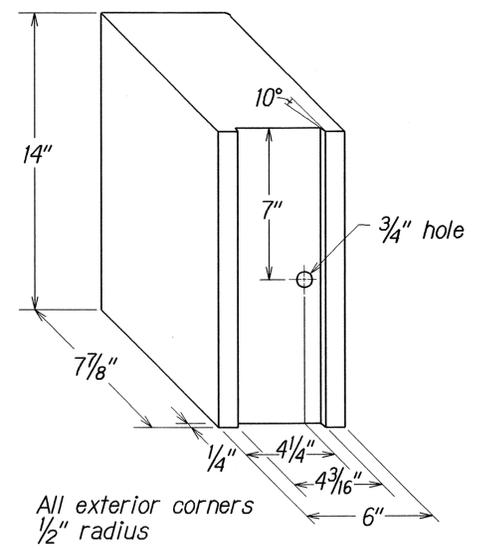


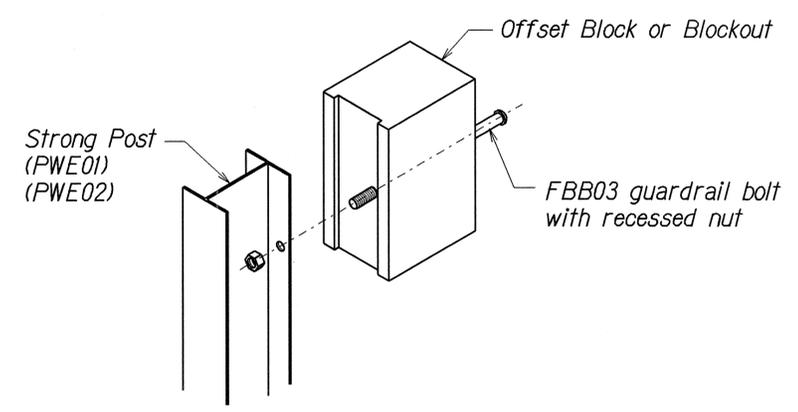
RECYCLED PLASTIC BLOCKOUT (TYPE I)



RECYCLED POLYETHYLENE OFFSET BLOCK (TYPE II)

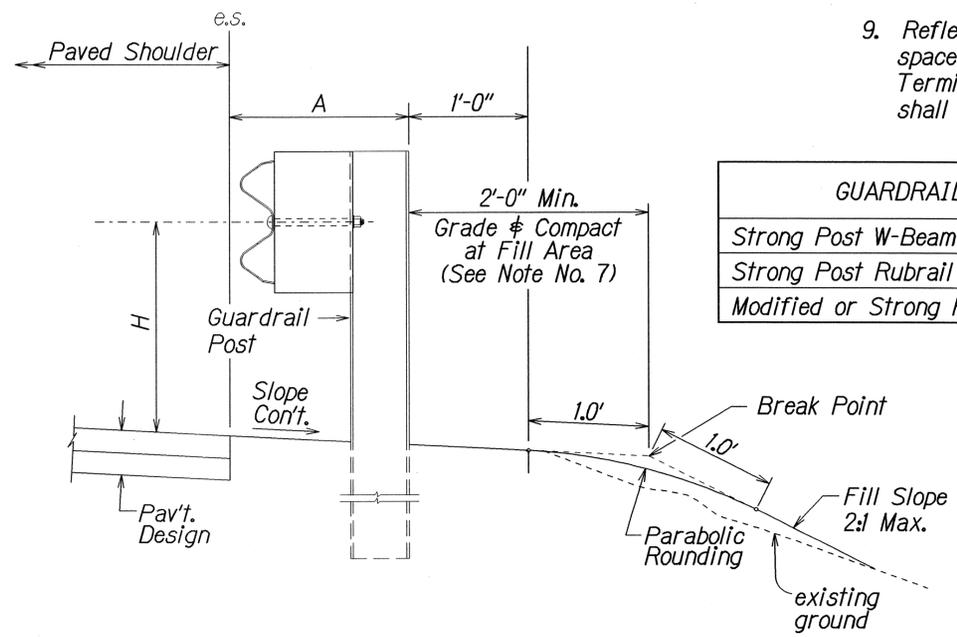
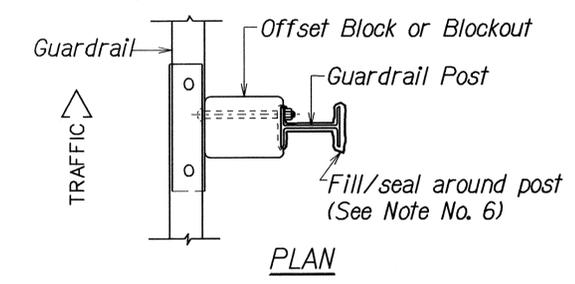
GENERAL NOTES

- 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 fasteners, 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 adjacent guardrail system.



Exploded View
(Rail and washer not shown)

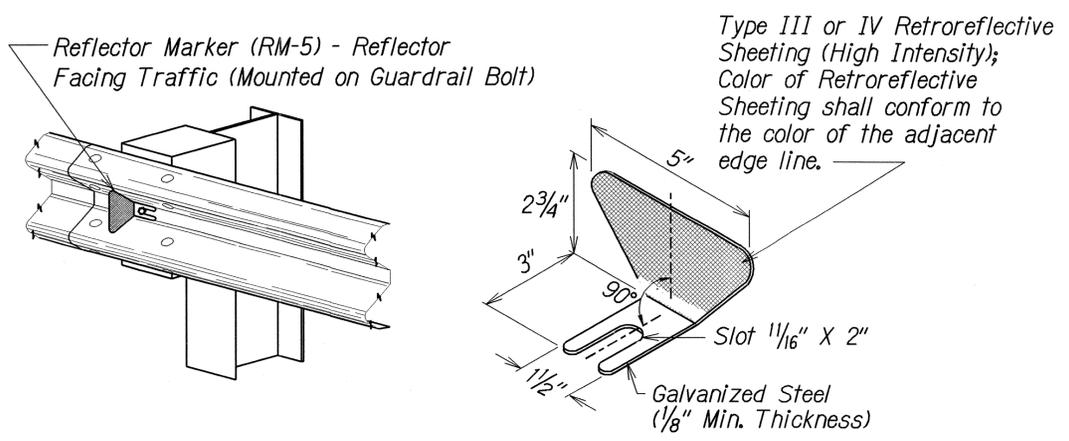
STEEL POST AND BLOCK DETAIL



ELEVATION

TYPICAL GUARDRAIL INSTALLATION

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

DATE: _____
 SURVEY PLOTTED BY: _____
 DRAWN BY: _____
 CHECKED BY: _____
 ORIGINAL PLAN: _____
 NOTE BOOK: _____
 QUANTITIES BY: _____
 CHECKED BY: _____

12/21/03 14lr.rubyl.guardrail/1e50rev.dgn (standard plan TE-50 r09.01.00)

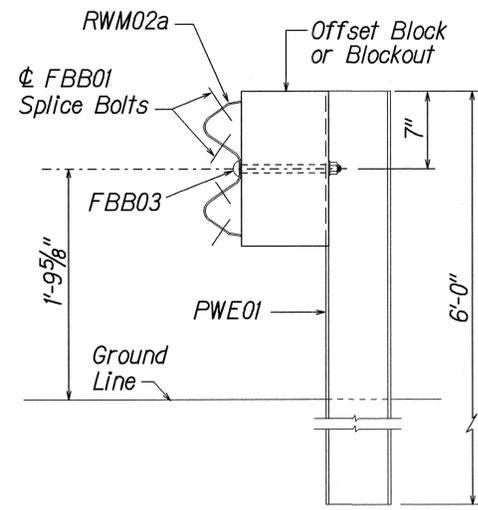
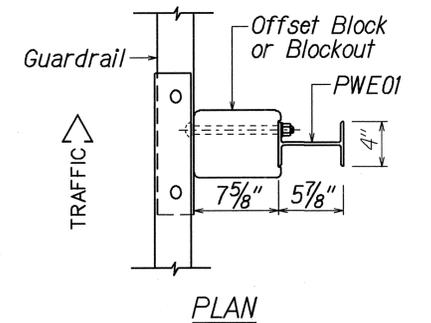
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

GUARDRAIL DETAILS & NOTES

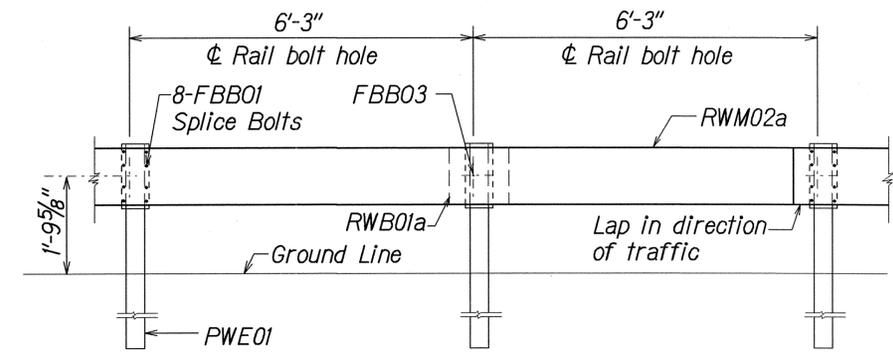
KAMEHAMEHA HIGHWAY REHABILITATION
 Waihau Street to H-2 Interchange
 Federal Aid Project No. NH-099-1(24)

Scale: NTS Date: June, 2005

SHEET No. 1 OF 11 SHEETS

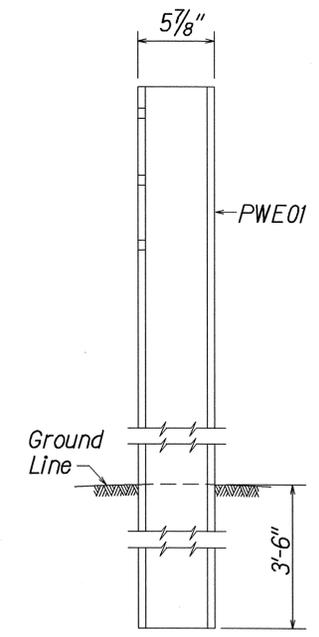


STRONG POST W-BEAM GUARDRAIL (SGR04a)

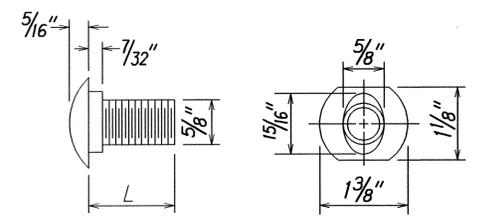
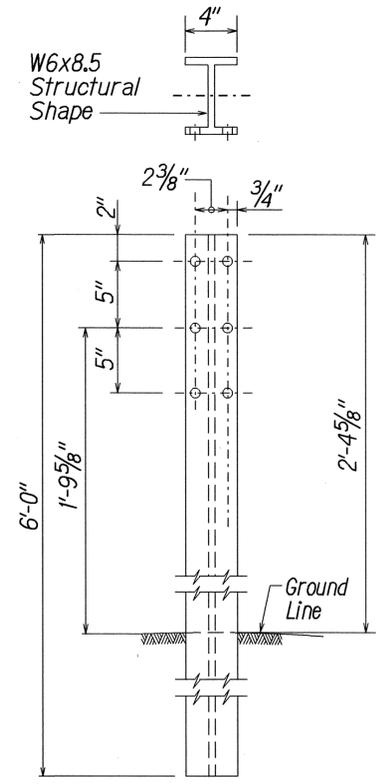


STRONG POST W-BEAM GUARDRAIL WITH RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT

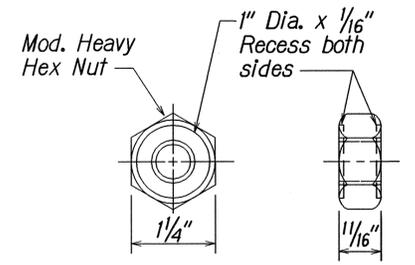
NOTE:
All Holes are 3/4" Dia.



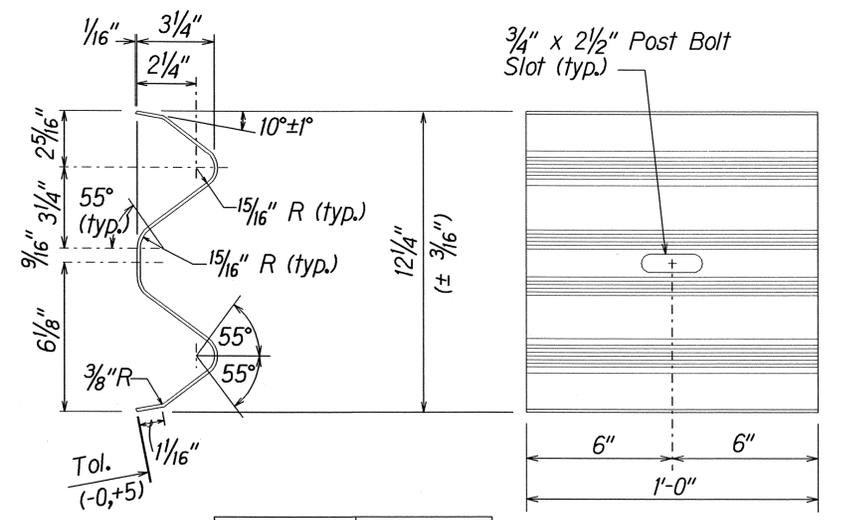
W-BEAM STRONG POST (PWE01)



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

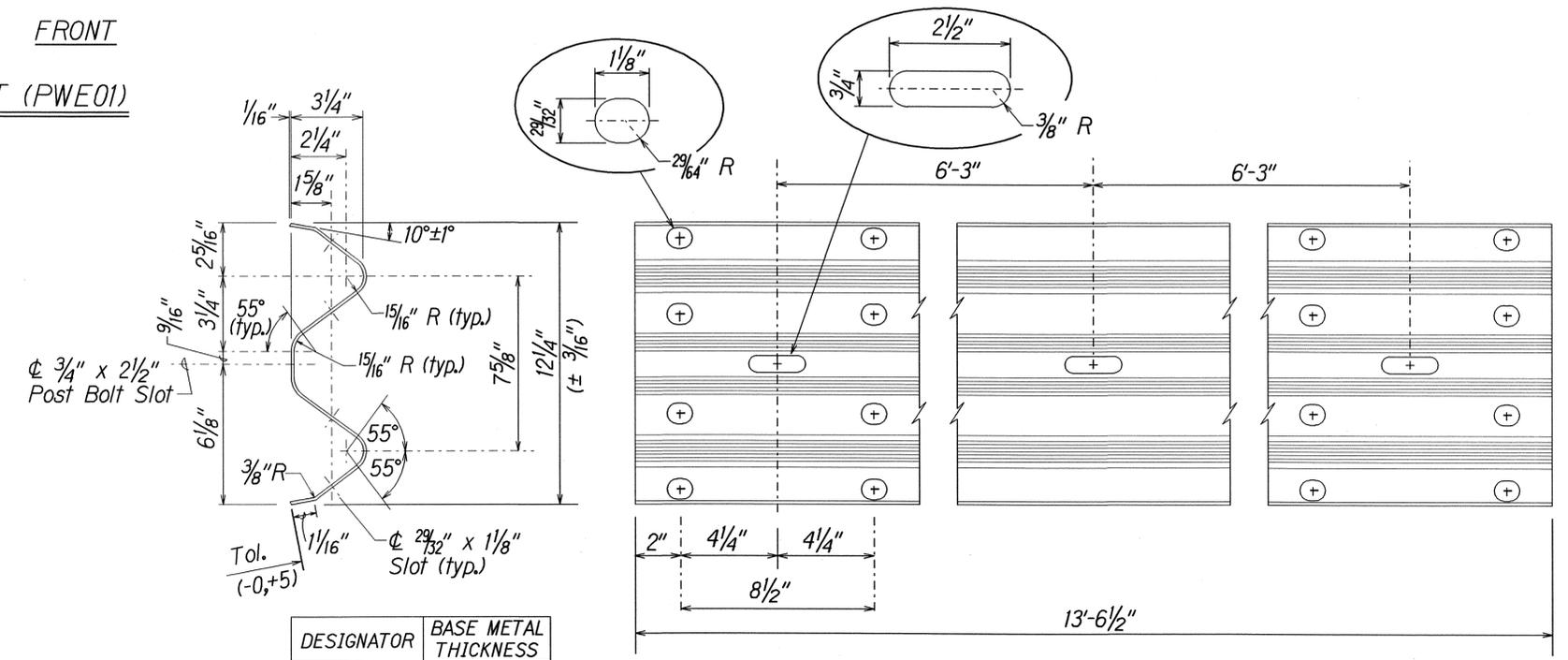


GUARDRAIL BOLTS AND RECESSED NUT



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)

SURVEY PROVIDED BY: _____ DATE: _____
 DRAWN BY: _____
 CHECKED BY: _____
 DESIGNED BY: _____
 QUANTITIES BY: _____
 E:\nh099\02.dgn
 c:\24\03 -tdl\cuby\guardrail\wbeams02.dgn (standard plan TE-50, R03,06,07)

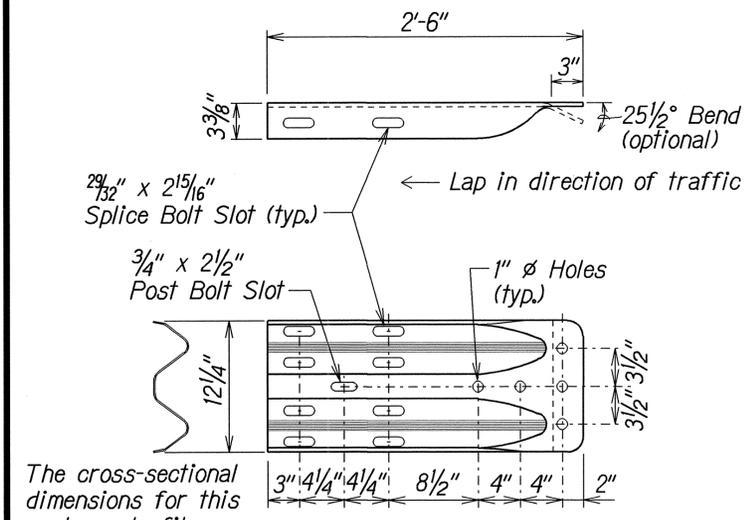
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARDRAIL DETAILS & NOTES

KAMEHAMEHA HIGHWAY REHABILITATION
Waihau Street to H-2 Interchange
Federal Aid Project No. NH-099-1(24)

Scale: NTS Date: June, 2005

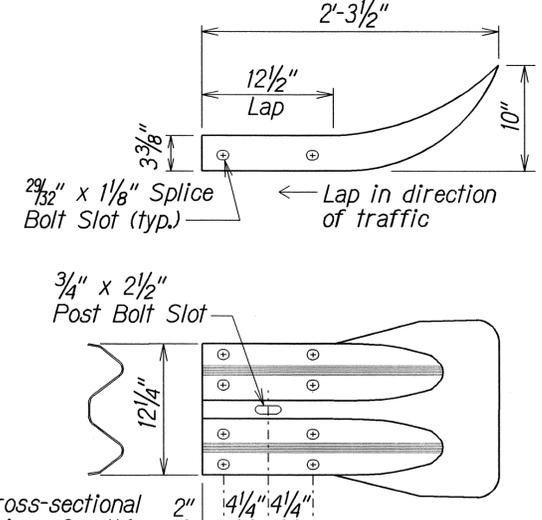
SHEET No. 2 OF 11 SHEETS



The cross-sectional dimensions for this part are to fit over part RWM02a on the approach end and under part RWM02a on the trailing end.

DESIGNATOR	BASE METAL THICKNESS
RWE02b	10 Gauge

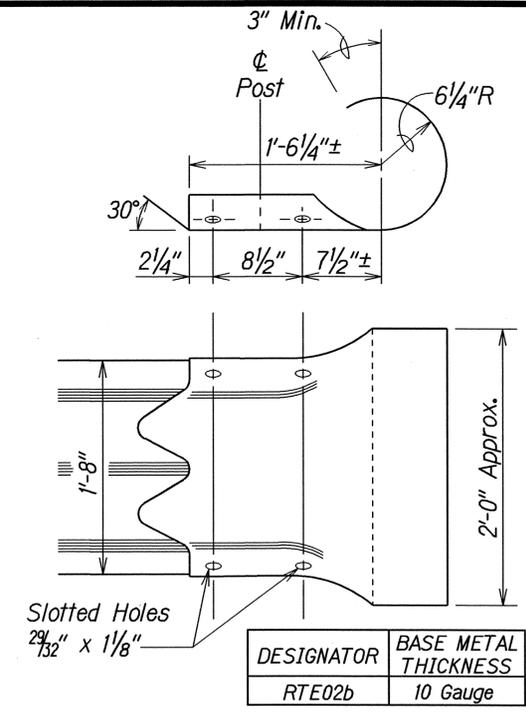
W-BEAM TERMINAL CONNECTOR (RWE02b)



The cross-sectional dimensions for this part are to fit over part RWM02a on the approach end and under part RWM02a on the trailing end.

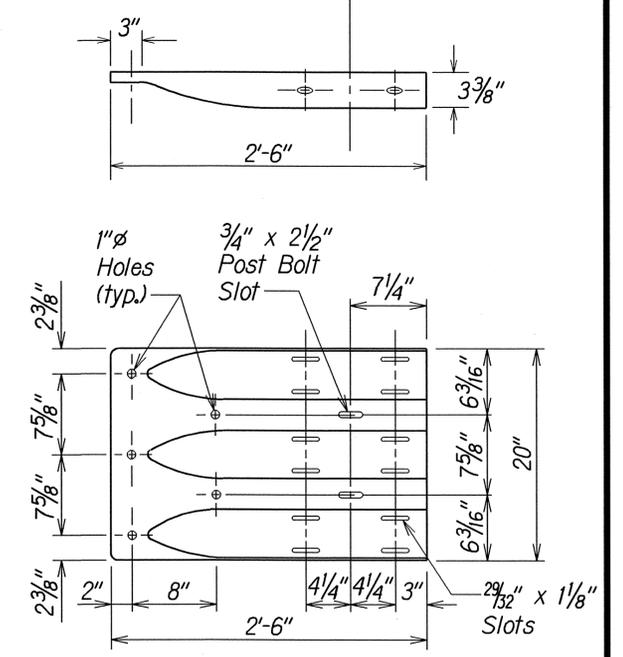
DESIGNATOR	BASE METAL THICKNESS
RWE01a	12 Gauge

W-BEAM END SECTION (FLARED RWE01a)



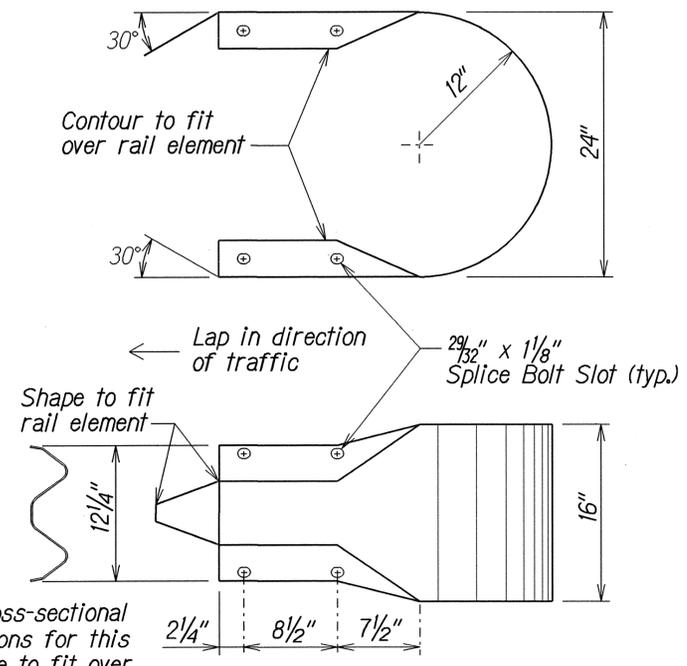
DESIGNATOR	BASE METAL THICKNESS
RTE02b	10 Gauge

THRIE-BEAM END SECTION (ROUNDED) (RTE02b)



DESIGNATOR	BASE METAL THICKNESS
RTE01b	10 Gauge

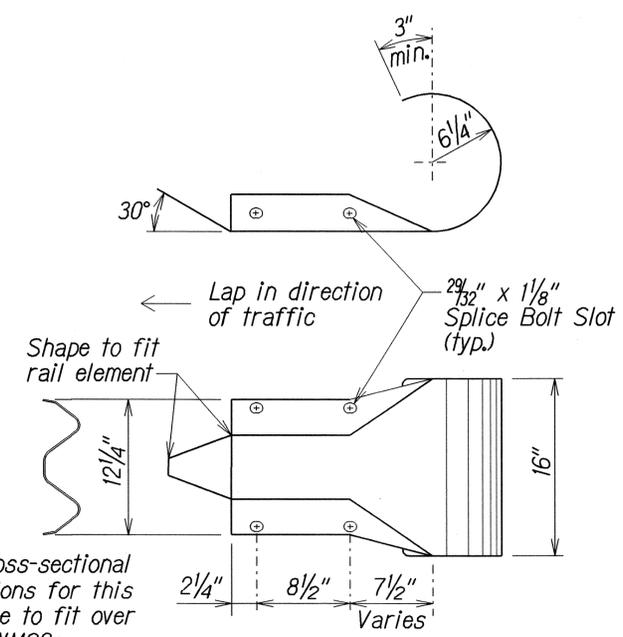
THRIE-BEAM TERMINAL CONNECTOR (RTE01b)



The cross-sectional dimensions for this part are to fit over part RWM02a

DESIGNATOR	BASE METAL THICKNESS
RWE06a	12 Gauge

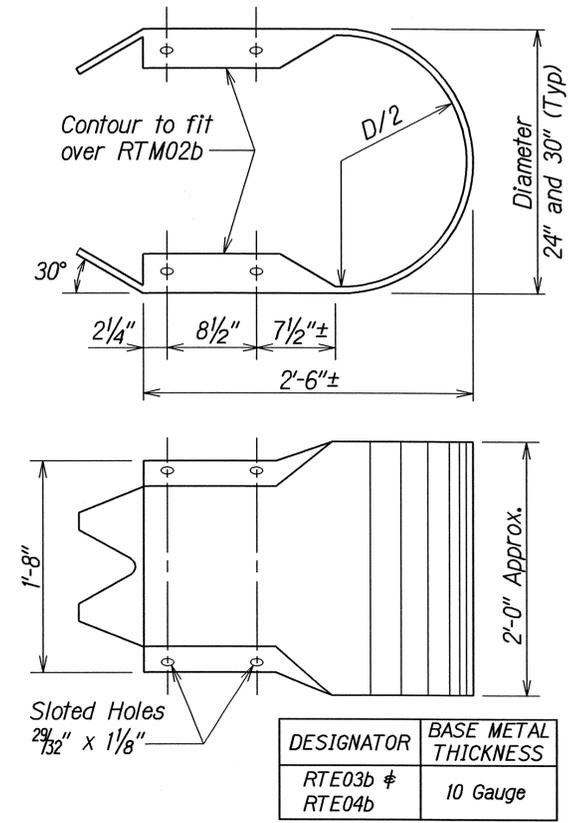
W-BEAM END SECTION (BUFFER RWE06a)



The cross-sectional dimensions for this part are to fit over part RWM02a

DESIGNATOR	BASE METAL THICKNESS
RWE03a	12 Gauge

W-BEAM END SECTION (ROUNDED RWE03a)

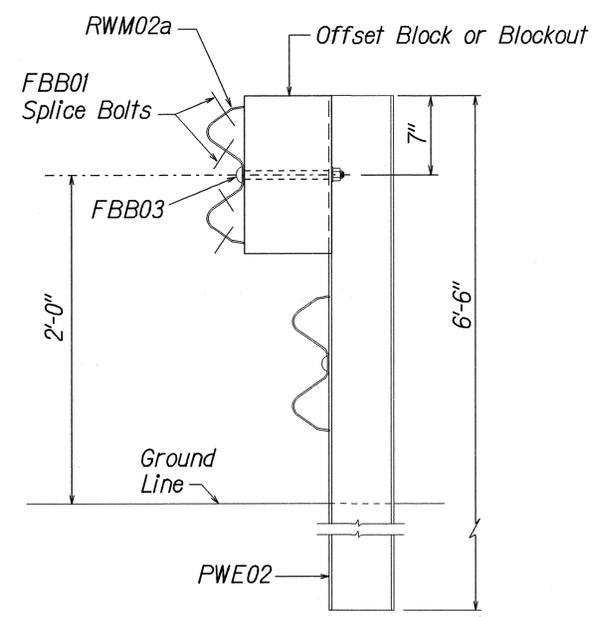


DESIGNATOR	BASE METAL THICKNESS
RTE03b & RTE04b	10 Gauge

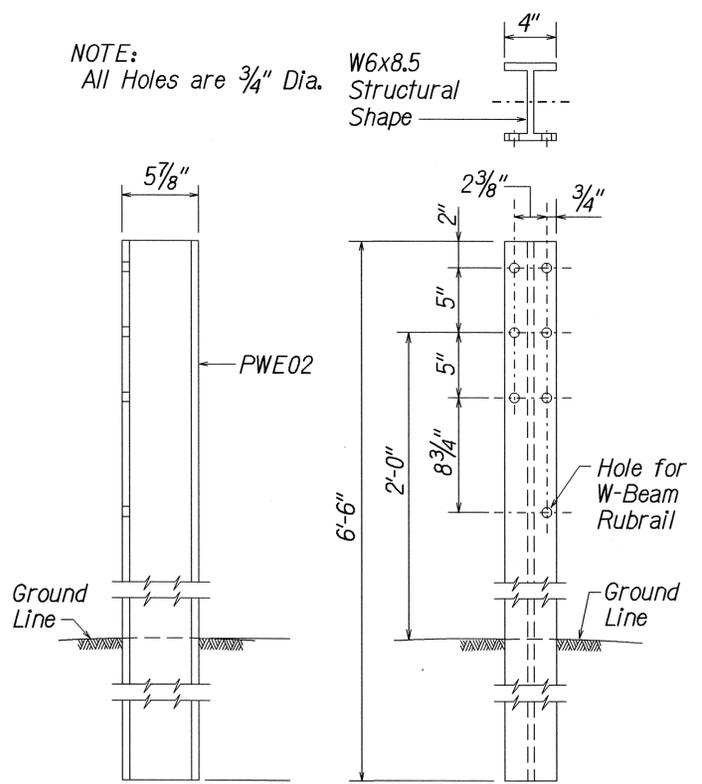
THRIE-BEAM END SECTION (BUFFER RTE03b or RTE04b)

SURVEY PLOTTED BY: DATE: X
 DRAWN BY: X
 CHECKED BY: X
 DESIGNED BY: X
 QUANTITIES BY: X
 @mhbpr03.com
 Standard plan TE-51 r08.01(87)
 fdl-cubv-guardrail/tes51.dwg

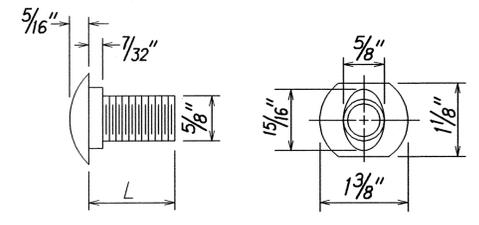
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
GUARDRAIL TERMINAL CONNECTORS AND END SECTIONS
 KAMEHAMEHA HIGHWAY REHABILITATION
 Waihau Street to H-2 Interchange
 Federal Aid Project No. NH-099-1(24)
 Scale: NTS Date: June, 2006
 SHEET No. 3 OF 11 SHEETS



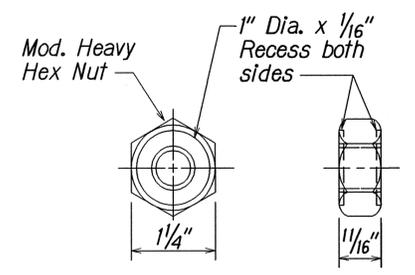
ELEVATION
STRONG POST RUBRAIL (W-BEAM) GUARDRAIL



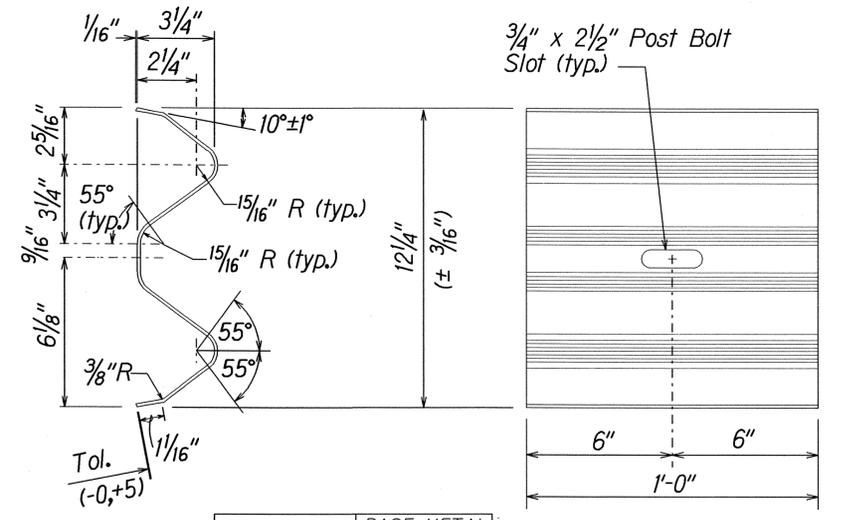
SIDE
FRONT
W-BEAM STRONG POST (PWE02)



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

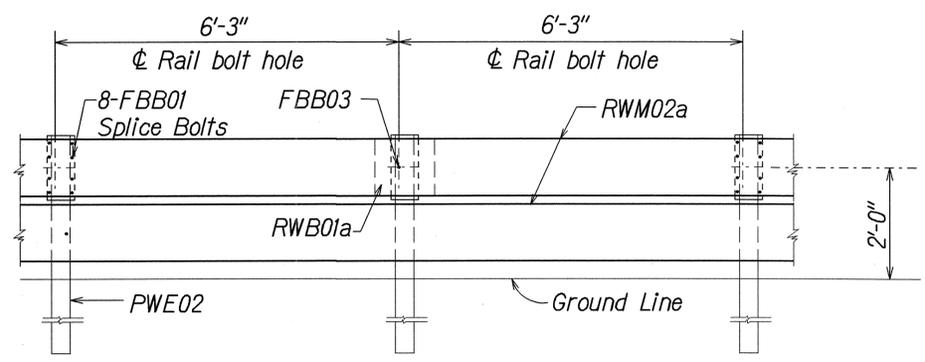


GUARDRAIL BOLTS AND RECESSED NUT

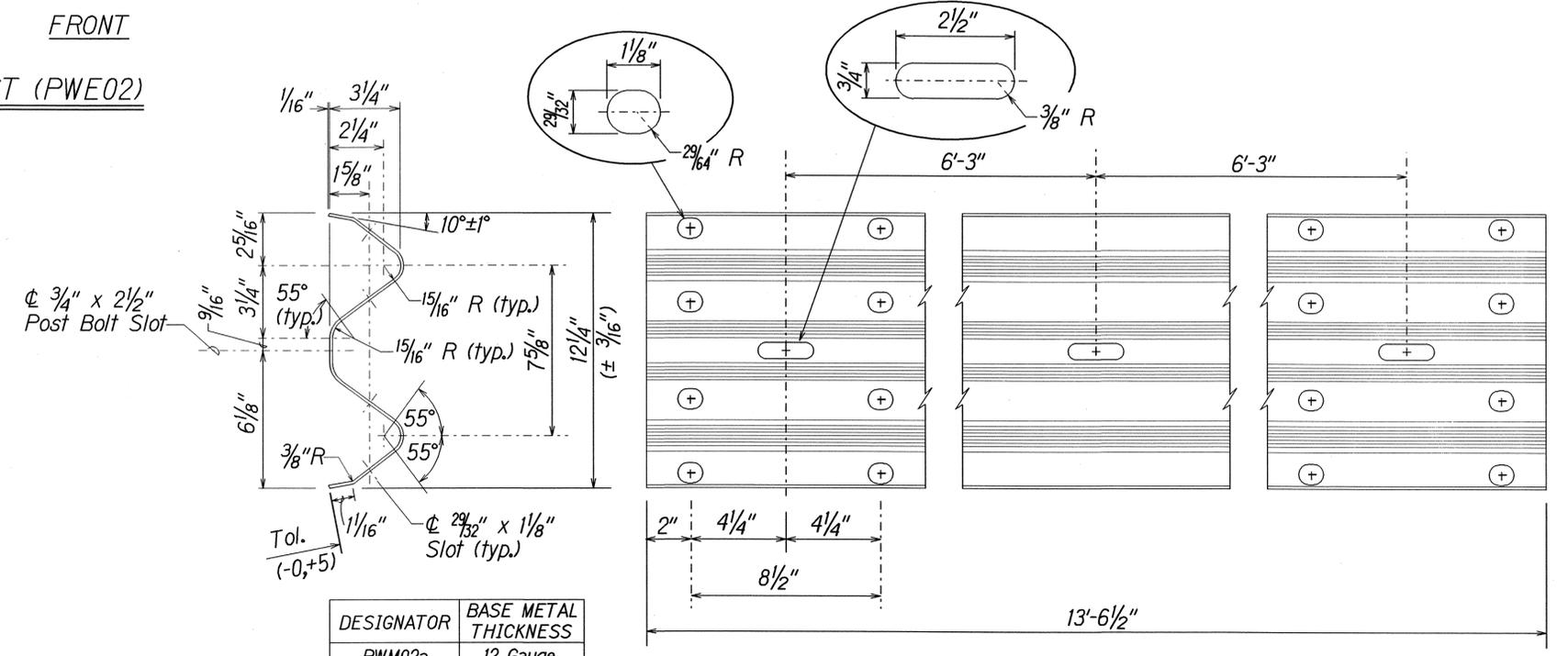


DESIGNATOR	BASE METAL THICKNESS
RWB01a	12 Gauge

W-BEAM BACK-UP-PLATE (RWB01a)

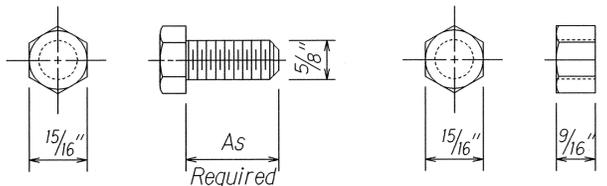


ELEVATION
STRONG POST RUBRAIL (W-BEAM) GUARDRAIL WITH RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT



DESIGNATOR	BASE METAL THICKNESS
RWM02a	12 Gauge

2 SPACE W-BEAM GUARDRAIL (RWM02a)

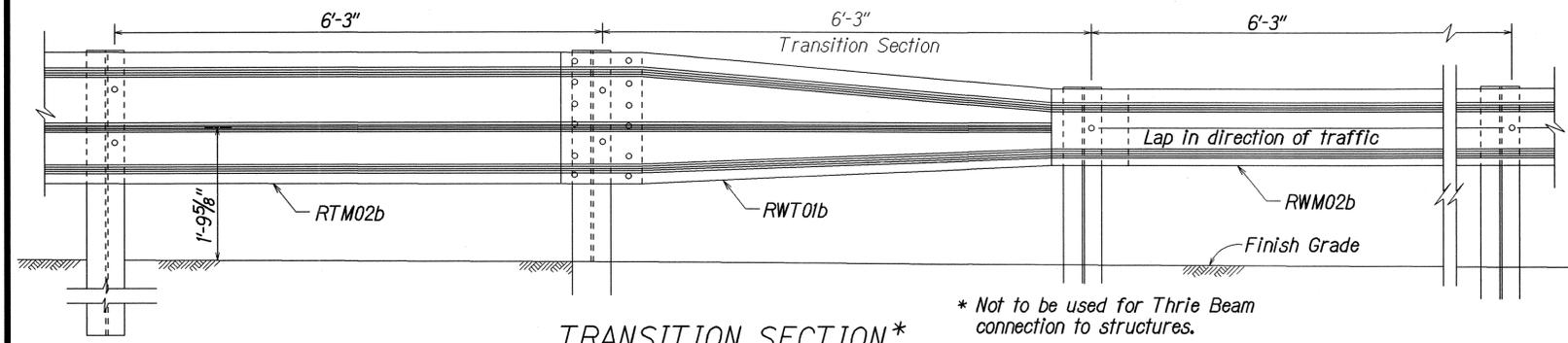


HEX BOLT & NUT (FBX16a)

DATE: _____
 DRAWN BY: _____
 CHECKED BY: _____
 DESIGNED BY: _____
 QUANTITIES BY: _____
 ORIGINAL PLAN: _____

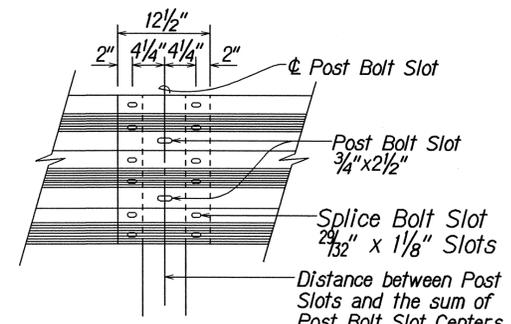
standard plan TE-52 (11/03/89)
 railrub/guardrail/rubrail.dgn

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
STRONG POST RUBRAIL (W-BEAM) GUARDRAIL
 KAMEHAMEHA HIGHWAY REHABILITATION
 Waihau Street to H-2 Interchange
 Federal Aid Project No. NH-099-1(24)
 Scale: NTS Date: June, 2005
 SHEET No. 4 OF 11 SHEETS

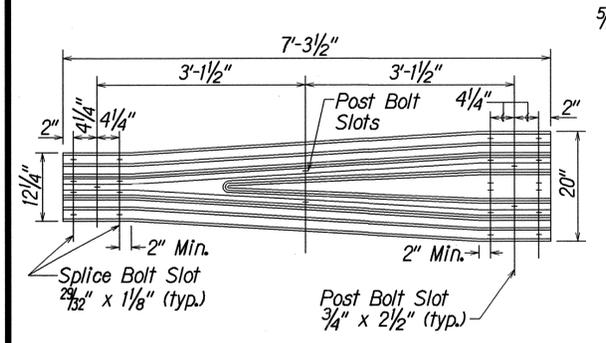


TRANSITION SECTION*

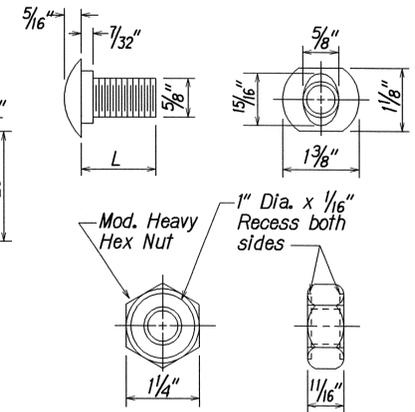
* Not to be used for Thrie Beam connection to structures.



RAIL SPLICE

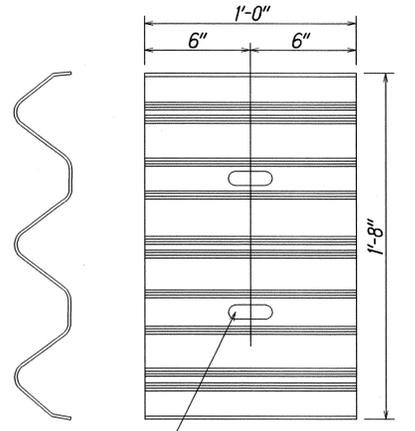


TRANSITION SECTION (RWT01b)



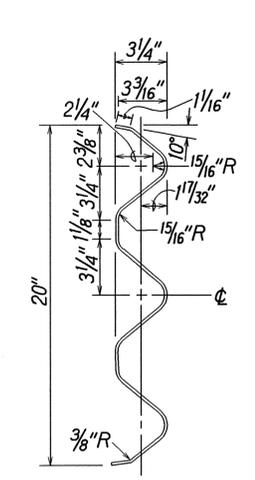
DESIGNATOR	L
FBB01	1 3/8"
FBB02	2"
FBB03	10"

GUARDRAIL BOLTS AND RECESSED NUT

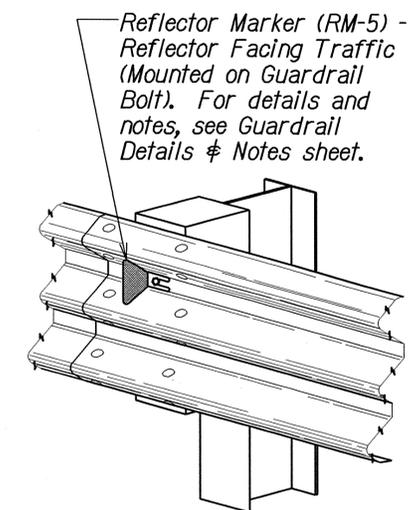


BACKUP PLATE (RTB01b)

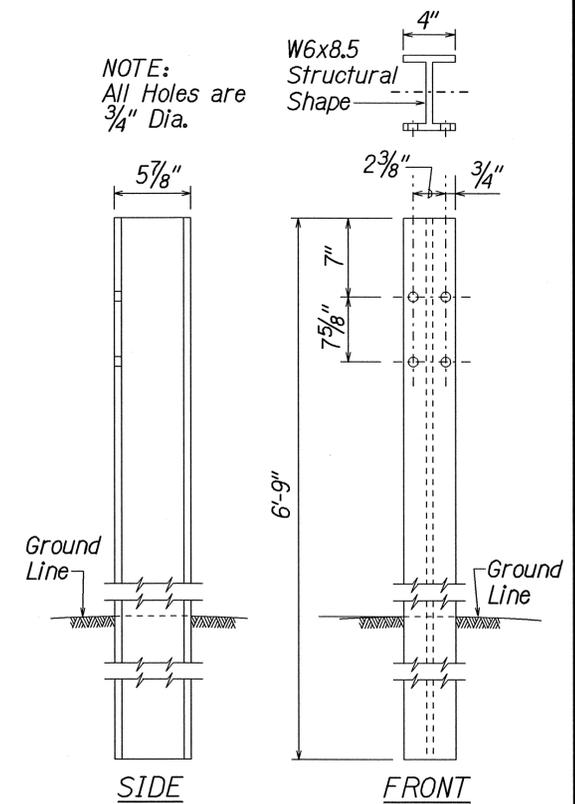
(Use at Posts where Splices do not occur)



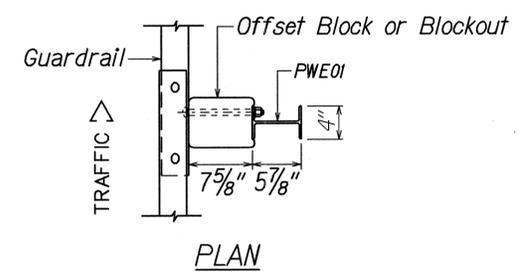
SECTION THRU RAIL ELEMENT (RTM02b)



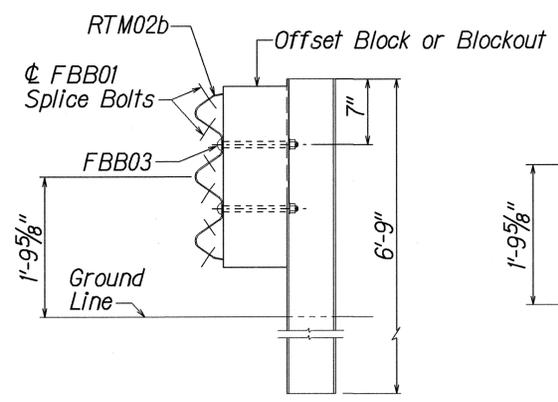
TYPICAL INSTALLATION OF REFLECTOR MARKER (RM-5)



THRIE-BEAM STRONG POST FOR PLASTIC SPACER BLOCKS

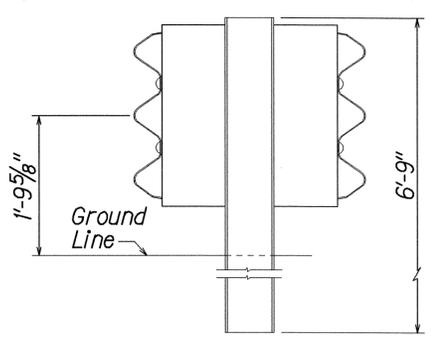


PLAN



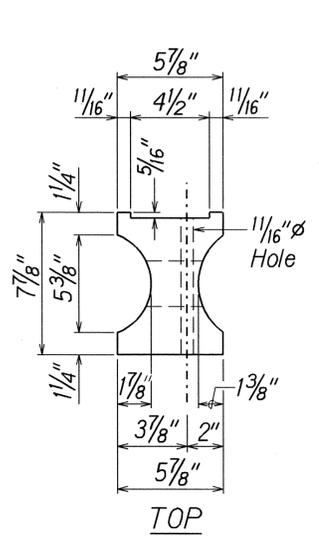
ELEVATION

STRONG POST THRIE-BEAM GUARDRAIL (SGR09a)



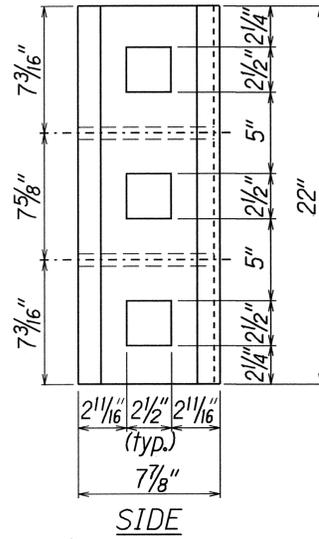
ELEVATION

STRONG POST THRIE-BEAM MEDIAN GUARDRAIL (SGM09a)

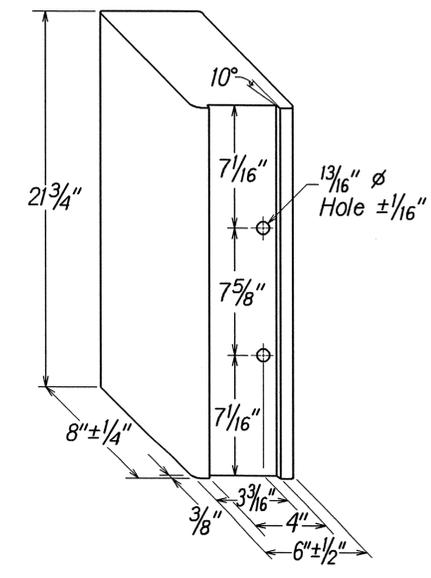


TOP

MODIFIED 6X8X22 PLASTIC BLOCKOUT (TYPE I-THRIE)



SIDE



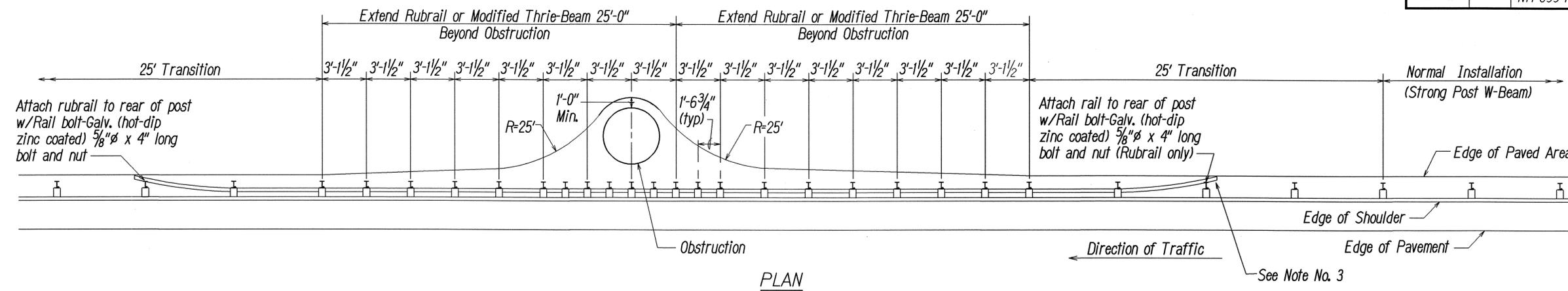
RECYCLED POLYETHYLENE THRIE-BEAM OFFSET BLOCK (TYPE II - THRIE)

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

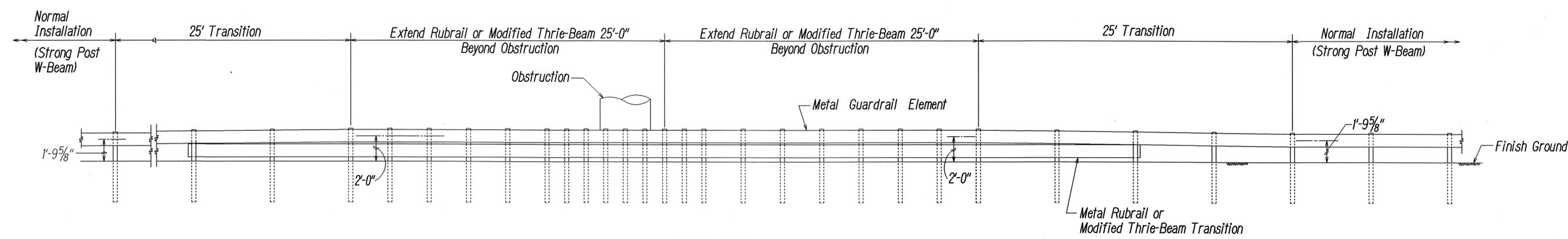
09/17/03 tdl:ubj/guardrail/thriebeam.dgn (standard plan TE-57 r11/03/89 & TE-57a r11/03/89)

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
STRONG POST
THRIE-BEAM GUARDRAIL
 KAMEHAMEHA HIGHWAY REHABILITATION
 Waihau Street to H-2 Interchange
 Federal Aid Project No. NH-099-1(24)
 Scale: NTS Date: June, 2005
 SHEET No. 5 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-099-1(24)	2007	33	74



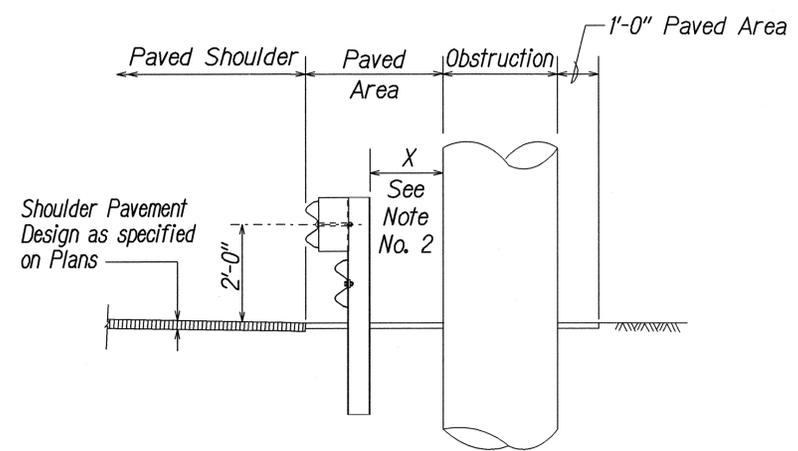
PLAN



ELEVATION

NOTES:

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 termini may become a hazard to pedestrians & bicyclists.



TYPICAL SECTION AT OBSTRUCTION

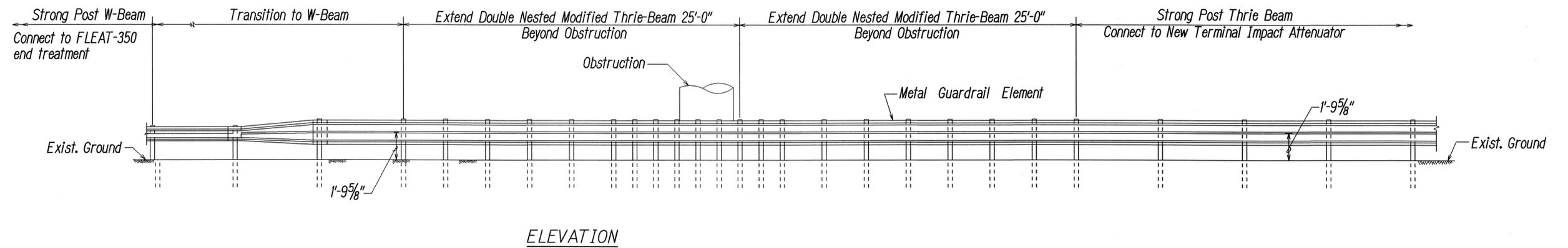
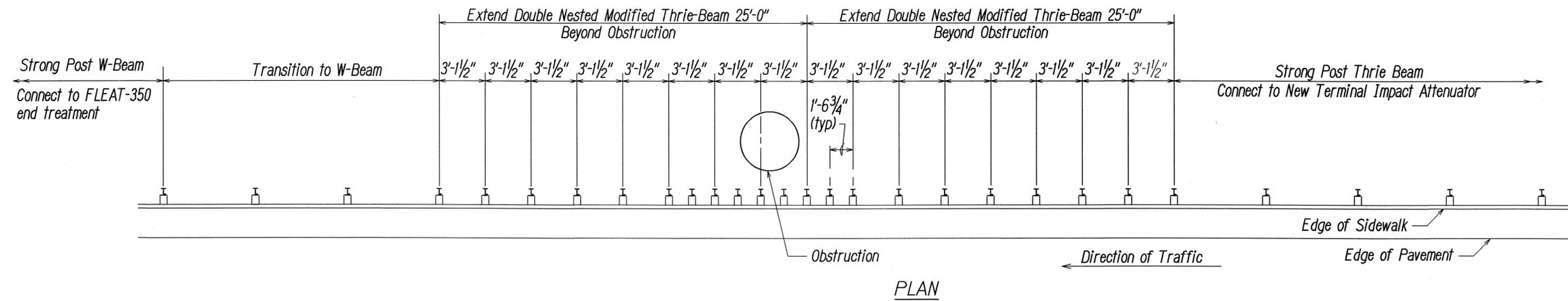
DETAIL OF GUARDRAIL INSTALLATION AT OBSTRUCTION

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
PLANNED BY	
ORIGINAL PLAN	

r8/21/01 tdl/ruby/guardrail/1654rev.dgn (standard plan TE-53, 039/01/87 # TE-54 r11/03/88)

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
GUARDRAIL DETAILS
 (AT OBSTRUCTION)
 KAMEHAMEHA HIGHWAY REHABILITATION
 Waihau Street to H-2 Interchange
 Federal Aid Project No. NH-099-1(24)
 Scale: NTS Date: June, 2005
 SHEET No. 6 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-099-1(24)	2007	34	74



SPECIAL DETAIL OF GUARDRAIL INSTALLATION AT OBSTRUCTION

NOTES:

1. All Guardrail and Concrete Barrier Designs at Obstructions shall be approved by the Engineer.

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
TRACED BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	

r8/21/01 rtr:cuby/guardrail/res4rev.dgn (standard plan TE-53 r09/01/87 # TE-54 r11/03/89)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

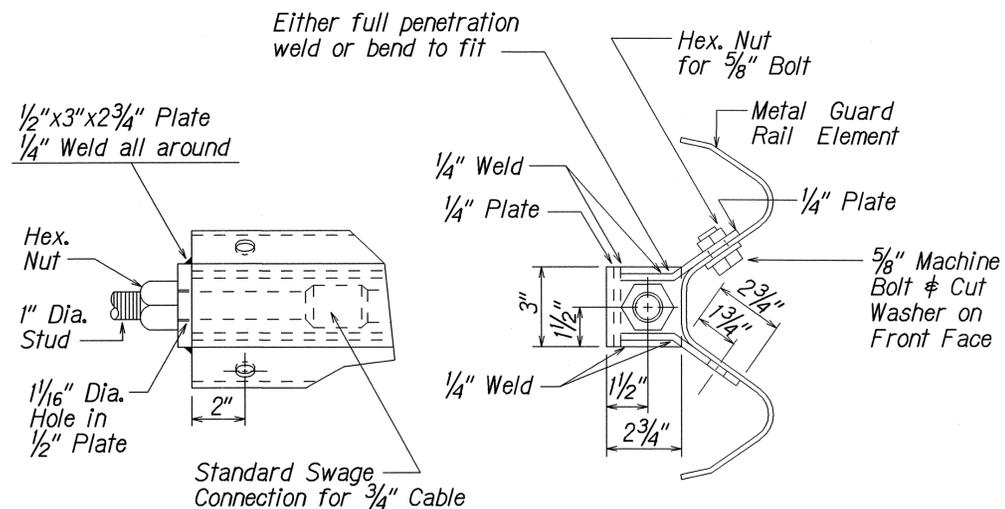
GUARDRAIL DETAILS
(AT OBSTRUCTION - SPECIAL DESIGN)

KAMEHAMEHA HIGHWAY REHABILITATION
Waihau Street to H-2 Interchange
Federal Aid Project No. NH-099-1(24)

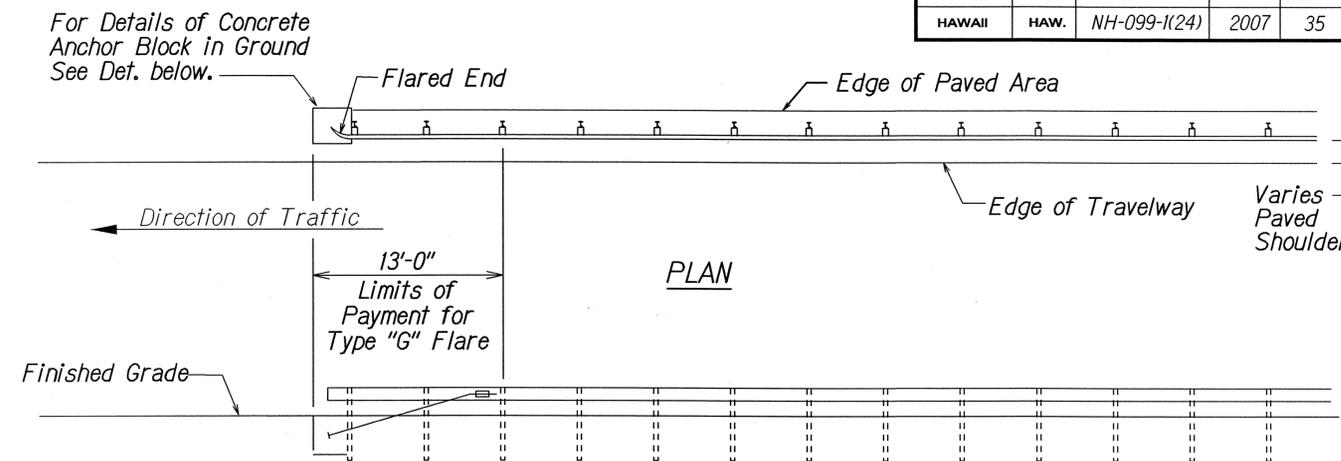
Scale: NTS Date: June, 2005

SHEET No. 7 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-099-1(24)	2007	35	74

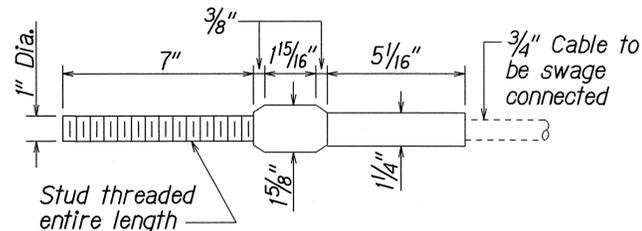


ANCHOR PLATE DETAILS



ELEVATION

TYPE "G" FLARE END TERMINAL



STANDARD SWAGED FITTING AND STUD

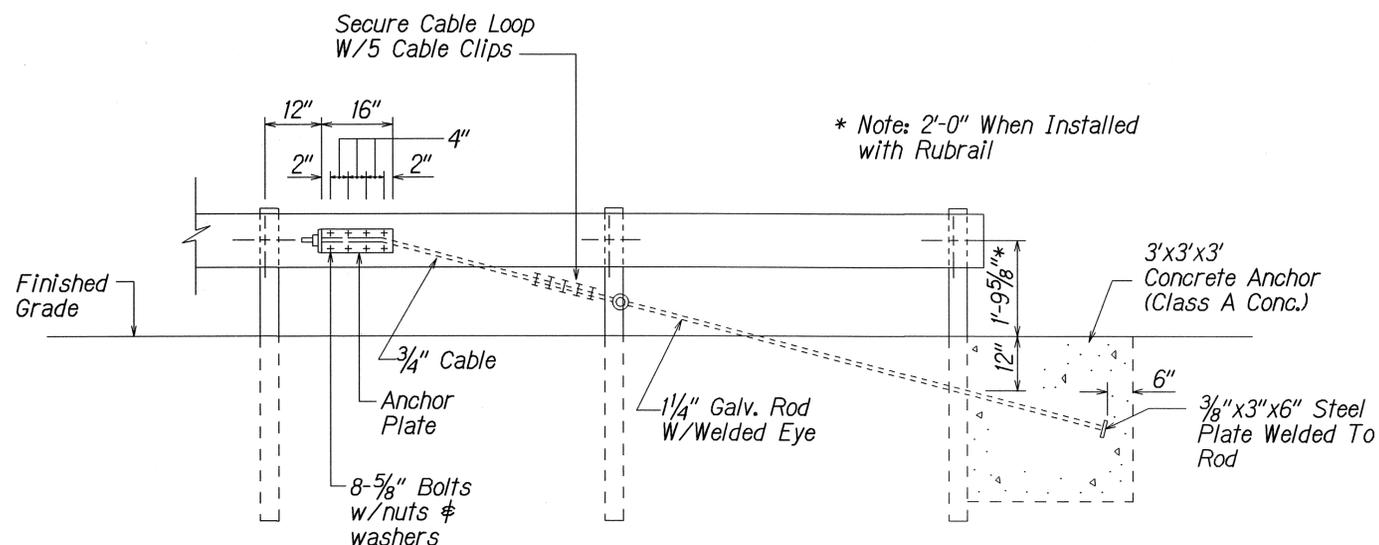
NOTE:

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.



ANCHOR BLOCK DETAIL

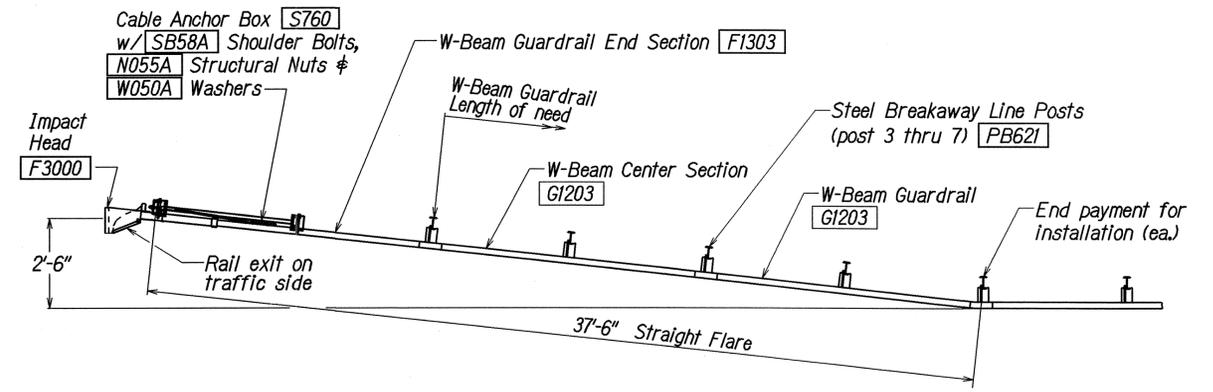
- Concrete, G.R.P., excavation, anchor rod and miscellaneous appurtenances necessary to anchor the guardrail ends shall be incidental to metal guardrail.

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

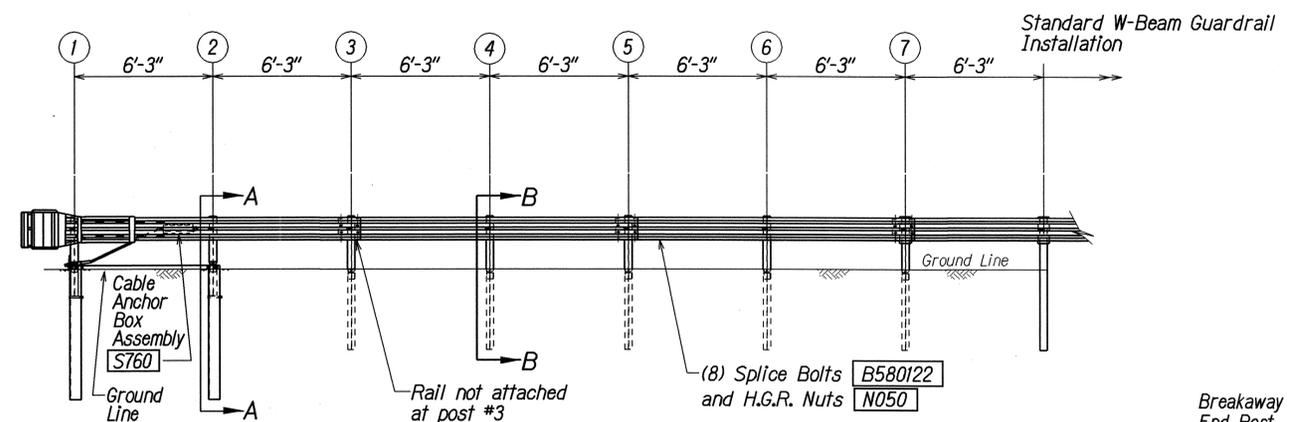
r3/13/02 tdl/rubyl/guardrail/hs59red.dwg (standard plan TE-59 R11/03/09)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
GUARDRAIL DETAILS
TYPE "G" FLARE
KAMEHAMEHA HIGHWAY REHABILITATION
Waihu Street to H-2 Interchange
Federal Aid Project No. NH-099-1(24)
Scale: NTS Date: June, 2005
SHEET No. 8 OF 11 SHEETS

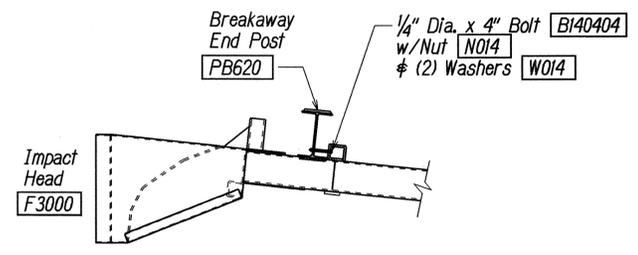
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-099-1(24)	2007	36	74



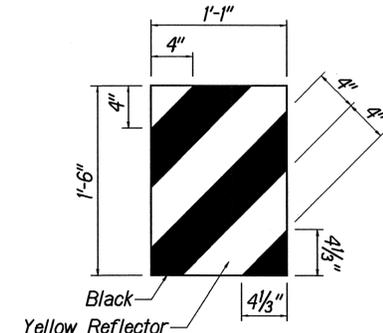
TRAFFIC →
PLAN



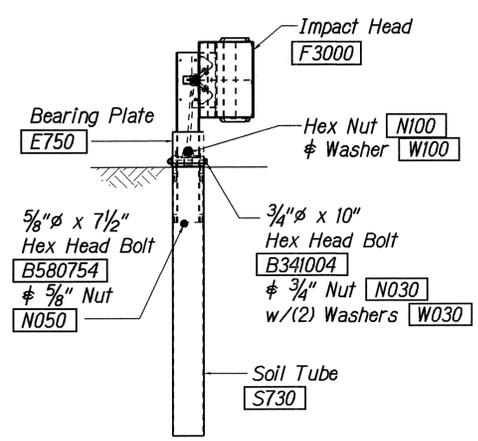
ELEVATION



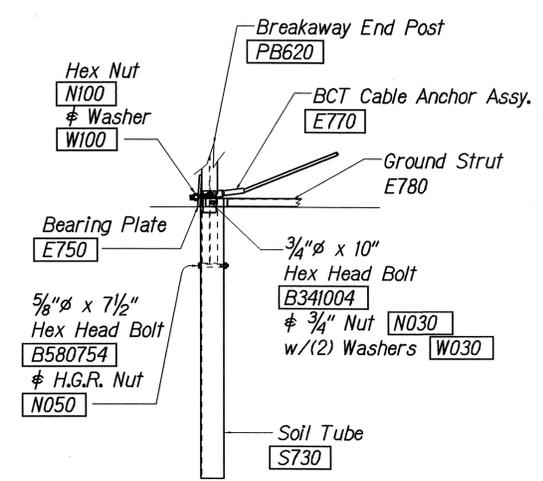
IMPACT HEAD CONNECTING DETAIL



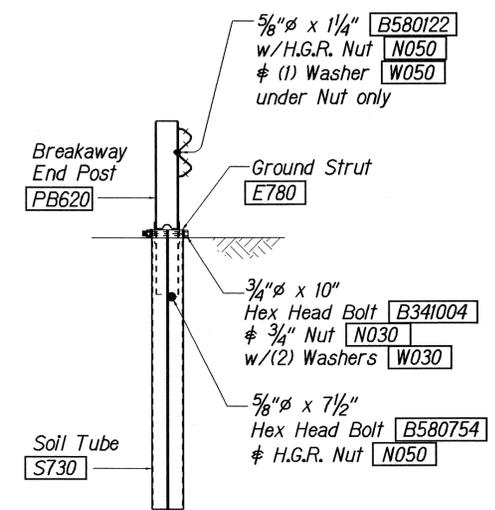
**IHRM(R)
IMPACT HEAD REFLECTOR
MARKER INSERT
DETAIL**



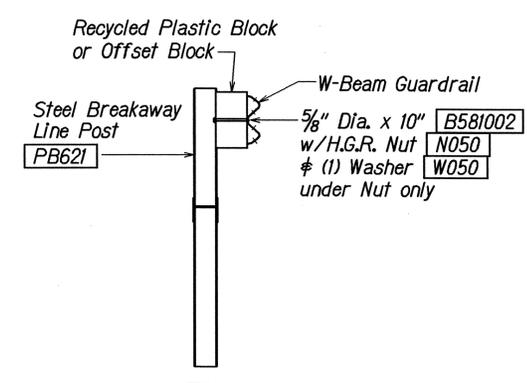
FRONT VIEW OF POST 1



PARTIAL VIEW OF POST 1



**SECTION A-A
at Post #2**



**SECTION B-B
(Typical @ Post 3 - 7)
NOTE: RAIL NOT BOLTED @ POST #3**

- GENERAL NOTES**
- Breakaway steel 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 shall 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.

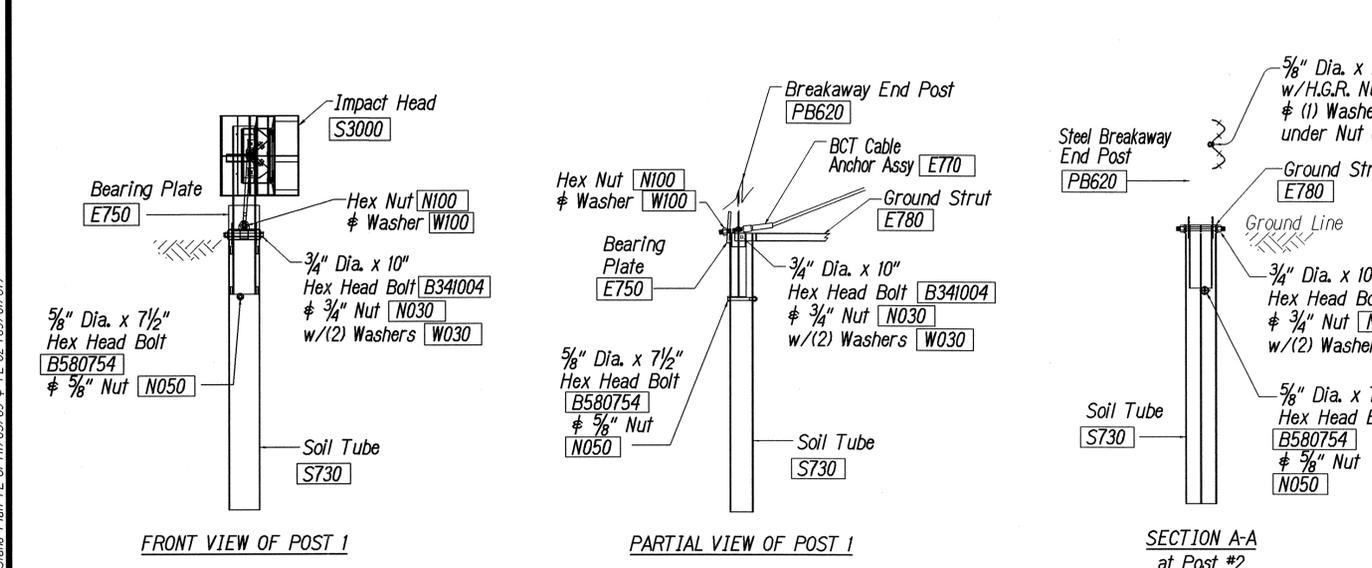
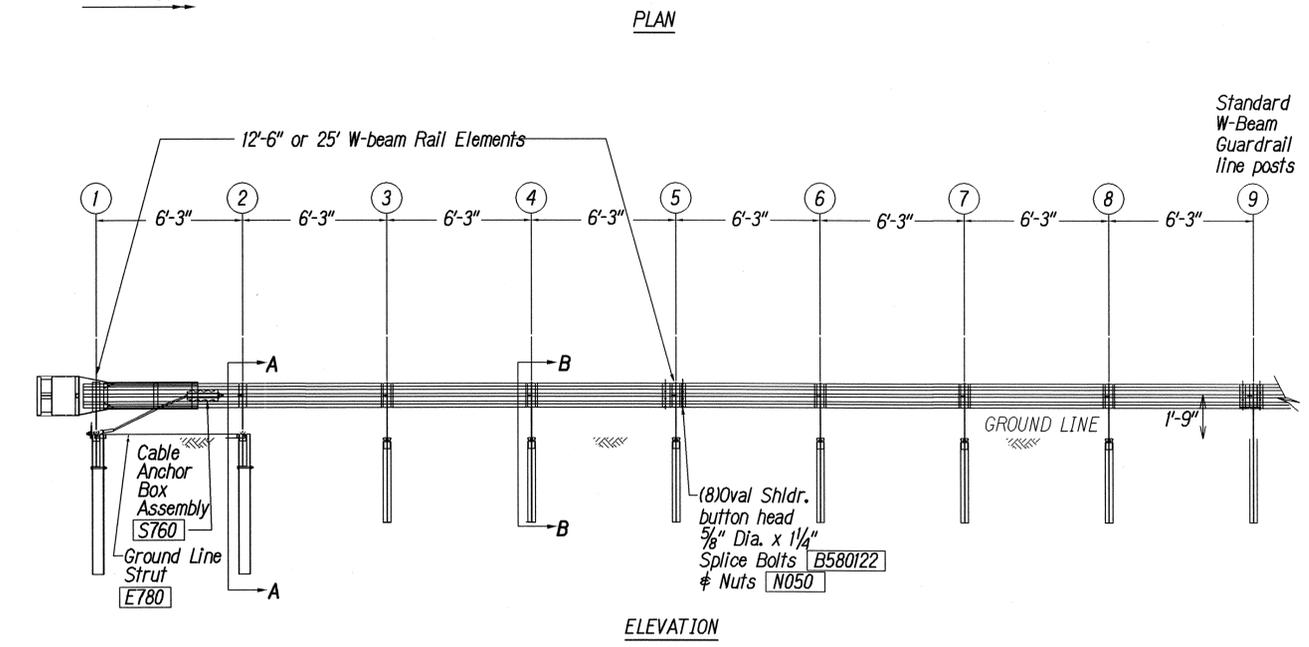
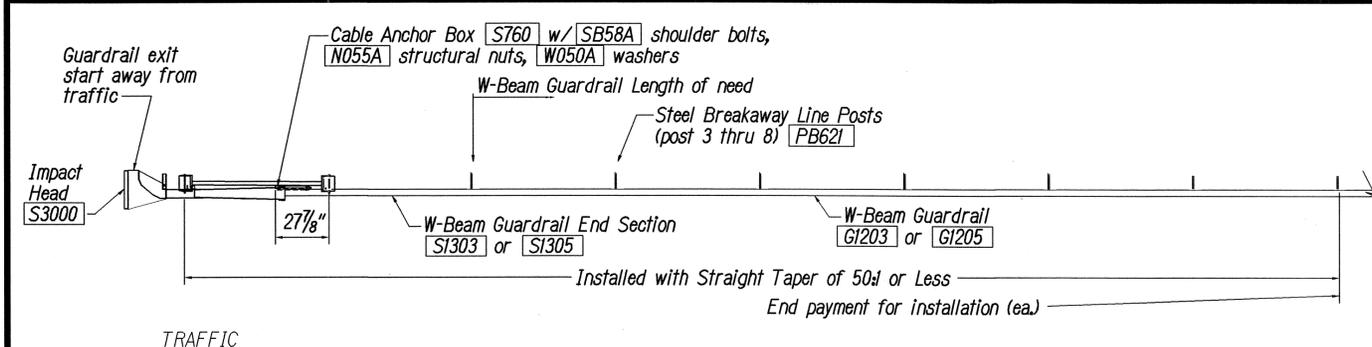
ITEM NO.	QTY.	BILL OF MATERIALS
F3000	1	IMPACT HEAD
F1303	1	W-BEAM GUARDRAIL END SECTION, 12 GA.
G1203	2	W-BEAM GUARDRAIL, 12 GA.
S730	2	*FOUNDATION SOIL TUBE, 6" x 8" x 72"
E750	1	BEARING PLATE
S760	1	CABLE ANCHOR BOX
E770	1	BCT CABLE ANCHOR ASSEMBLY
E780	1	GROUND STRUT
PB620	2	STEEL BREAKAWAY END POST
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 (SPLICE 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

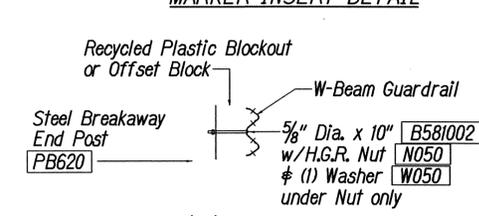
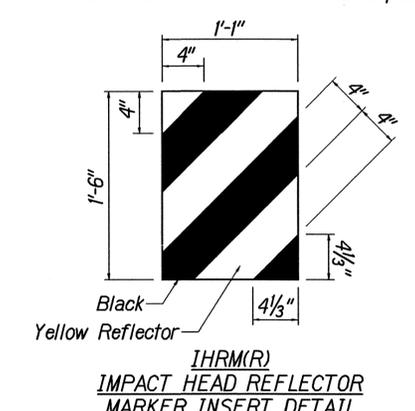
SURVEY PLOTTED BY: _____ DATE: _____
 DRAWN BY: _____
 CHECKED BY: _____
 DESIGNED BY: _____
 QUANTITIES BY: _____
 18/12/02 tdl:rubby/guardrail/fleat350.dgn (standard plan TE-61 r1/03/09 & TE-62 r09/01/07)

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
FLEAT-350
FLARED ENERGY ABSORBING TERMINAL
 KAMEHAMEHA HIGHWAY REHABILITATION
 Waihau Street to H-2 Interchange
 Federal Aid Project No. NH-099-1(24)
 Not to Scale Date: June, 2005
 SHEET No. 9 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-099-1(24)	2007	37	74



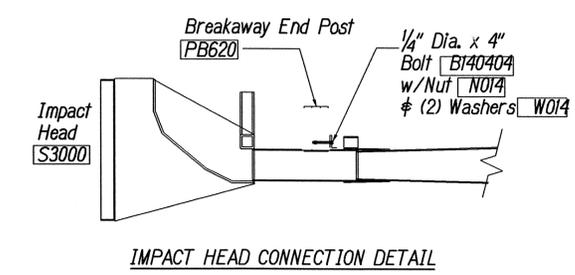
- GENERAL NOTES:**
- Breakaway steel posts are required with the Sequential Kinking Terminal.
 - All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
 - When the Sequential Kinking Terminal is selected as the end treatment for W-Beam Guardrail installation, the W-Beam Guardrail will be flared at a rate of 50:1 to prevent the impact head from encroaching on the shoulder. The flare is not required and may be decreased or eliminated for specific installations.
 - The soil tube 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. They shall not be driven with the post in the tube. If the soil 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.
 - A special site evaluation should be considered prior to using the Sequential Kinking Terminal where there is less than 25' between the outlet side of the Sequential Kinking Terminal and any adjacent driving lane.
 - (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.



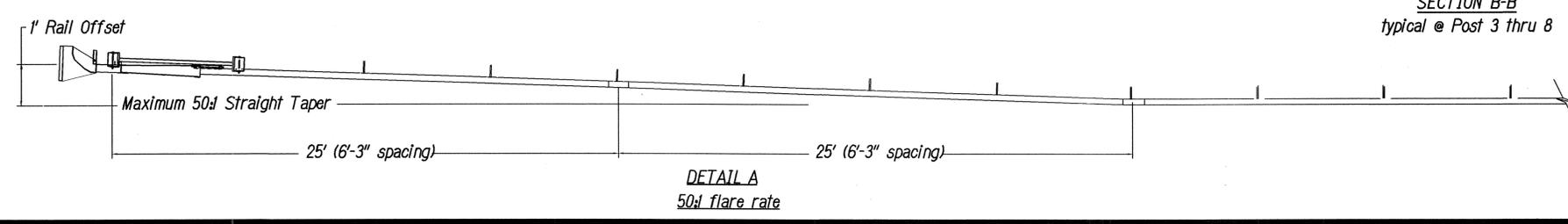
ITEM NO.	QTY.	BILL OF MATERIALS
S3000	1	IMPACT HEAD
S1303/S1305	1	W-BEAM GUARDRAIL END SECTION 12.5' or 25'
G1203/G1205	3/1	W-BEAM GUARDRAIL, 12 GA., 12.5' or 25'
S730	2	*FOUNDATION SOIL TUBE, 6" x 8" x 72"
E750	1	BEARING PLATE
S760	1	CABLE ANCHOR BOX
E770	1	BCT CABLE ANCHOR ASSEMBLY
E780	1	GROUND STRUT
PB620	2	STEEL BREAKAWAY END POSTS
PB621	6	STEEL BREAKAWAY LINE POSTS
	6	RECYCLED PLASTIC BLOCKOUTS OR OFFSET BLOCK
	1	IMPACT HEAD REFLECTOR MARKER - IHRM(R) OR (L)
HARDWARE		
B580122	17/33	5/8" Dia. x 1 1/4" SPLICE BOLTS, POST #2
B580754	2	5/8" Dia. x 7 1/2" HEX BOLTS
B341004	2	3/4" Dia. x 10" HEX BOLTS
B341002	6	5/8" Dia. x 10" H.G.R. BOLT (POST 2 ONLY)
B581802	6	5/8" Dia. x 18" H.G.R. BOLT (POST 3 THRU 8)
N050	26/42	5/8" Dia. H.G.R. NUT (SPLICE 17/33, SOIL TUBES 2, POST 2 THRU 8)
N030	2	3/4" Dia. HEX NUTS
W050	7	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 BOLTS
N055A	8	1/2" A325 STRUCTURAL NUTS
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



ORIGINAL PLAN DATE: 11/03/09 # TE-62-09(01/07)
 QUANTITY PROVIDED BY: []
 DRAWN BY: []
 TRACED BY: []
 DESIGNED BY: []
 QUANTITIES BY: []
 CHECKED BY: []



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SKT-350

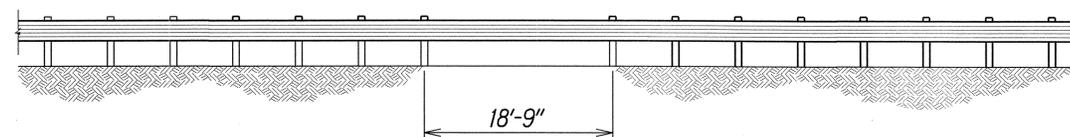
SEQUENTIAL KINKING TERMINAL

KAMEHAMEHA HIGHWAY REHABILITATION
Waihu Street to H-2 Interchange
Federal Aid Project No. NH-099-1(24)

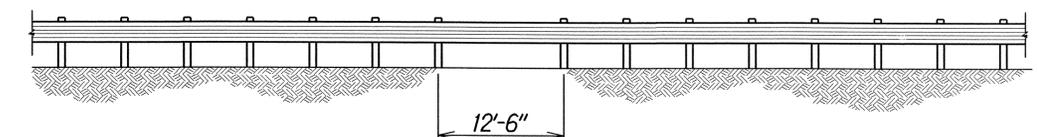
Not to Scale Date: June, 2005

SHEET No. 10 OF 11 SHEETS

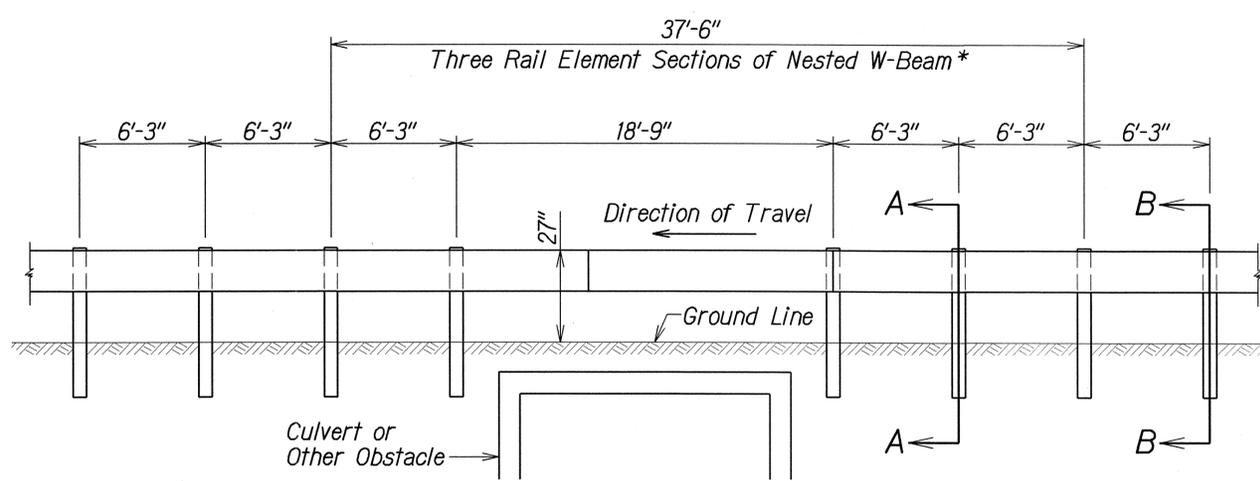
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-099-1(24)	2006	38	73



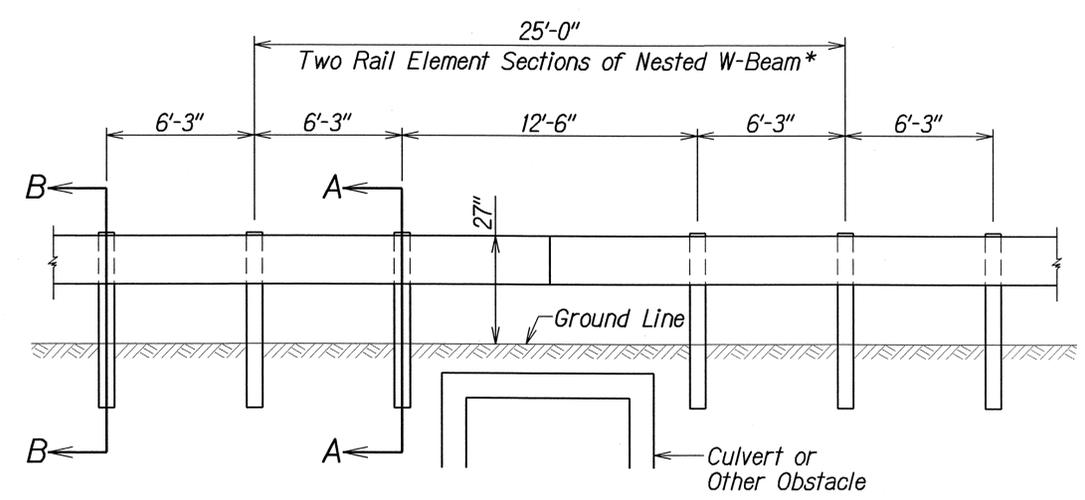
LONG SPAN OVER CULVERT



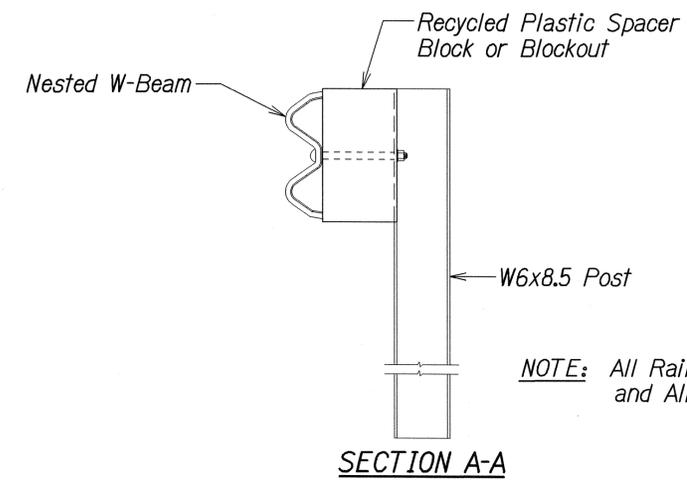
LONG SPAN OVER CULVERT



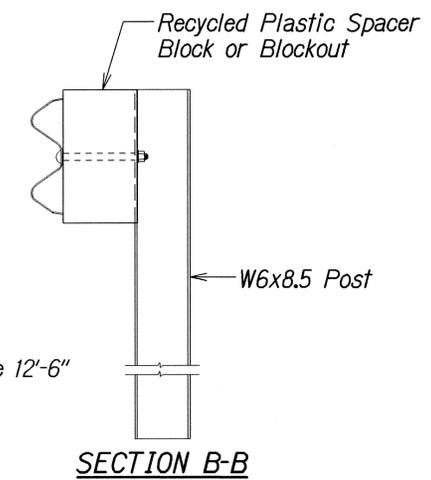
NESTED LONG SPAN STRONG POST W-BEAM GUARDRAIL OVER 18'-9" CULVERT
(MAXIMUM DYNAMIC DEFLECTION OF 3.2 FT.)



(SPlice IN CENTER OF 12'-6" SPACING)
NESTED LONG SPAN STRONG POST W-BEAM GUARDRAIL OVER 12'-6" CULVERT
(MAXIMUM DYNAMIC DEFLECTION OF 3.1 FT.)



SECTION A-A



SECTION B-B

NOTE: All Rail Elements Sections are 12'-6" and All Posts are 6' Long

*Note: All nested W-Beam splice points shall be staggered.

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

4/22/04 tdr:cby/guardrail/inst/whsems04.dgn

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARDRAIL DETAILS

KAMEHAMEHA HIGHWAY REHABILITATION
Waihau Street to H-2 Interchange
Federal Aid Project No. NH-099-1(24)

Scale: NTS Date: January, 2005

SHEET No. 11 OF 11 SHEETS