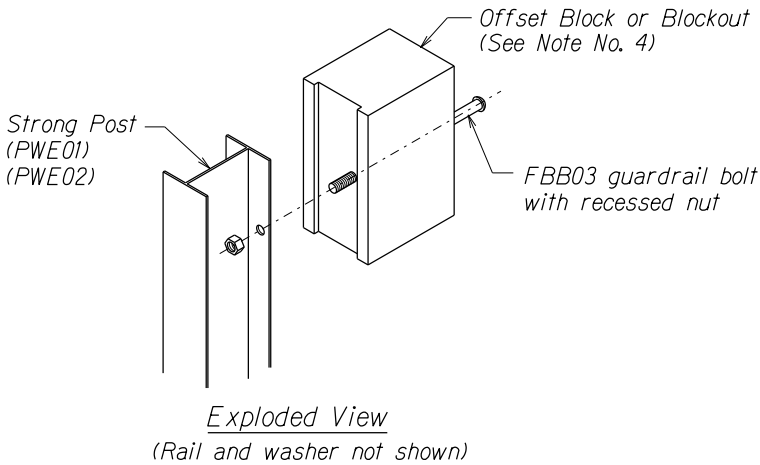
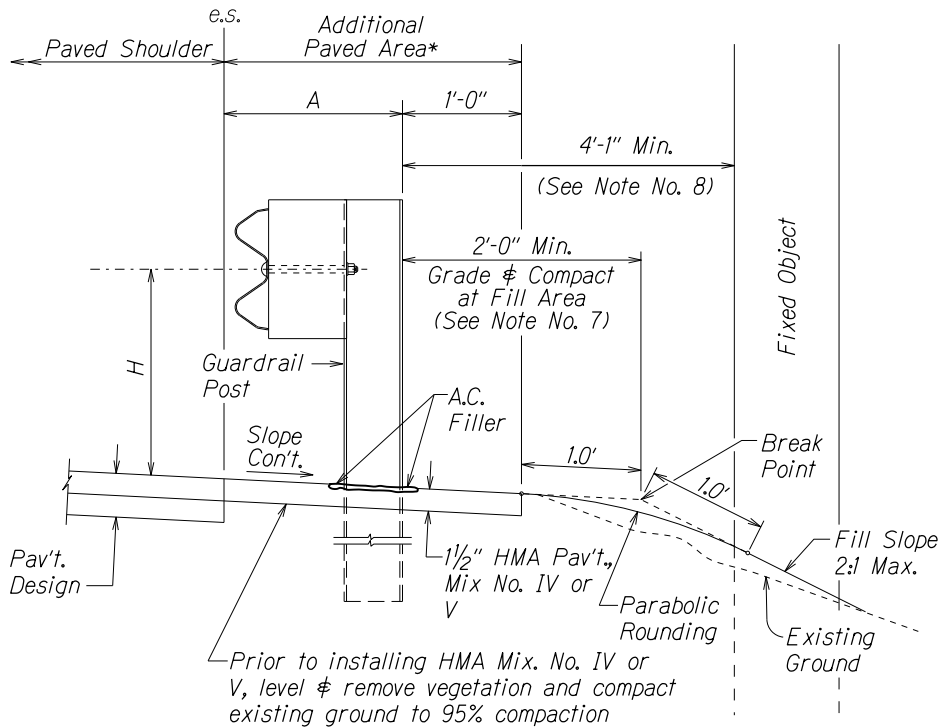
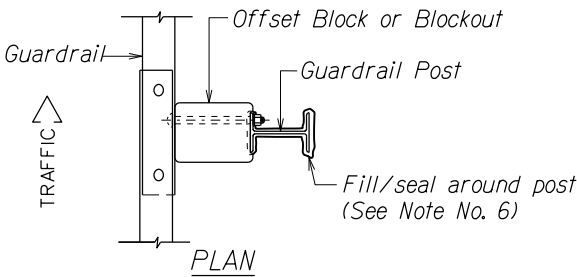


GENERAL NOTES

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 by the Engineer.
3. All fasteners, posts, and rail elements (i.e. FBB03, PWE01, RWM04b, 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 Blockout 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. Minimum working width (clear distance) between back of MGS post to any fixed object is 4'-1" (49").
9. New Hot Mix Asphalt (HMA) pavement at guardrails shall extend 6 feet longitudinally beyond terminal ends.
10. 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 guardrail system.

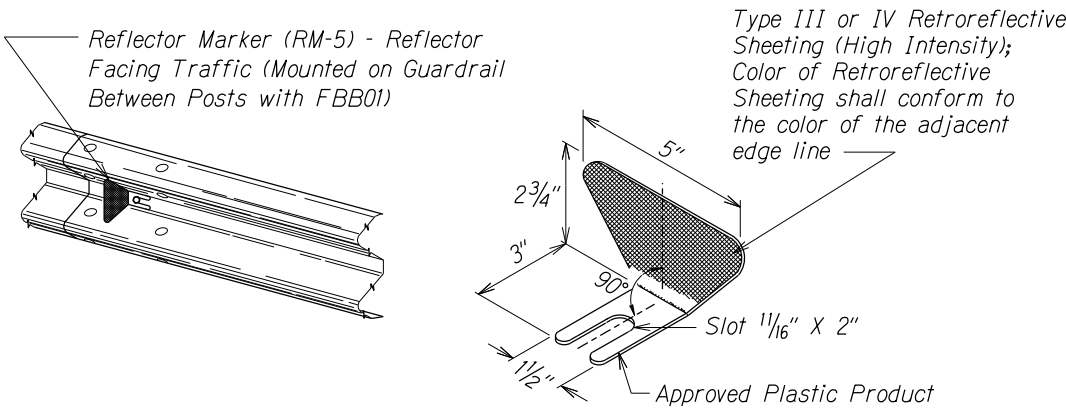


STEEL POST AND BLOCK DETAIL



TYPICAL GUARDRAIL INSTALLATION

GUARDRAIL TYPE	DIMENSION	
	H	A
MGS w/ Standard 8" Offset Block	2'-1"	1'-6"
MGS w/ No Blockout	2'-7/8"	9/4"



REFLECTOR MARKER (RM-5) DETAIL AND TYPICAL INSTALLATION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-037-110271	2019	ADD. 7	35

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

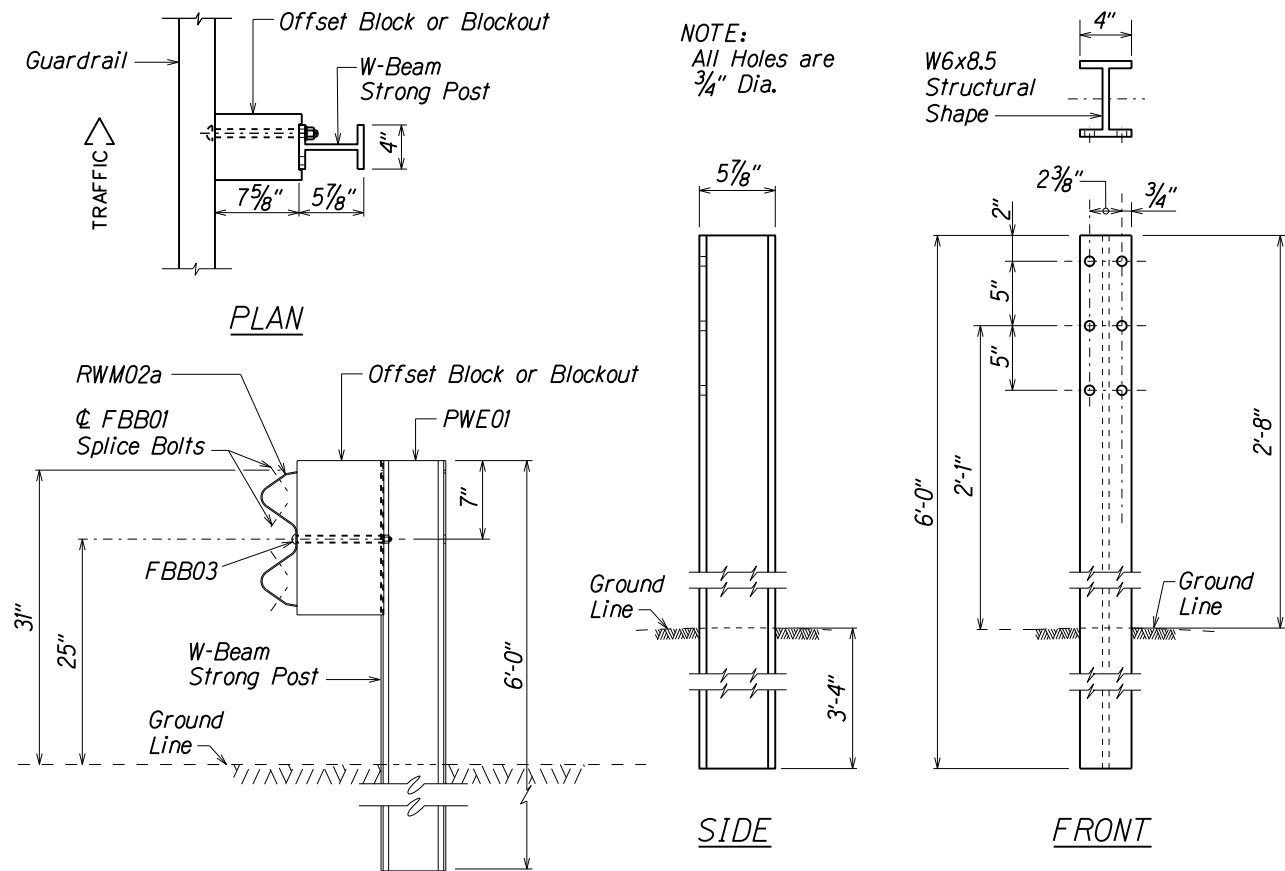
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DATE REVISION

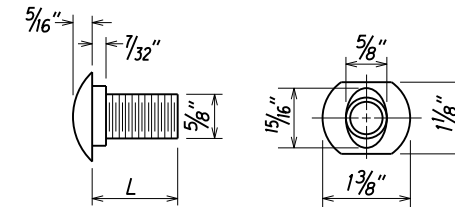
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
GUARDRAIL DETAILS & NOTES
KULA HIGHWAY GUARDRAIL AND SHOULDER IMPROVEMENTS
Omaopio Road to Sun Yat Sen Park
Federal-Aid Project No. STP-037-110271
Scale: NTS Date: September, 2018
SHEET No. 1 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-037-110271	2019	ADD. 8	35

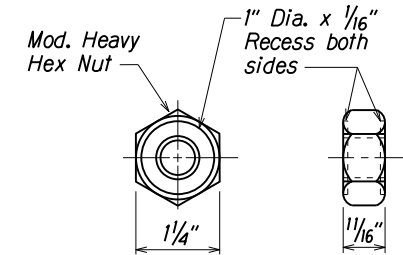


NOTE:
All Holes are
3/4" Dia.

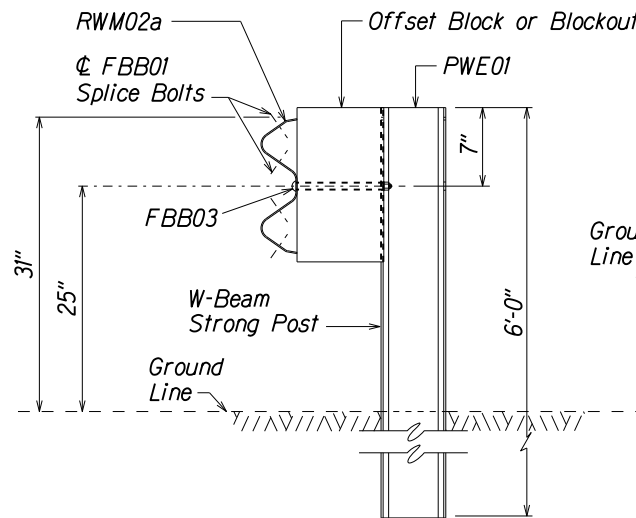
W6x8.5
Structural
Shape



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



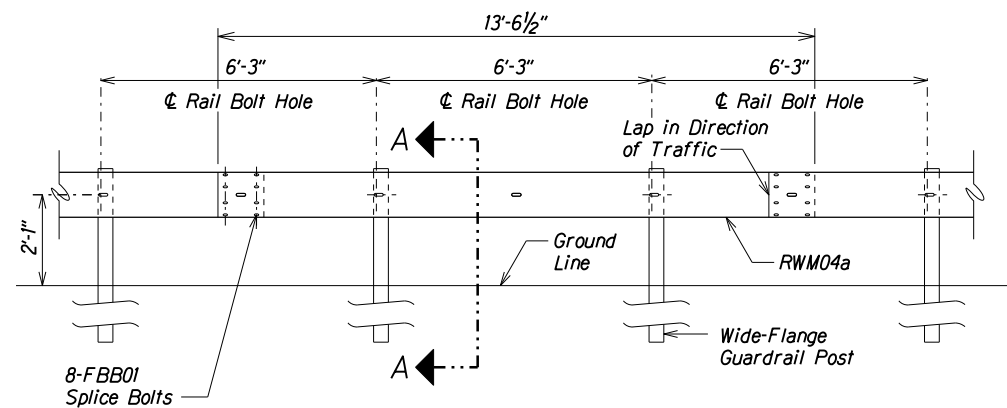
GUARDRAIL BOLTS AND RECESSED NUT



SECTION A-A

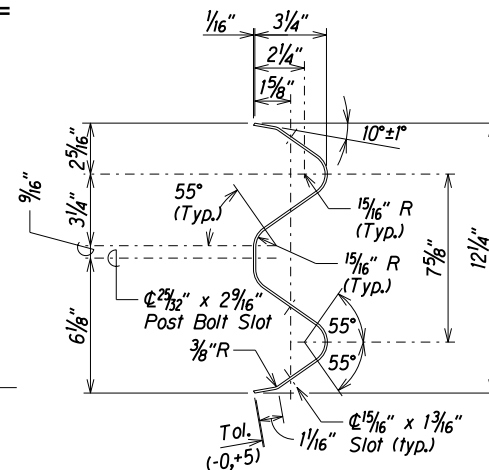
W-BEAM STRONG POST (PWE01)

DESIGNATOR	BASE METAL THICKNESS
RWM04a	12 Gauge

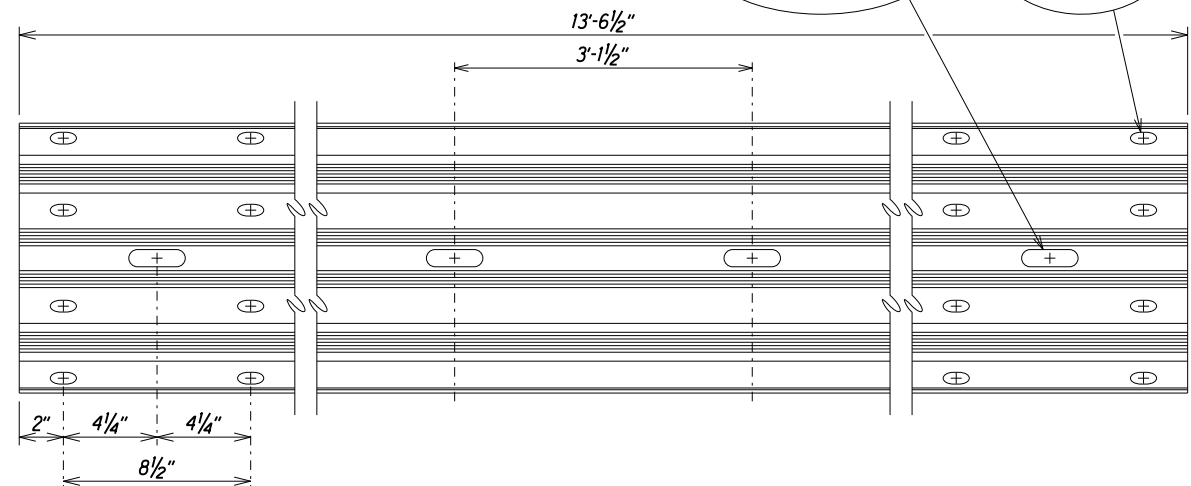


ELEVATION

MIDWEST GUARDRAIL SYSTEM WITH STANDARD 8" OFFSET BLOCK (SGR47)



4 SPACE W-BEAM GUARDRAIL (RWM04a)



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from original Bid Set.

DATE REVISION

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION 31" W-BEAM GUARDRAIL WITH STANDARD 8" OFFSET BLOCK KULA HIGHWAY GUARDRAIL & SHOULDER IMPROVEMENTS Omaopio Road to Sun Yat Sen Park Federal-Aid Project No. STP-037-110271 Scale: NTS Date: September, 2018

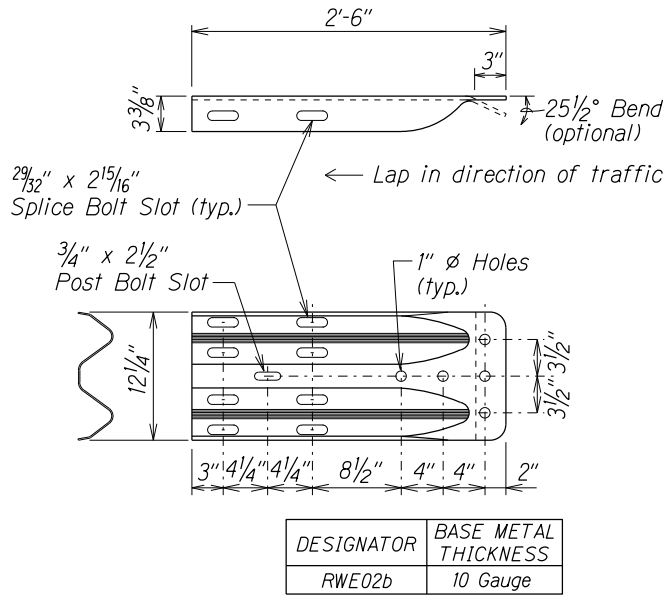
SHEET No. 2 OF 7 SHEETS

ADD. 8

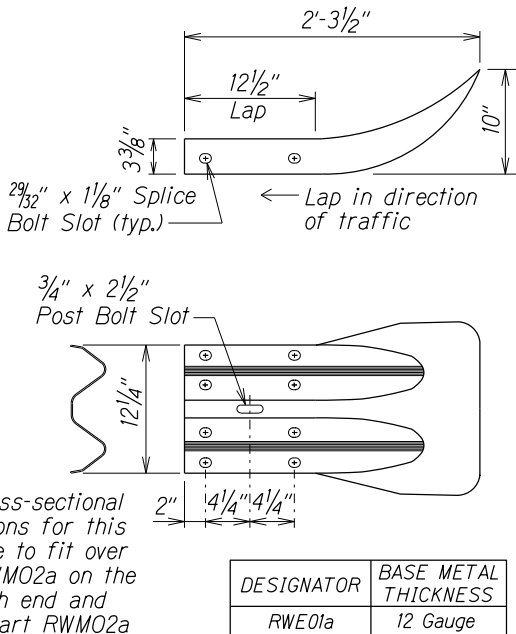
ORIGINAL PLAN	DATE	DESIGNED BY	CHECKED BY
NOTE BOOK			
N.			

107/28/17 D:\107\28\17\1072817\Standards\Traffic\Guardrail Standards\m2_wbeams.dgn

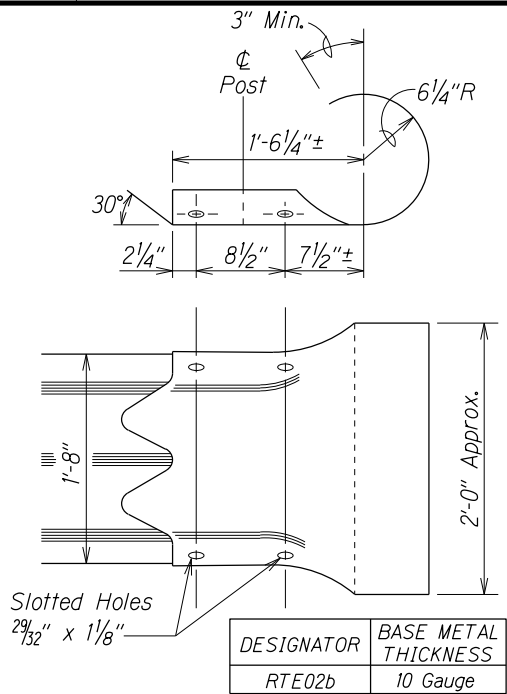
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-037-11(027)	2019	ADD.10	35



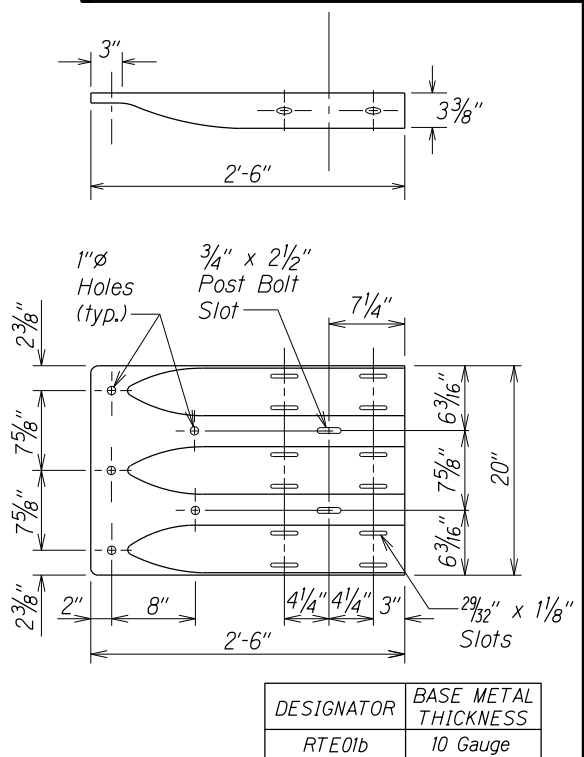
W-BEAM TERMINAL CONNECTOR (RWE02b)



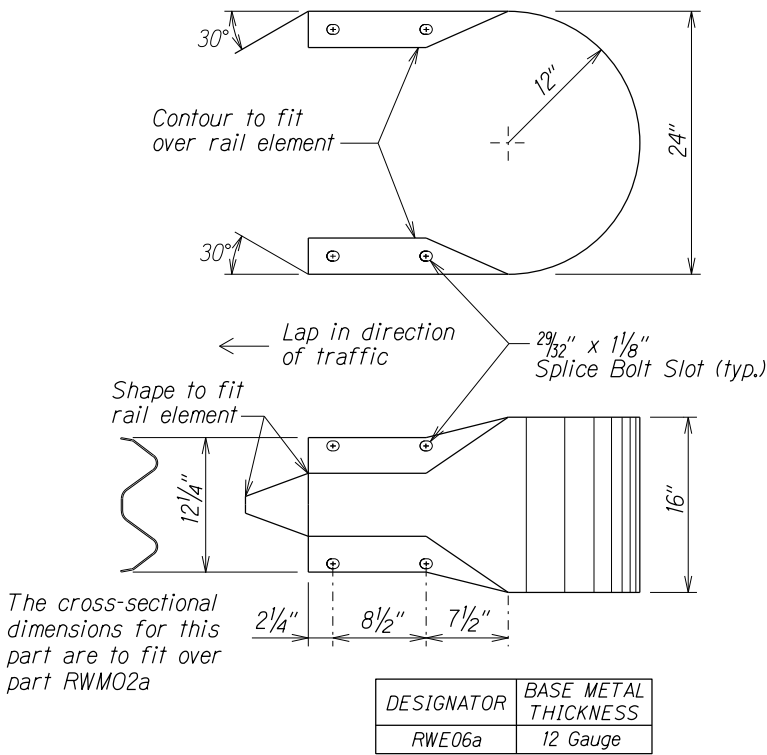
W-BEAM END SECTION (FLARED RWE01a)



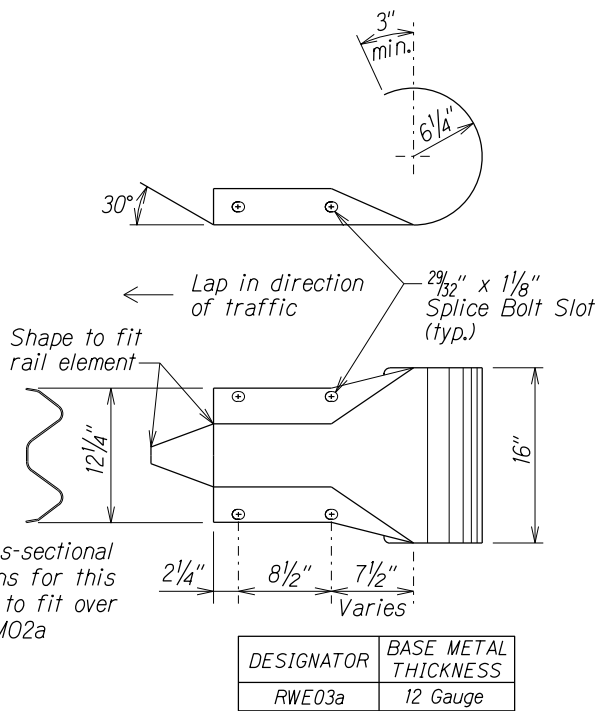
THRIE-BEAM SECTION (ROUNDED) (RTE02b)



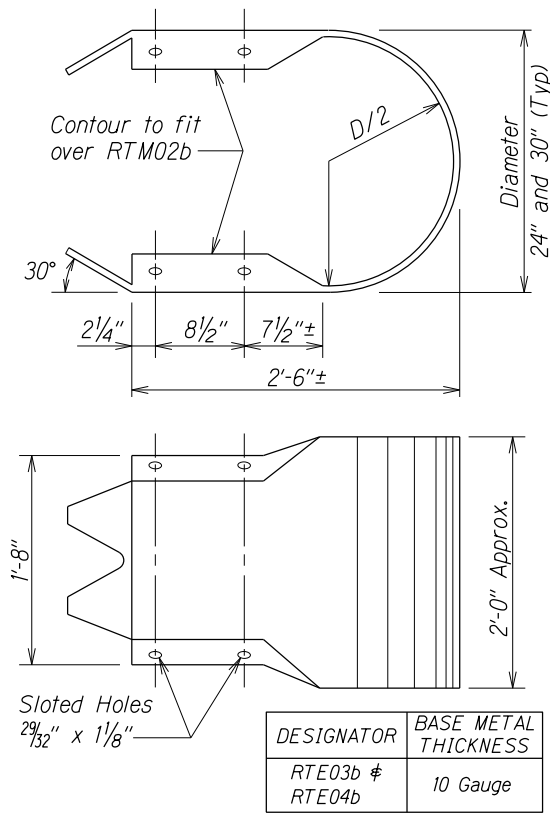
THRIE-BEAM TERMINAL CONNECTOR (RTE01b)



W-BEAM END SECTION (BUFFER RWE06a)



W-BEAM END SECTION (ROUNDED RWE03a)



THRIE-BEAM END SECTION (BUFFER RTE03b or RTE04b)

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DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**GUARDRAIL TERMINAL CONNECTORS
AND END SECTIONS**

KULA HIGHWAY GUARDRAIL & SHOULDER IMPROVEMENTS

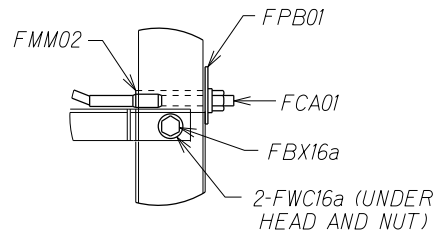
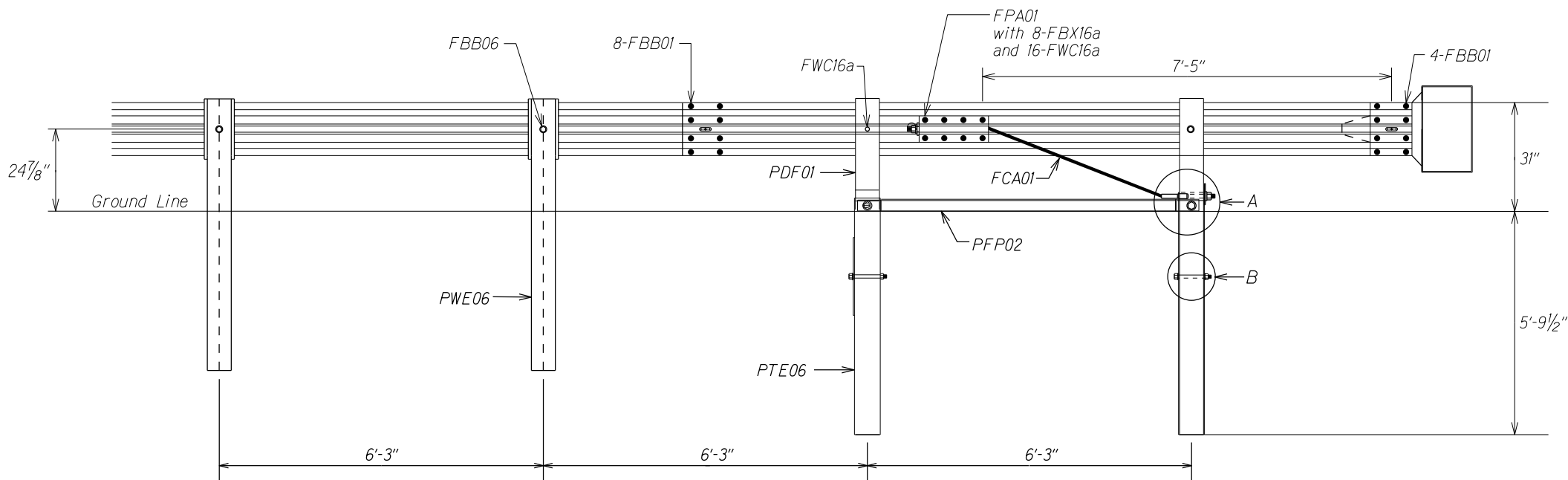
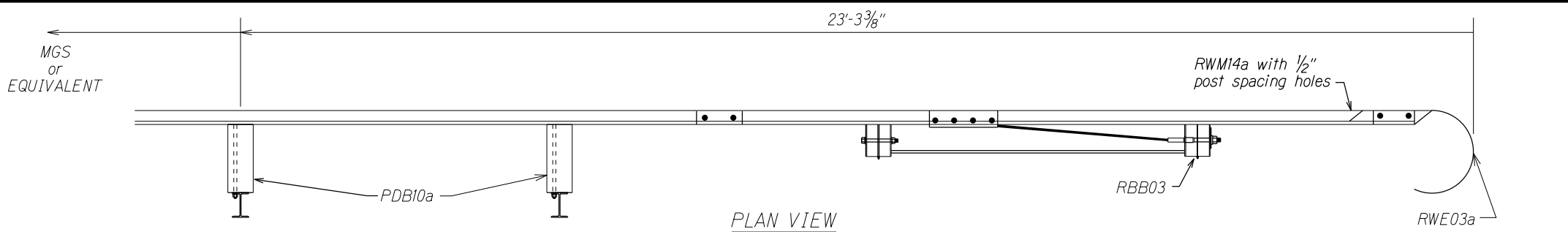
Omaopio Road to Sun Yat Sen Park

Federal-Aid Project No. STP-037-11(027)

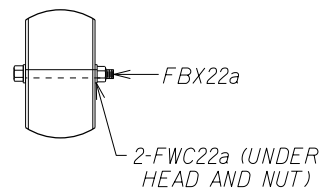
Scale: NTS Date: September, 2018

SHEET No. 4 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-037-11(027)	2019	ADD. 11	35

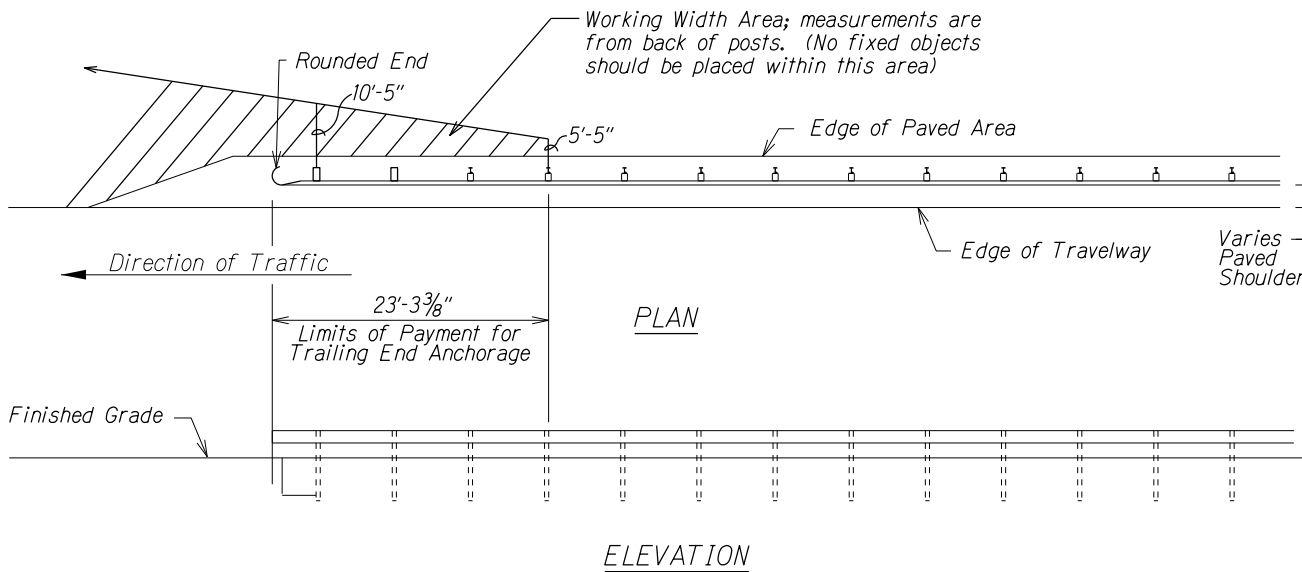


DETAIL A



DETAIL B

ITEM NO.	QTY	COMPONENTS
FBB01	12	Guardrail Bolt and Nut
FBB03	2	Guardrail Bolt and Nut
FBB06	1	Guardrail Bolt and Nut
FBX16a	2	Hex Head Bolt (10") and Nut
FBX16a	8	Hex Head Bolt (1 1/2") and Nut
FBX22a	2	Hex Head Bolt (7 1/2") and Nut
FCA01	1	BCT Anchor Cable Assembly
PDB10a	2	MGS Timber Blockout
PFP02	1	Strut and Yoke Assembly
PWE06	1	Wide-Flange Guardrail Post
FMM02	1	BCT Post Sleeve
FPA01	1	Anchor Bracket Assembly
FPB01	1	BCT Bearing Plate
FWC16a	22	Circular Washer
FWC22a	4	Circular Washer
PDF01	2	BCT Timber Post
PTE06	2	Foundation Tube
RWE03a	1	W-Beam Rounded End Section
RWM14a	1	W-Beam MGS End Section

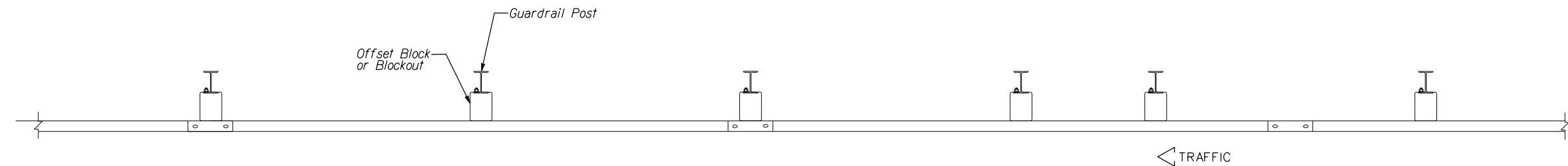


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DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION TRAILING-END ANCHORAGE SYSTEM KULA HIGHWAY GUARDRAIL & SHOULDER IMPROVEMENTS Omaopio Road to Sun Yat Sen Park Federal-Aid Project No. STP-037-11(027) Scale: NTS Date: September, 2018 SHEET No. 5 OF 7 SHEETS	

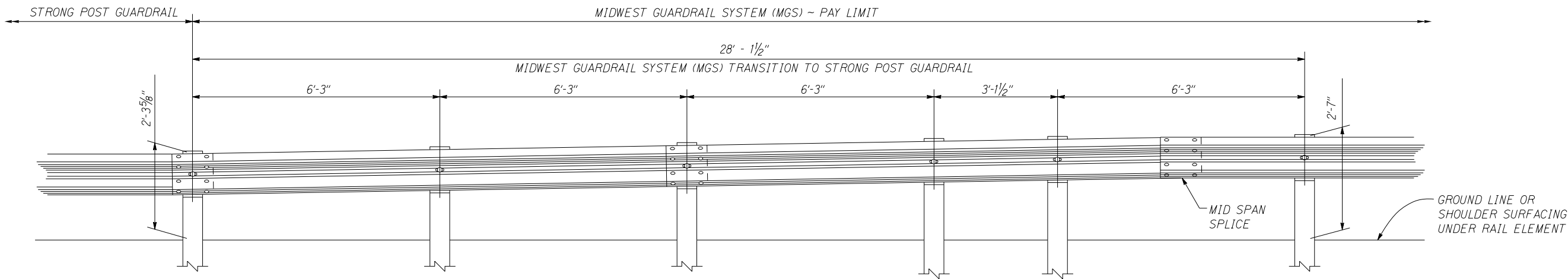
SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	

11/16/17 102m/guardrail/M-8

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-037-1(027)	2019	ADD.12	35



PLAN



ELEVATION

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DESIGNED BY	
QUANTITIES BY	CHECKED BY	
10/06/16		

10/06/16 D:\sr2\Ernest\Standards\Traffic Guardrail Standards\mlt_midwest.dgn

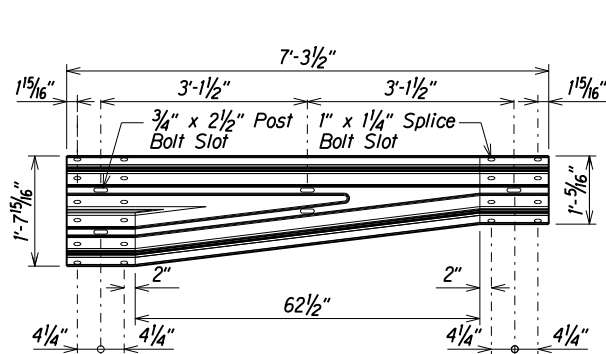
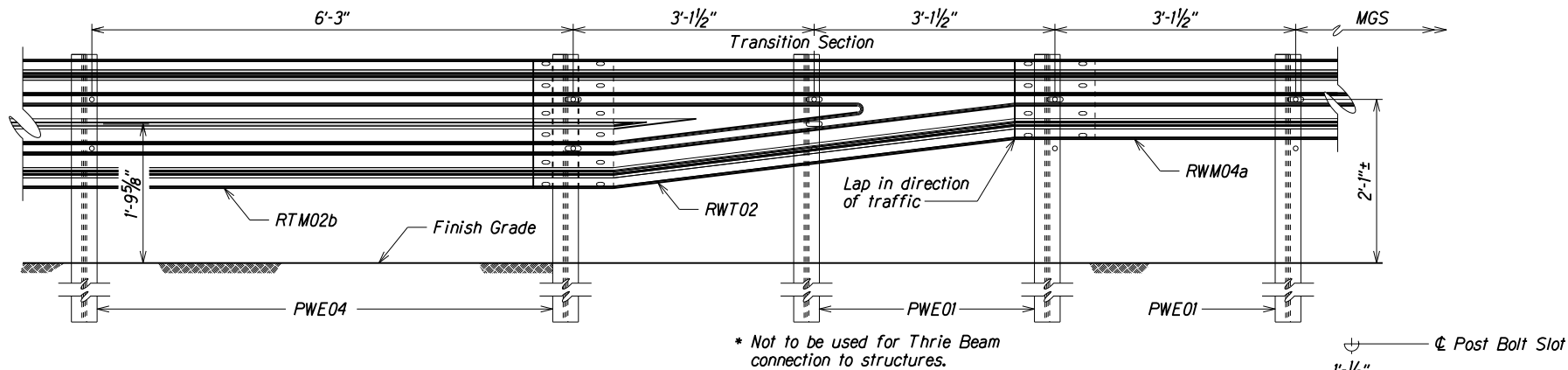
8/30/19 Issuing sheet inadvertently left out from original Bid Set.

DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**MGS TRANSITION TO
STRONG POST GUARDRAIL**
KULA HIGHWAY GUARDRAIL & SHOULDER IMPROVEMENTS
Omaopio Road to Sun Yat Sen Park
Federal-Aid Project No. STP-037-1(027)
Scale: NTS Date: September, 2018

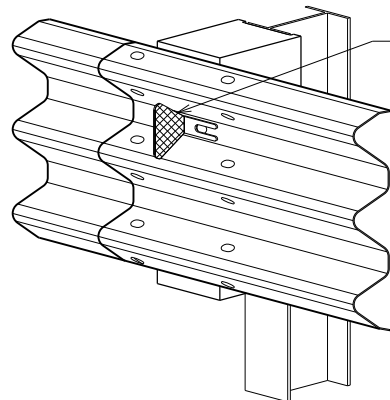
SHEET No. 6 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-037-110271	2019	ADD.13	35

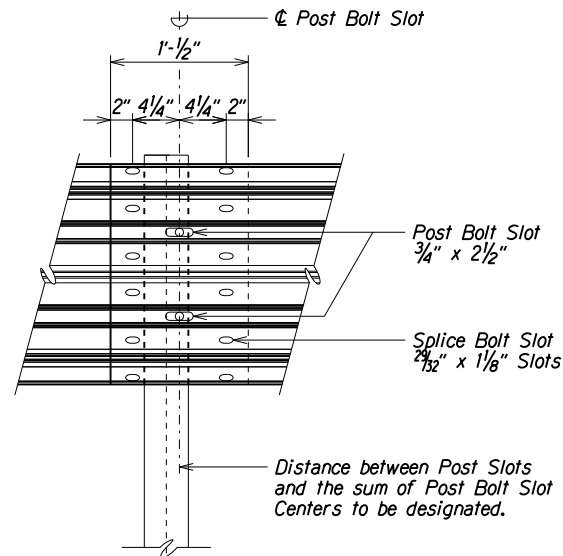


TRANSITION SECTION (RWT02)

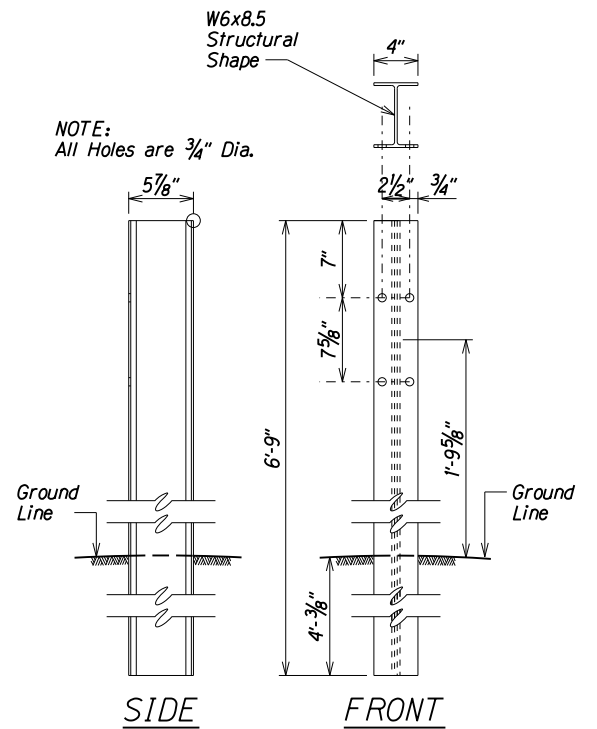
TRANSITION SECTION *



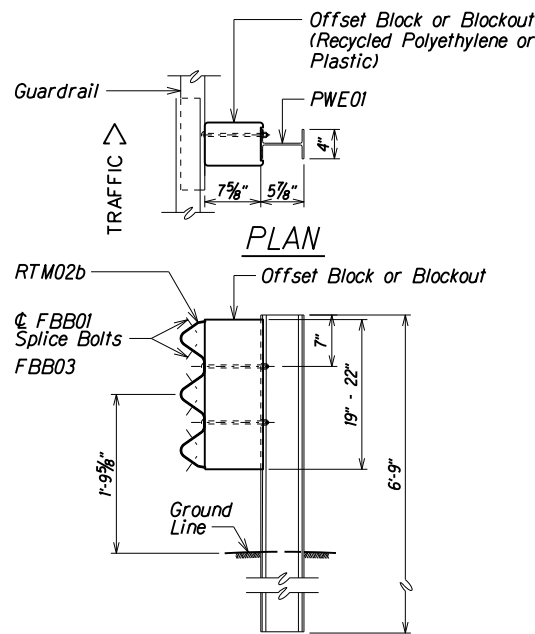
TYPICAL INSTALLATION OF REFLECTOR MARKER (RM-5)



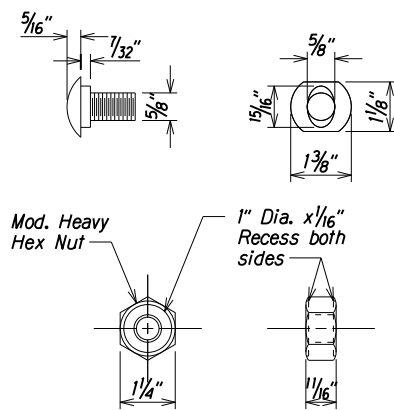
RAIL SPLICE



THRIE-BEAM STRONG POST FOR PLASTIC SPACER BLOCKS PWE04

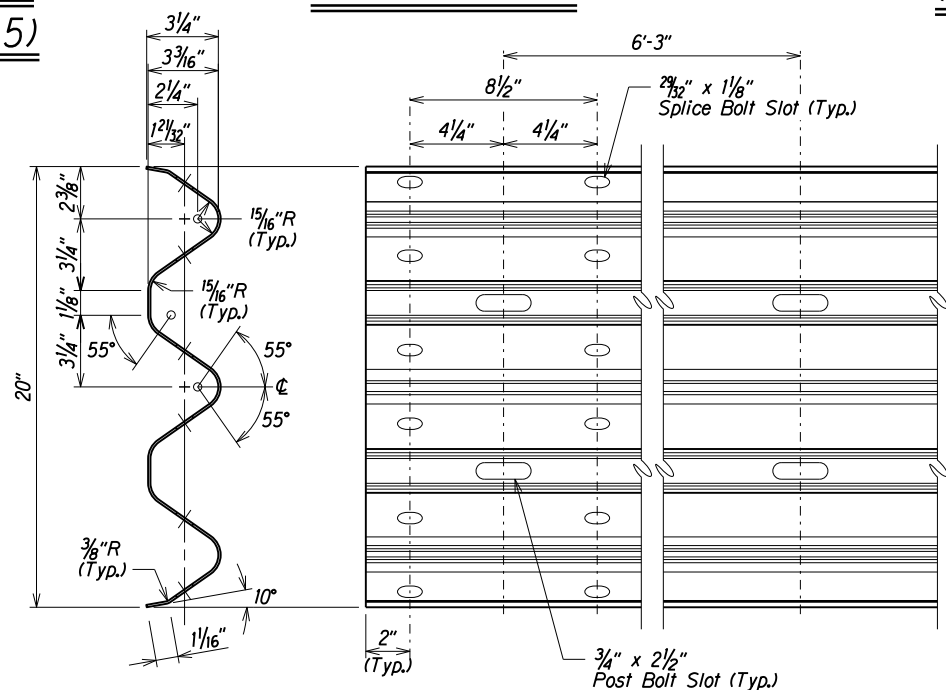


STRONG POST THRIE-BEAM GUARDRAIL (SGR09a)



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

GUARDRAIL BOLTS AND RECESSED NUT



1 & 2 SPACE THRIE-BEAM GUARDRAIL (RTM02b)

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DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION STRONG POST THRIE-BEAM GUARDRAIL KULA HIGHWAY GUARDRAIL & SHOULDER IMPROVEMENTS Omaopio Road to Sun Yat Sen Park Federal-Aid Project No. STP-037-110271 Scale: NTS Date: September, 2018	
SHEET No. 7 OF 7 SHEETS	

SURVEY PLOTTED BY	DATE	X
DESIGNED BY	DESIGNED BY	X
NOTE BOOK	QUANTITIES BY	
NO.	CHECKED BY	

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