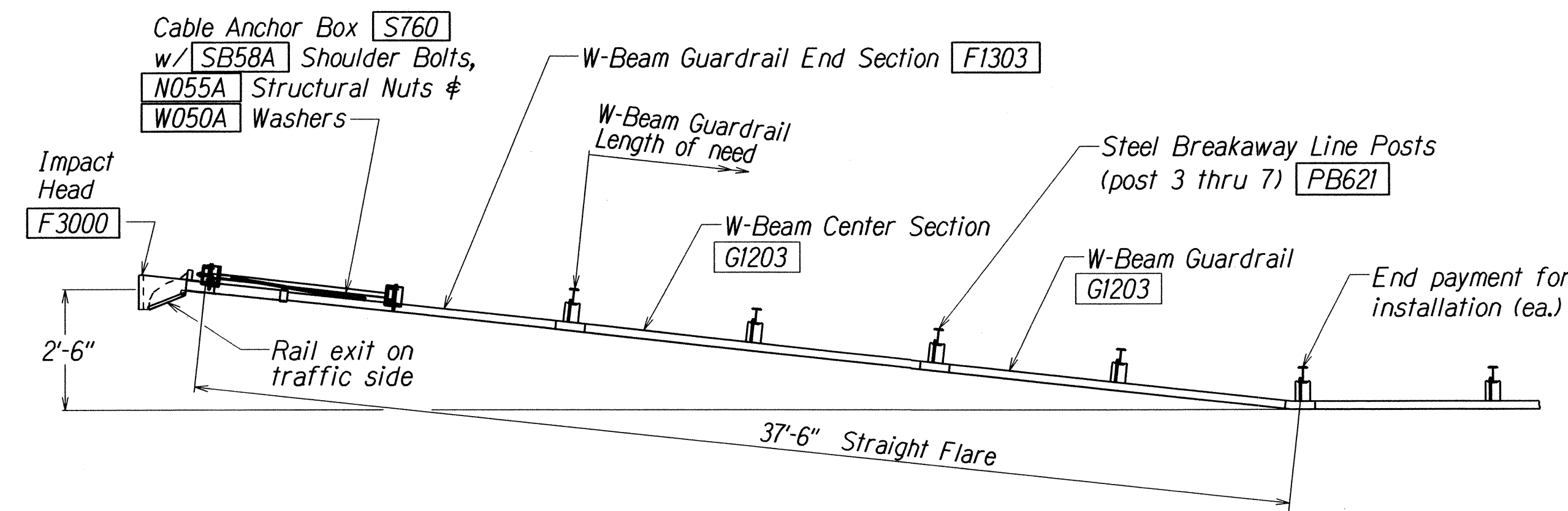
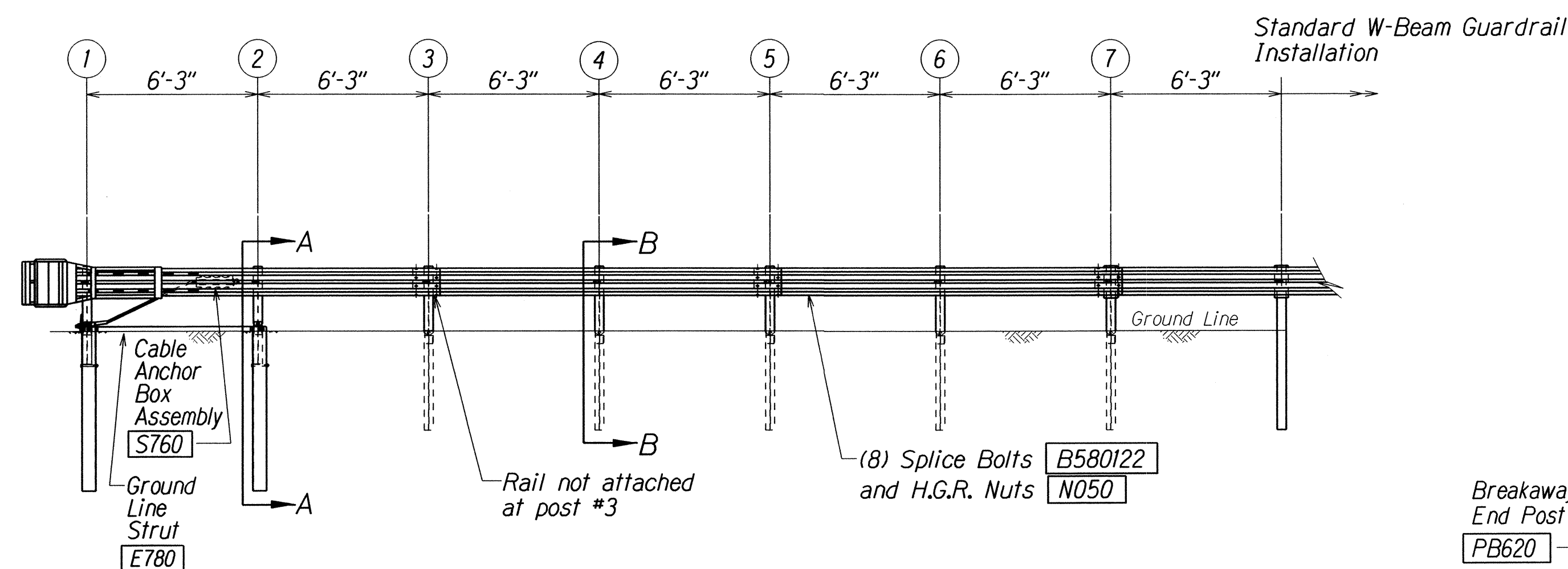


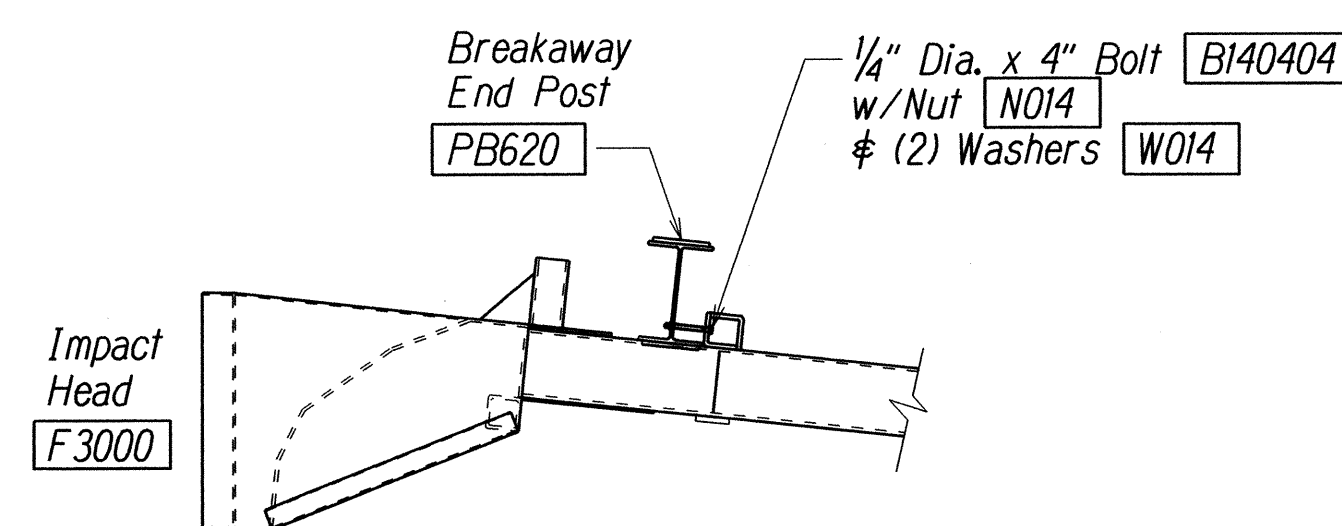
FED. ROAD DIST. NO.	STATE	FED-AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(067)	2016	9	17



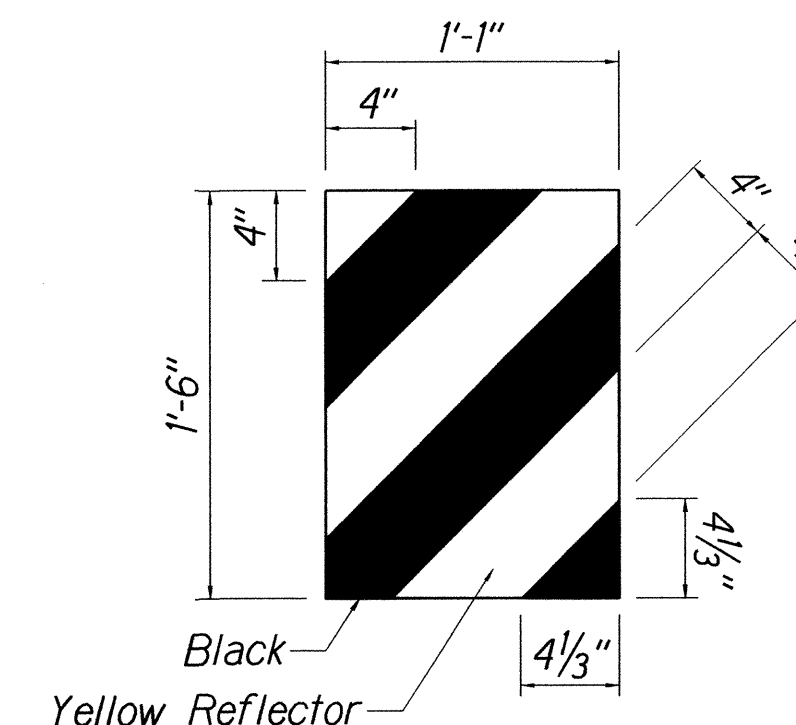
PLAN



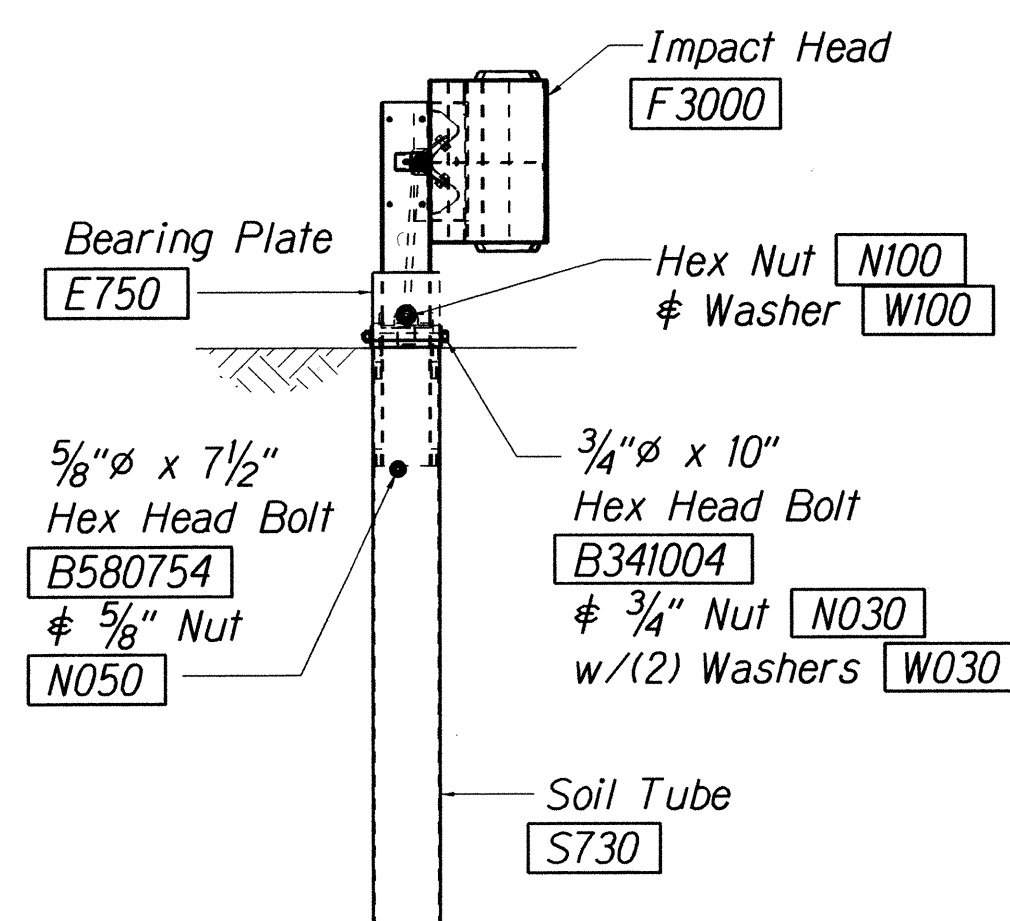
ELEVATION



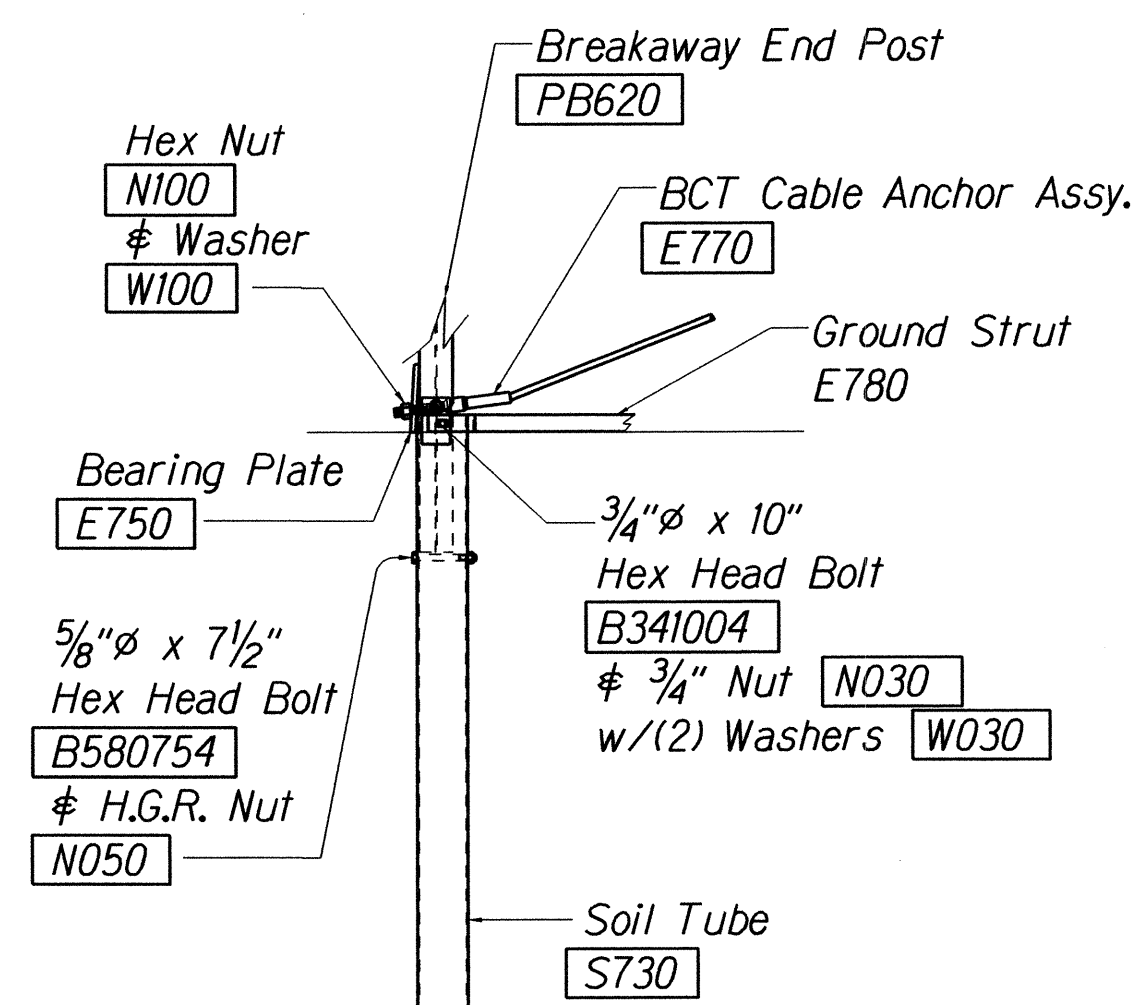
IMPACT HEAD CONNECTING DETAIL



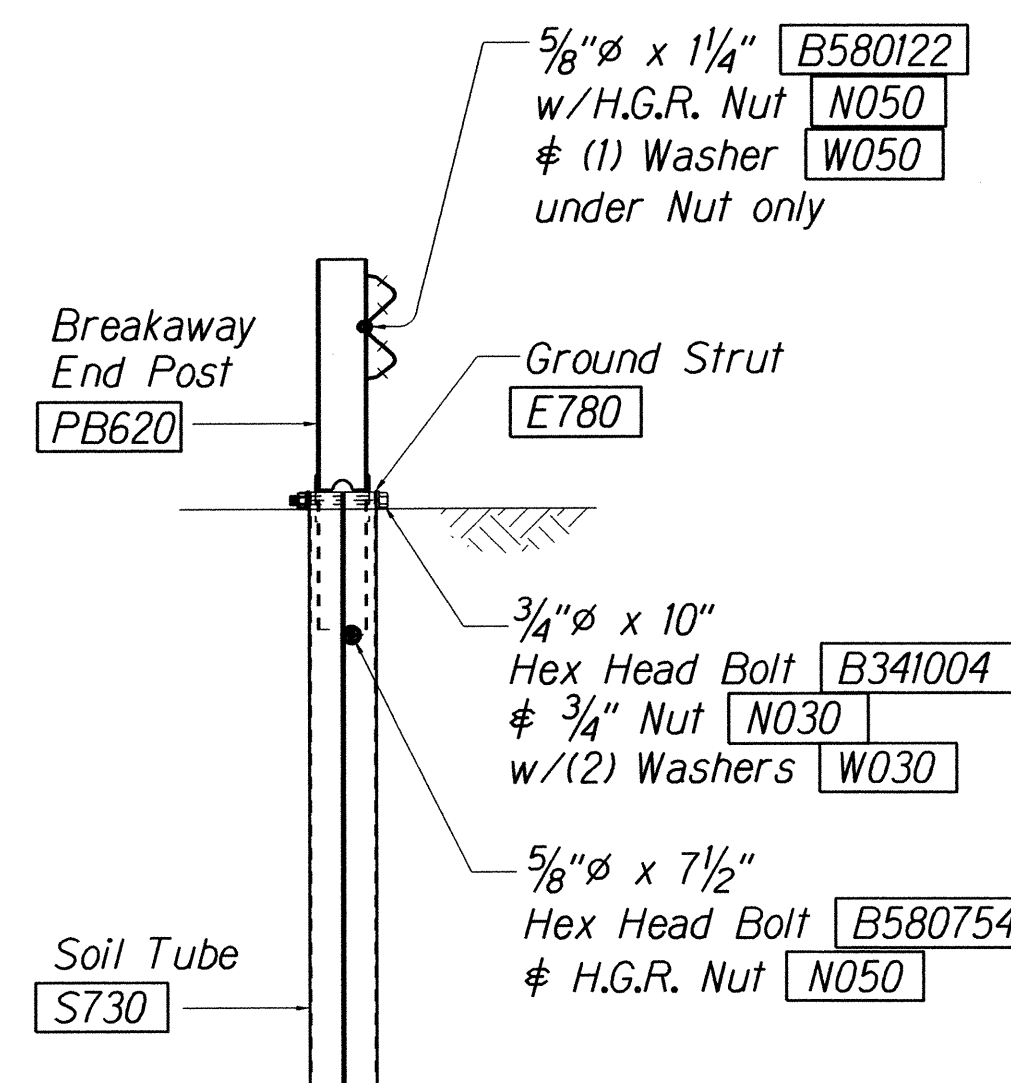
[HRM(R)]
IMPACT HEAD REFLECTOR
MARKER INSERT
DETAIL



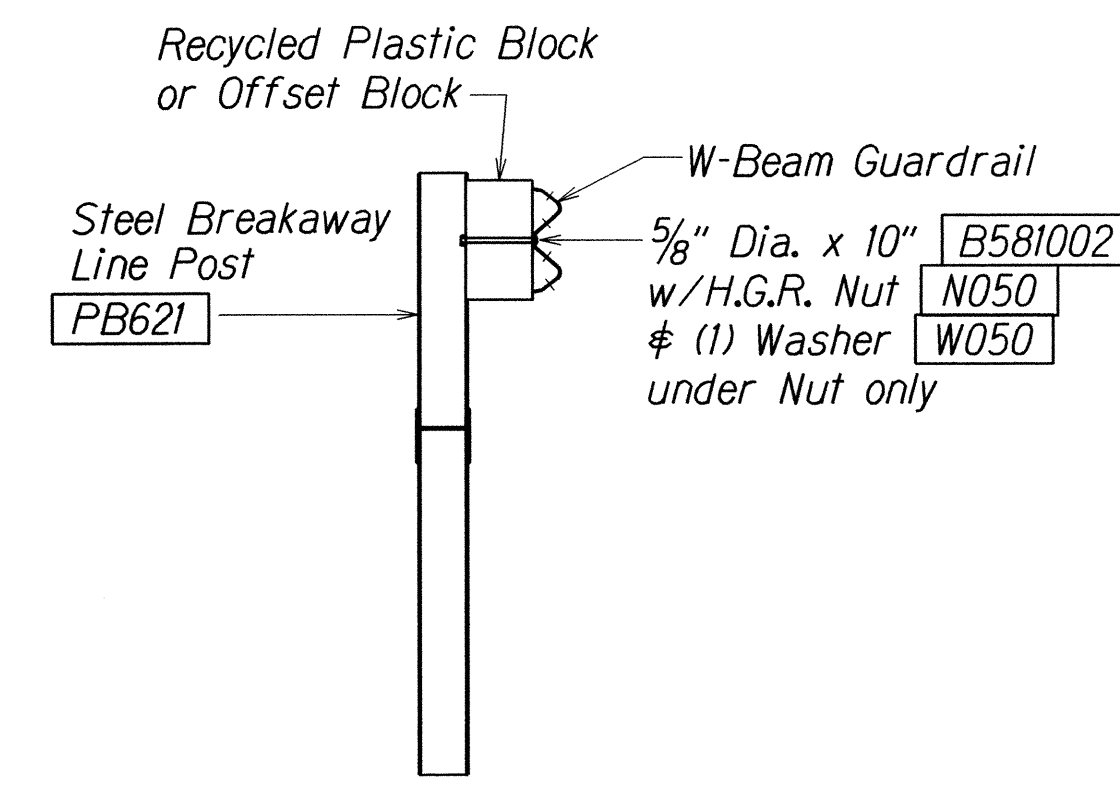
FRONT VIEW OF POST 1



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

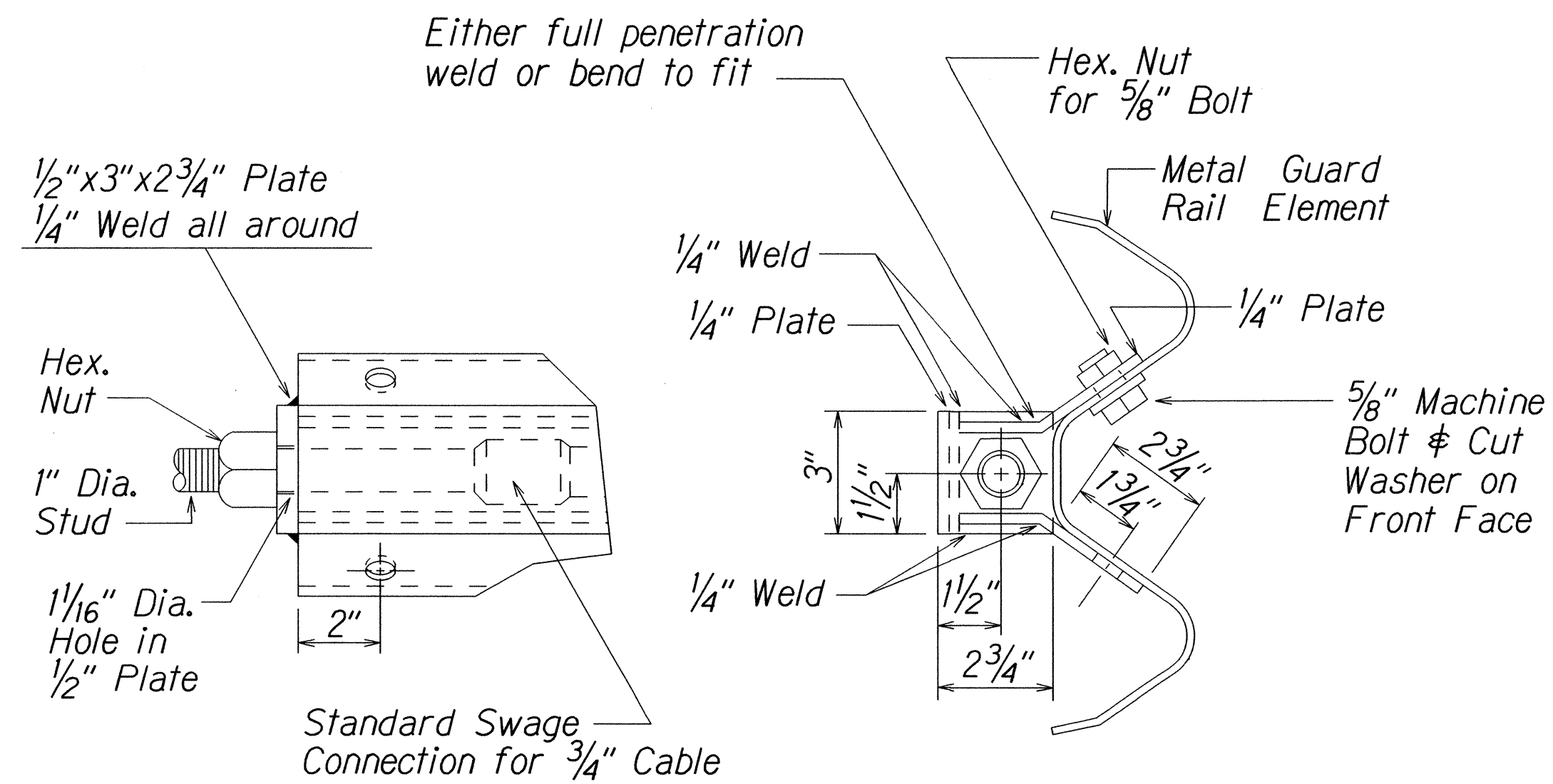
1. Breakaway steel posts are required with the FLEAT Terminal.
2. All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
3. The soil tubes shall not protrude more than 4" above ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
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 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.
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.

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

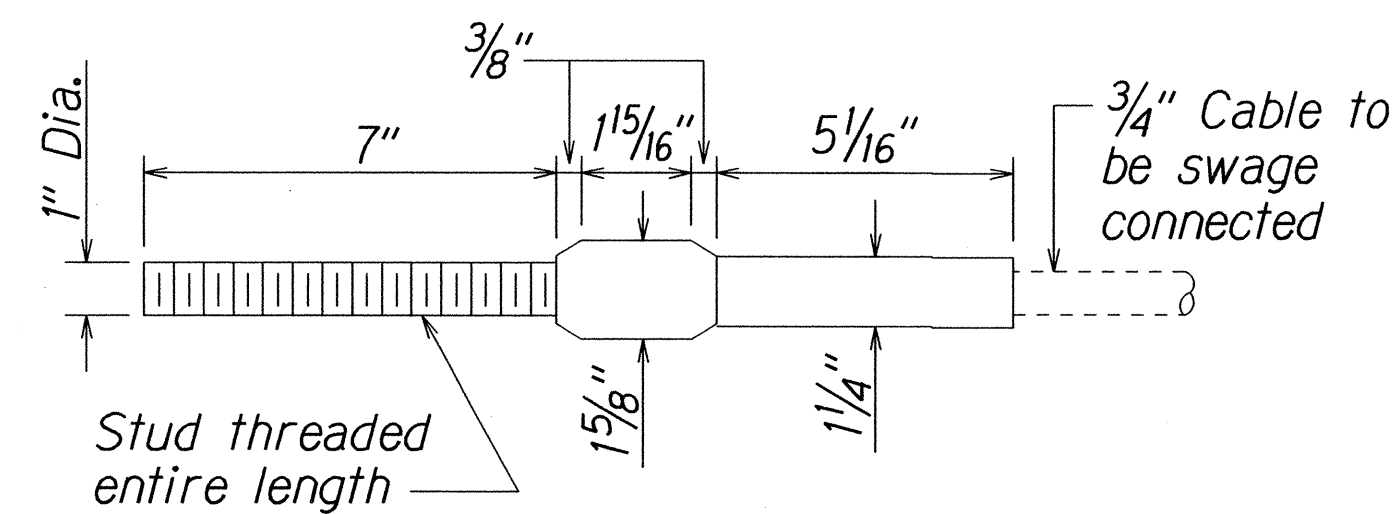
Foundation Tube Options For Posts 1 & 2
 *6'-0" Split Foundation Tubes S730
 *6'-0" Solid Foundation Tubes E731
 *5'-0" Foundation Tubes S735 W/Soil Plates SP600
 *4'-6" Foundation Tubes E735 W/Soil Plates SP600

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
FLARED ENERGY ABSORBING TERMINAL (FLEAT-350)
 GUARDRAIL AND SHOULDER IMPROVEMENTS
 AT VARIOUS LOCATIONS
 Kuhio Highway, ROUTE 56 (M.P. 3.70)
 Kuhio Highway, ROUTE 560 (M.P. 6.25)
 Fed-Aid Proj. No. STP-0700(067)
 Not to Scale Date: October 2015
 SHEET No. 3 OF 7 SHEETS

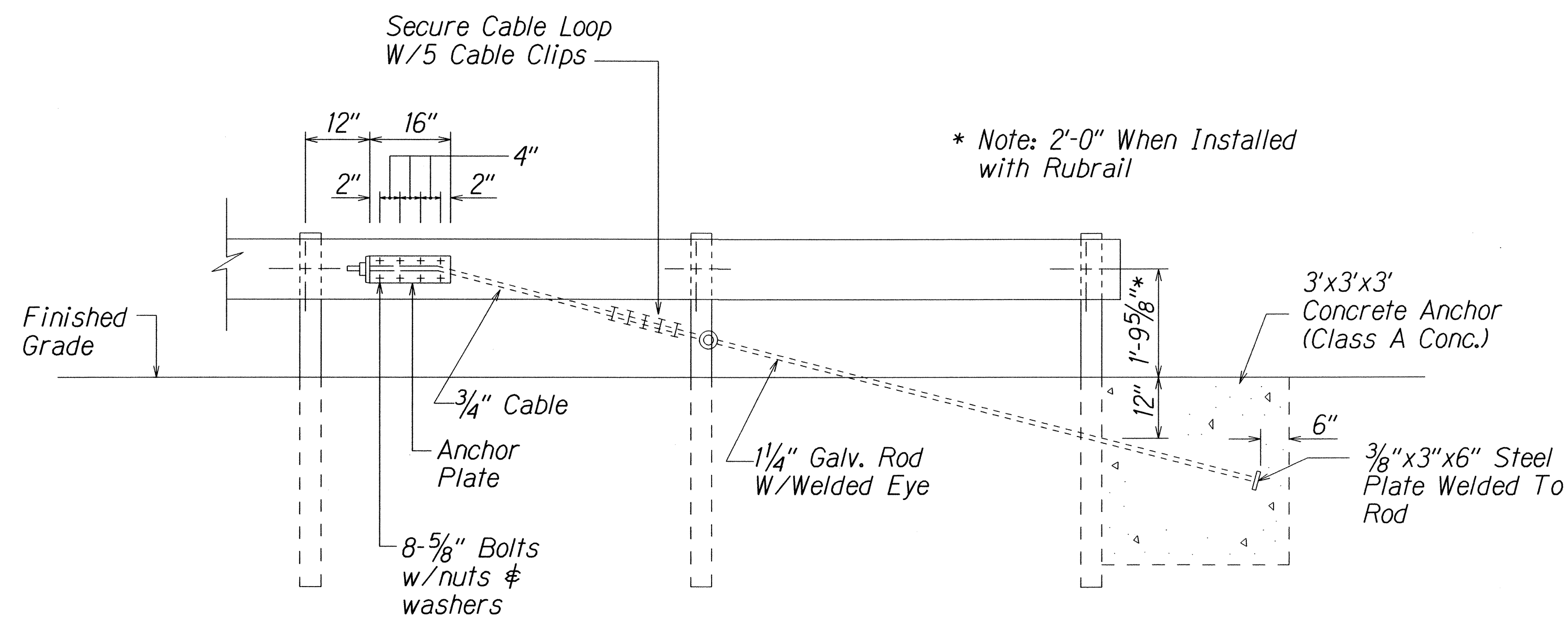
FED. ROAD DIST. NO.	STATE	FED-AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(067)	2016	10	17



ANCHOR PLATE DETAILS



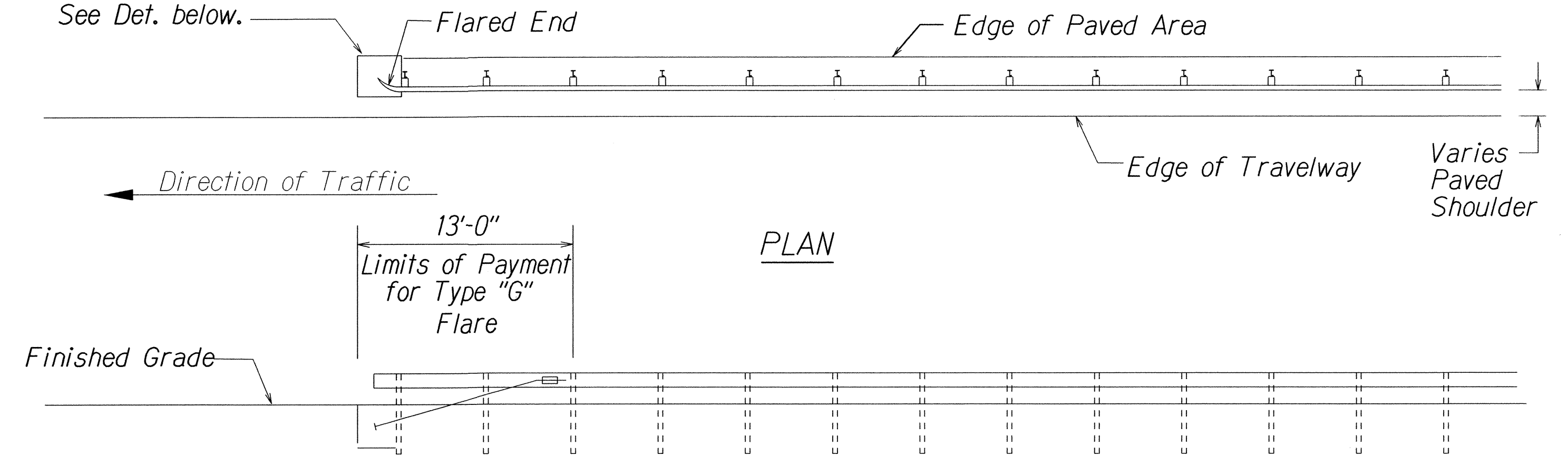
STANDARD SWAGED FITTING AND STUD



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.

For Details of Concrete Anchor Block in Ground See Def. below.



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).

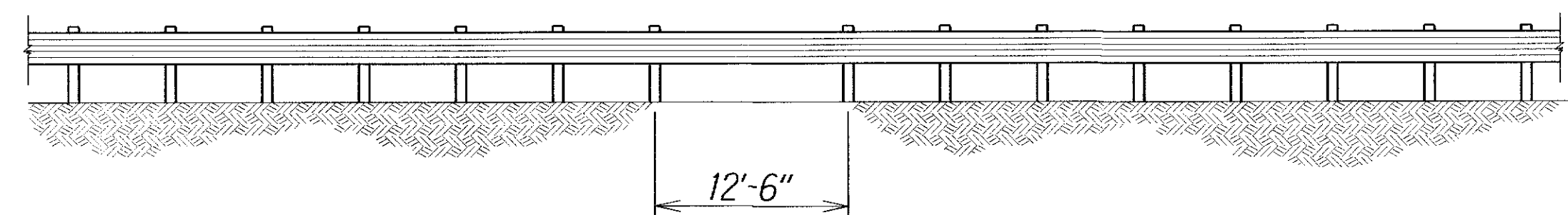
The radius of the radial termini is an Engineer's judgement based on the site evaluation. The Engineer shall consider safety (minimize the spearing & blunt end situation); degree and potential seriousness of the hazard; bicycle and pedestrian accessibility; maintenance equipment accessibility; Right-of-Way 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.

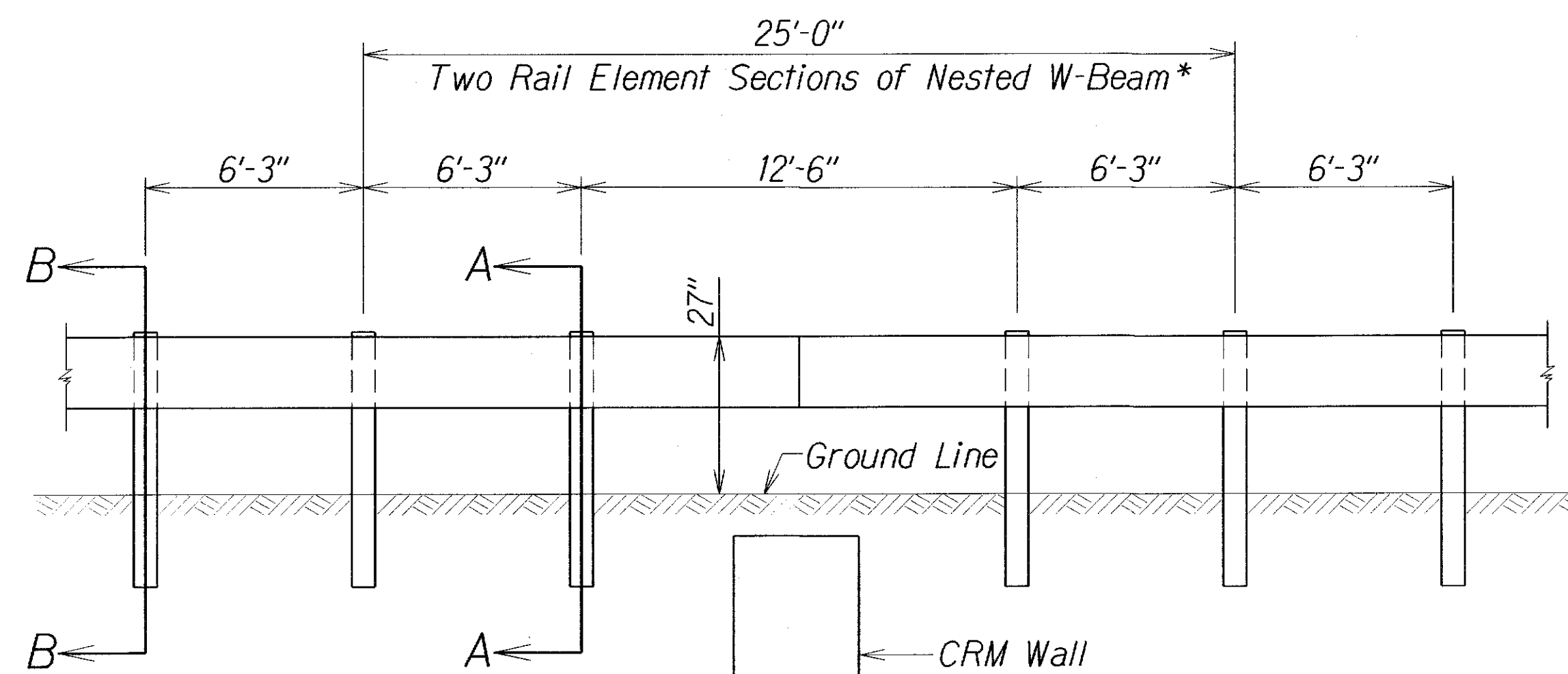
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
REFERENCE	DESIGNED BY	
	CHECKED BY	

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
TYPE "G" TERMINAL END	
GUARDRAIL AND SHOULDER IMPROVEMENTS AT VARIOUS LOCATIONS	
Kuhio Highway, ROUTE 56 (M.P. 3.70)	
Kuhio Highway, ROUTE 560 (M.P. 6.25)	
Fed-Aid Proj. No. STP-0700(067)	
Not to Scale	Date: October 2015
SHEET No. 4	OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED-AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(067)	2016	ADD. 11	17



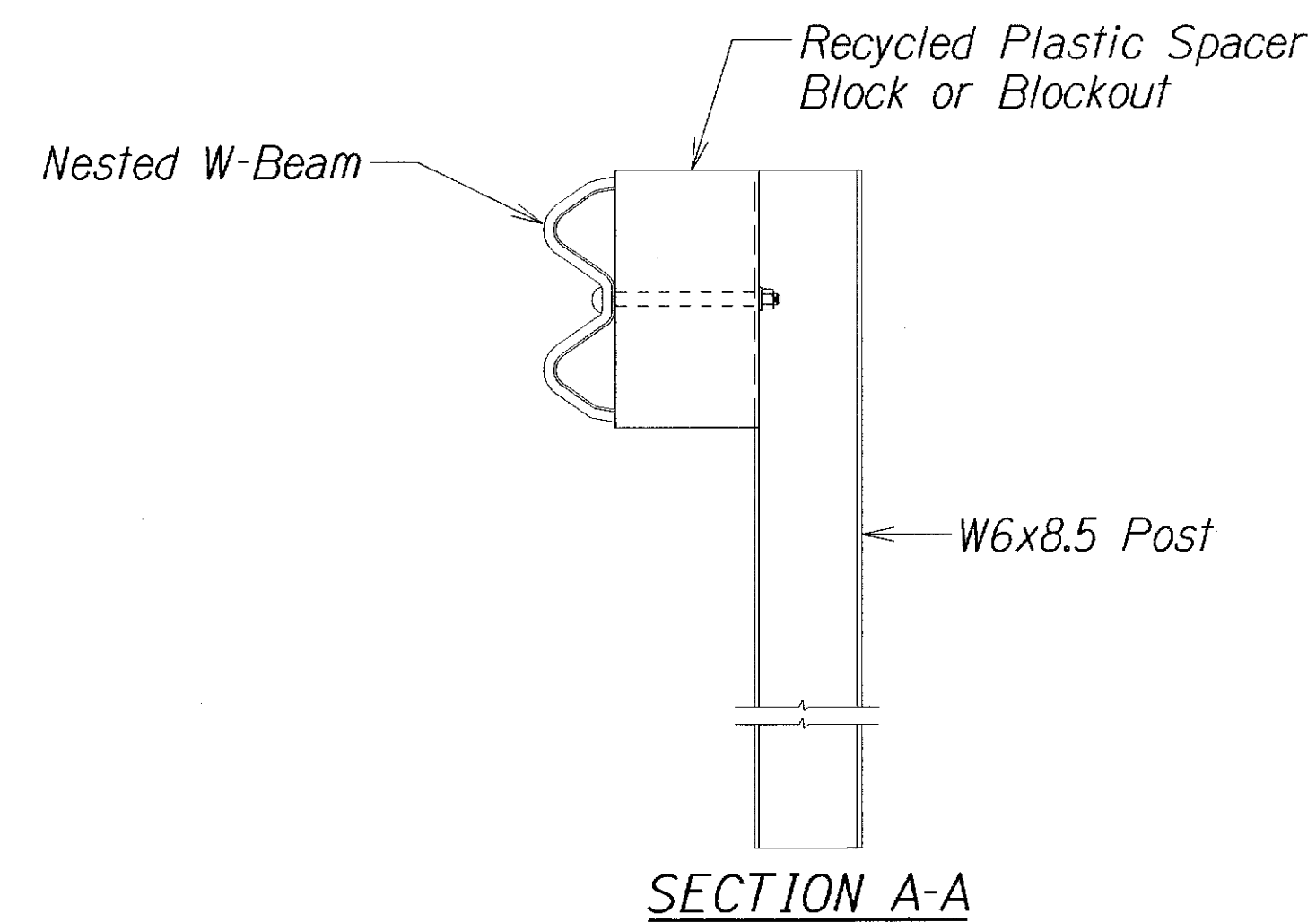
LONG SPAN 12'-6" OVER CRM WALL



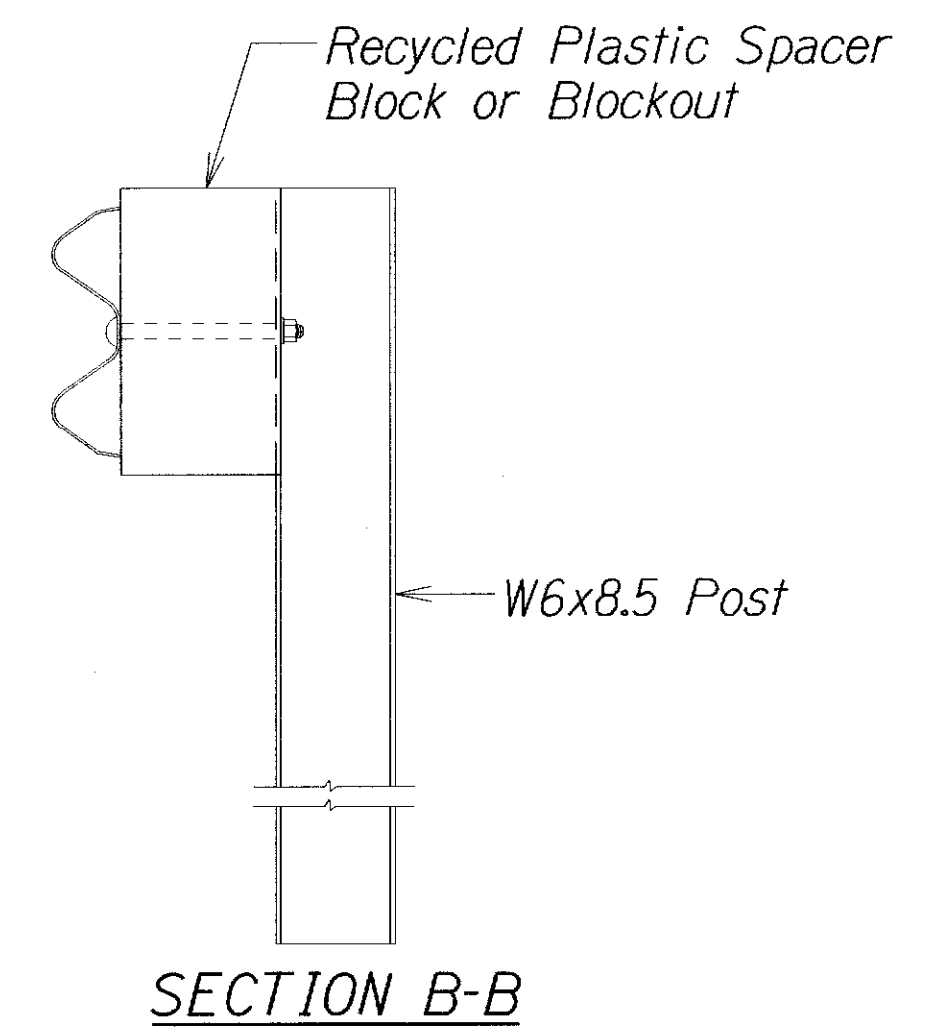
(SPlice IN CENTER OF 12'-6" SPACING)

NESTED LONG SPAN STRONG POST
W-BEAM GUARDRAIL OVER CRM WALL
(MAXIMUM DYNAMIC DEFLECTION OF 3.1 FT.)

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



SECTION A-A



SECTION B-B

NOTE: All Rail Elements Sections are 12'-6"
and All Posts are 8' Long

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DESIGNED BY	
AS NOTED	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NESTED LONG SPAN STRONG POST
W-BEAM GUARDRAIL
GUARDRAIL AND SHOULDER IMPROVEMENTS
AT VARIOUS LOCATIONS
Kuhio Highway Route 56 (M.P. 3.70)
Kuhio Highway Route 560 (M.P. 6.25)
Fed-Aid Project No. STP-0700(067)

Scale: Not to scale Date: August 2016

SHEET No. 5 OF 7 SHEETS

