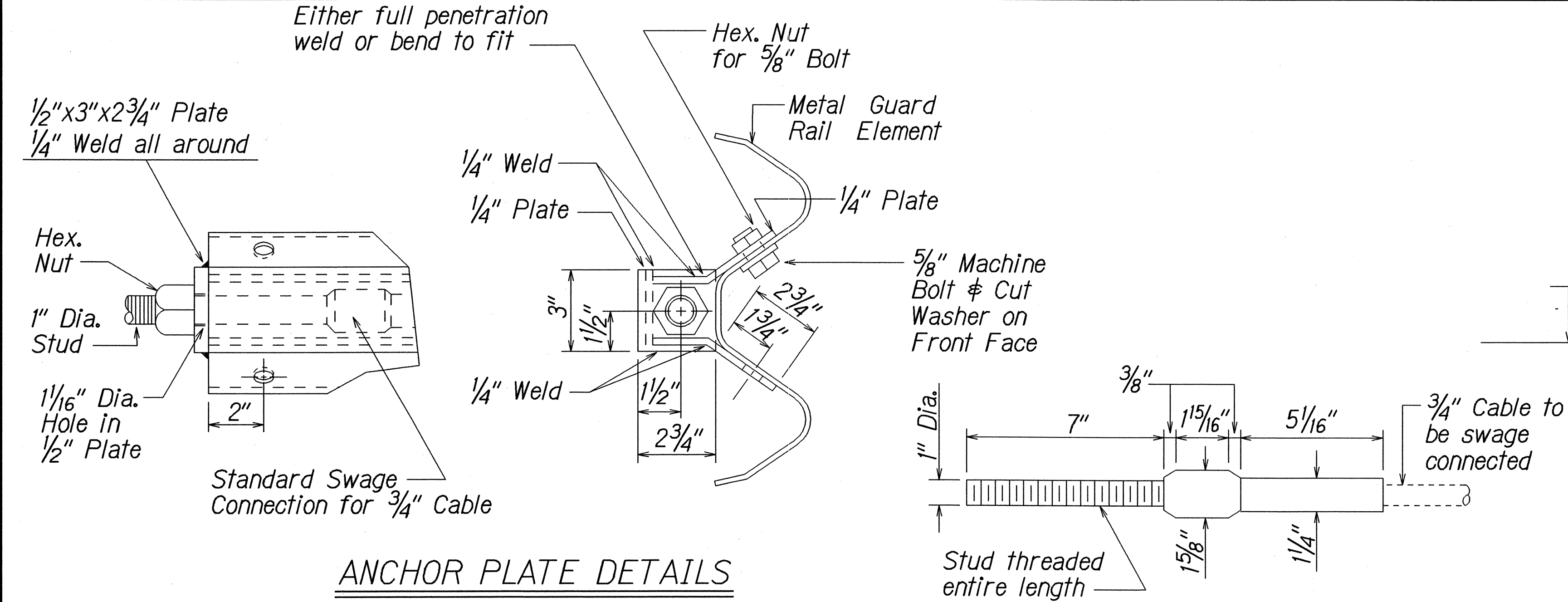
**STRONG POST W-BEAM GUARDRAIL**

Hawaii Belt Road  
Traffic Operational Improvements  
At Kulaimano Road  
Project No. 19J-01-02

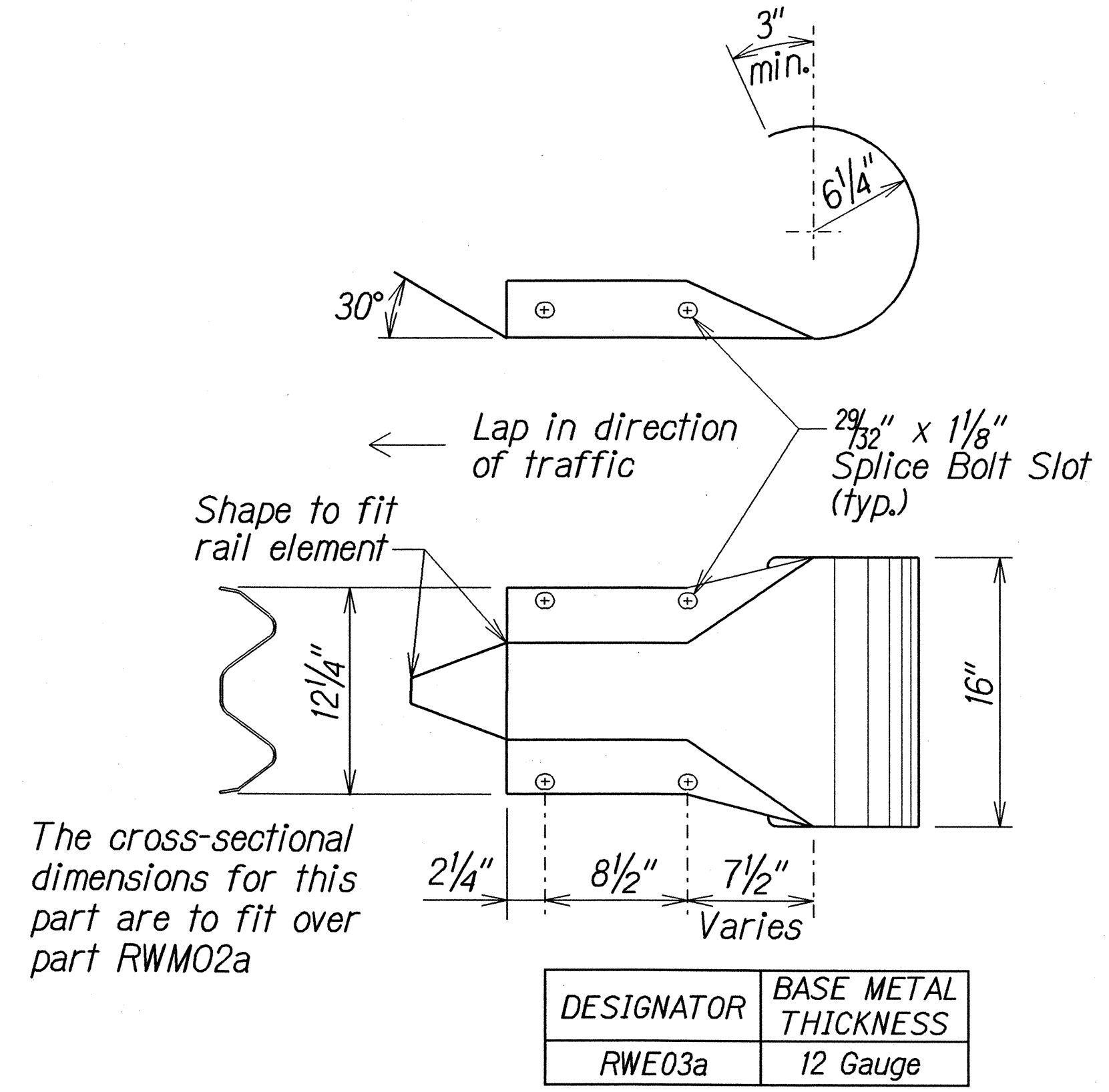
Scale: No Scale Date: Feb. 2003

SHEET No. 2 OF 4 SHEETS

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------|-------------|-----------|--------------|
| HAWAII              | HAW.  | 19J-01-02 | 2004        | 28        | 40           |



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



**NOTE:**

Type "G" Modified End Terminal is a site specific end terminal with a taper and radial termini. A site specific 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.

|                   |       |
|-------------------|-------|
| DATE              | _____ |
| SURVEY PLOTTED BY | _____ |
| DRAWN BY          | _____ |
| TRACED BY         | _____ |
| DESIGNED BY       | _____ |
| NOTE BOOK         | _____ |
| QUANTITIES BY     | _____ |
| CHECKED BY        | _____ |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**GUARDRAIL DETAILS**

Hawaii Belt Road  
Traffic Operational Improvements  
At Kulaimano Road  
Project No. 19J-01-02

Scale: No Scale Date: Feb. 2003

SHEET No. 3 OF 4 SHEETS