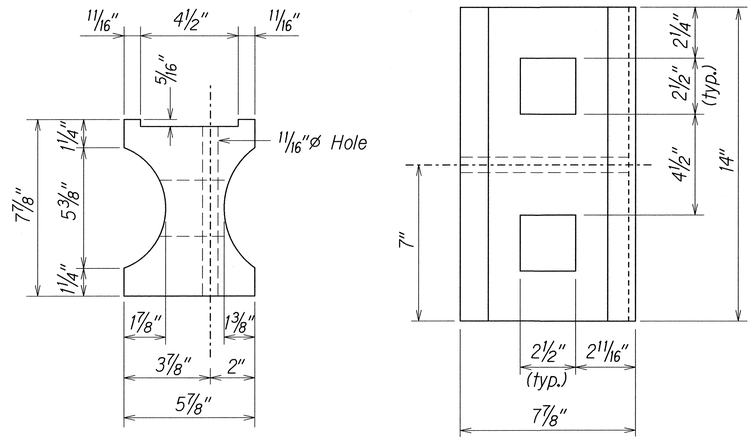
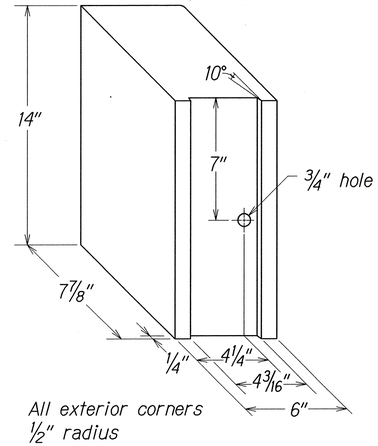
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HSIP-H3-1(081)	2013	9	36

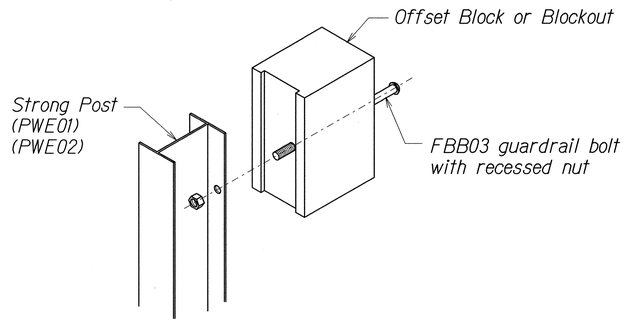


TOP SIDE

RECYCLED PLASTIC BLOCKOUT (TYPE I)

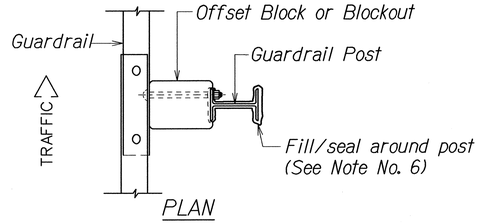


RECYCLED POLYETHYLENE OFFSET BLOCK (TYPE II)

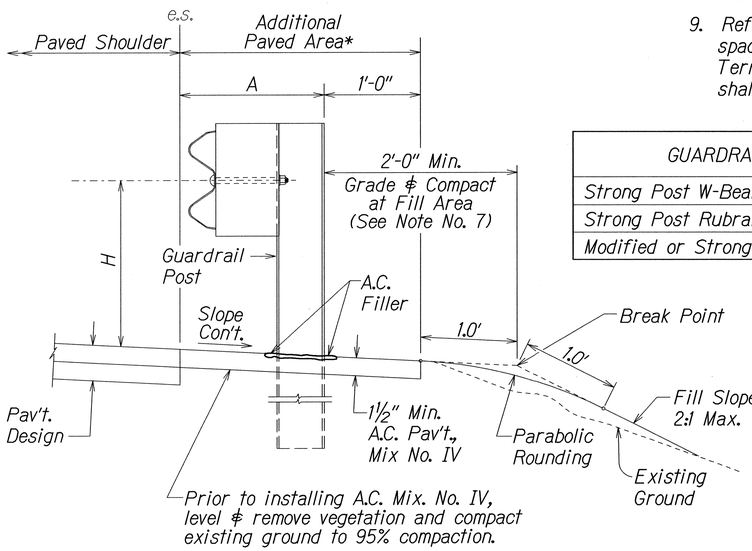


Exploded View
(Rail and washer not shown)

STEEL POST AND BLOCK DETAIL



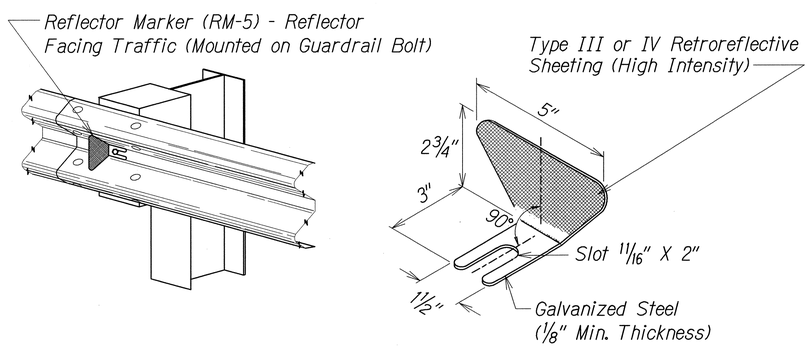
PLAN



ELEVATION

GUARDRAIL TYPE	DIMENSION	
	H	A
Strong Post W-Beam	1'-9 5/8"	1'-6"
Strong Post Rubrail (W-Beam)	2'-0"	1'-6"
Modified or Strong Post Thrie Beam	2'-0"	2'-0"

TYPICAL GUARDRAIL INSTALLATION



REFLECTOR MARKER (RM-5) DETAIL AND TYPICAL INSTALLATION

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 X	
NOTE BOOK dd-Robert	TRACED BY X	
	DESIGNED BY X	
	QUANTITIES BY	
	CHECKED BY	

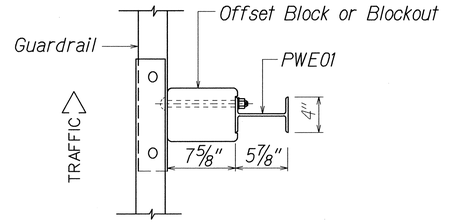
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARDRAIL DETAILS & NOTES

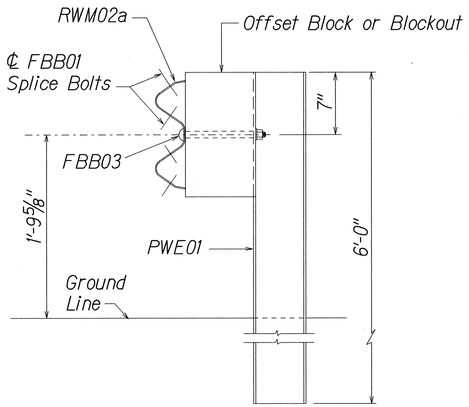
INTERSTATE ROUTE H-3 SAFETY IMPROVEMENTS
Halekou Interchange to
Kaneohe Marine Corps Base Hawaii
Federal Aid Project No. HSIP-H3-1(081)
Date: Aug, 2013

SHEET No. 1 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HSIP-H3-1(081)	2013	10	36



PLAN

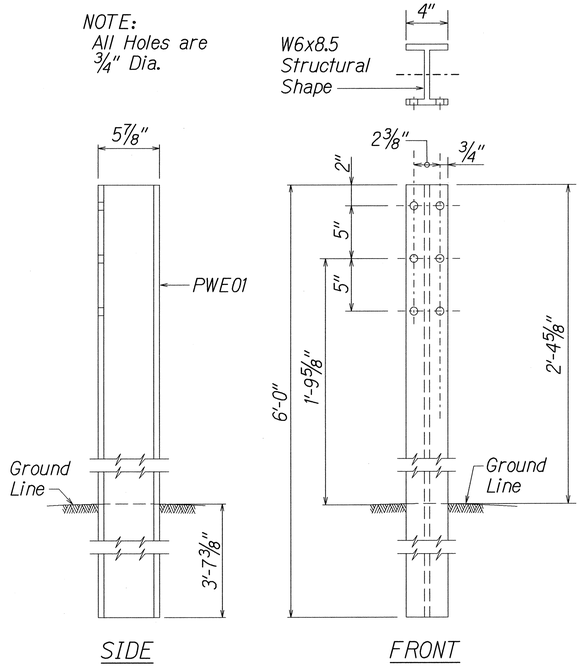


ELEVATION

STRONG POST W-BEAM GUARDRAIL

(SGR04a)

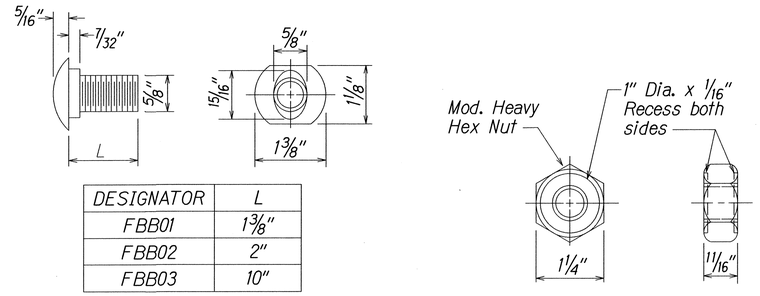
NOTE:
All Holes are
3/4" Dia.



SIDE

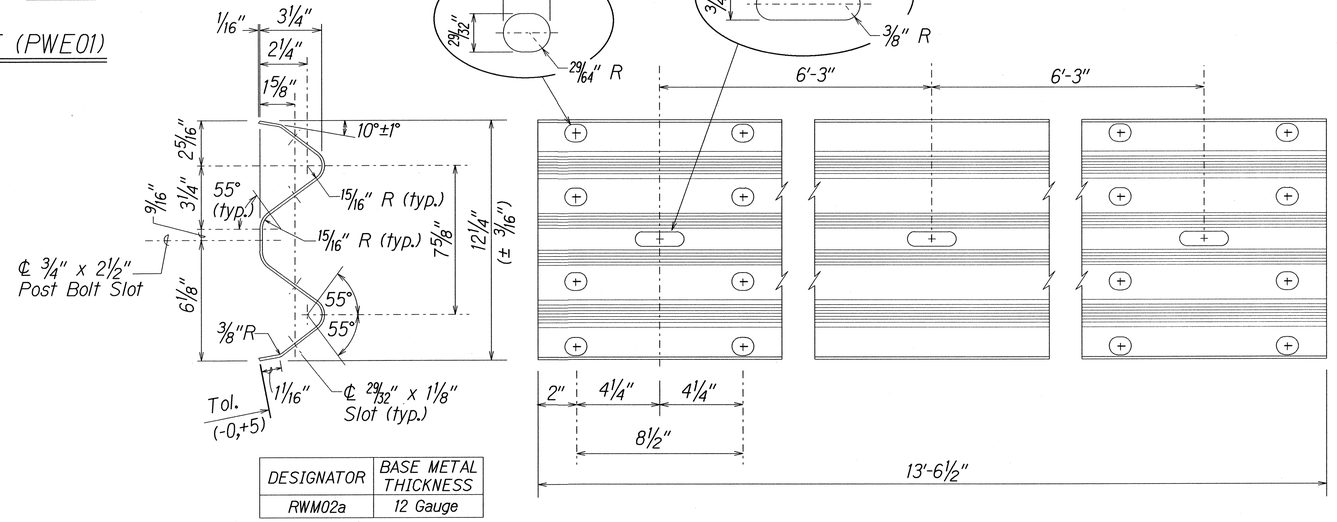
FRONT

W-BEAM STRONG POST (PWE01)



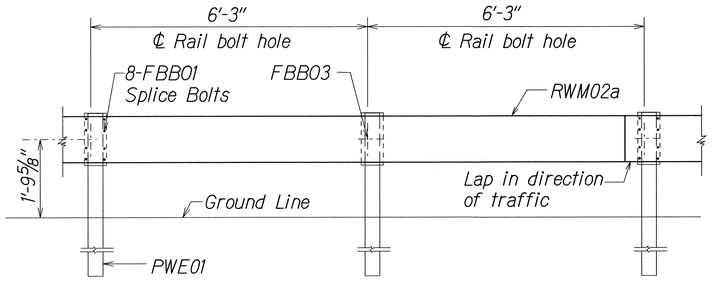
DESIGNATOR	L
FBB01	1 3/8"
FBB02	2"
FBB03	10"

GUARDRAIL BOLTS AND RECESSED NUT



DESIGNATOR	BASE METAL THICKNESS
RWM02a	12 Gauge

2 SPACE W-BEAM GUARDRAIL (RWM02a)



ELEVATION

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

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

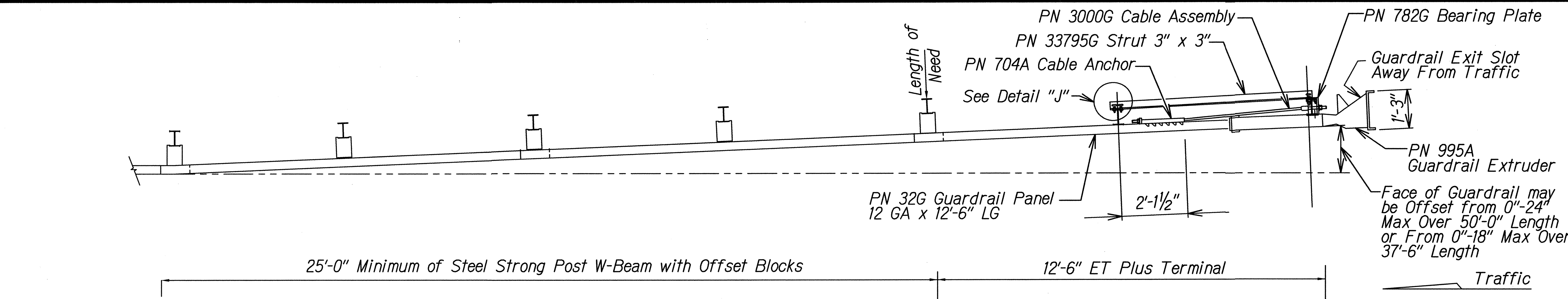
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

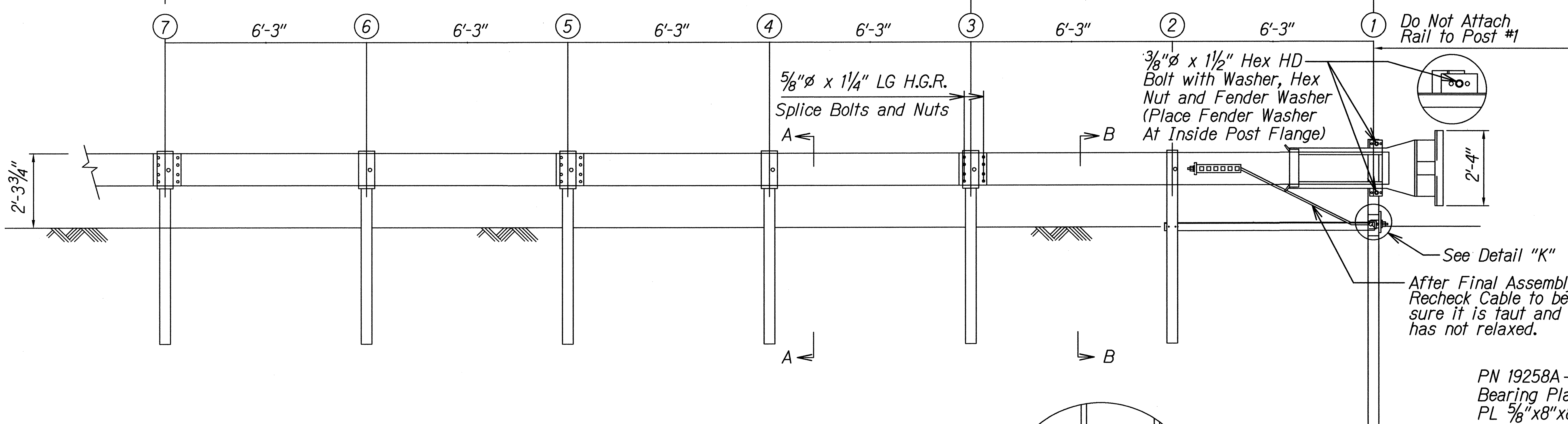
STRONG POST W-BEAM GUARDRAIL

INTERSTATE ROUTE H-3 SAFETY IMPROVEMENTS
Halekou Interchange to
Kaneohe Marine Corps Base Hawaii
Federal Aid Project No. HSIP-H3-1(081)
Date: Aug, 2013

SHEET No. 2 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HSIP-H3-1(081)	2013	11	36

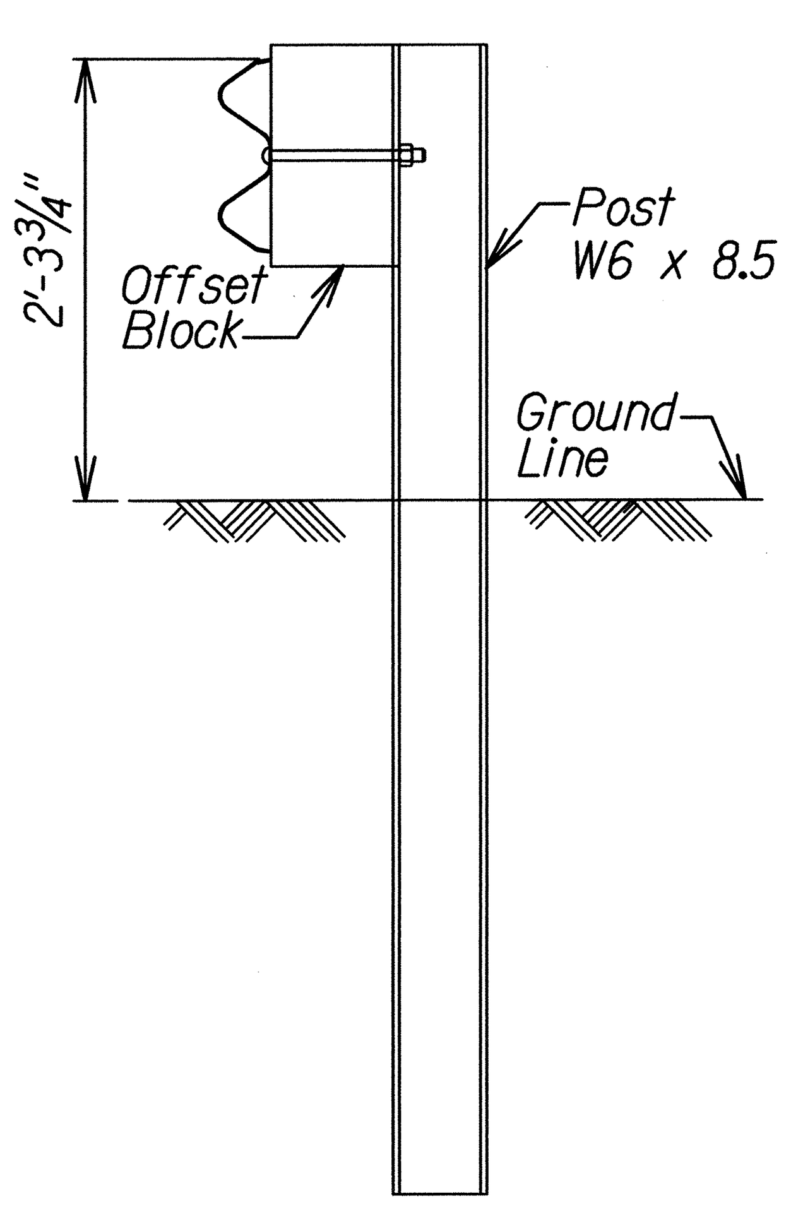




NOTE: Do attach guardrail to Post #1.

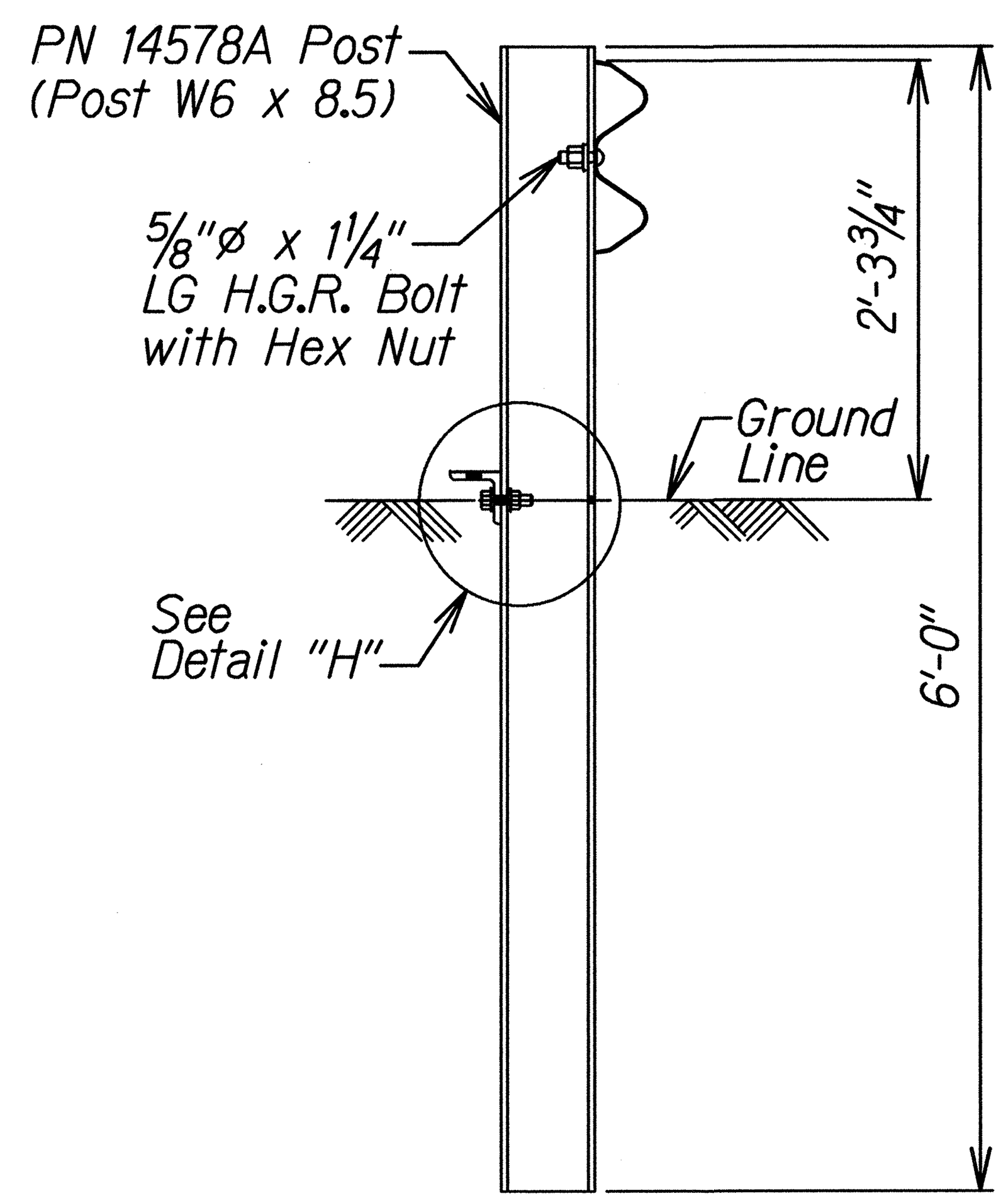
Object Marker Note:

The stripes for Object Marker shall slope downward at an angle of 45° towards the sides of the extruder head where traffic is to pass.



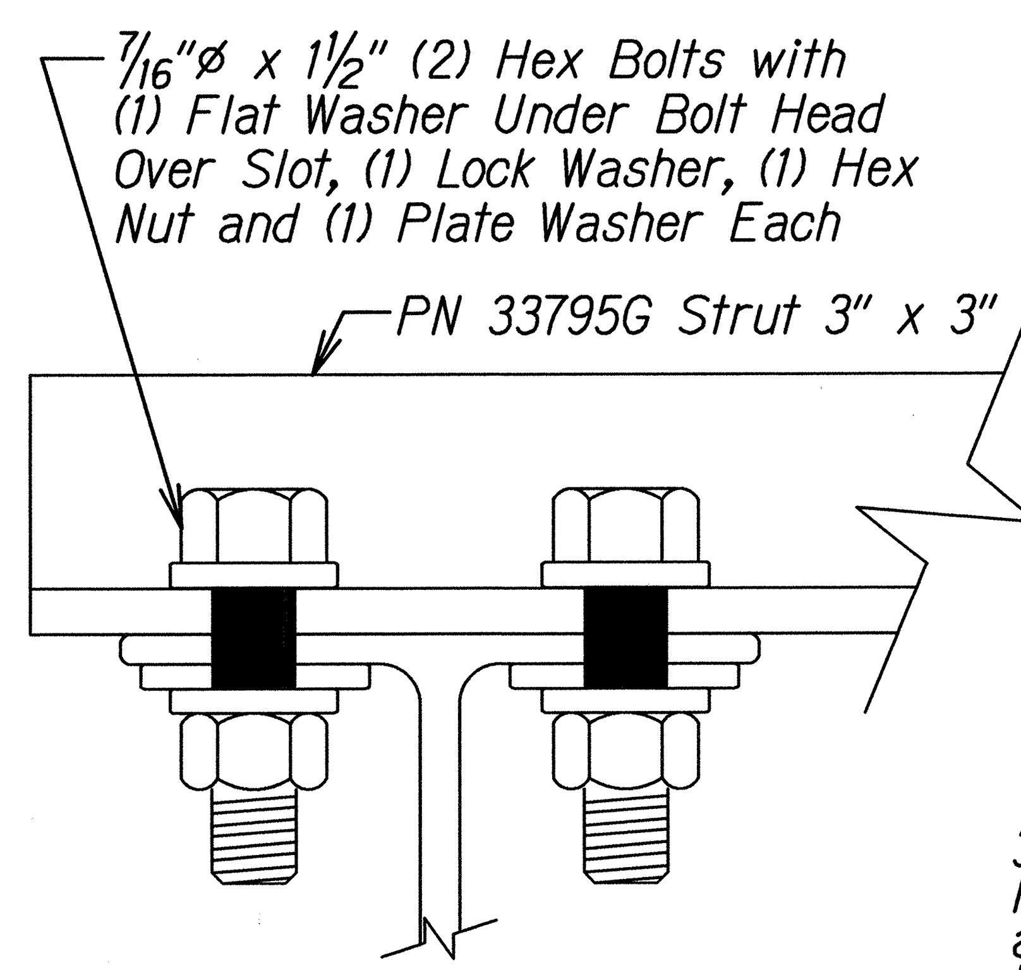
SECTION "A-A"

(TYP @ Posts #3 and Beyond)

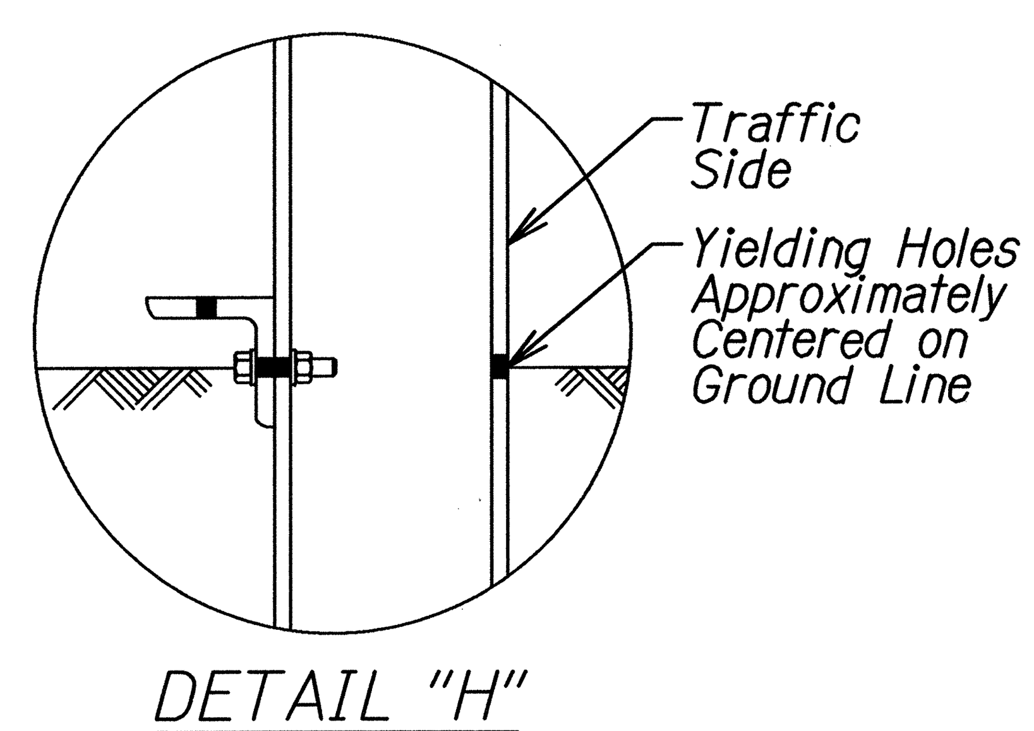


SECTION "B-B"

(Post #2)

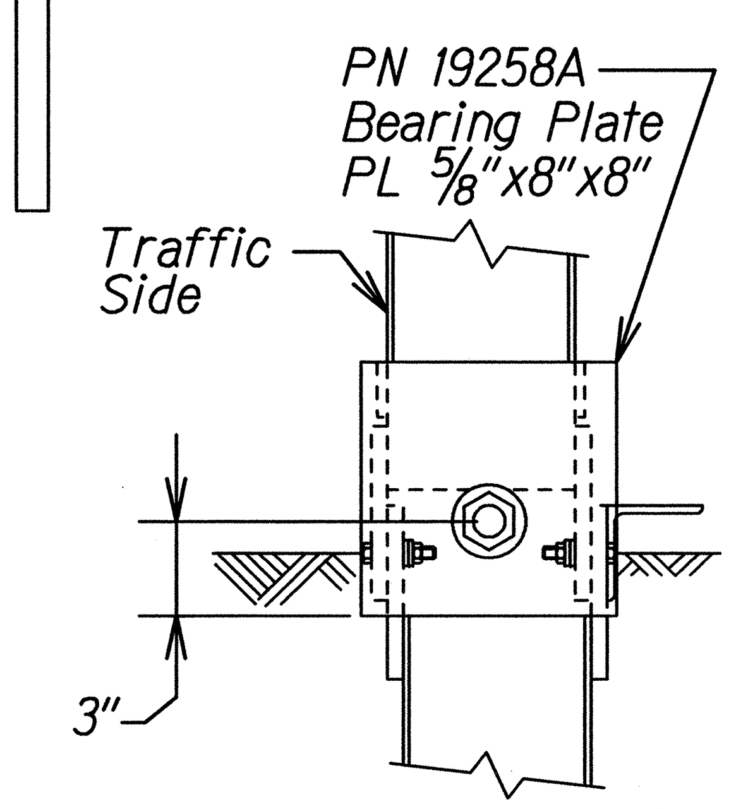


DETAIL "J"

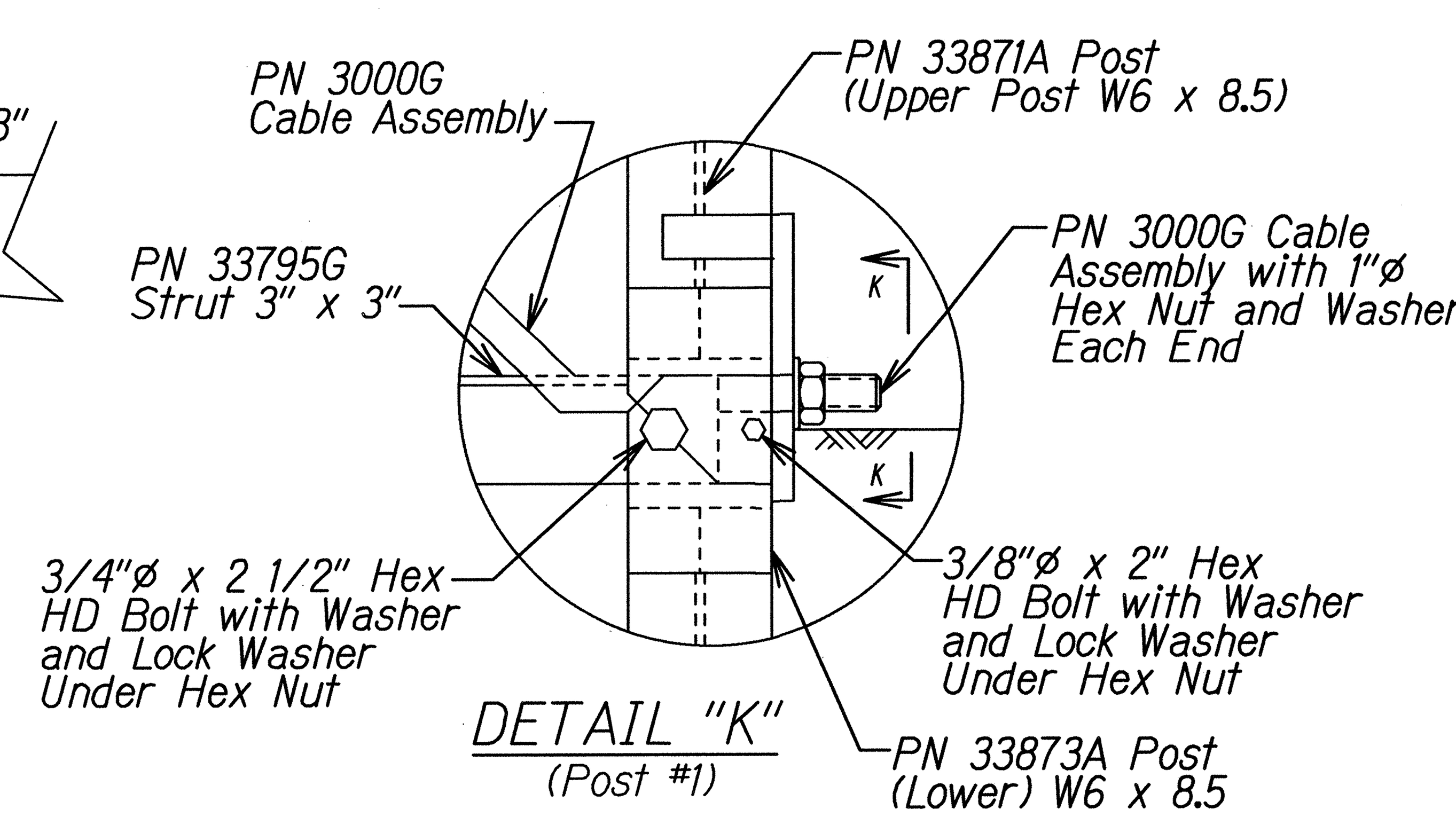


DETAIL "H"

(Post #2)



VIEW "K-K"



DETAIL "K"

(Post #1)

BILL OF MATERIAL		
32G	1	12/12'-6/6'3/S ANC (Guardrail)
704A	1	Cable Anchor Bracket
995A	1	ET-Plus Extruder
3000G	1	Cable ¾ x 6'6"
3340G	9	5/8" Hex Nut
3360G	9	5/8"ø x 1¼" Splice Bolt
3701G	2	¾" Flat Washer
3704G	2	¾" Hex Nut
3717G	2	¾"ø x 2½" Hex HD Bolt
3900G	2	1" Flat Washer
3910G	2	1" Hex Nut
4254G	4	3/8" Flat Washer
4255G	2	3/8" Fender Washer (1½" OD)
4258G	2	3/8" Lock Washer
4261G	2	3/8"ø x 1½" Hex HD Bolt
4389G	2	7/16" Flat Washer
4390G	2	7/16"ø x 1½" Hex HD Bolt
4393G	2	7/16" Lock Washer
4396G	2	7/16" Hex Nut
4699G	2	¾" Lock Washer
6321G	2	3/8"ø x 2" Hex HD Bolt
6405G	4	3/8" Hex Nut
6668B	1	Object Marker
14578G	1	Post SYT #2
19258A	1	5/8" x 8" x 8" Bearing Plate
33795G	1	Angle Strut (ET/SYTP/HBA)
33871A	1	Post ET Plus HBA #1 Top
33873A	1	Post ET Plus HBA #1 Bottom

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

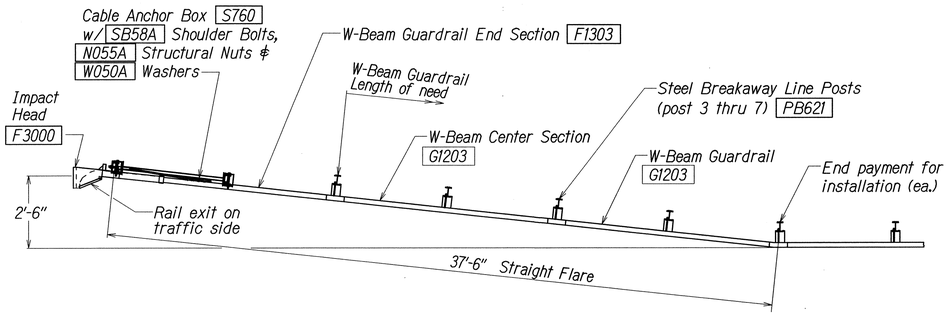
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ET-PLUS (TL-3)

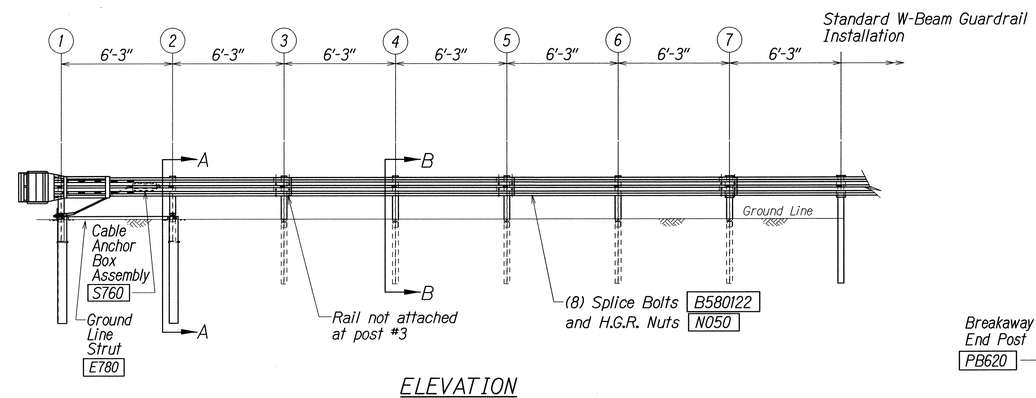
INTERSTATE ROUTE H-3
SAFETY IMPROVEMENTS
Halekou Interchange to Kaneohe
Marine Corps Base Hawaii
Federal Aid Project No. HSIP-H3-1(081)

Scale: NTS Date: Aug, 2013

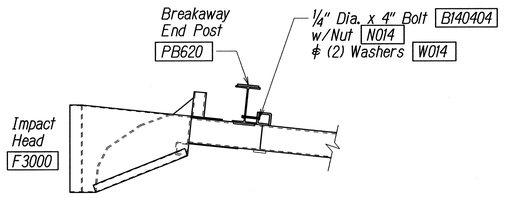
SHEET No. 3 OF 4 SHEETS



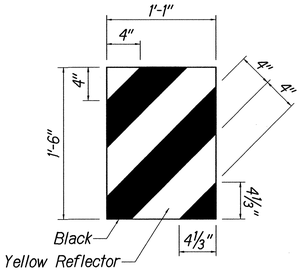
PLAN



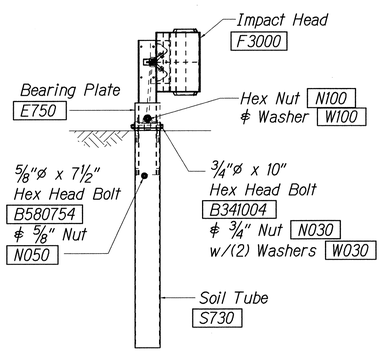
ELEVATION



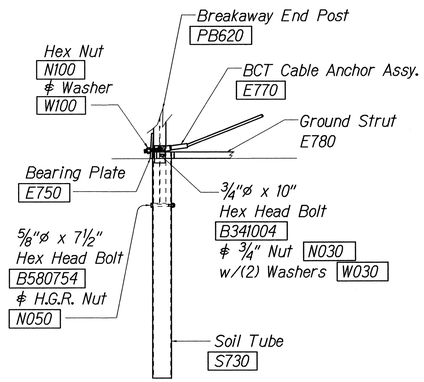
IMPACT HEAD CONNECTING DETAIL



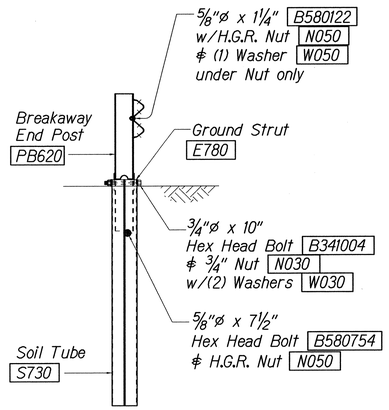
IHRM(R)
IMPACT HEAD REFLECTOR MARKER INSERT DETAIL



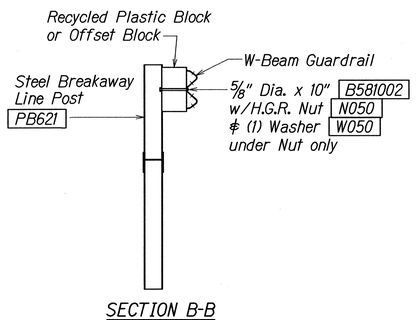
FRONT VIEW OF POST 1



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

1. Breakaway steel posts are required with the FLEAT Terminal.
2. All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
3. 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.
4. 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.
5. 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 ½" 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.
6. 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.
7. (R) or (L) indicates right or left Impact Head Reflector Marker (IHRM). Providing and installing of IHRM shall be considered incidental to end treatment.
8. The stripes for IHRM shall slope downward at an angle of 45° towards the side of the end treatment that traffic is to pass.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HSIP-H3-1(081)	2013	12	36

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 1¼" SPLICE BOLT, POST #2
B580754	2	5/8" Dia. x 7½" HEX BOLT
B341004	2	¾" 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	¾" Dia. HEX NUT
W050	6	H.G.R. WASHER
W030	4	¾" ID WASHER
N100	2	1" ANCHOR CABLE HEX NUT
W100	2	1" ANCHOR CABLE WASHER
B140404	2	¼" x 4" HEX BOLT
N014	2	¼" HEX NUT
W014	4	¼" WASHER
SB58A	8	CABLE ANCHOR BOX SHOULDER BOLT
N055A	8	½" 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

(standard plan TE-61 rll/03/89 & TE-62 r09/01/87)

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FLEAT-350

FLARED ENERGY ABSORBING TERMINAL

INTERSTATE ROUTE H-3 SAFETY IMPROVEMENTS
Halekou Interchange to
Kaneohe Marine Corps Base Hawaii
Federal Aid Project No. HSIP-H3-1(081)

Not to Scale — Date: Aug, 2013

SHEET No. 4 OF 4 SHEETS