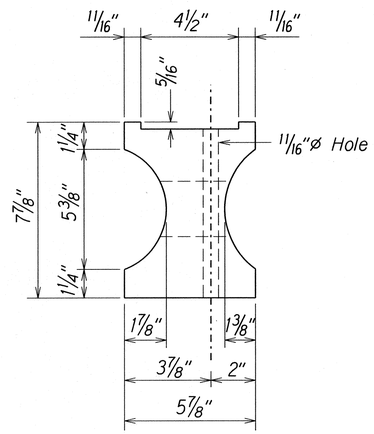
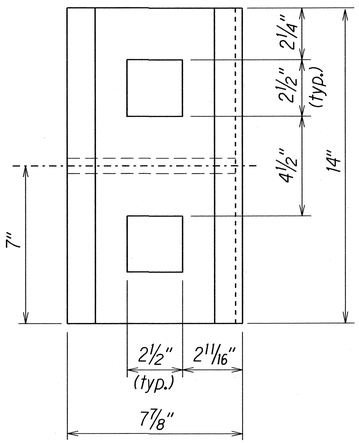
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	32	111

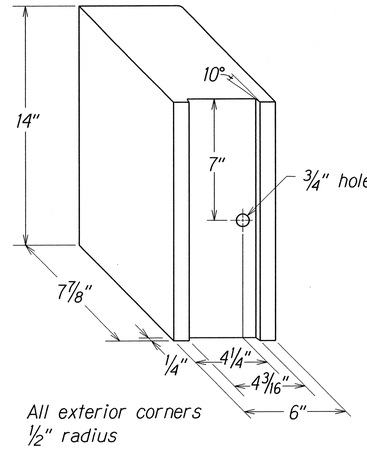


TOP

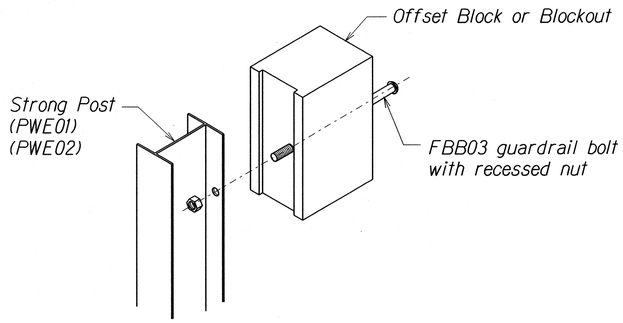


SIDE

RECYCLED PLASTIC BLOCKOUT (TYPE I)

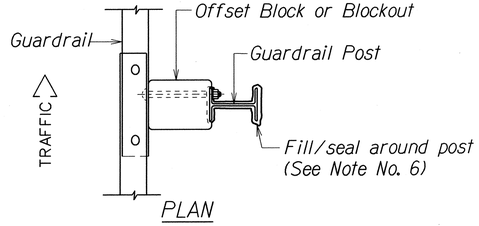


RECYCLED POLYETHYLENE OFFSET BLOCK (TYPE II)

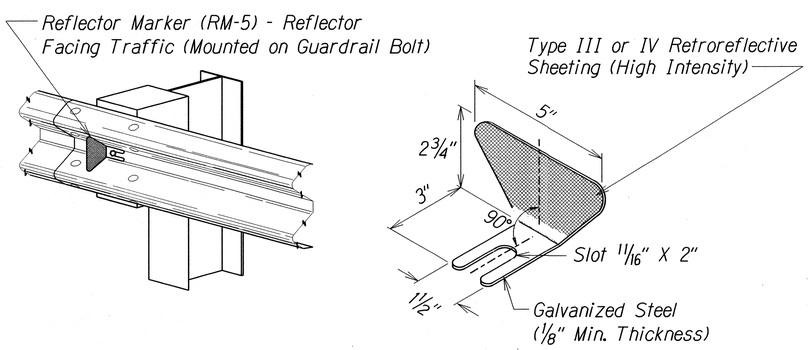


Exploded View
(Rail and washer not shown)

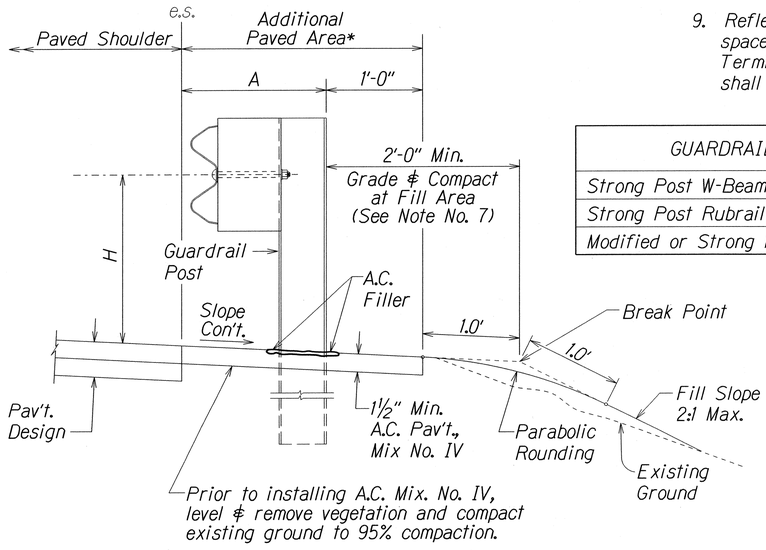
STEEL POST AND BLOCK DETAIL



PLAN



REFLECTOR MARKER (RM-5) DETAIL AND TYPICAL INSTALLATION



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"

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.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY JL	
	TRACED BY	
NOTE BOOK	DESIGNED BY JL	
	QUANTITIES BY	
	CHECKED BY	
	No.	

r2/28/02 tdl:ruby/guardrail/he50revdgn (standard plan TE-50 r09/01/00)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

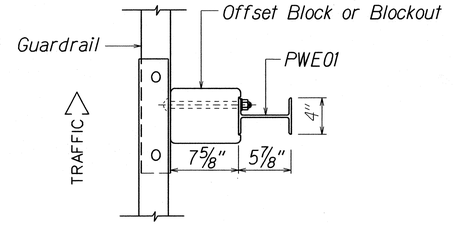
GUARDRAIL DETAILS & NOTES

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

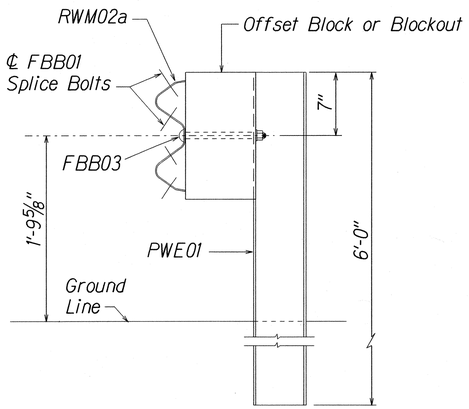
Scale: NTS Date: Sept., 2015

SHEET No. 1 OF 12 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	33	111

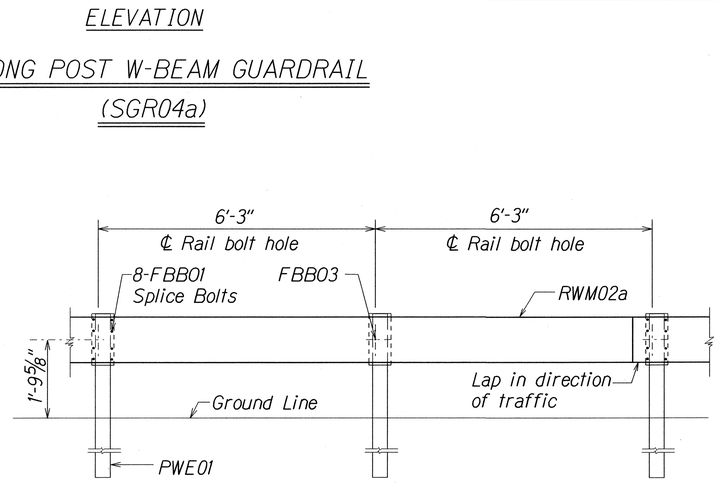


PLAN



ELEVATION

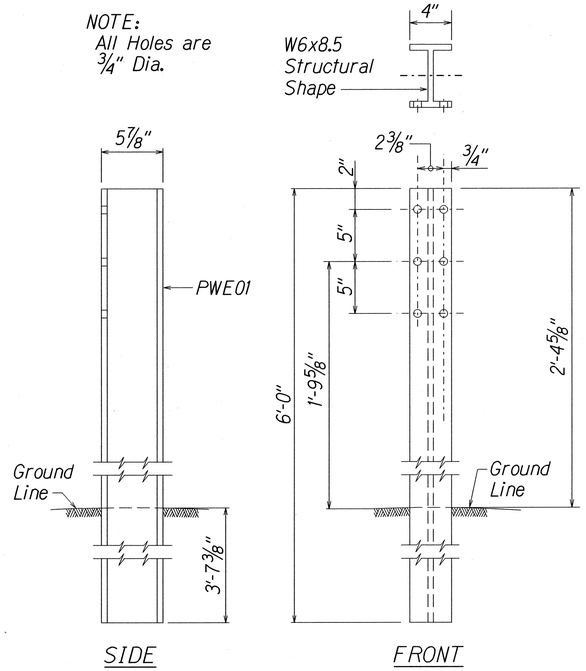
STRONG POST W-BEAM GUARDRAIL (SGR04a)



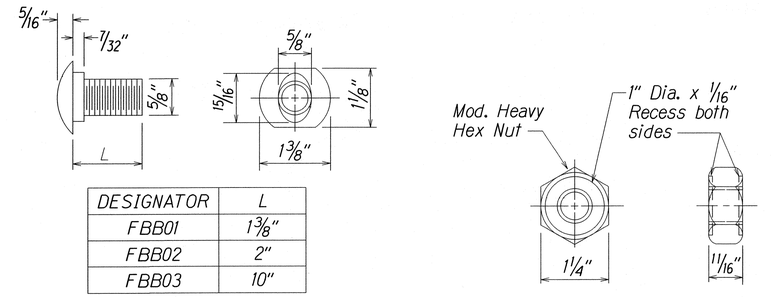
ELEVATION

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

NOTE:
All Holes are
3/4" Dia.

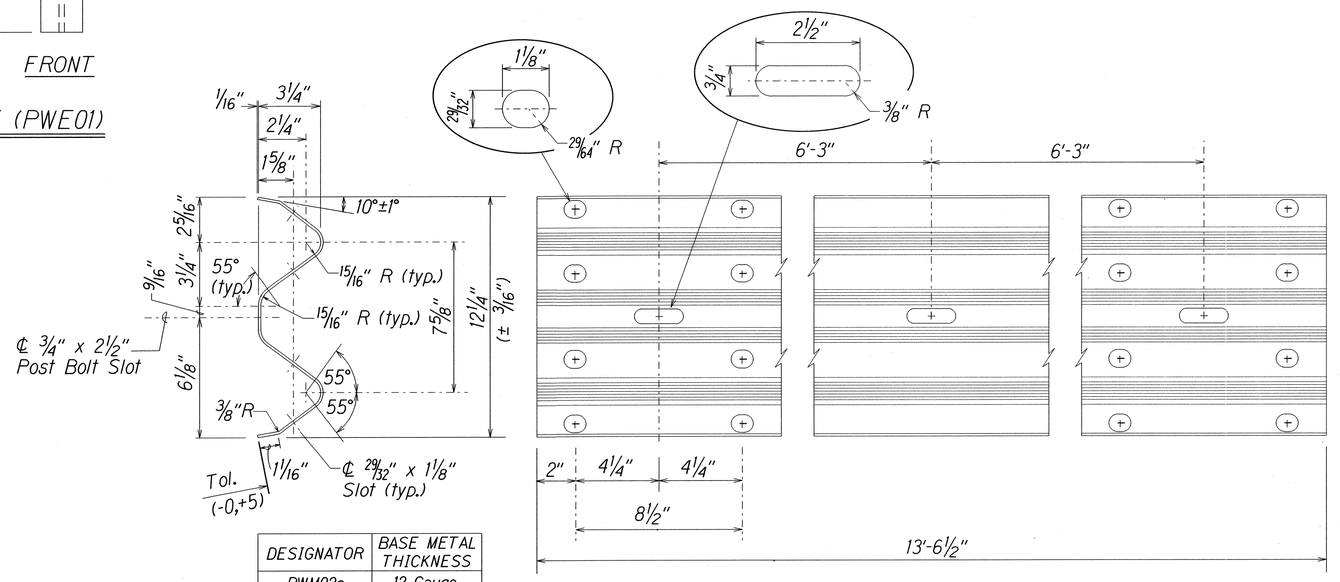


W-BEAM STRONG POST (PWE01)



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

GUARDRAIL BOLTS AND RECESSED NUT



DESIGNATOR	BASE METAL THICKNESS
RWM02a	12 Gauge

2 SPACE W-BEAM GUARDRAIL (RWM02a)

ORIGINAL PLAN
NOTE BOOK
N.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

r11/01/05 tdl:ruby/guardrail/wbeamsp.dgn (standard plan TF-50 103/06/87)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

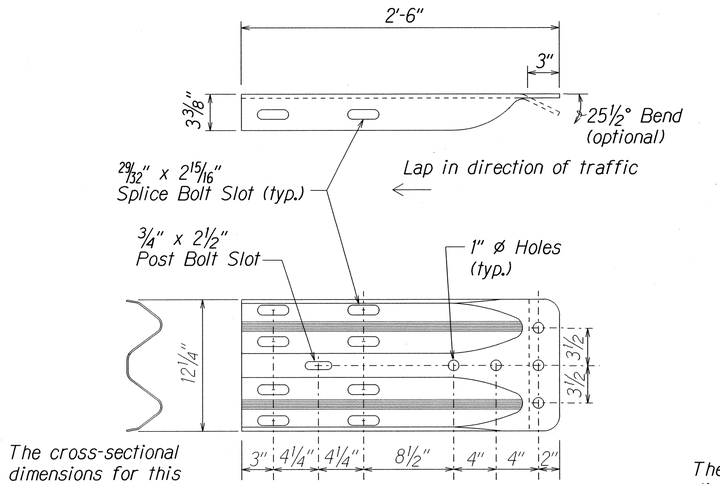
STRONG POST W-BEAM GUARDRAIL

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

Scale: NTS Date: Sept., 2015

SHEET No. 2 OF 12 SHEETS

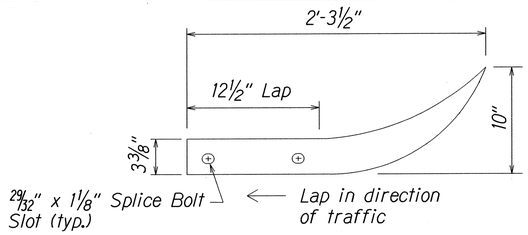
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	34	111



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

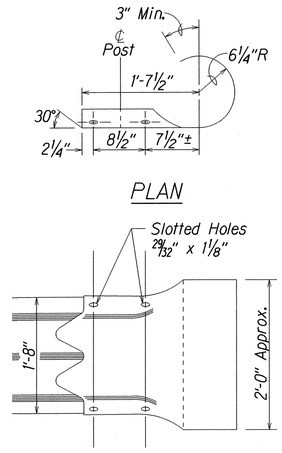
W-BEAM TERMINAL CONNECTOR (RWE02b)



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)

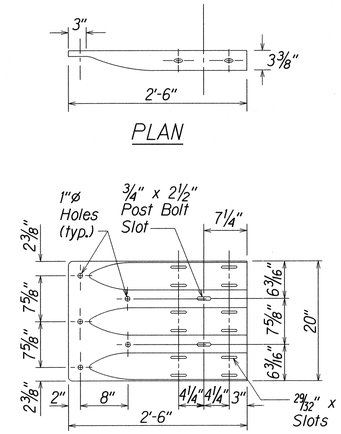


PLAN

ELEVATION

DESIGNATOR	BASE METAL THICKNESS
RTE02b	10 Gauge

THRIE-BEAM SECTION (ROUNDED) (RTE02b)

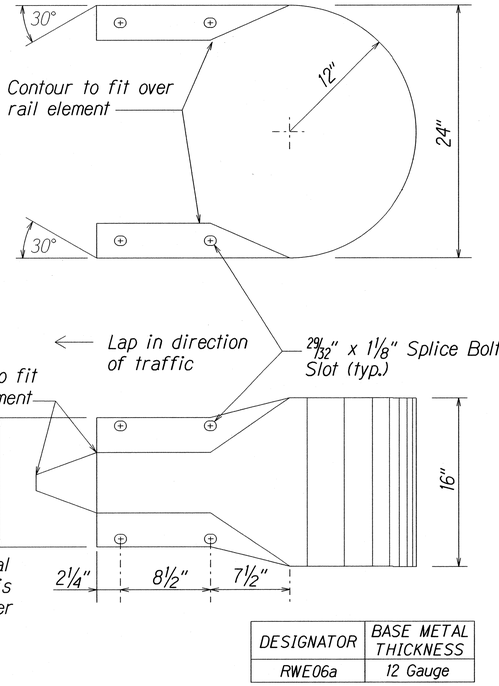


PLAN

ELEVATION

DESIGNATOR	BASE METAL THICKNESS
RTE01b	10 Gauge

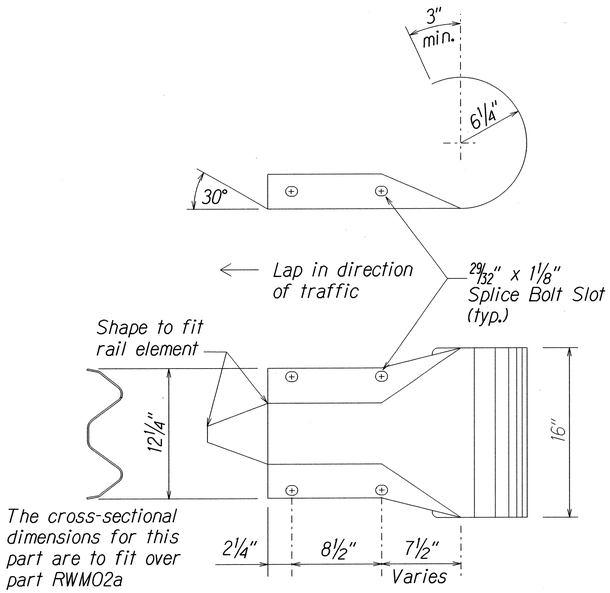
THRIE-BEAM TERMINAL CONNECTOR (RTE01b)



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

DESIGNATOR	BASE METAL THICKNESS
RWE06a	12 Gauge

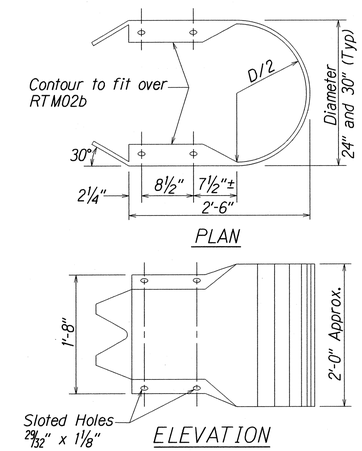
W-BEAM END SECTION (BUFFER RWE06a)



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)



PLAN

ELEVATION

DESIGNATOR	BASE METAL THICKNESS
RTE03b & RTE04b	10 Gauge

THRIE-BEAM END SECTION (BUFFER RTE03b or RTE04b)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARDRAIL TERMINAL CONNECTORS AND END SECTIONS

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

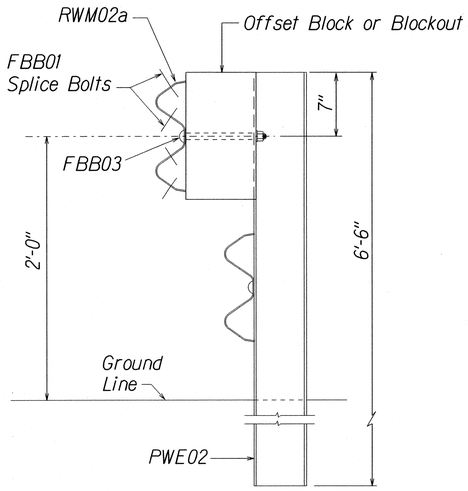
Scale: NTS Date: Sept., 2015

SHEET No. 3 OF 12 SHEETS

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

r6/13/01 tdl:uby/guardrail/fe5lrev.dgn (standard plan TE-51 09/01/87)

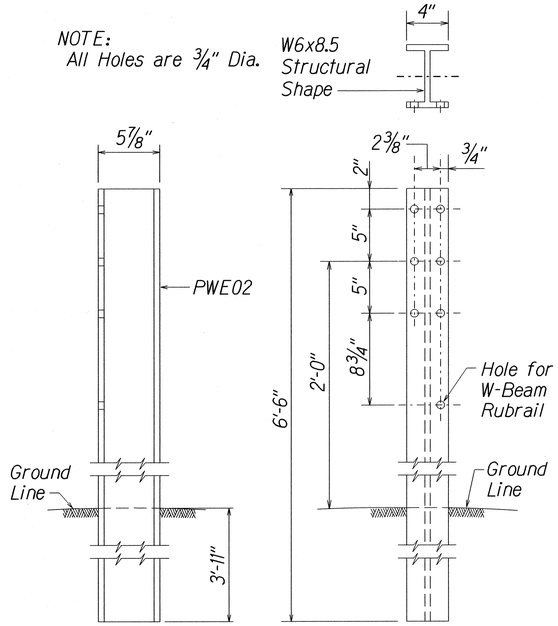
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	35	111



ELEVATION

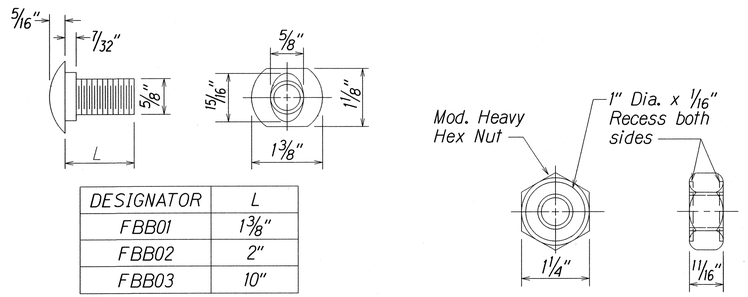
STRONG POST RUBRAIL (W-BEAM) GUARDRAIL

NOTE:
All Holes are 3/4" Dia.



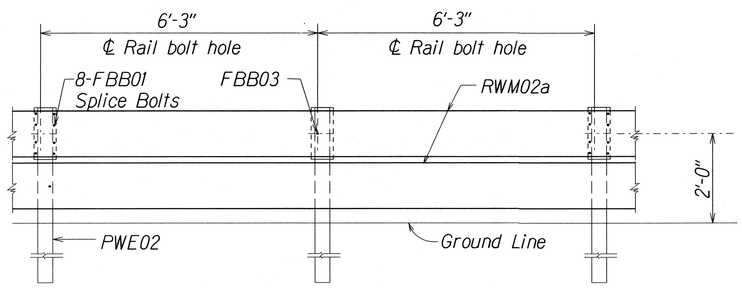
SIDE FRONT

W-BEAM STRONG POST (PWE02)



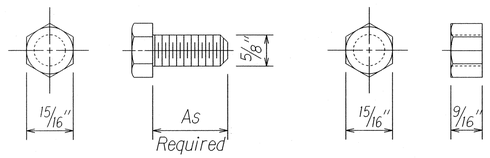
DESIGNATOR	L
FBB01	1 3/8"
FBB02	2"
FBB03	10"

GUARDRAIL BOLTS AND RECESSED NUT

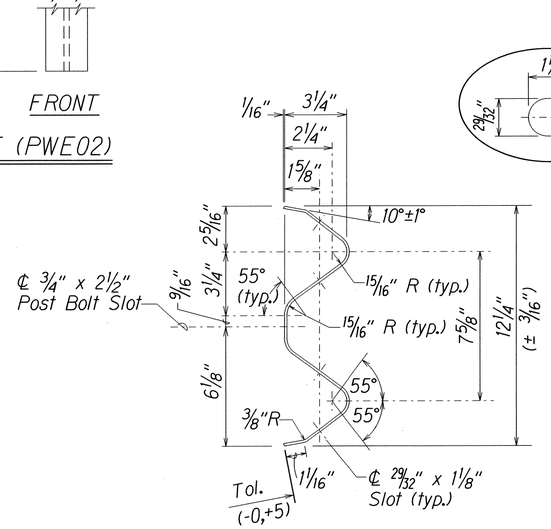


ELEVATION

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



HEX BOLT & NUT (FBX16a)



DESIGNATOR	BASE METAL THICKNESS
RWM02a	12 Gauge

2 SPACE W-BEAM GUARDRAIL (RWM02a)

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

rtl:ruby/guardrail/rubrail.dgn (standard plan TE-52 rtl:03/89)
rtl:01/05

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

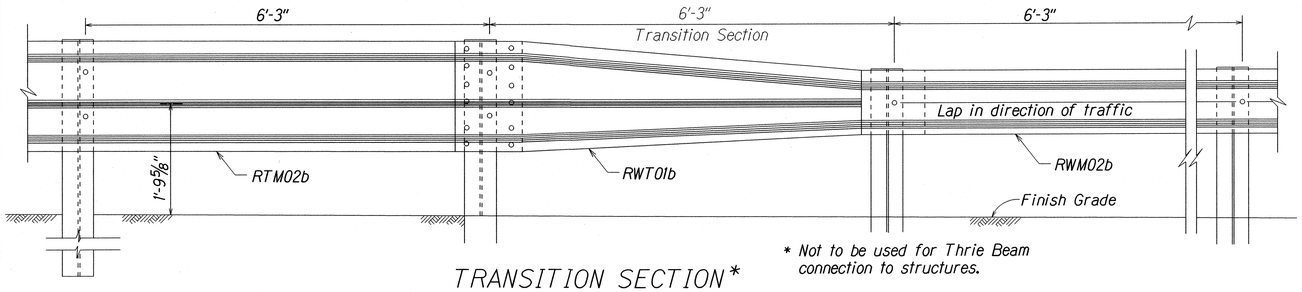
STRONG POST RUBRAIL (W-BEAM) GUARDRAIL

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

Scale: NTS Date: Sept., 2015

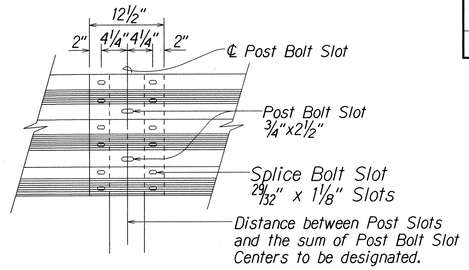
SHEET No. 4 OF 12 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	36	111



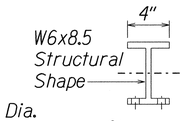
* Not to be used for Thrie Beam connection to structures.

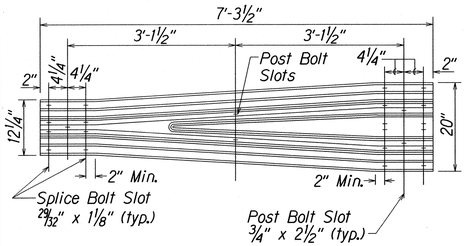
TRANSITION SECTION*



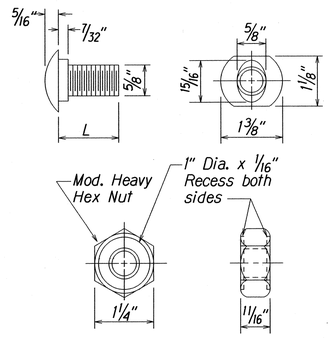
RAIL SPLICE

NOTE:
All Holes are ¾" Dia.



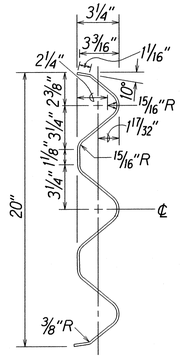


TRANSITION SECTION (RWT01b)

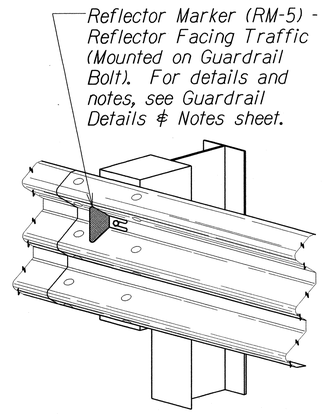


DESIGNATOR	L
FBB01	1⅜"
FBB02	2"
FBB03	10"

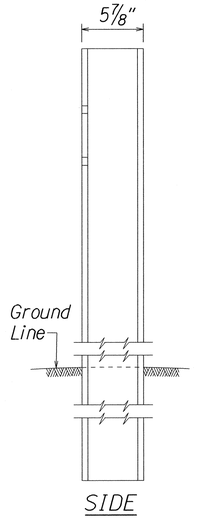
GUARDRAIL BOLTS AND RECESSED NUT

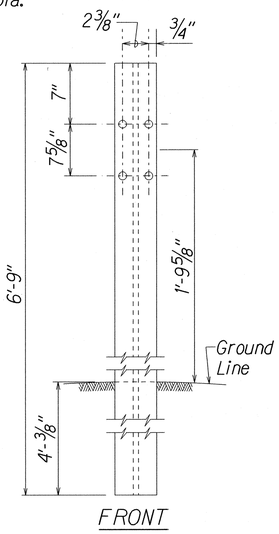


SECTION THRU RAIL ELEMENT (RTM02b)

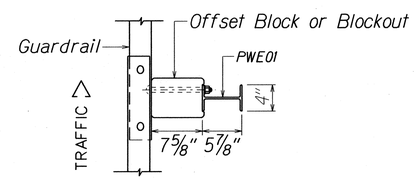


TYPICAL INSTALLATION OF REFLECTOR MARKER (RM-5)

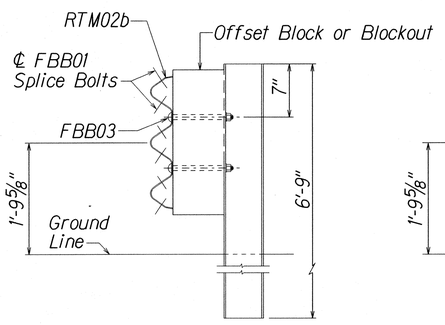




THRIE-BEAM STRONG POST FOR PLASTIC SPACER BLOCKS

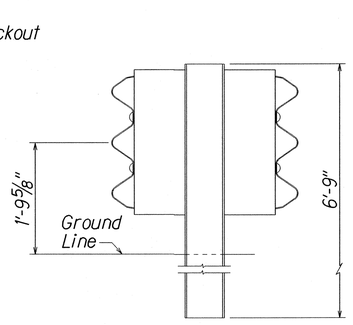


PLAN



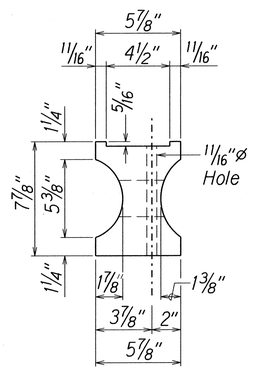
ELEVATION

STRONG POST THRIE-BEAM GUARDRAIL (SGR09a)

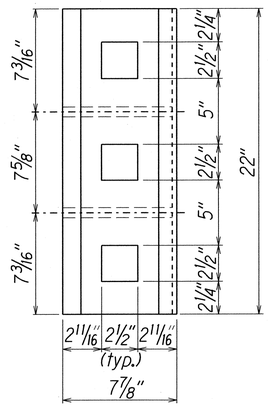


ELEVATION

STRONG POST THRIE-BEAM MEDIAN GUARDRAIL (SGM09a)

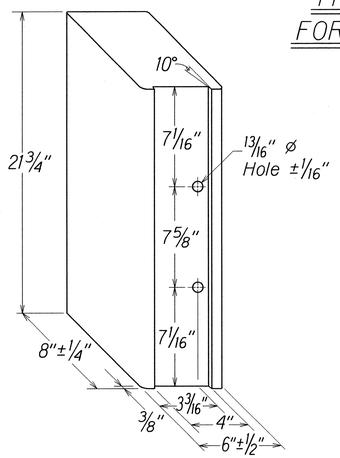


TOP



SIDE

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

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

Scale: NTS Date: Sept., 2015

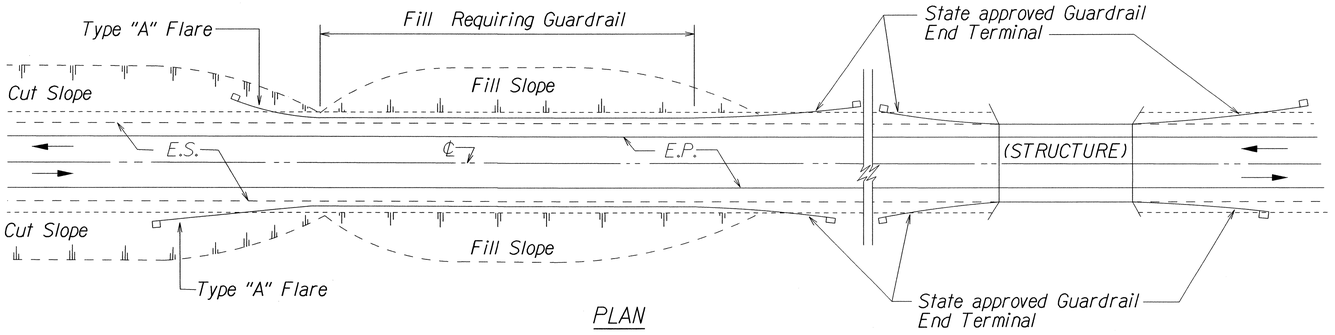
SHEET No. 5 OF 12 SHEETS

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

rtd/ruby/guardrail/thriebeamdgn (standard plan TE-57 rtl/03/89 & TE-57a rtl/03/89)

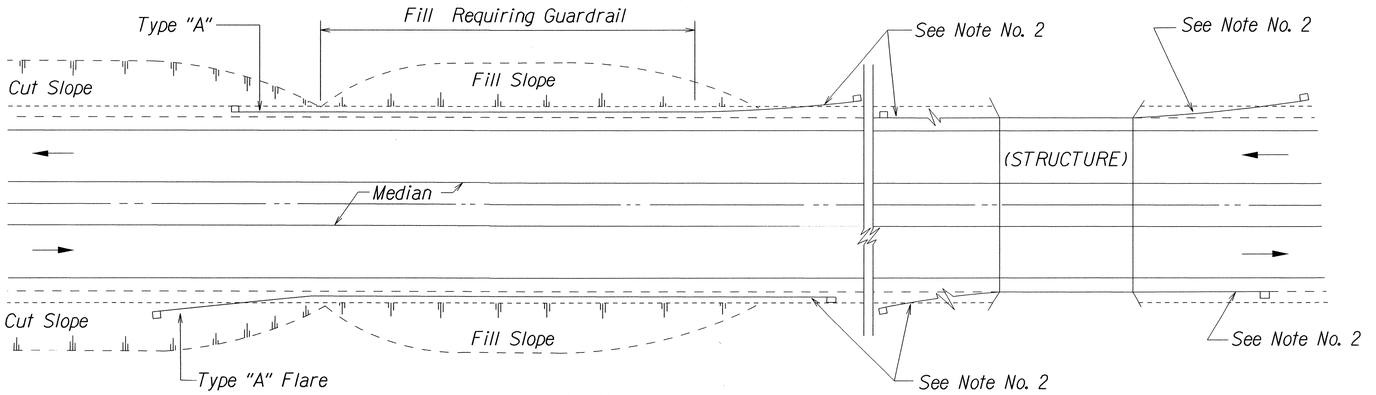
rtl/01/05

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	ADD. 37	111



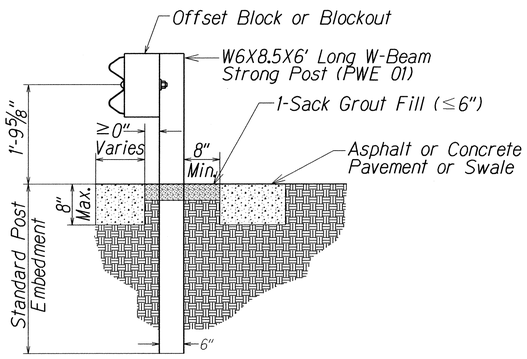
PLAN

TWO WAY ROADWAY

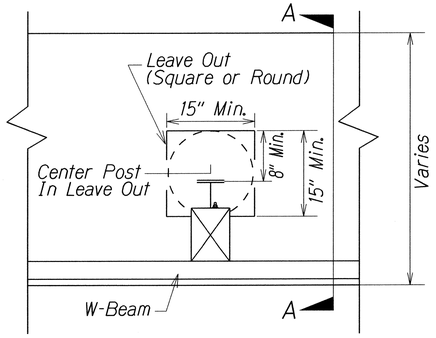


PLAN

ONE WAY ROADWAY (DIVIDED HIGHWAY)



SECTION A-A



STEEL POST DETAIL

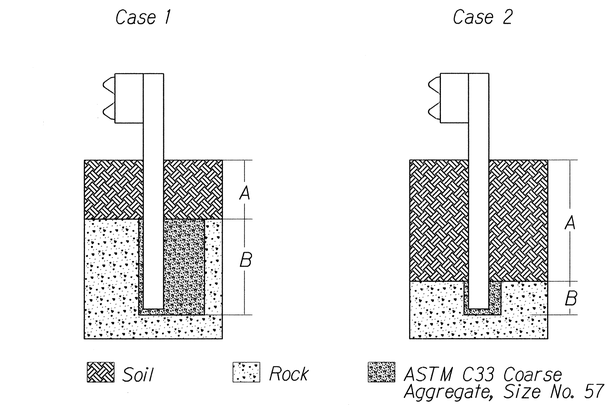
STRONG POST W-BEAM GUARDRAIL POST IN PAVEMENT OR DRAINAGE SWALE

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.

NOTES (STRONG POST W-BEAM IN ROCK):

1. Backfill of drilled holes shall be with compressible material, ASTM C33 Coarse Aggregate, Size No. 57.
2. Elongated 21-inch long hole can be accomplished by drilling three 8-inch diameter holes at 6 1/2-inches on center.



Plan View Steel Posts
Either hole configuration acceptable

(A) ranging from 0 to 18-inches, the depth of required drilling (B) is equal to 24-inches.

Overlying Soil Depths of 0 to 18-inches

(A) ranging from 18-inches to the embedment depth of the post, depth of required drilling (B) is equal to either 12-inches or the desired embedment depth minus the depth of soil whichever is less.

Overlying Soil Depths of 18 to 42-inches

STRONG POST W-BEAM GUARDRAIL IN ROCK

DATE	REVISION
1 10/28/15	Replace Sheet.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARDRAIL DETAILS

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

Scale: NTS Date: Sept., 2015

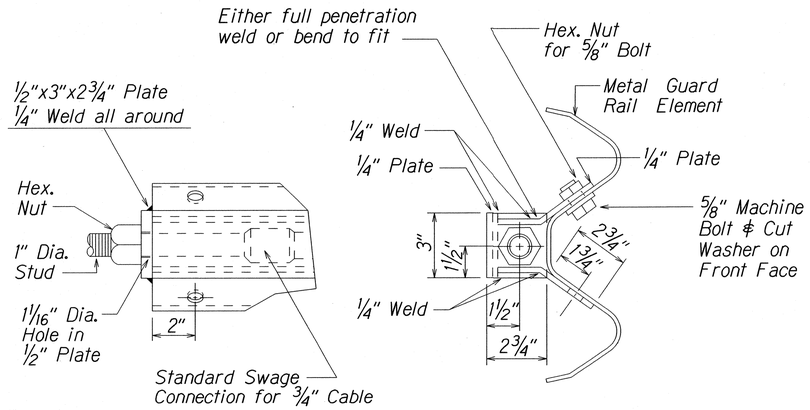
SHEET No. 6 OF 12 SHEETS

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

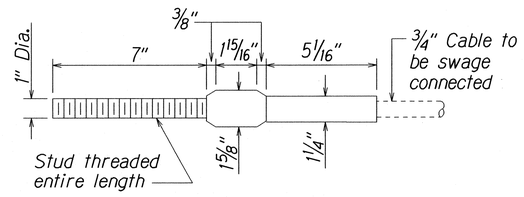
r10/22/15 16f:/dgn/guardrail/hs59rev_B1.dgn

ADD. 37

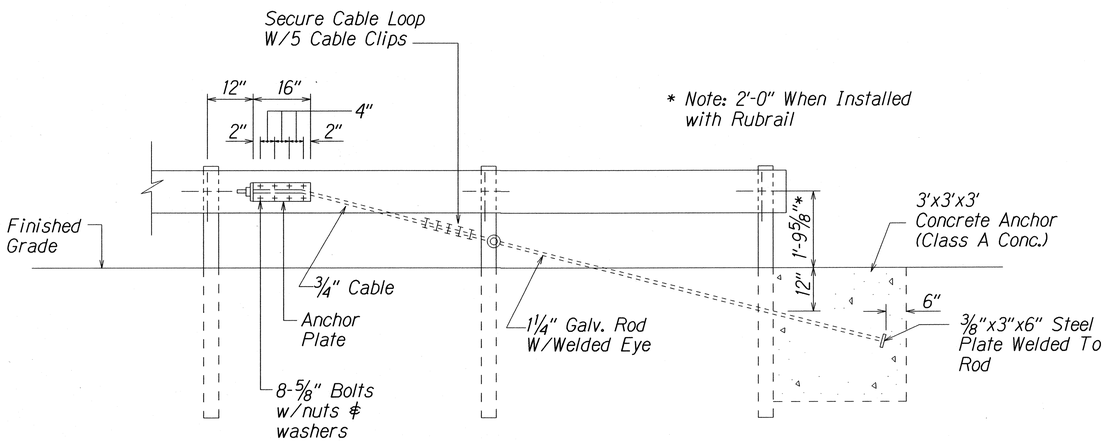
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	38	111



ANCHOR PLATE DETAILS

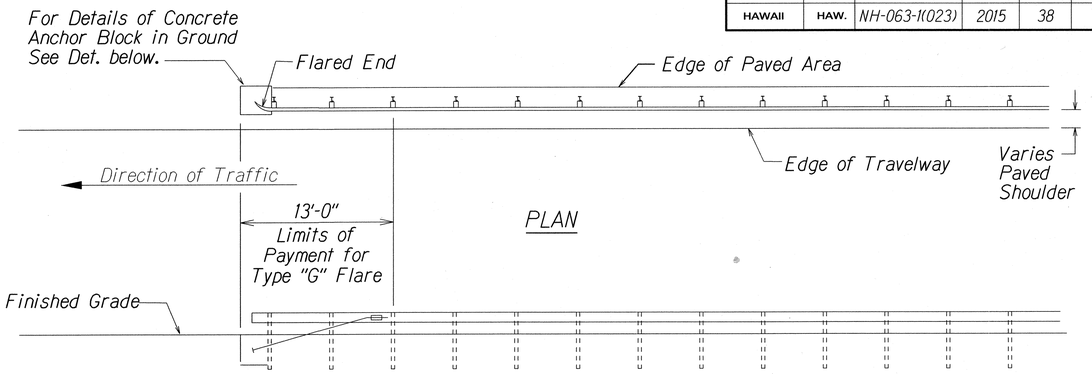


STANDARD SWAGED FITTING AND STUD



ANCHOR BLOCK DETAIL

1. 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.

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

r3/13/02 fdl:ruby/guardrail/te59revdgn (standard plan TE-59 rll/03/89)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

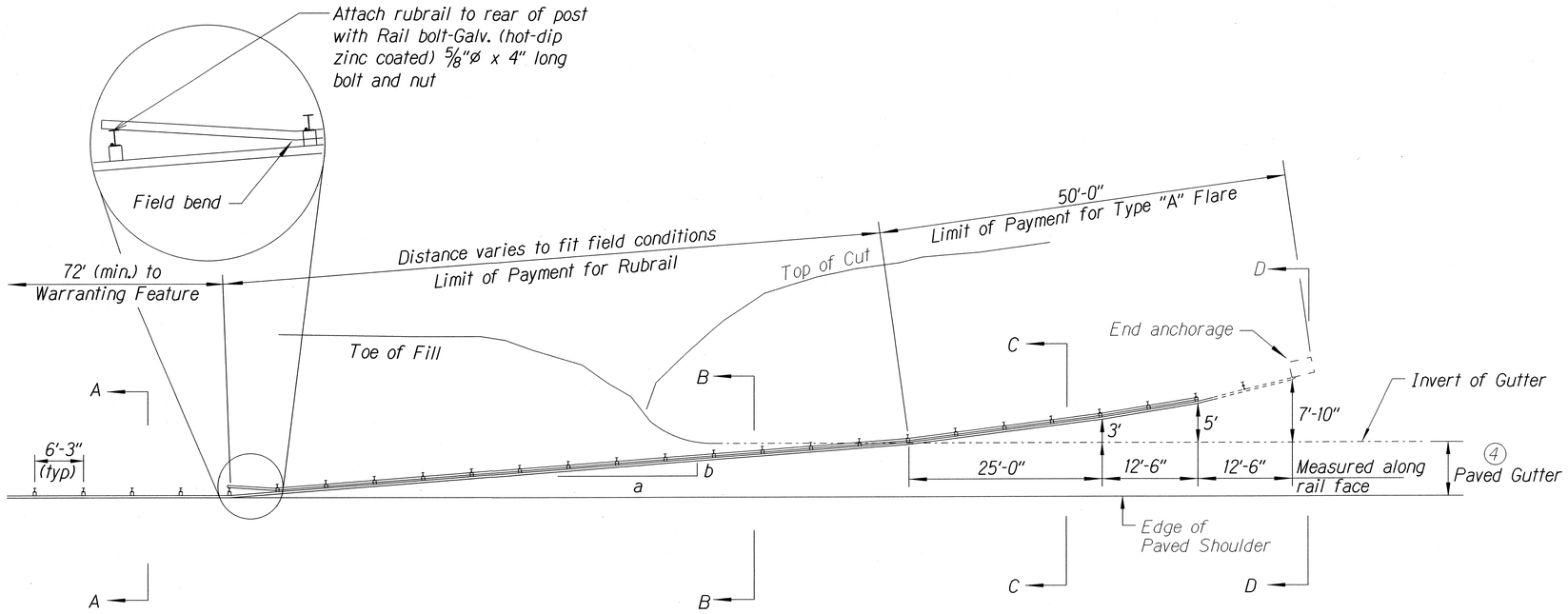
GUARDRAIL DETAILS

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

Scale: NTS Date: Sept., 2015

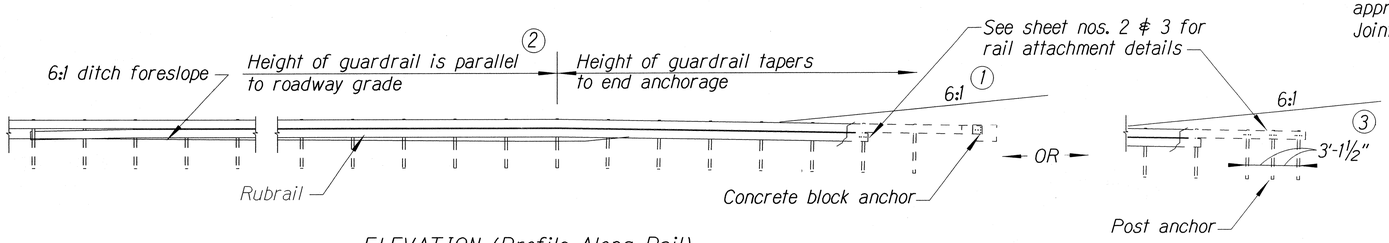
SHEET No. 7 OF 12 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	39	111

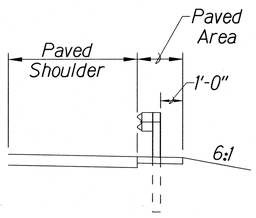


PLAN

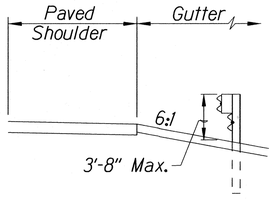
Design speed mph	a:b
68	15:1
62	13:1
56	12:1
50	11:1
43	10:1
37	9:1
31	7:1



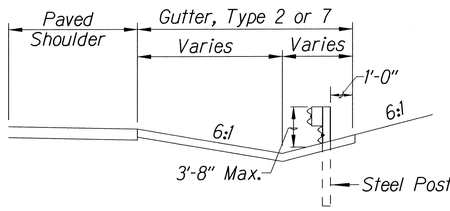
ELEVATION (Profile Along Rail)



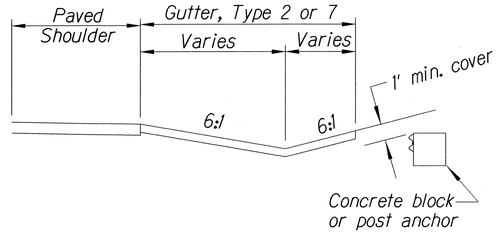
Section A-A



Section B-B
(With Rubrail)



Section C-C
(With Rubrail)



General Notes

1. A 6:1 or flatter slope is desireable. However, a steeper or flatter existing slope may be used.
2. Height of guardrail may be tapered down in elevation to maintain 3'-8" maximum height.
3. All posts are 8'-0" in length from where the guardrail flares away from the shoulder back to the post anchor. Posts for the post anchor are 6'-0" long.
4. Variable Paved Gutter offsets may be used to fit field conditions.
5. The Guardrail Posts shall be located away from the gutter/swale invert.
6. All fasteners, posts, blocks and rail elements 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-AGCARTBA Joint Cooperative Committee.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY JL	
NOTE BOOK dd.x N. Hilo	TRACED BY JL	
	DESIGNED BY JL	
	QUANTITIES BY	
	CHECKED BY	

r8/21/01 td:/uby/guardrail/a4gcrvedditch.dgn (standard plan TE-58 07/01/86, TE-59 rll/03/89 & TE-60 07/01/86)

BACKSLOPE ANCHOR TERMINAL (WITH 6:1 PAVED GUTTER AND TYPE "A" FLARE)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

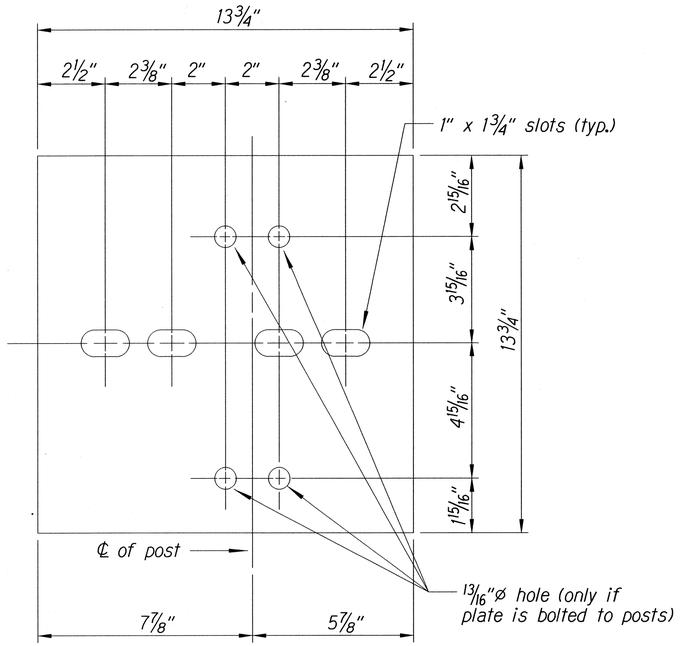
TYPE "A" FLARE

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

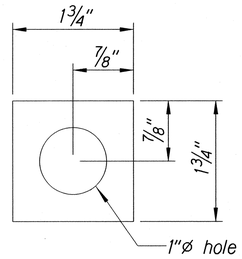
Scale: NTS Date: Sept., 2015

SHEET No. 8 OF 12 SHEETS

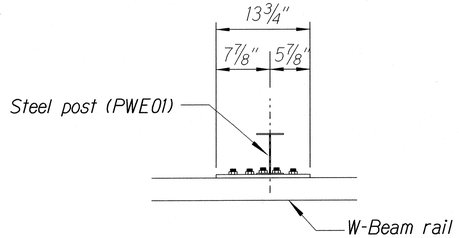
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	40	111



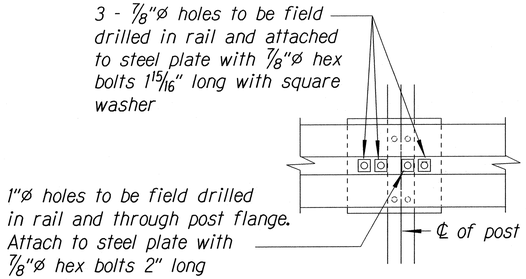
Steel Plate - ½"
(Hot-dip Zinc Coated Galvanized Welded or Bolted to Post)



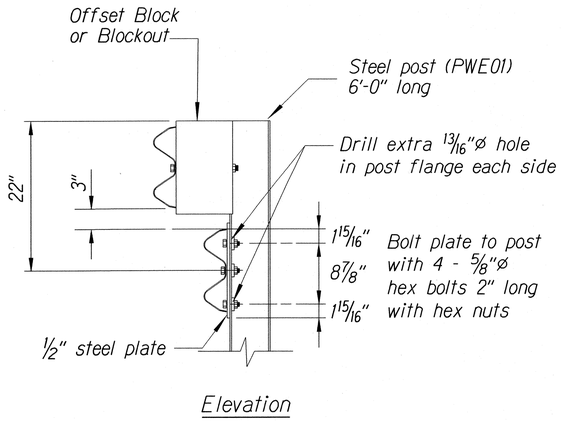
Square Washer
(3⁄16" Thick - Hot-dip Zinc Coated Galvanized)



Plan

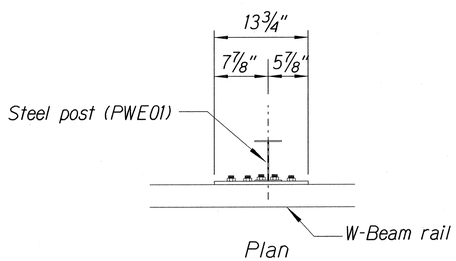


Front View

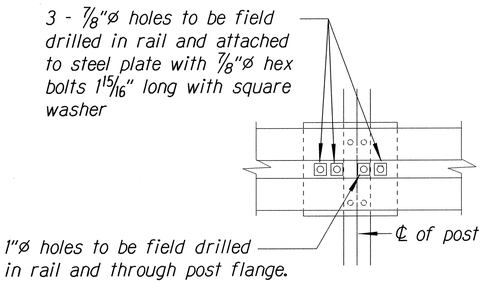


Elevation

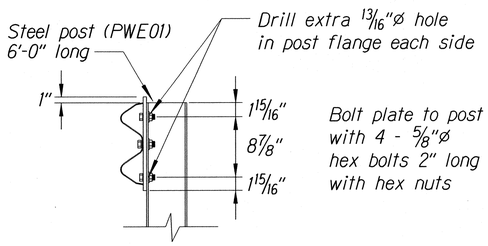
RUBRAIL ANCHOR DETAILS



Plan



Front View



Elevation

POST ANCHOR DETAILS

BACKSLOPE ANCHOR TERMINAL END ANCHORAGE DETAILS
TYPE "A" FLARE)

Note:

All fasteners, posts, blocks and rail elements 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-AGCARTBA Joint Cooperative Committee.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY JJ	
	TRACED BY	
NOTE BOOK dd.x No. xxpp	DESIGNED BY JJ	
	QUANTITIES BY	
	CHECKED BY	

r3/01/99 tdl:/uby/guardrail/gkde02.dgn (standard plan TE-58 07/01/86, TE-59 rlv/03/89 & TE-60 07/01/86)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

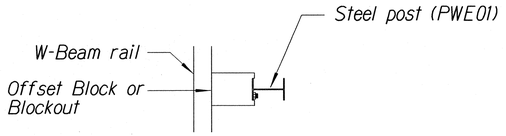
TYPE "A" FLARE

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

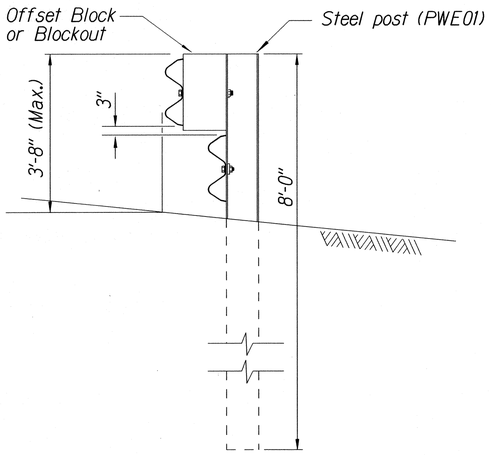
Scale: NTS Date: Sept., 2015

SHEET No. 9 OF 12 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	41	111

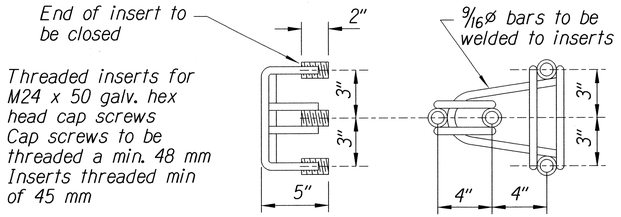


Plan

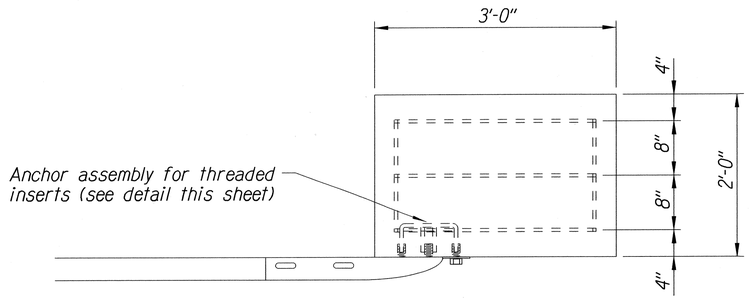


Elevation

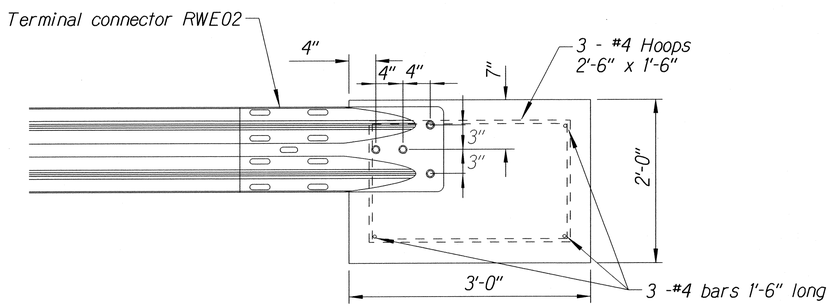
STEEL POST GUARDRAIL
WITH RUBRAIL



ANCHOR ASSEMBLY
CONCRETE BLOCK ANCHOR



Plan



Elevation

CONCRETE BLOCK ANCHOR
(2' X 2' X 3')

BACKSLOPE ANCHOR TERMINAL END ANCHORAGE DETAILS
TYPE "A" FLARE)

Note:

All fasteners, posts, blocks and rail elements 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-AGCARTBA Joint Cooperative Committee.

ORIGINAL PLAN	SURVEY PLOTTED BY _____ DATE _____
	DRAWN BY J.
	TRACED BY _____
NOTE BOOK dd.x	DESIGNED BY J.
N. Logo	QUANTITIES BY _____
	CHECKED BY _____

c3/01/99 td:/ubi/guardrail/qddetl.dgn (standard plan TE-58 07/01/85, TE-59 rll/03/89 # TE-60 07/01/86)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

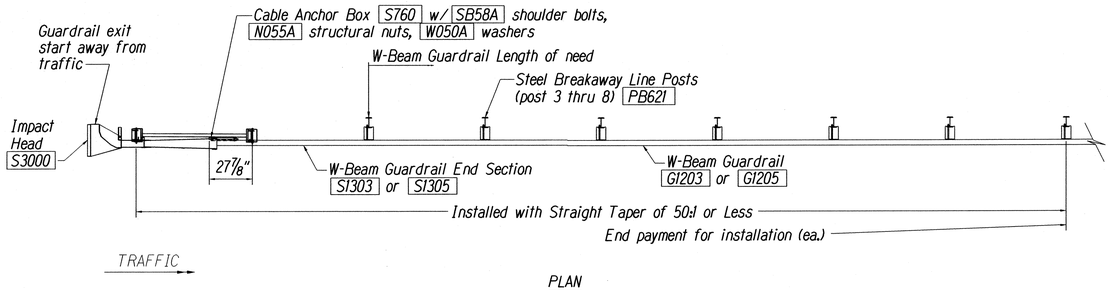
TYPE "A" FLARE

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

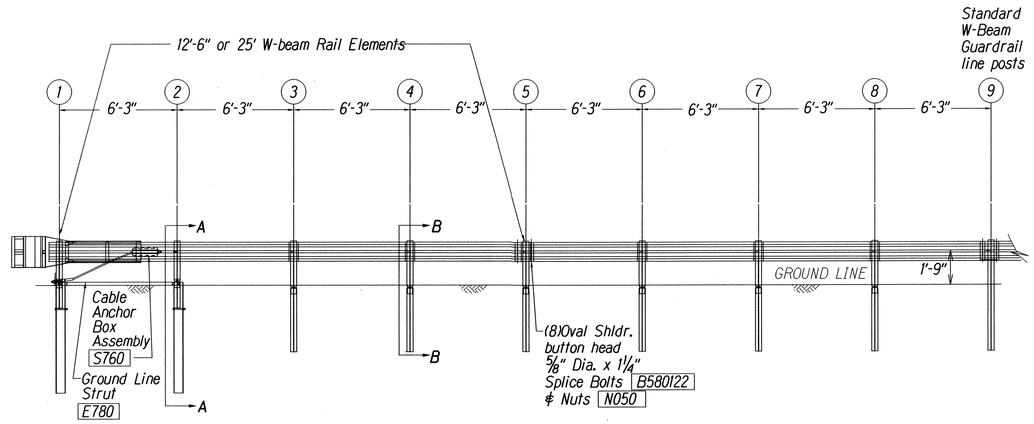
Scale: NTS Date: Sept., 2015

SHEET No. 10 OF 12 SHEETS

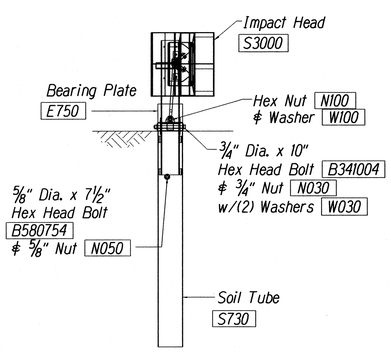
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	42	111



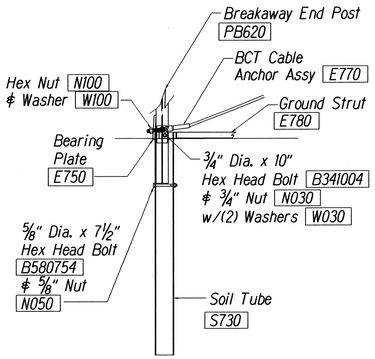
PLAN



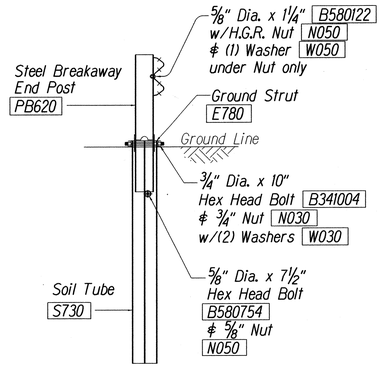
ELEVATION



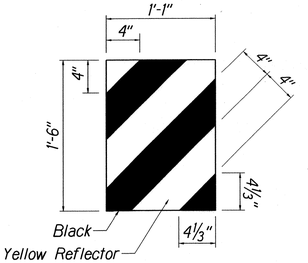
FRONT VIEW OF POST 1



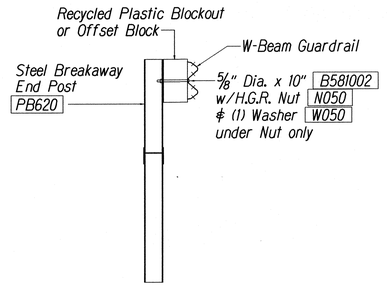
PARTIAL VIEW OF POST 1



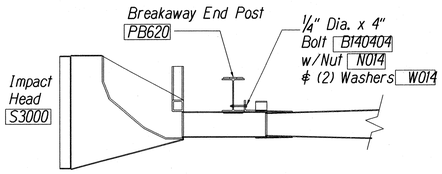
SECTION A-A
at Post #2



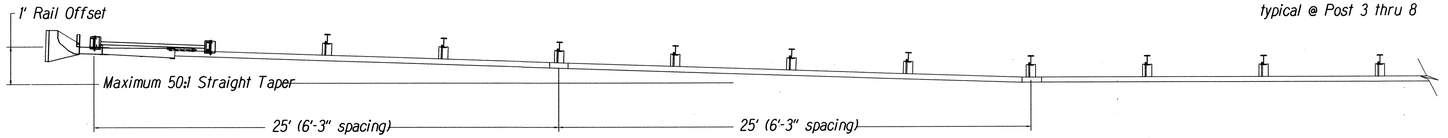
IHRM(R)
IMPACT HEAD REFLECTOR MARKER INSERT DETAIL



SECTION B-B
typical @ Post 3 thru 8



IMPACT HEAD CONNECTION DETAIL



DETAIL A
50:1 flare rate

GENERAL NOTES:

1. Breakaway steel posts are required with the Sequential Kinking Terminal.
2. All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. (R) or (L) indicates right or left Impact Head Reflector Marker (IHRM). Providing and installing of IHRM shall be considered incidental to end treatment.
10. 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
SI303/SI305	1	W-BEAM GUARDRAIL END SECTION (12 GA. 12.5' or 25')
GI203/GI205	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
NI00	2	1" ANCHOR CABLE HEX NUT
WI00	2	1" ANCHOR CABLE WASHER
BI40404	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 3/16" ID A325 STR. WASHER

Foundation Tube Options For Posts 1 & 2
*6'-0" Split Foundation Tubes S730
*6'-0" Solid Foundation Tubes E73I
*5'-0" Foundation Tubes S735 W/Soil Plates SP600
*4'-6" Foundation Tubes E735 W/Soil Plates SP600

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

tdl:ruby/guardrail/skt350.dgn (Stand Plan TE-61 rlt/03/89 & TE-62 rlt/09/01/87)
3/28/01

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SKT-350

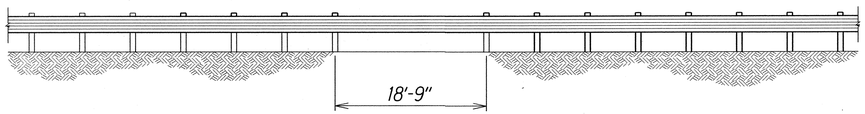
SEQUENTIAL KINKING TERMINAL

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

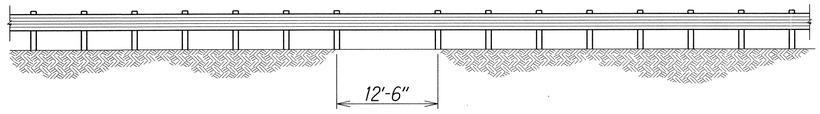
Scale: Not to Scale Date: Sept., 2015

SHEET No. 41 OF 42 SHEETS

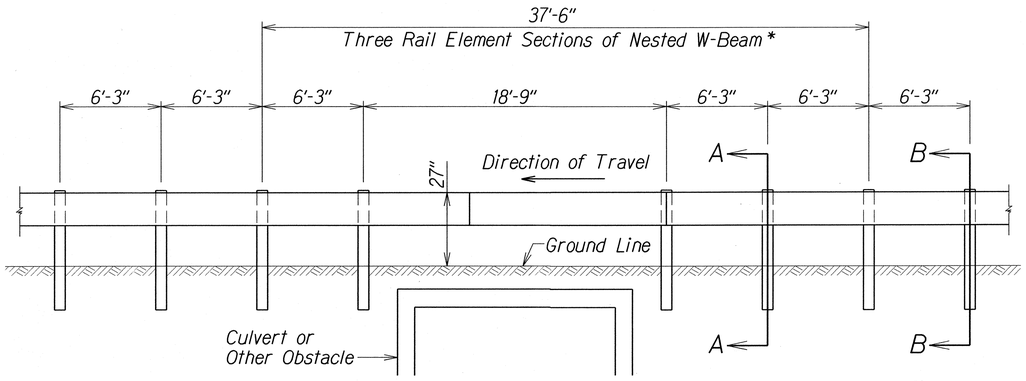
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-063-1(023)	2015	43	111



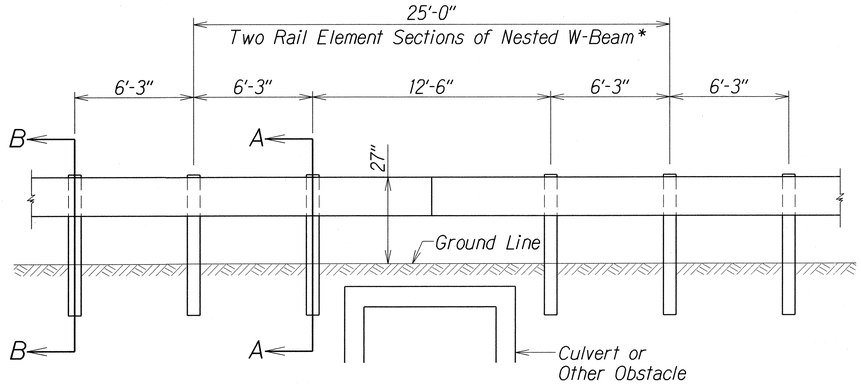
LONG SPAN OVER CULVERT



LONG SPAN OVER CULVERT

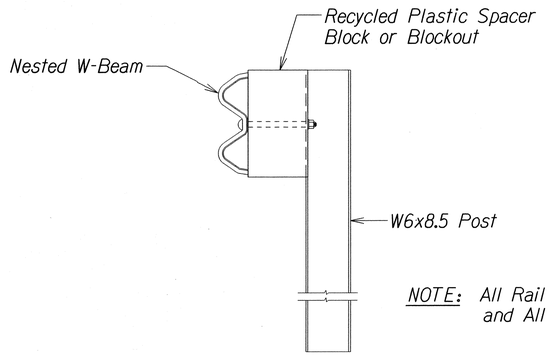


NESTED LONG SPAN STRONG POST
W-BEAM GUARDRAIL OVER 18'-9" CULVERT
(MAXIMUM DYNAMIC DEFLECTION OF 3.2 FT.)

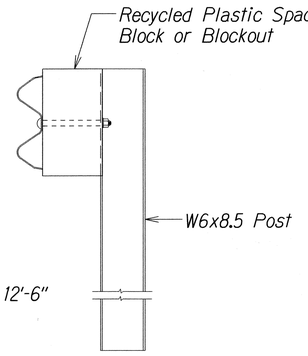


(SPLICE IN CENTER OF 12'-6" SPACING)

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 splices points shall be staggered.

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

td:ruby/guardrail/nstdwbeamsgdgn
4/22/04

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NESTED LONG SPAN STRONG POST
W-BEAM GUARDRAIL OVER CULVERT
LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
Federal Aid Project No. NH-063-1(023)

Scale: NTS Date: Sept., 2015

SHEET No. 12 OF 12 SHEETS