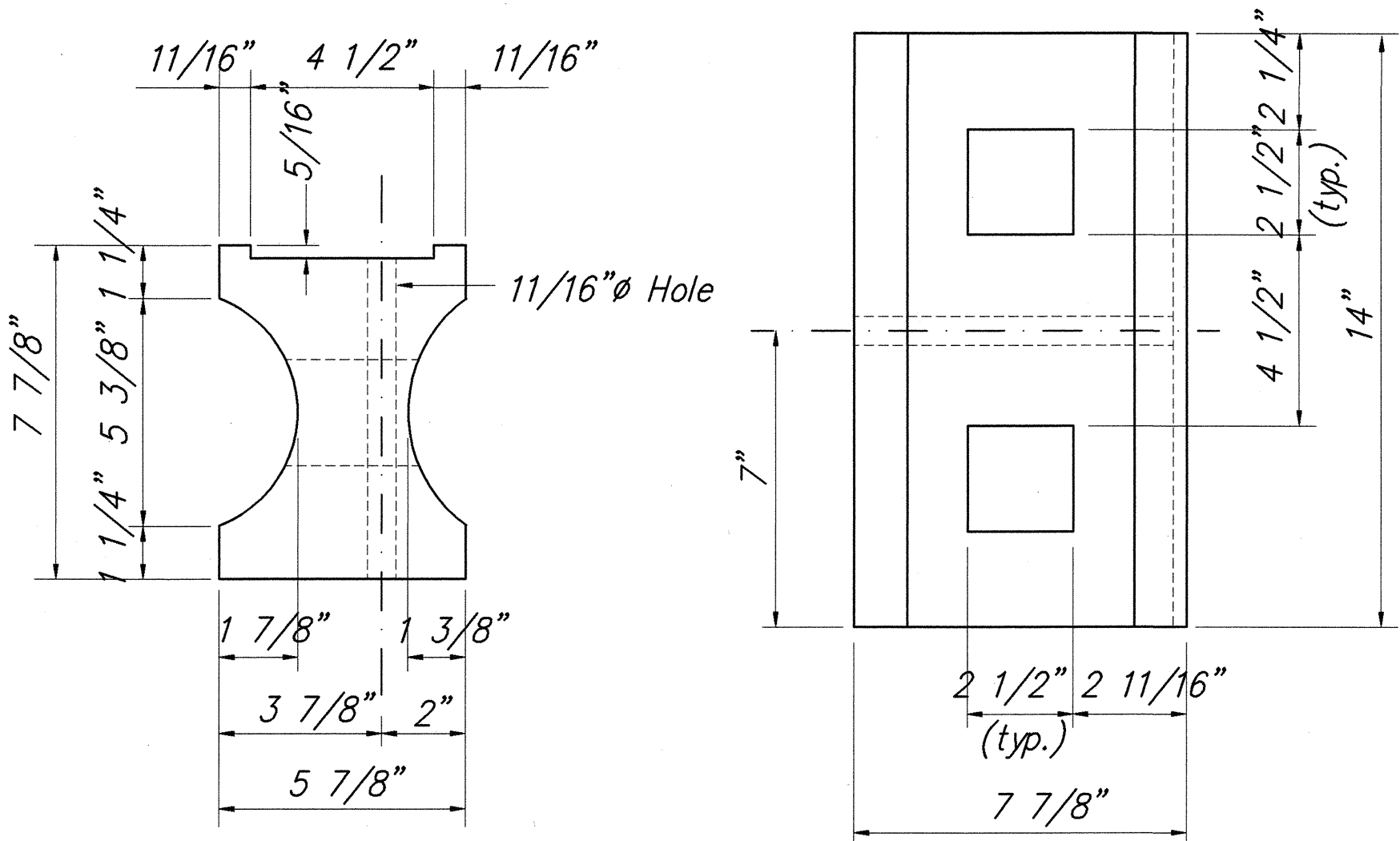
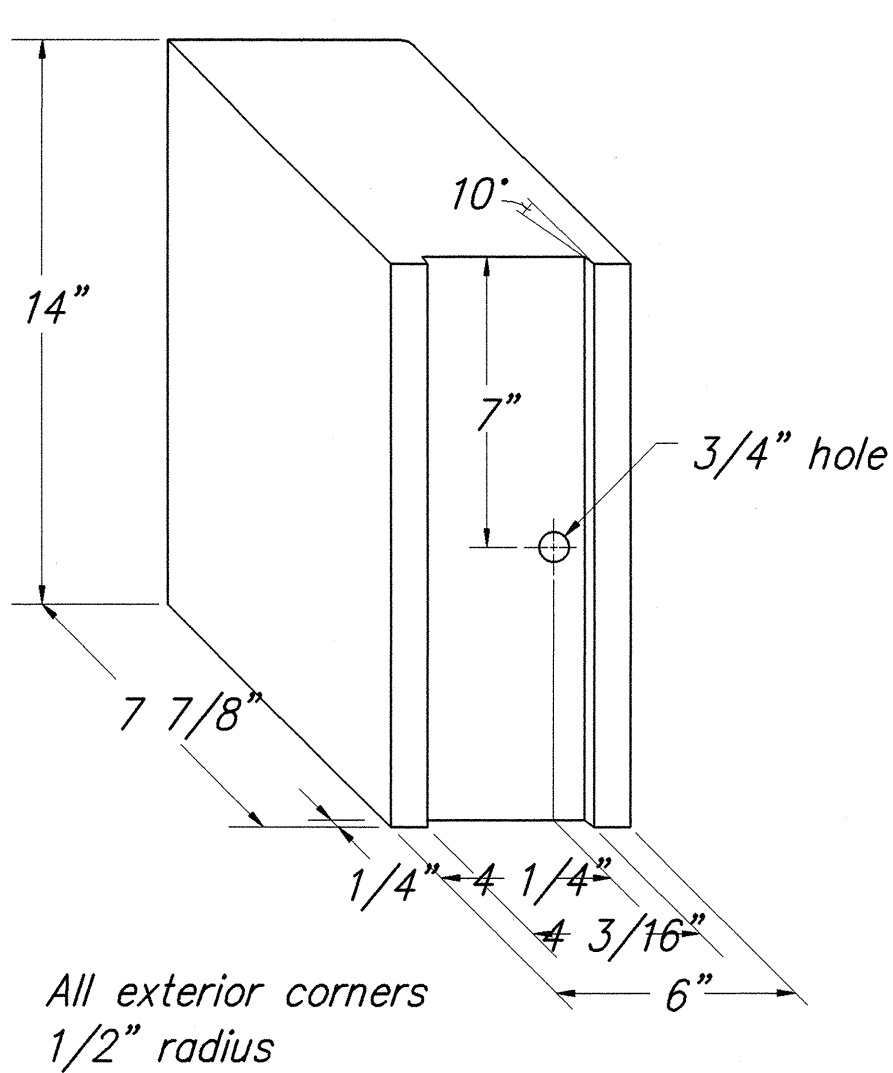


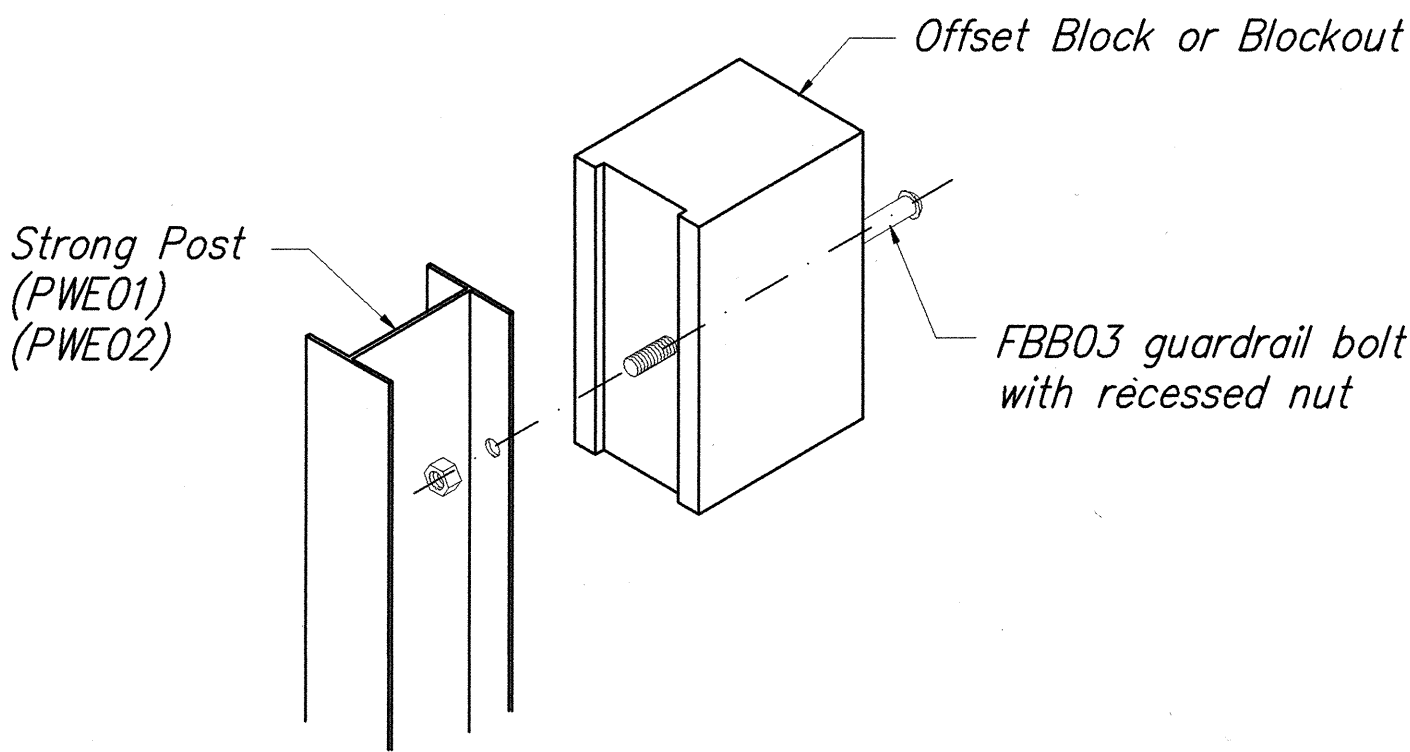
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|----------------|-------|----------------|-------------|-----------|--------------|
| HAWAII | HAW. | 220A-01-03M | 2003 | 21 | 37 |



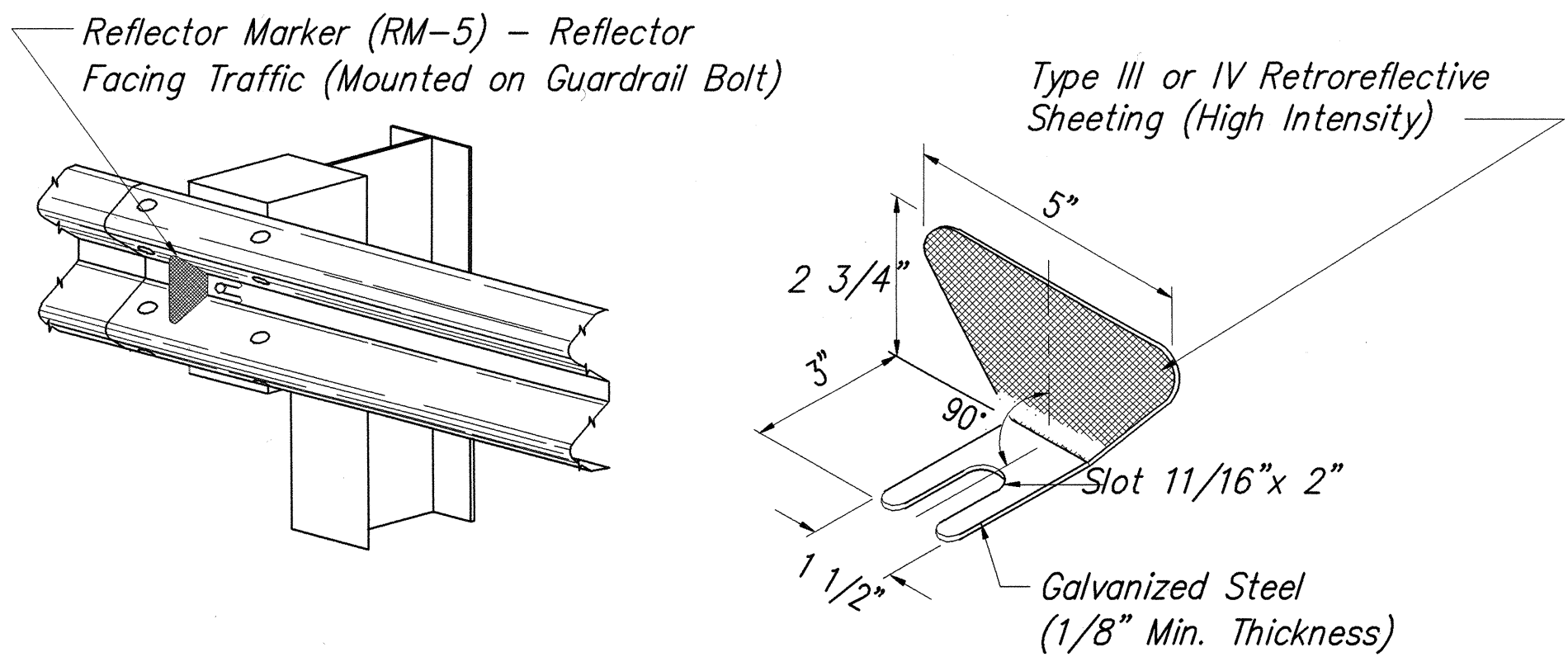
TOP
RECYCLED PLASTIC BLOCKOUT (TYPE I)
N.T.S.



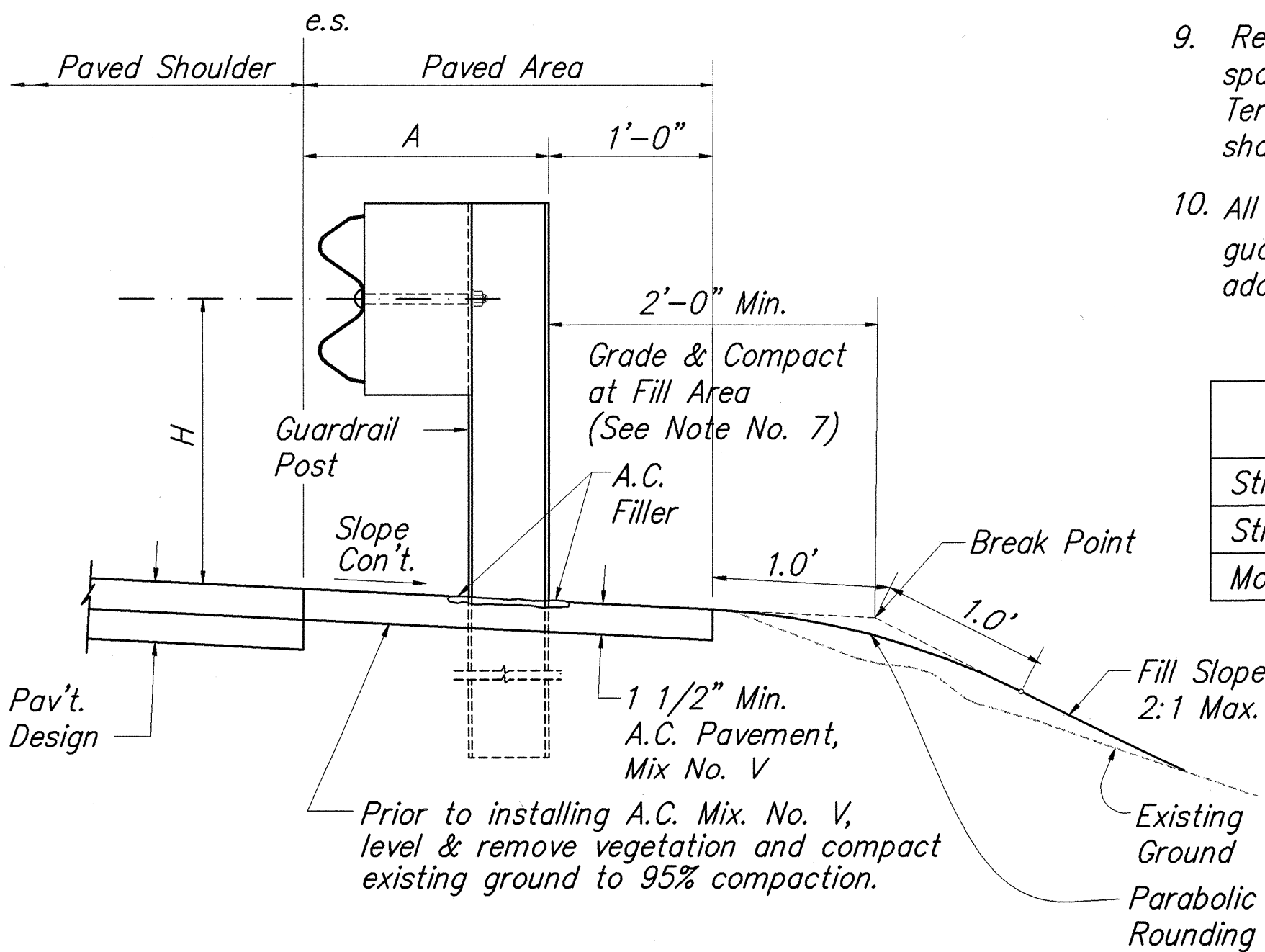
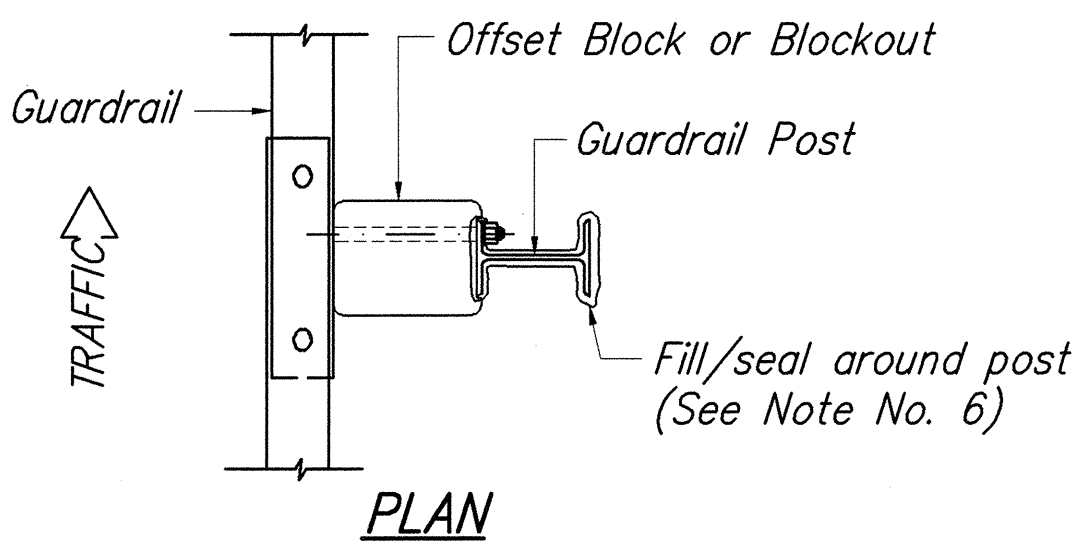
RECYCLED POLYETHYLENE
OFFSET BLOCK (TYPE II)
N.T.S.



Exploded View
(Rail and washer not shown)
STEEL POST AND BLOCK DETAIL
N.T.S.



REFLECTOR MARKER (RM-5)
DETAIL AND TYPICAL INSTALLATION
N.T.S.

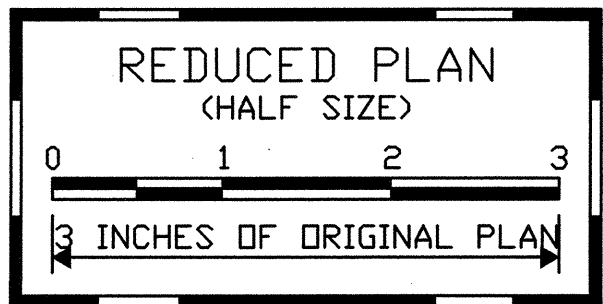


ELEVATION
TYPICAL GUARDRAIL INSTALLATION
N.T.S.

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, intermediate posts shall be installed, as shown on sheet C-20.
- 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 adjacent guardrail system.
- All new guardrail systems (system consist of total length of guardrail including both end treatments) shall include the additional paved area.

| 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

AKAKA FALLS ROAD RESURFACING

Hawaii Belt Road to Honoumua Town

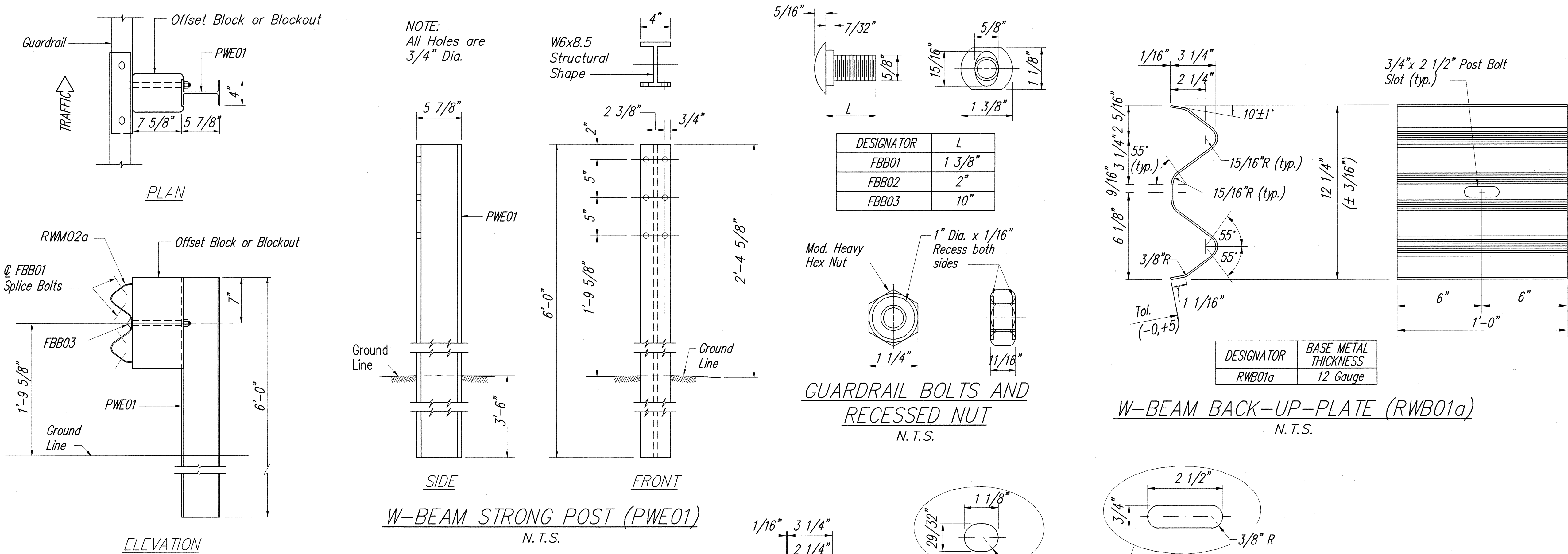
Project No. 220A-01-03M

Scale: As Noted Date: April 2003

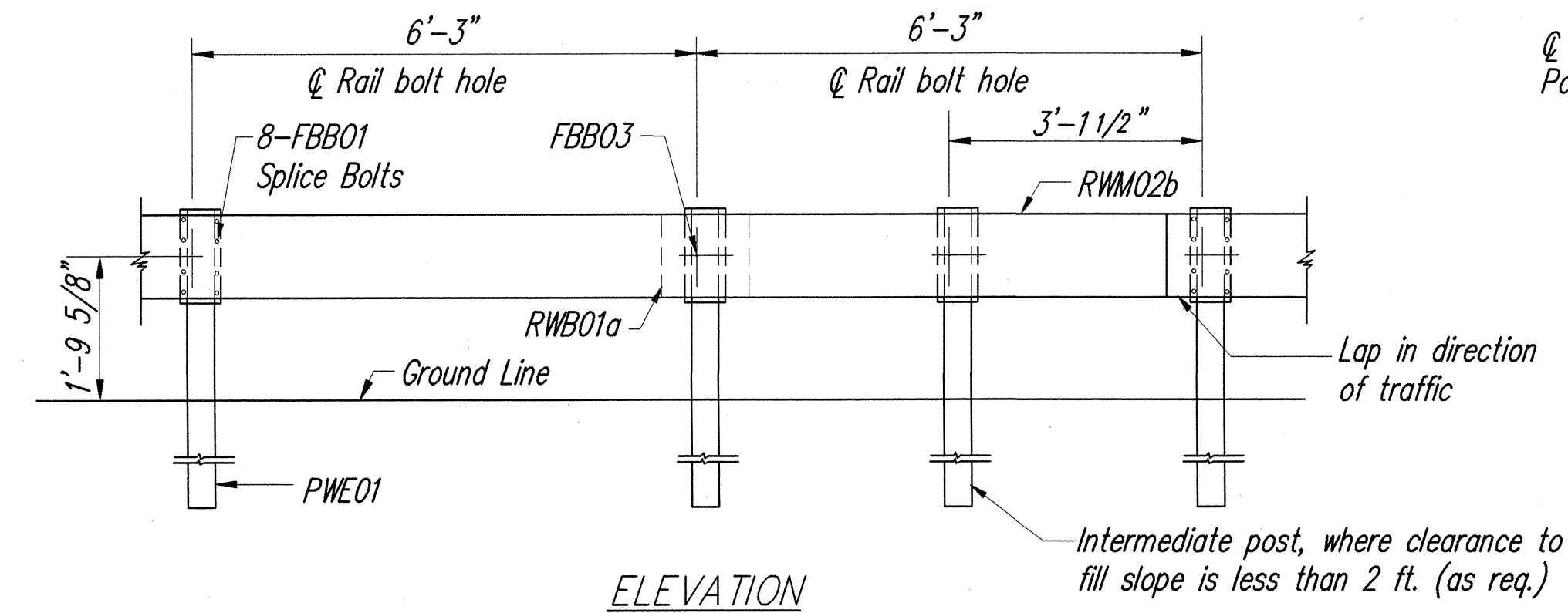
SHEET No. 1 OF 5 SHEETS

| | |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DESIGNED BY | |
| TRACED BY | |
| NOTE BOOK | |
| QUANTITIES BY | |
| CHECKED BY | |
| NO. | |

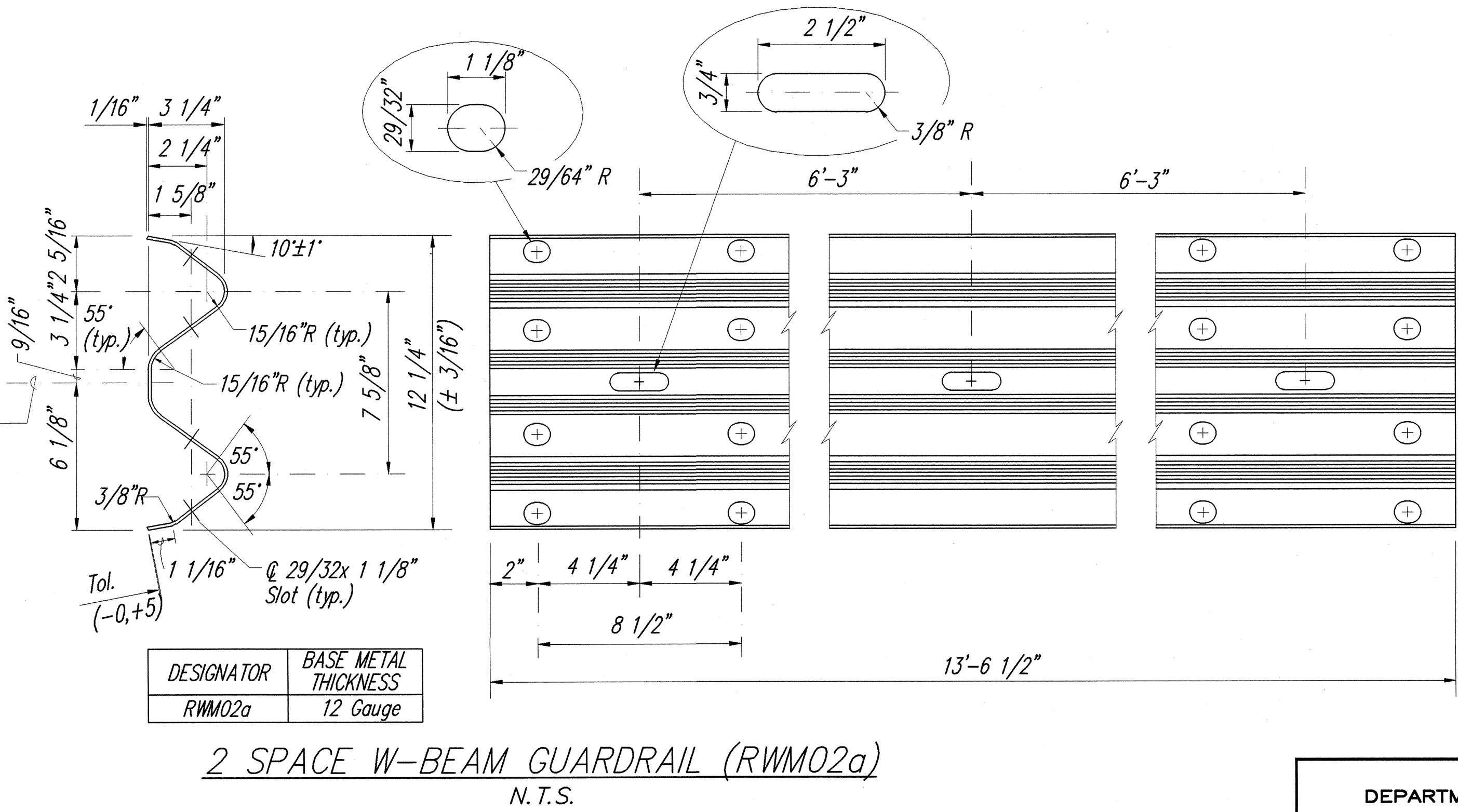
| ROAD DIST. NO. | STATE | PROJECT NUMBER | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|----------------|-------|----------------|-------------|-----------|--------------|
| HAWAII | HAW. | 220A-01-03M | 2003 | 22 | 37 |



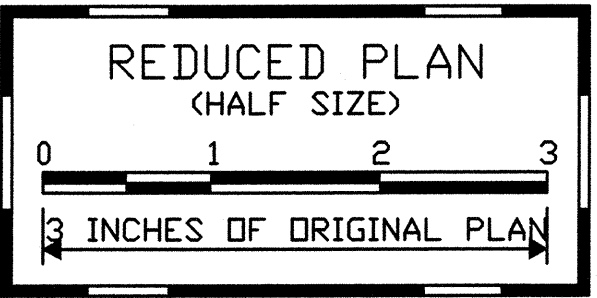
STRONG POST W-BEAM GUARDRAIL (SGR04a)
N.T.S.



STRONG POST W-BEAM GUARDRAIL WITH RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT
N.T.S.



2 SPACE W-BEAM GUARDRAIL (RWM02a)
N.T.S.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

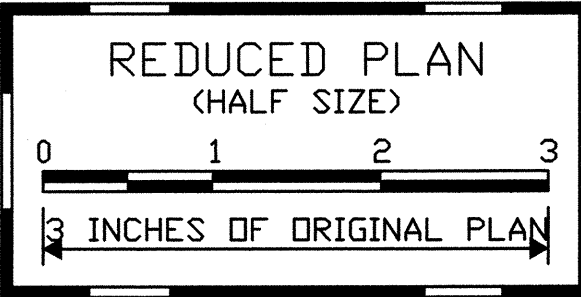
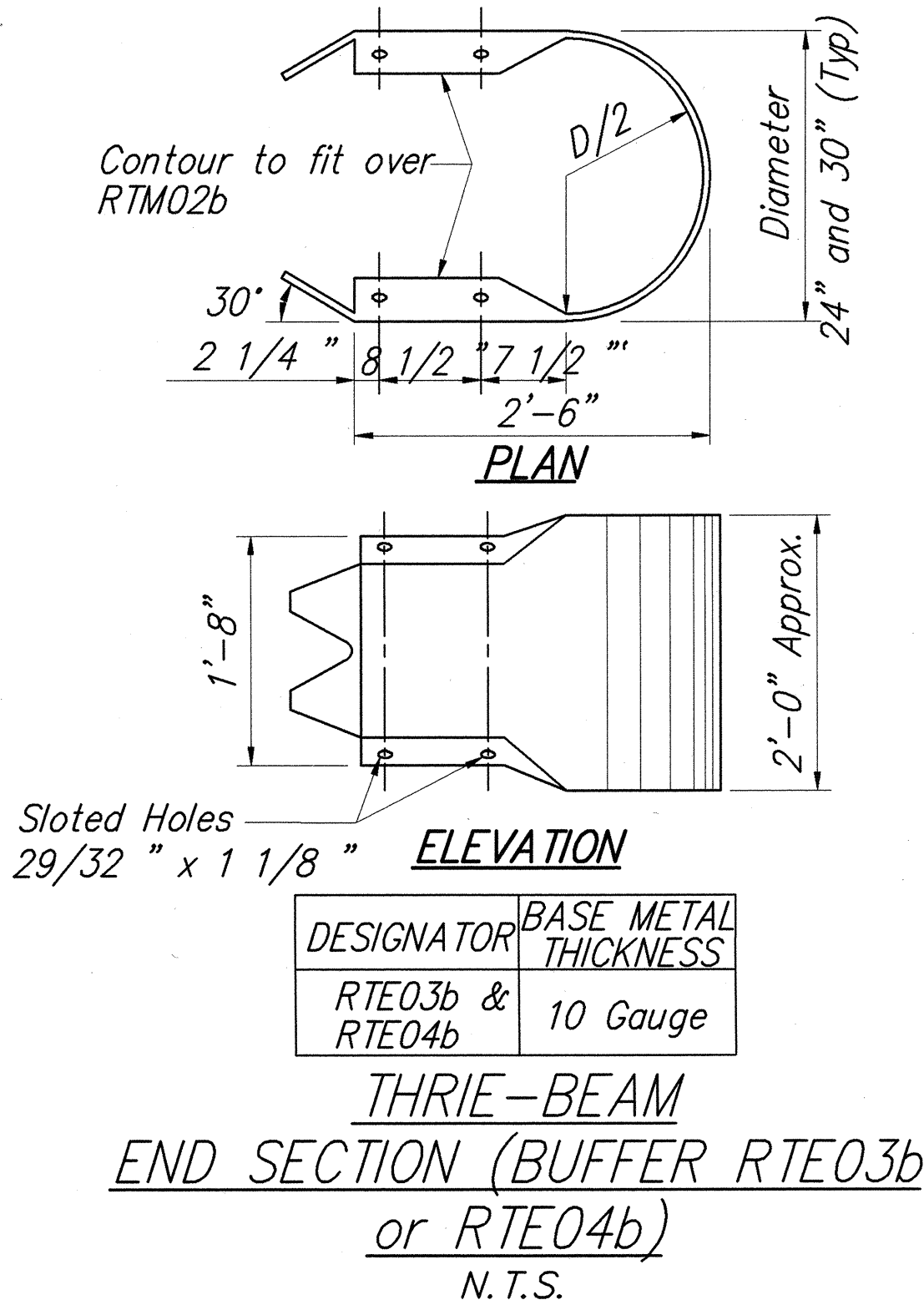
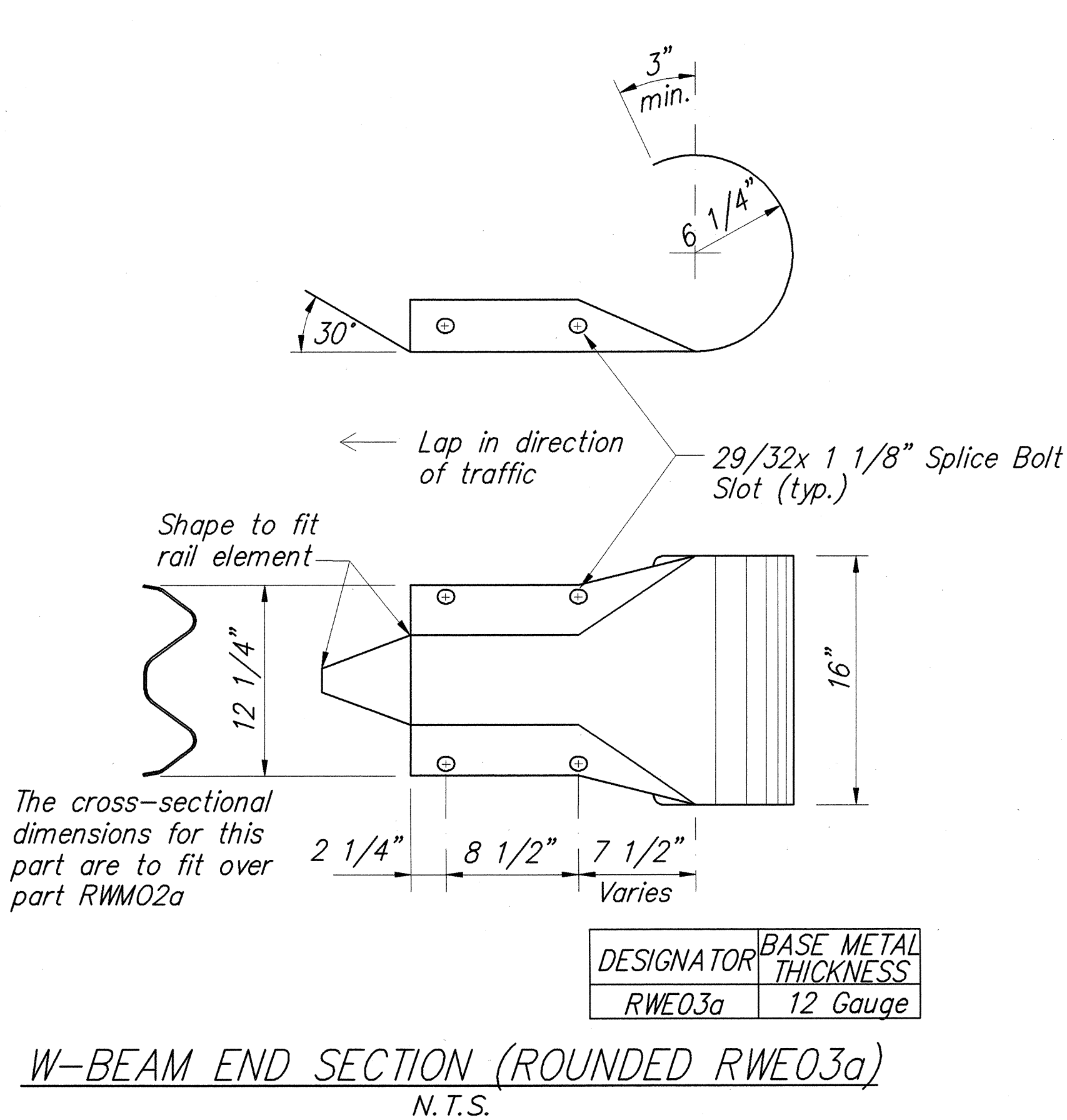
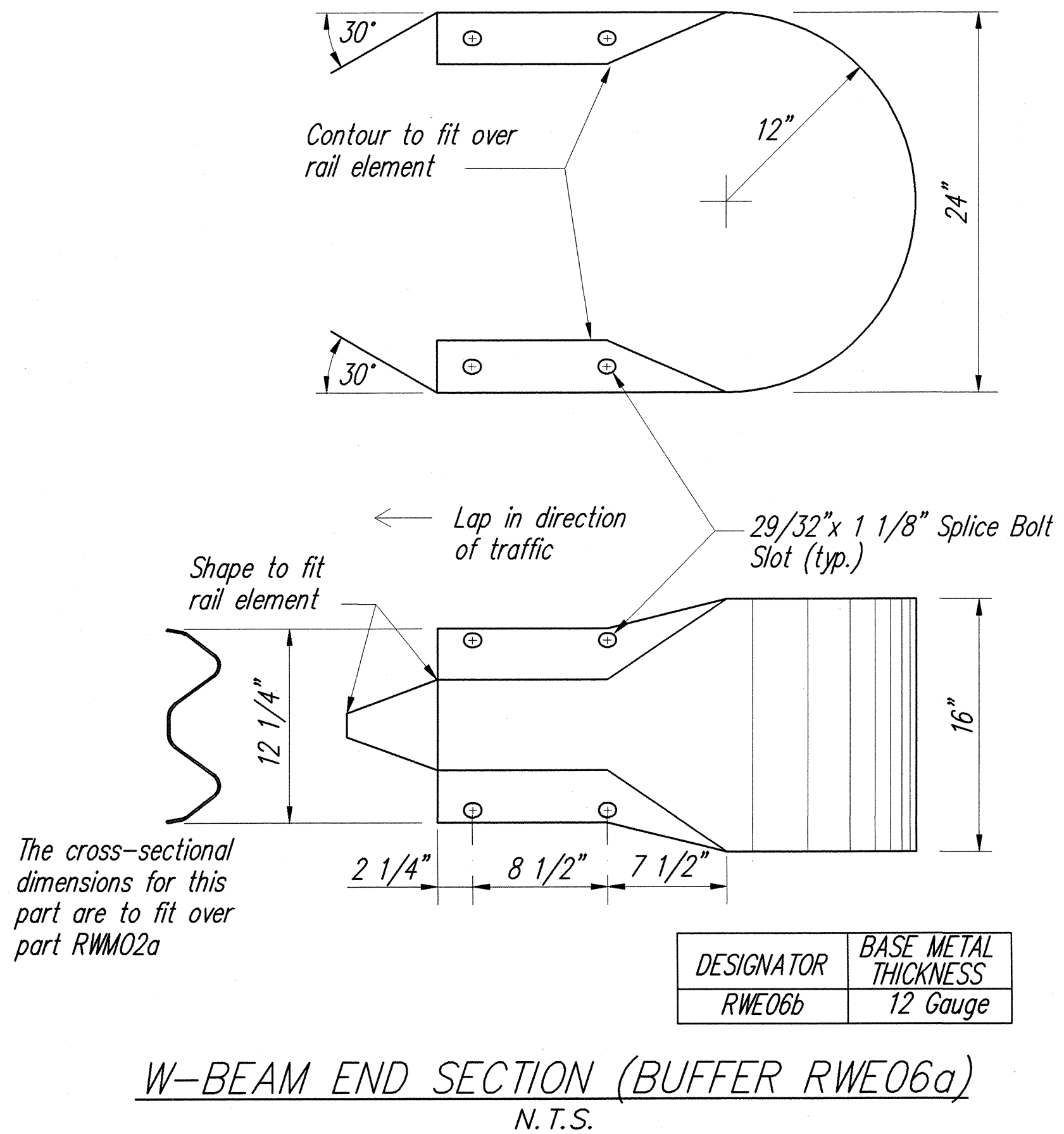
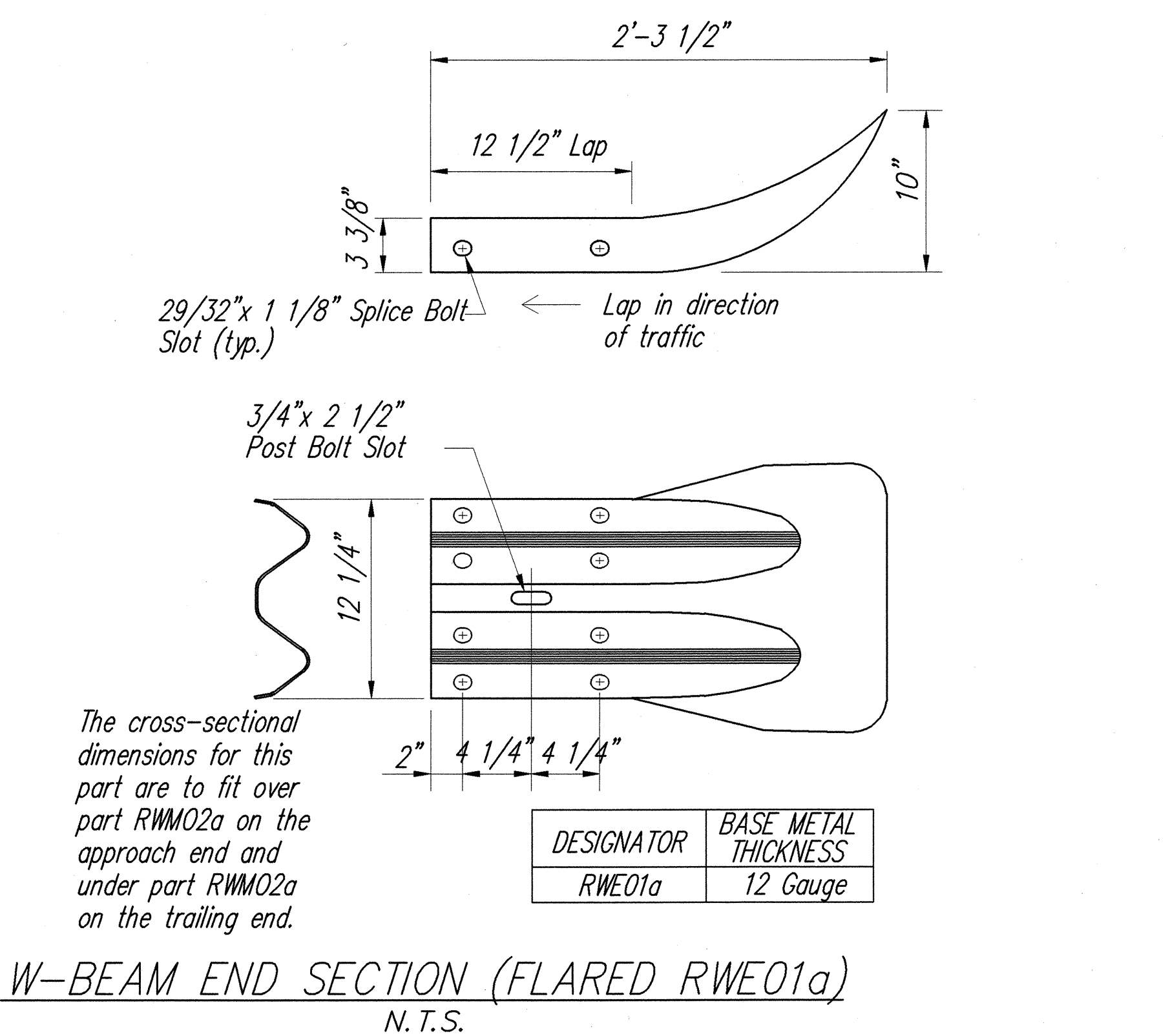
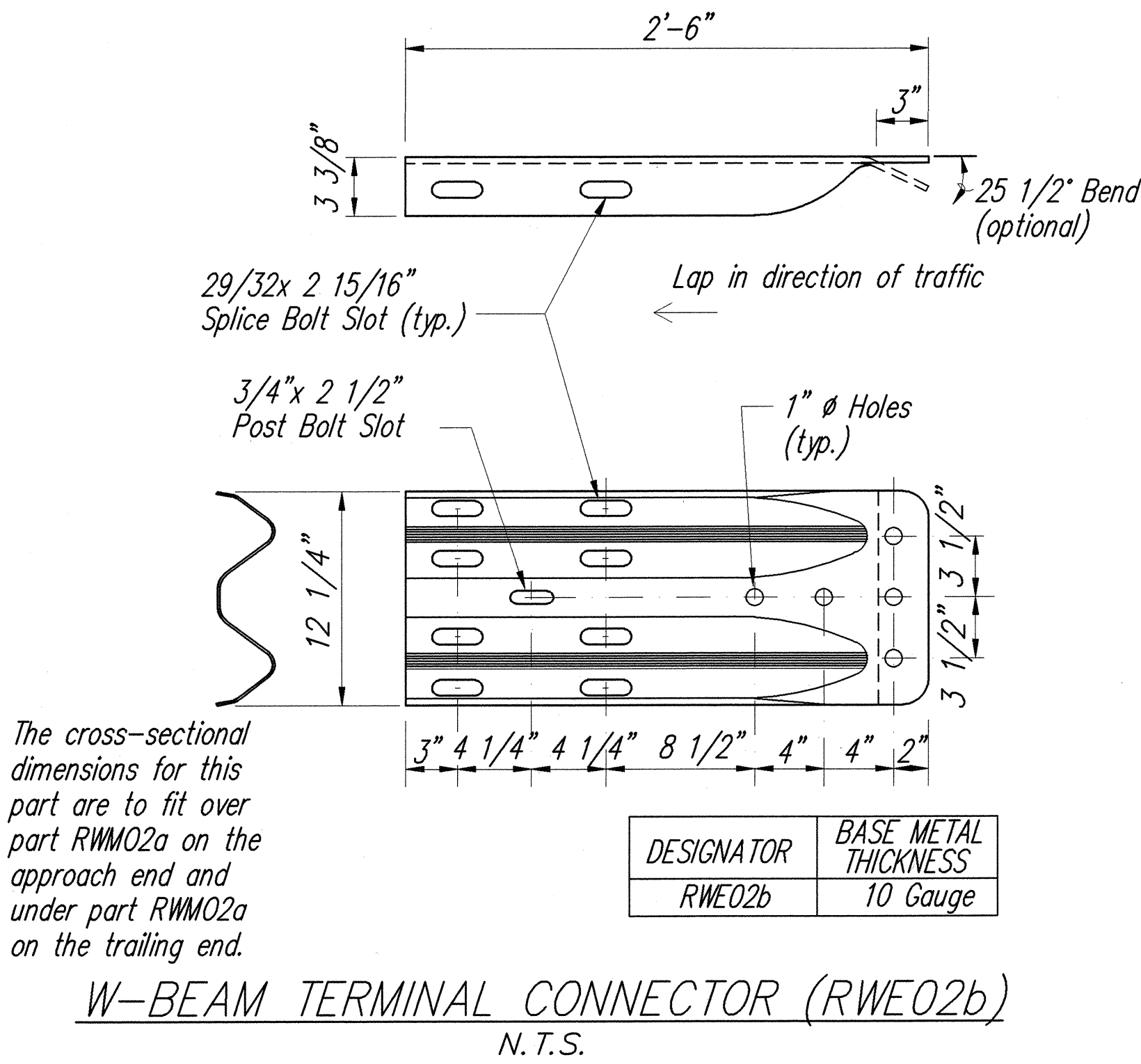
STRONG POST
W-BEAM GUARDRAIL
AKAKA FALLS ROAD RESURFACING
Hawaii Belt Road to Honoumuli Town
Project No. 220A-01-03M

Scale: As Noted Date: April 2003

SHEET No. 2 OF 5 SHEETS

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| NO. 1 | |
| NO. 2 | |
| NO. 3 | |
| NO. 4 | |
| NO. 5 | |
| NO. 6 | |
| NO. 7 | |
| NO. 8 | |
| NO. 9 | |
| NO. 10 | |
| NO. 11 | |
| NO. 12 | |
| NO. 13 | |
| NO. 14 | |
| NO. 15 | |
| NO. 16 | |
| NO. 17 | |
| NO. 18 | |
| NO. 19 | |
| NO. 20 | |
| NO. 21 | |
| NO. 22 | |
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| NO. 26 | |
| NO. 27 | |
| NO. 28 | |
| NO. 29 | |
| NO. 30 | |
| NO. 31 | |
| NO. 32 | |
| NO. 33 | |
| NO. 34 | |
| NO. 35 | |
| NO. 36 | |
| NO. 37 | |

| ROAD DIST. NO. | STATE | PROJECT NUMBER | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|----------------|-------|----------------|-------------|-----------|--------------|
| HAWAII | HAW. | 220A-01-03M | 2003 | 23 | 37 |



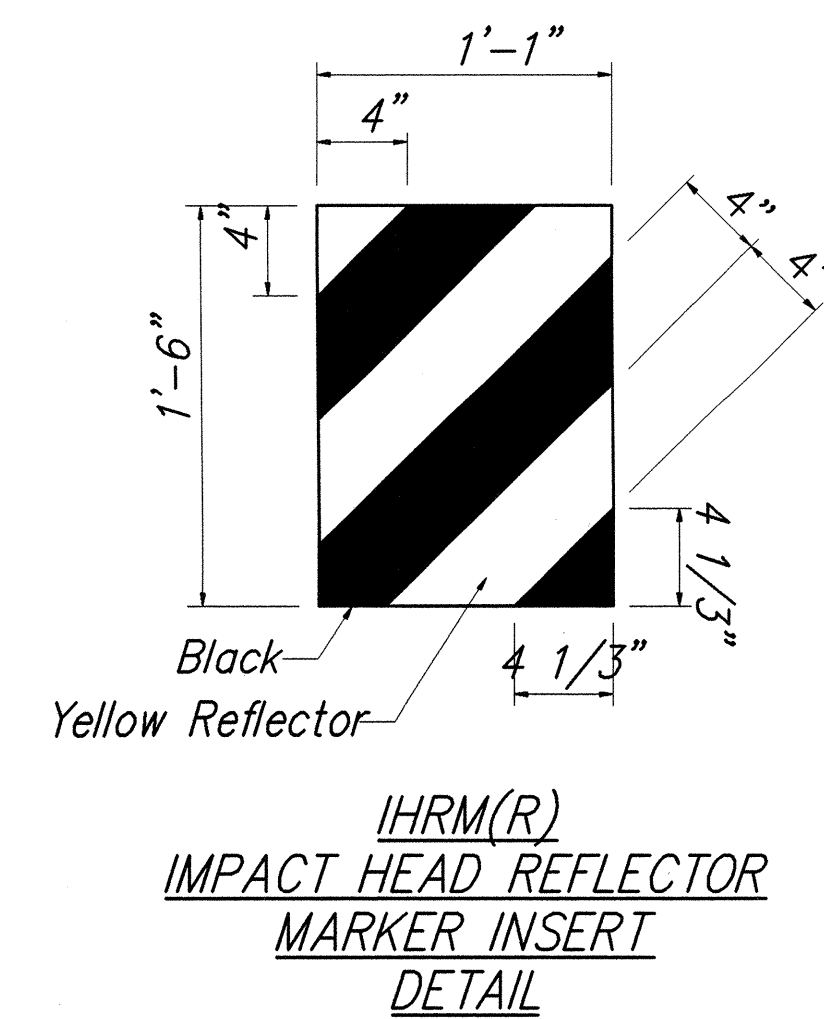
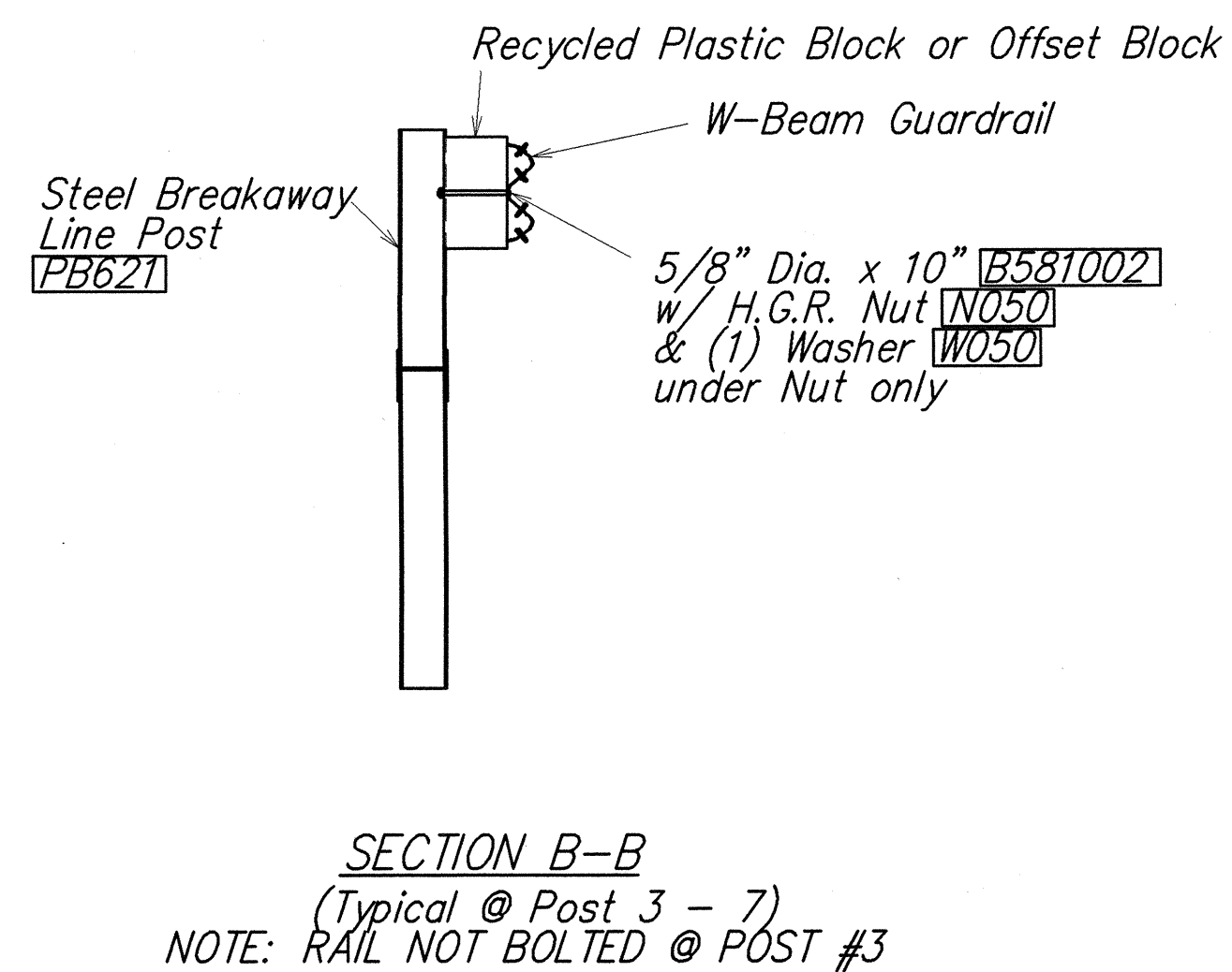
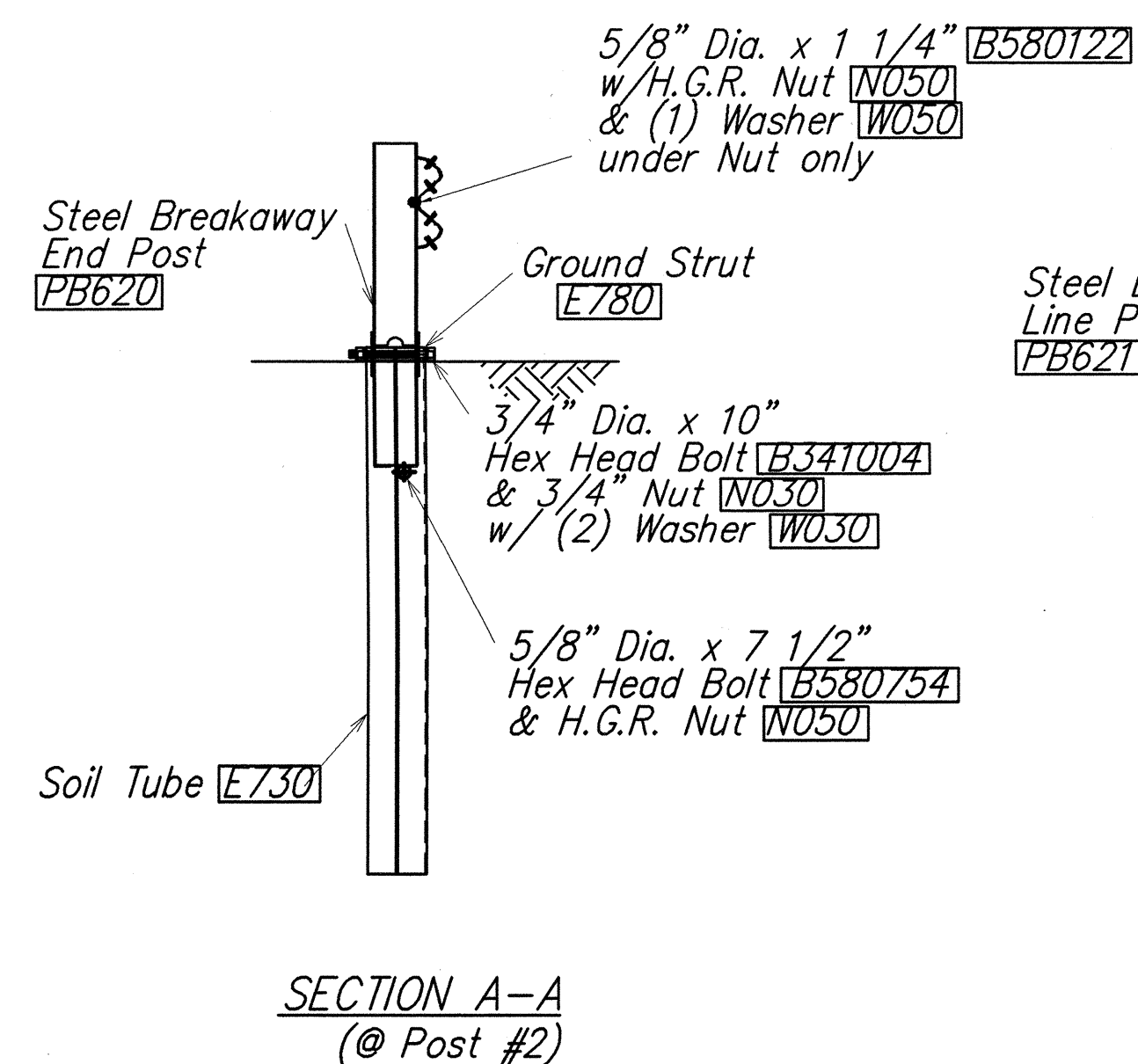
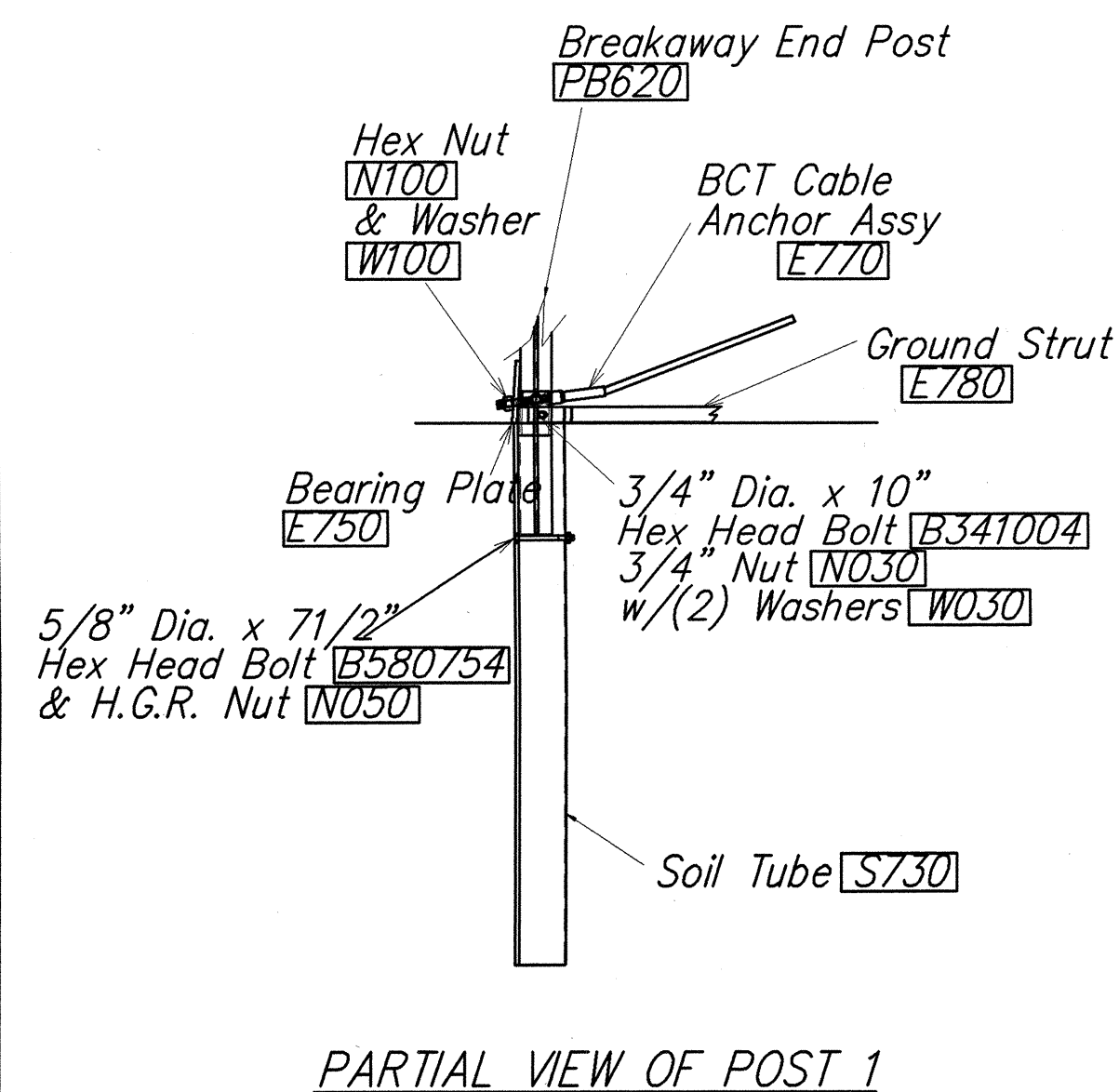
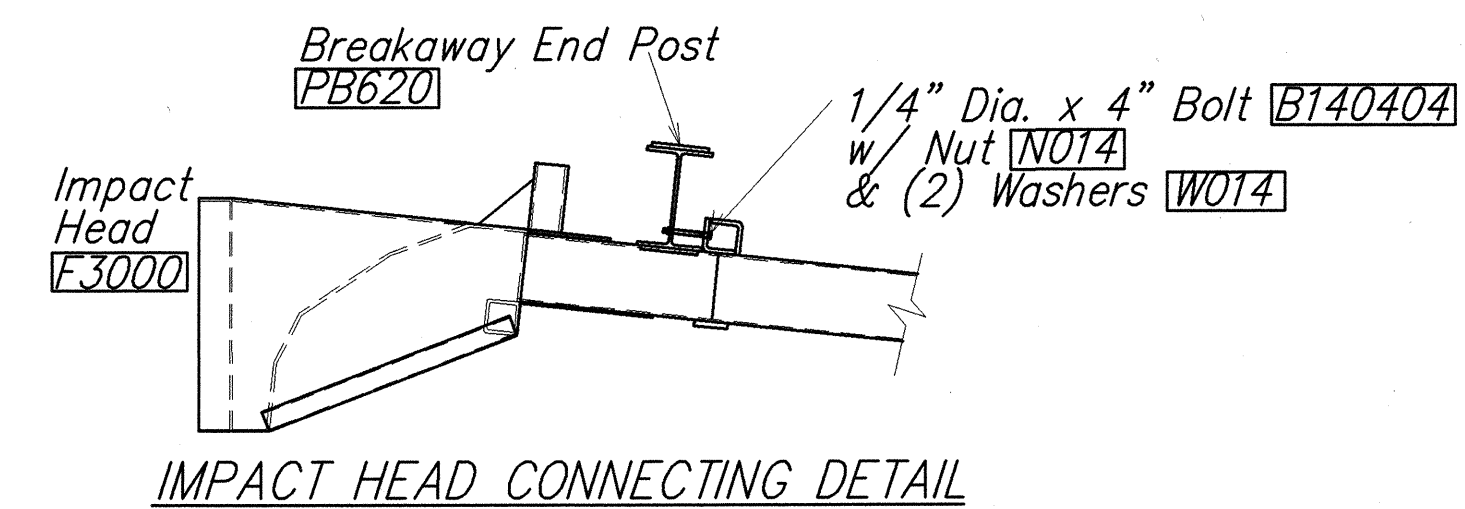
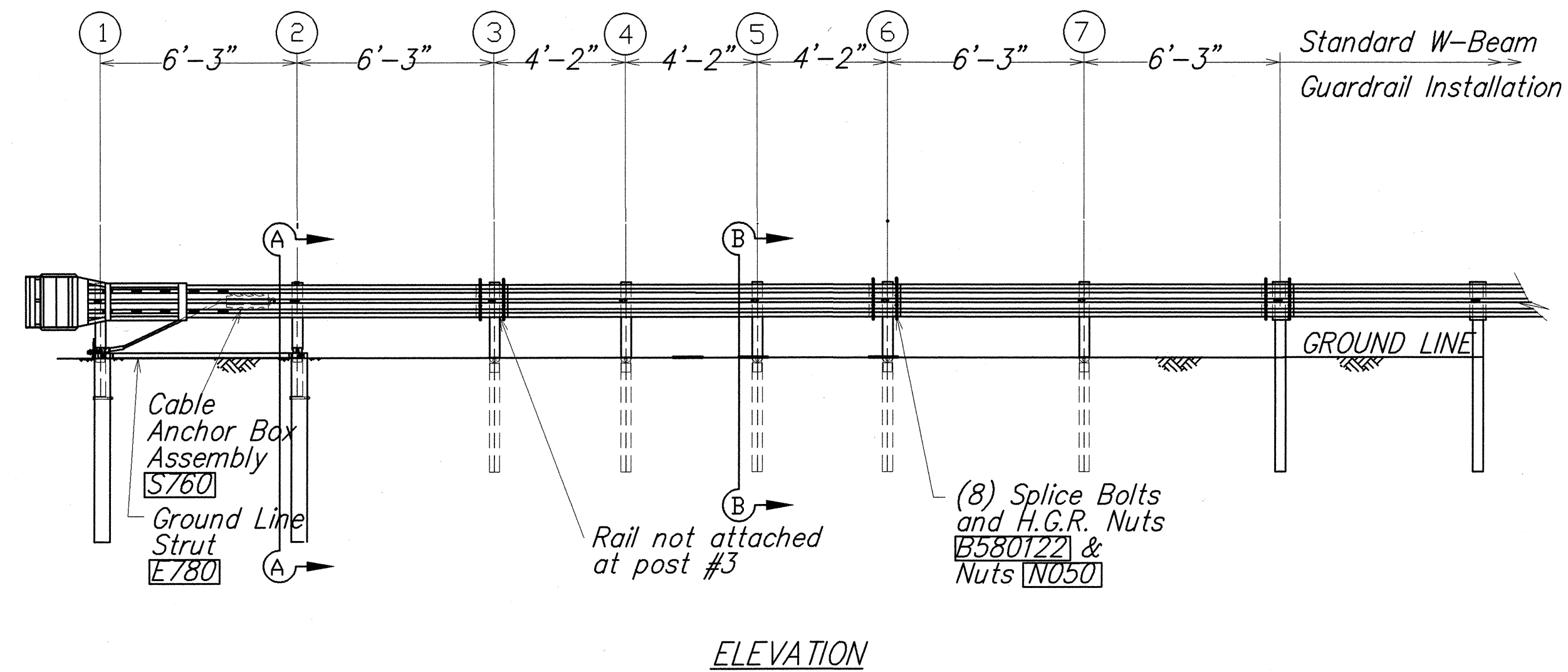
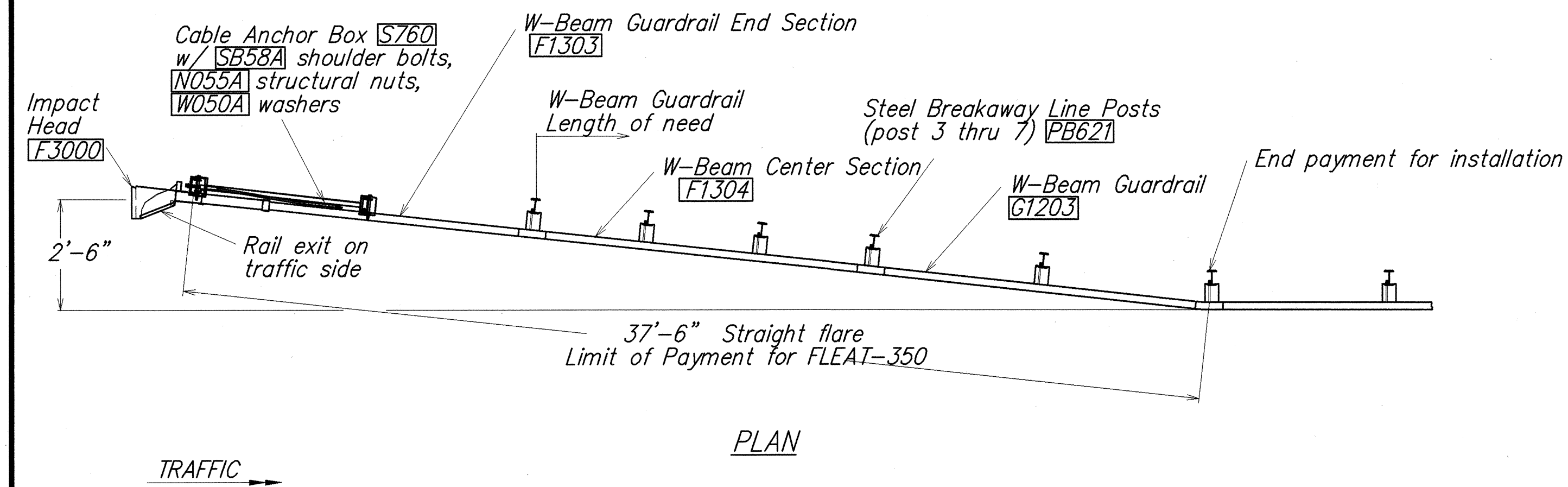
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARDRAIL TERMINAL
CONNECTIONS AND END SECTIONS
AKAKA FALLS ROAD RESURFACING
Hawaii Belt Road to Honoumuli Town
Project No. 220A-01-03M
Scale: As Noted Date: April 2003

SHEET No. 3 OF 5 SHEETS

| | | |
|---------------|-------------------|------|
| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
| NOTE BOOK | DRAWN BY | |
| | DESIGNED BY | |
| | QUANTITIES BY | |
| | CHECKED BY | |
| | | |

| ROAD DIST. NO. | STATE | PROJECT NUMBER | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|----------------|-------|----------------|-------------|-----------|--------------|
| HAWAII | HAW. | 220A-01-03M | 2003 | 23 | 37 |



GENERAL NOTES

- Breakaway 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 should 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. |
| F1304 | 1 | W-BEAM GUARDRAIL CENTER SECTION, 12 GA. |
| G1203 | 1 | 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 (SPURCE 24, SOIL TUBES 2, 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

| | |
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| SURVEY PLOTTED BY | DATE |
| DRAWN BY | |
| TRACED BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
| No. | |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
FLEAT-350
FLARED ENERGY ABSORBING TERMINAL
AKAKA FALLS ROAD RESURFACING
Hawaii Belt Road to Honoumuli Town
Project No. 220A-01-03M
Scale: As Noted Date: April 2003

SHEET No. 4 OF 5 SHEETS

