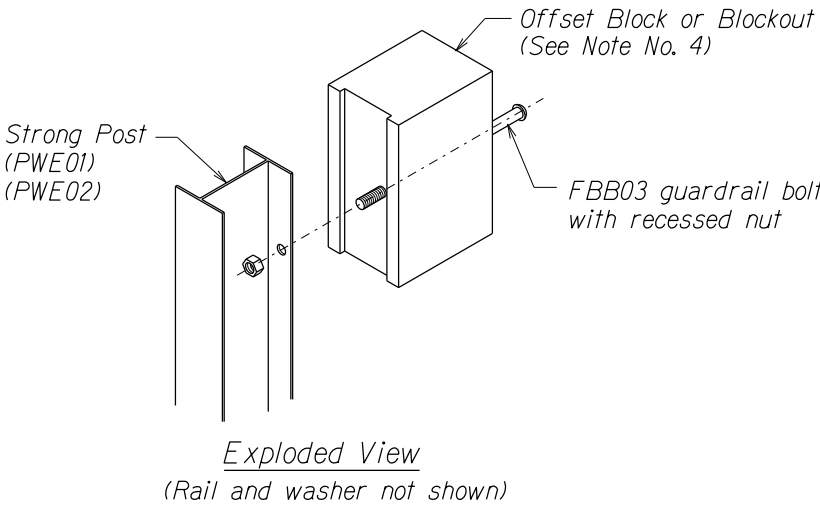
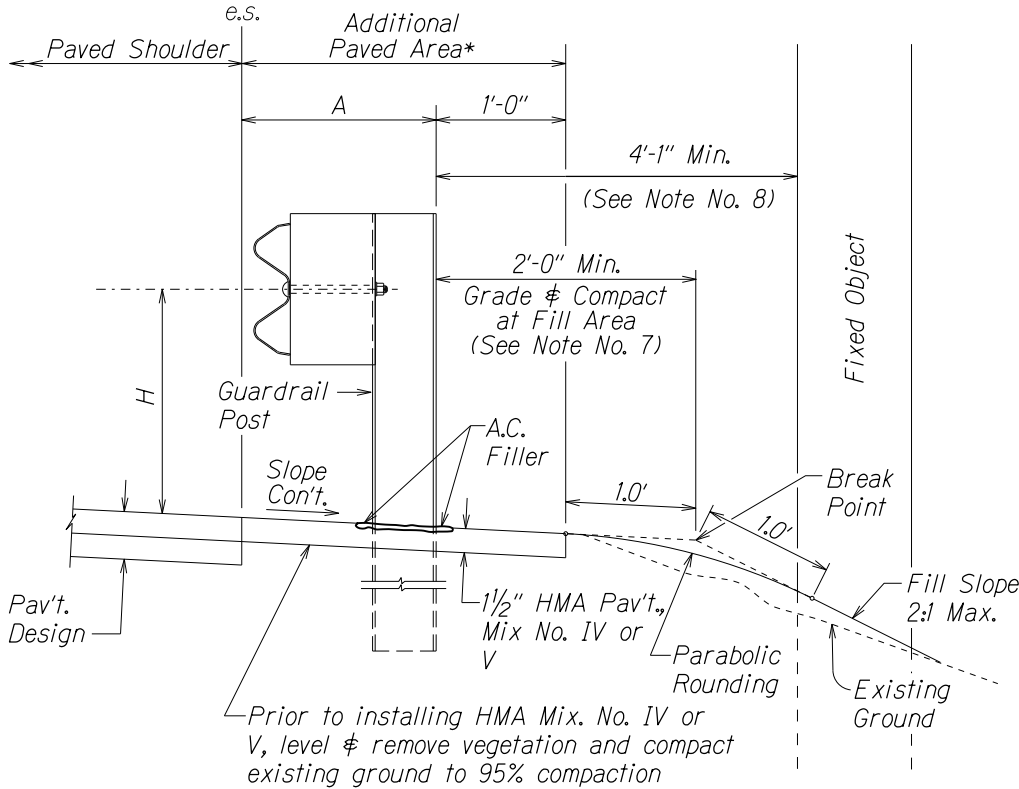
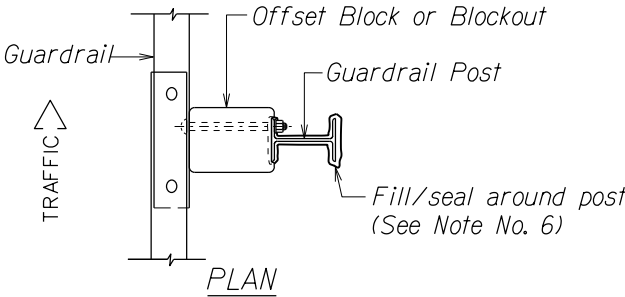


GENERAL NOTES

- 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 by the Engineer.
- 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.
- The Blockout 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.
- Minimum working width (clear distance) between back of MGS post to any fixed object is 4'-1" (49").
- New Hot Mix Asphalt (HMA) Mix No. V pavement at guardrails shall extend 6 feet longitudinally beyond terminal ends.
- Reflector Markers (RM-5) mounted on existing and new 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.
- The pay limit for MSKT-SP-MGS (TL-3), and MAX-Tension (TL-3) is 50 L.F., which shall be measured from Post 1 of the end terminal. Should the manufactured end terminal be less than 50 L.F. in length, the remaining length shall be considered incidental to the end terminal. All end terminal hardware extending beyond Post 1, such as hardware connecting to Post 0, shall also be considered incidental to the end terminal.
- The pay limit for MSKT-SP-MGS (TL-2), Soft Stop Terminal (TL-2), and MAX-Tension (TL-2) is 25 L.F., which shall be measured from Post 1 of the end terminal. Should the manufactured end terminal be less than 25 L.F. in length, the remaining length shall be considered incidental to the end terminal. All end terminal hardware extending beyond Post 1, such as hardware connecting to Post 0, shall also be considered incidental to the end terminal.
- Replace existing guardrail with metal offset block with plastic offset block. This work shall not be paid for separately, but shall be considered incidental to various guardrail contract items.
- For details of MSKT, Soft Stop and MAX-Tension Contractors shall refer for details for these products on the manufacturer's website or other information provided in the Road Design Guide.



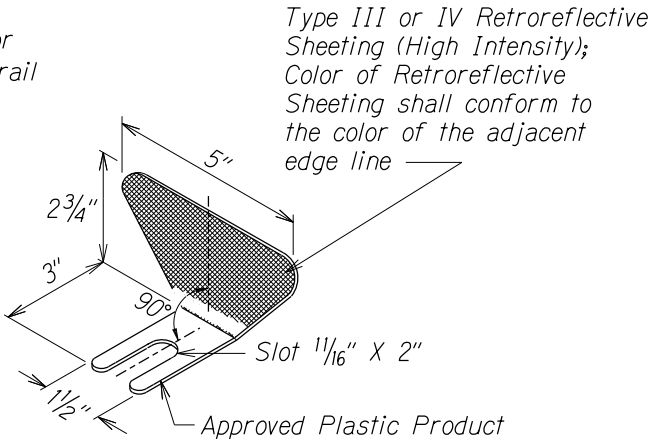
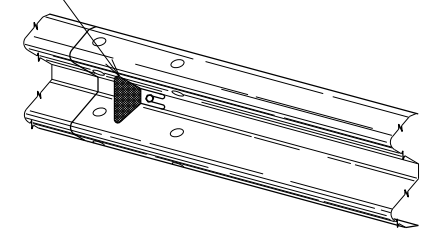
STEEL POST AND BLOCK DETAIL



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 1/4"

Reflector Marker (RM-5) - Reflector Facing Traffic (Mounted on Guardrail Between Posts with FBB01)



REFLECTOR MARKER (RM-5) DETAIL AND TYPICAL INSTALLATION



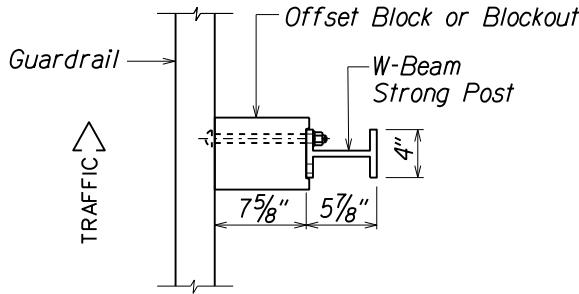
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARDRAIL DETAILS & NOTES
KULA HIGHWAY & PIILANI HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Vicinity of A'apueo Parkway to Omaopio Road
and North Kihei Road to Lipoa Parkway
Federal-Aid Project No. STP-0900(100)

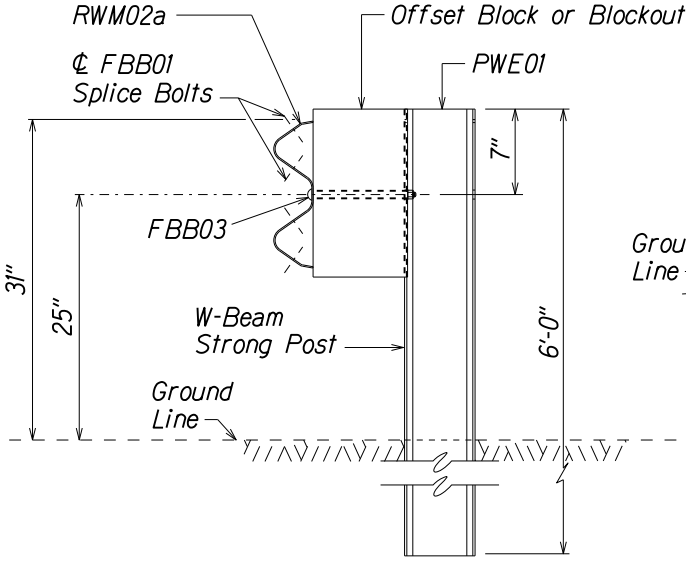
Scale: NTS Date: April, 2020

SHEET No. 1 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(100)	2020	8	28

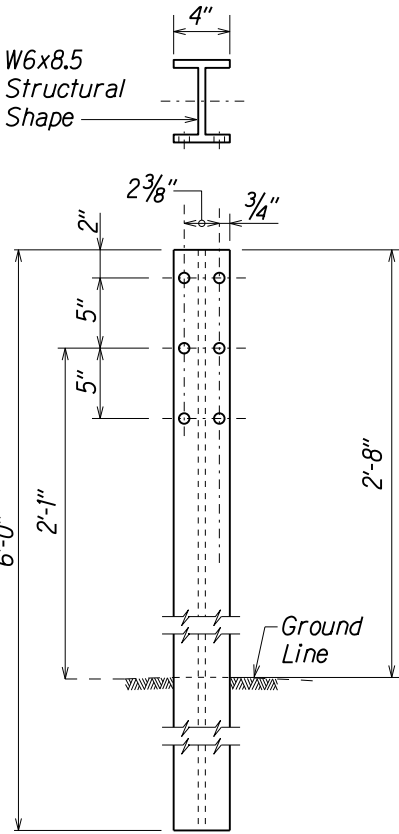


PLAN

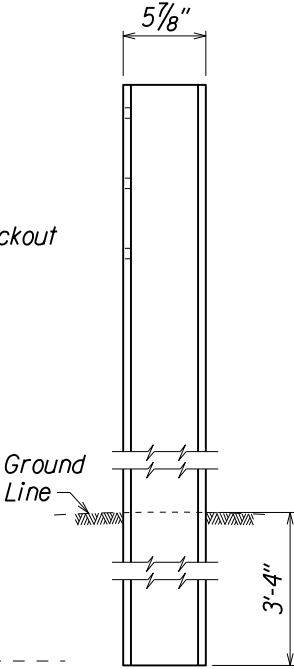


SECTION A-A

NOTE:
All Holes are
3/4" Dia.

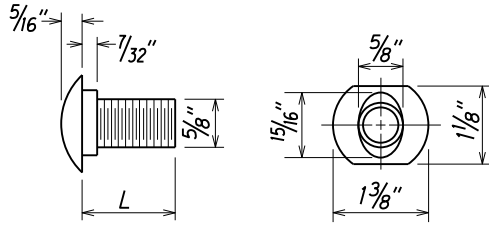


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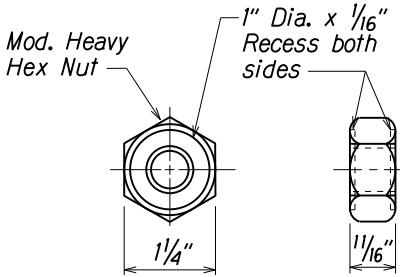


SIDE

W-BEAM STRONG POST
(PWE01)

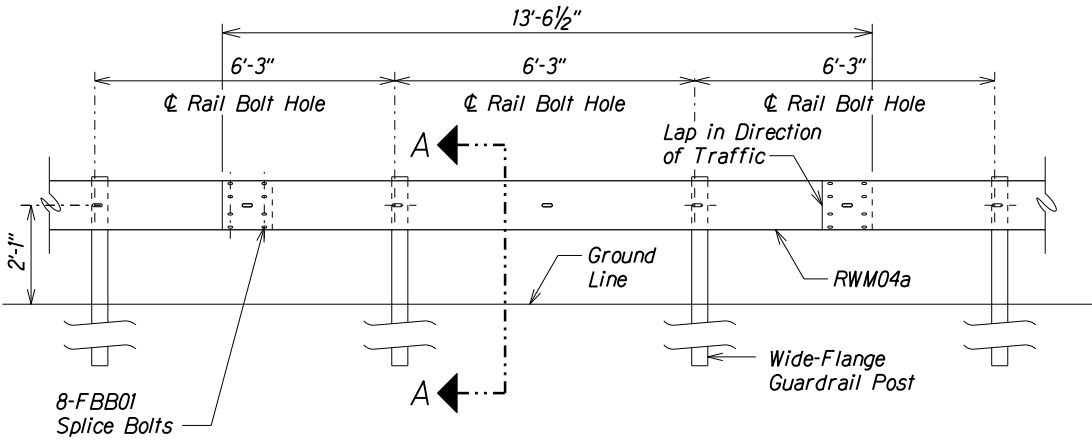
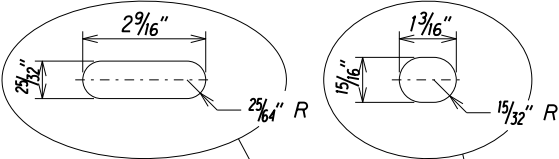


DESIGNATOR	L
FBB01	1 3/8"
FBB02	2"
FBB03	10"



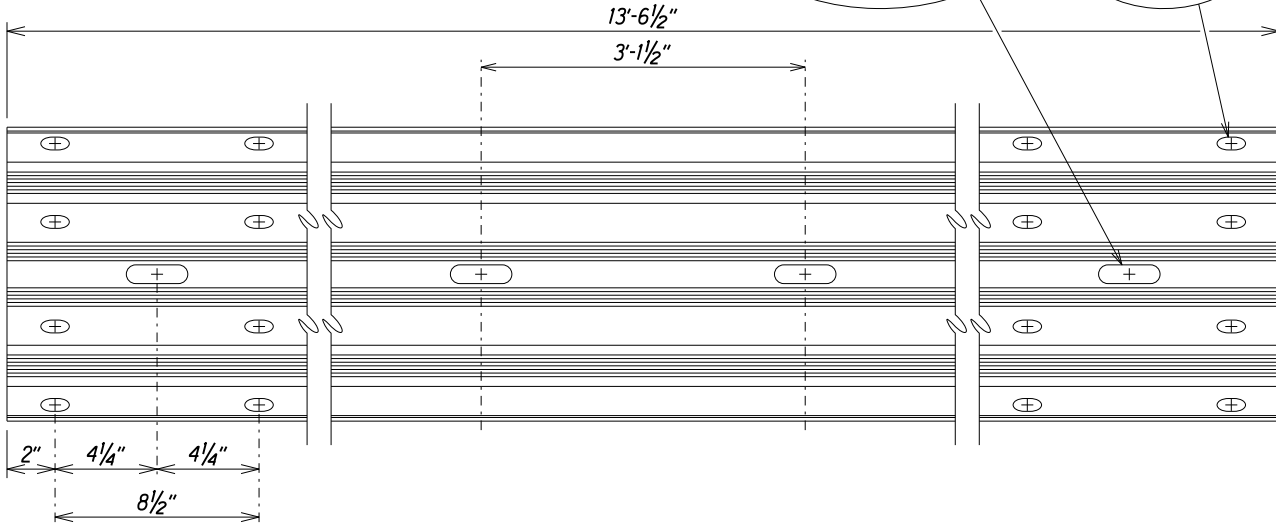
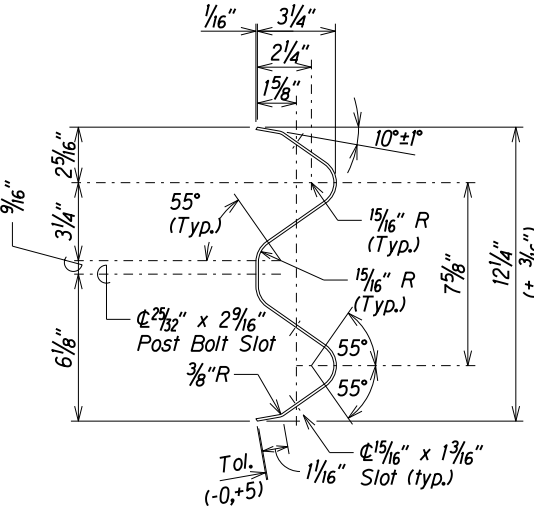
GUARDRAIL BOLTS AND RECESSED NUT

DESIGNATOR	BASE METAL THICKNESS
RWM04a	12 Gauge



ELEVATION

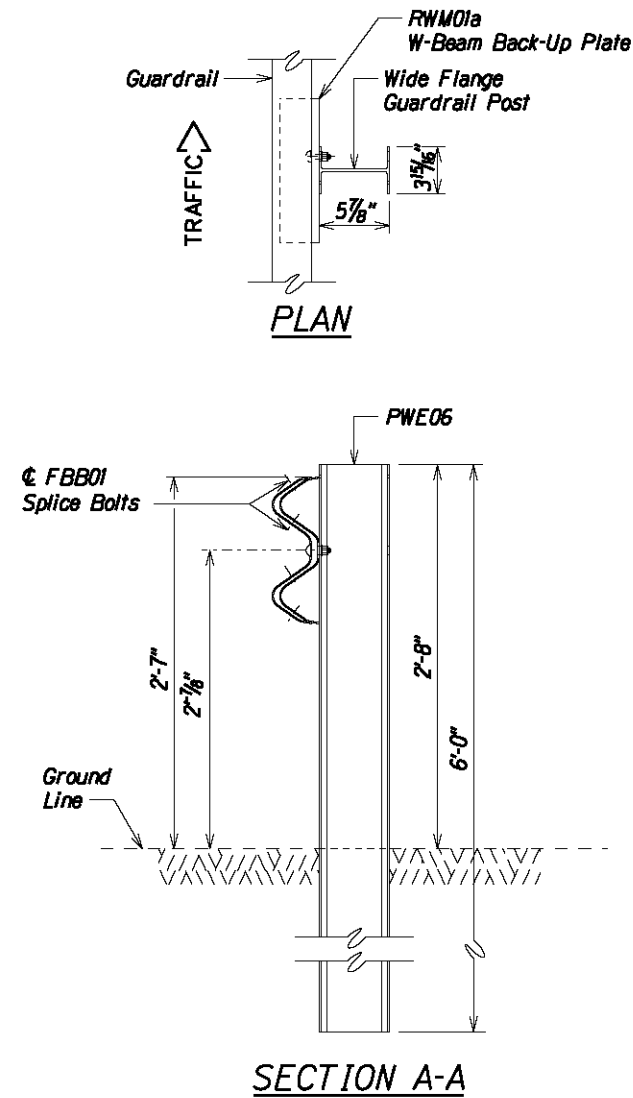
MIDWEST GUARDRAIL SYSTEM WITH
STANDARD 8" OFFSET BLOCK (SGR47)



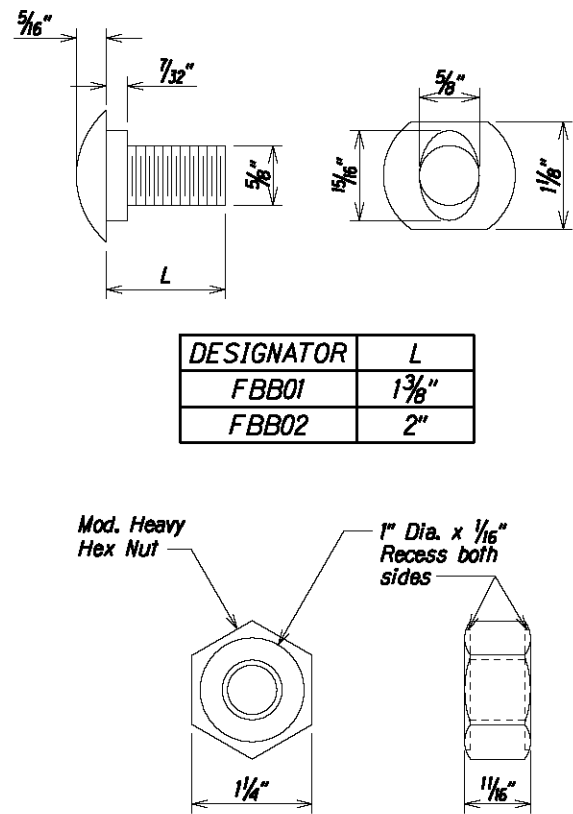
4 SPACE W-BEAM GUARDRAIL (RWM04a)



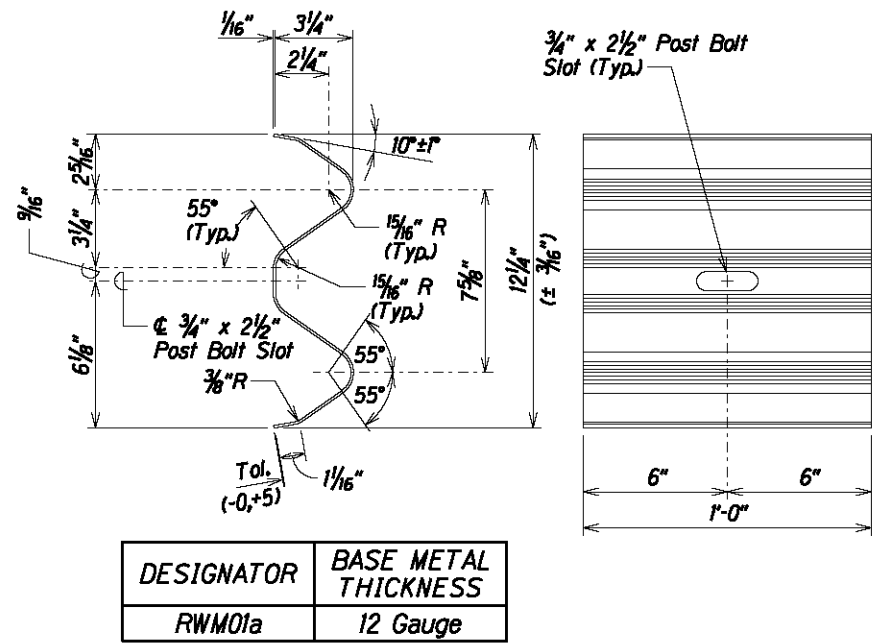
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**31" W-BEAM GUARDRAIL WITH
STANDARD 8" OFFSET BLOCK**
KULA HWY. & PIILANI HWY. GDRAIL. & SHLDR. IMPROV'TS.
Vicinity of A'apueo Pkwy. to Omaopio Rd. & N. Kihei Rd. to Lipoa Pkwy.
Federal-Aid Project No. STP-0900(100)
Scale: NTS Date: April, 2020
SHEET No. 2 OF 7 SHEETS



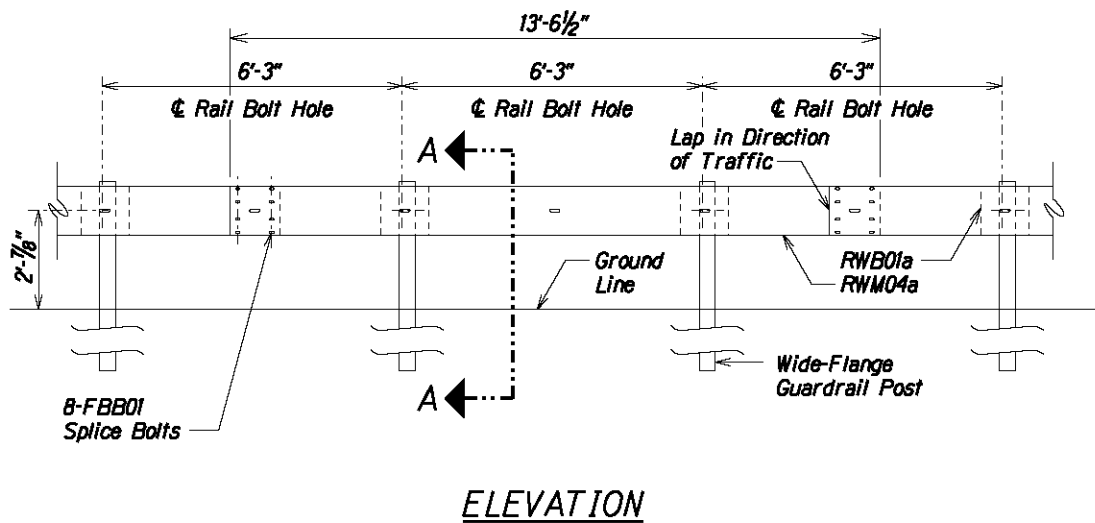
WIDE-FLANGE GUARDRAIL POST
(PWE06)



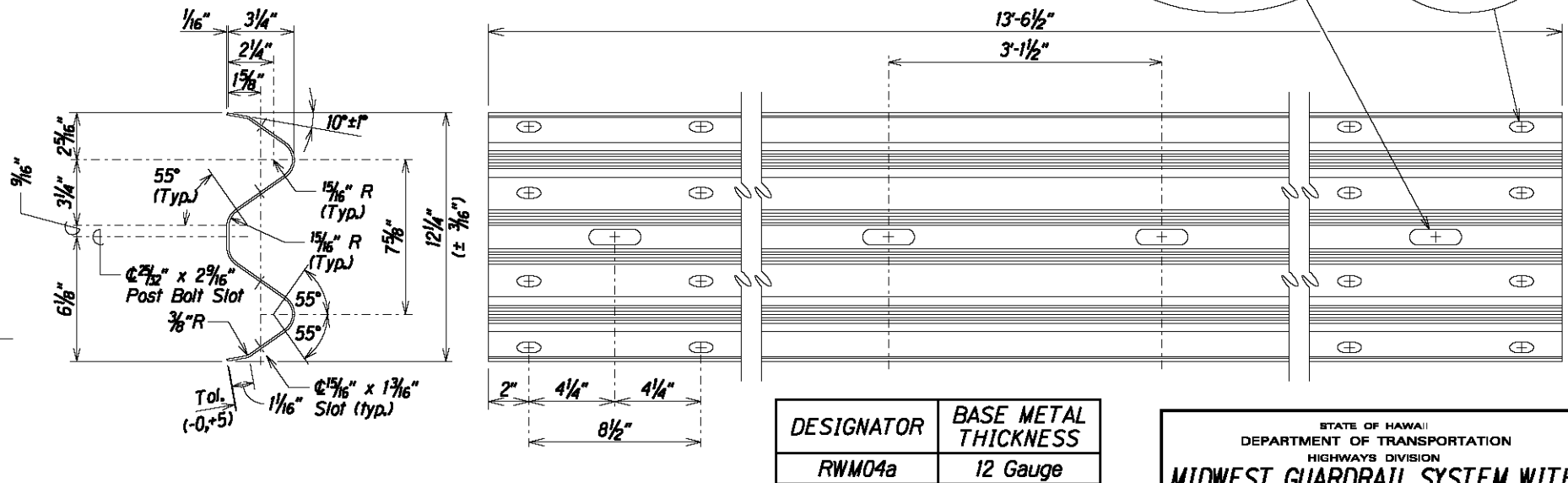
GUARDRAIL BOLTS AND
RECESSED NUT



W-BEAM BACK-UP PLATE (RWM01a)



MIDWEST GUARDRAIL SYSTEM WITH
NO BLOCKOUTS (SGR41)



4 SPACE W-BEAM GUARDRAIL (RWM04a)

9/4/20	Delete Midwest Guardrail System with No Blockouts (SGR41).
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

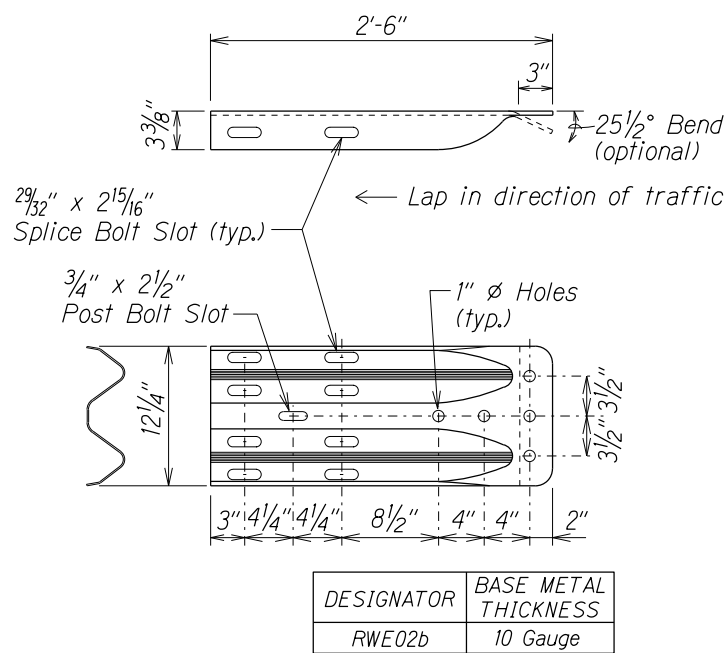
MIDWEST GUARDRAIL SYSTEM WITH
NO BLOCKOUTS

KULA HWY. & PILANI HWY. GDRAIL & SHLDR. IMPROVTS.
Vicinity of Aapua Pkwy. to Omaoia Rd. & N. Kihei Rd. to Lipoa Pkwy.

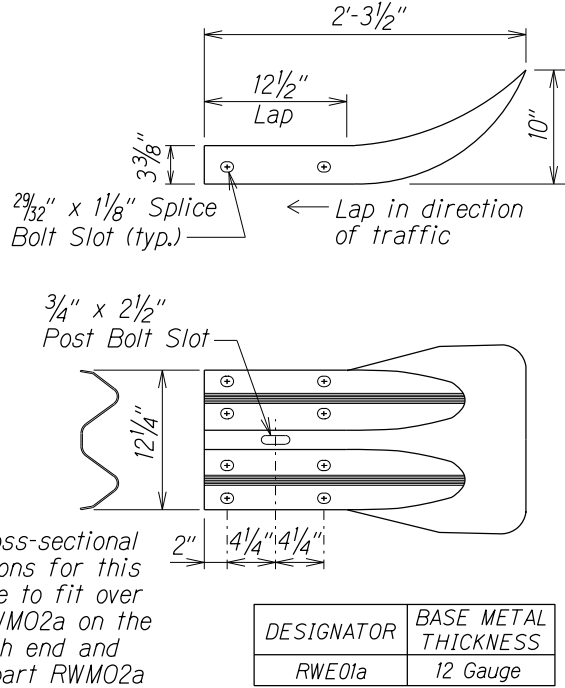
Federal-Aid Project No. STP-0900(100)
Scale: NTS Date: April, 2020

SHEET No. 3 OF 7 SHEETS

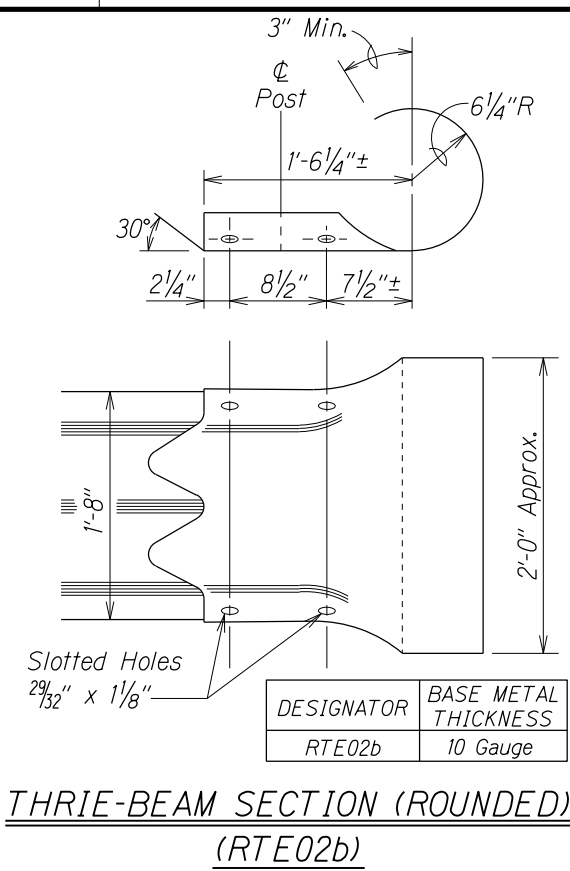
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(100)	2020	10	28



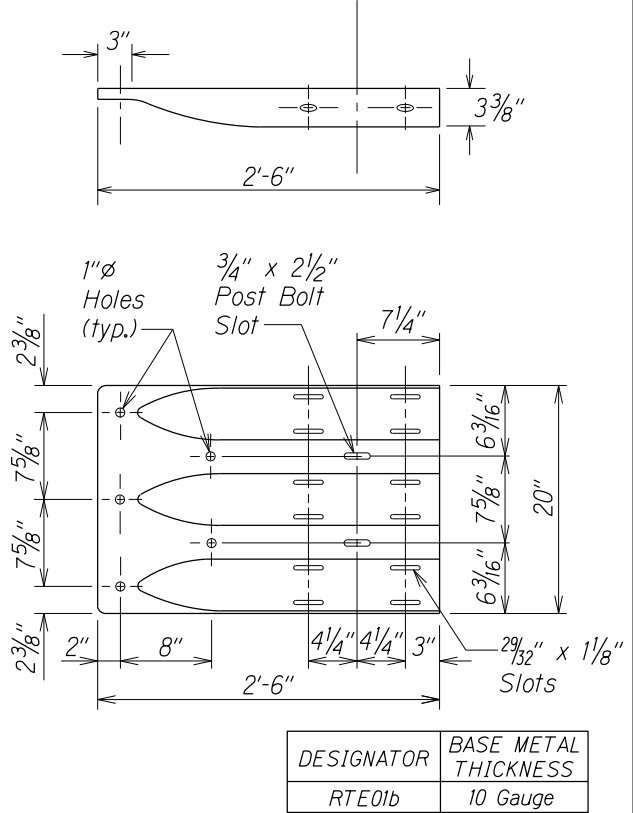
W-BEAM TERMINAL CONNECTOR (RWE02b)



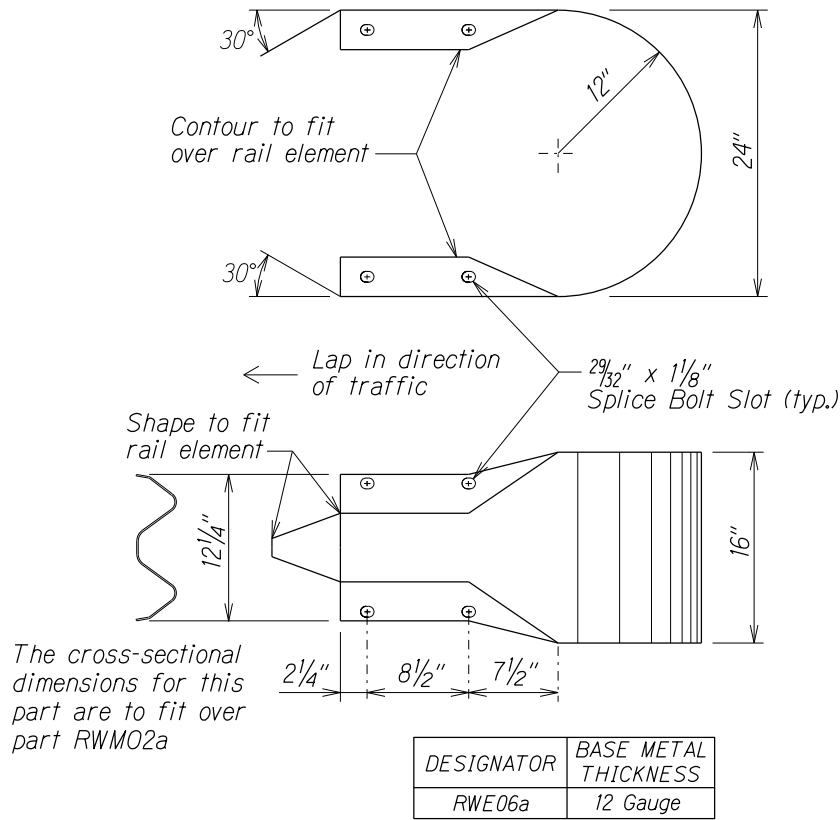
W-BEAM END SECTION (FLARED RWE01a)



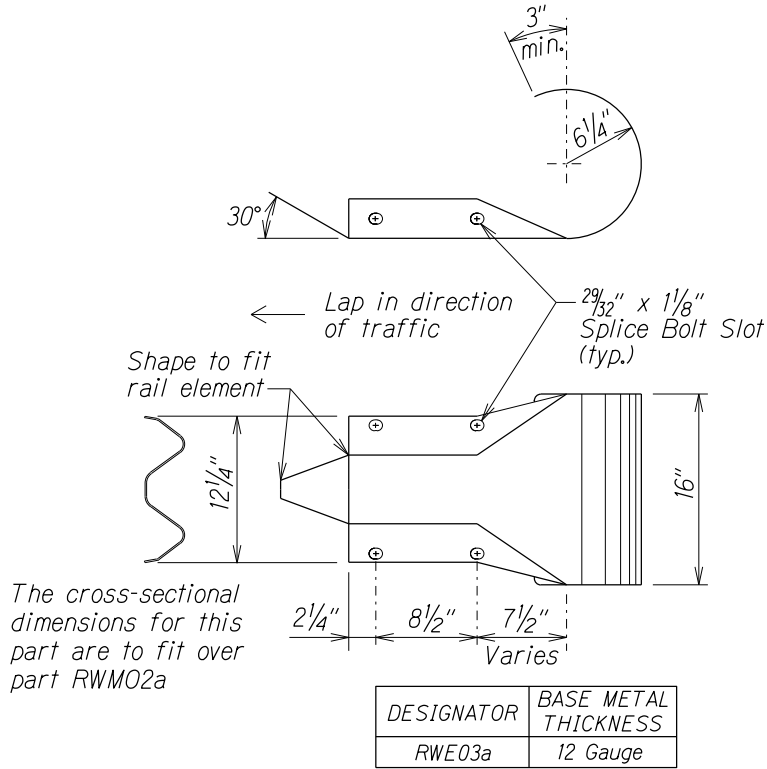
THRIE-BEAM SECTION (ROUNDED) (RTE02b)



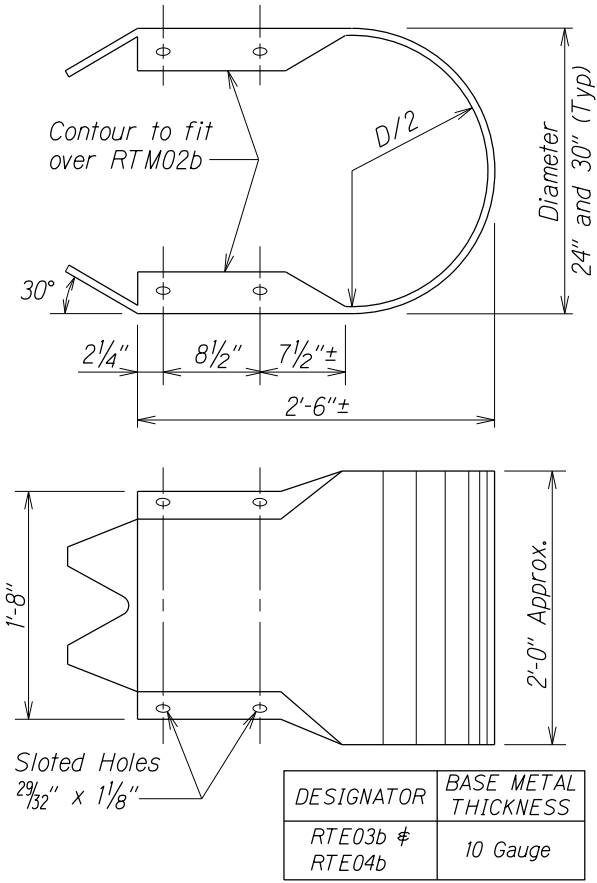
THRIE-BEAM TERMINAL CONNECTOR (RTE01b)



W-BEAM END SECTION (BUFFER RWE06a)



W-BEAM END SECTION (ROUNDED RWE03a)



THRIE-BEAM END SECTION (BUFFER RTE03b or RTE04b)



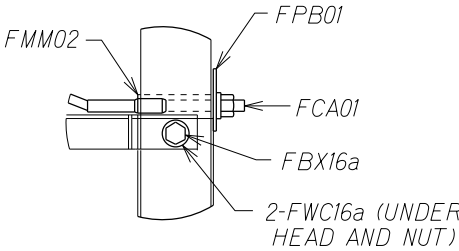
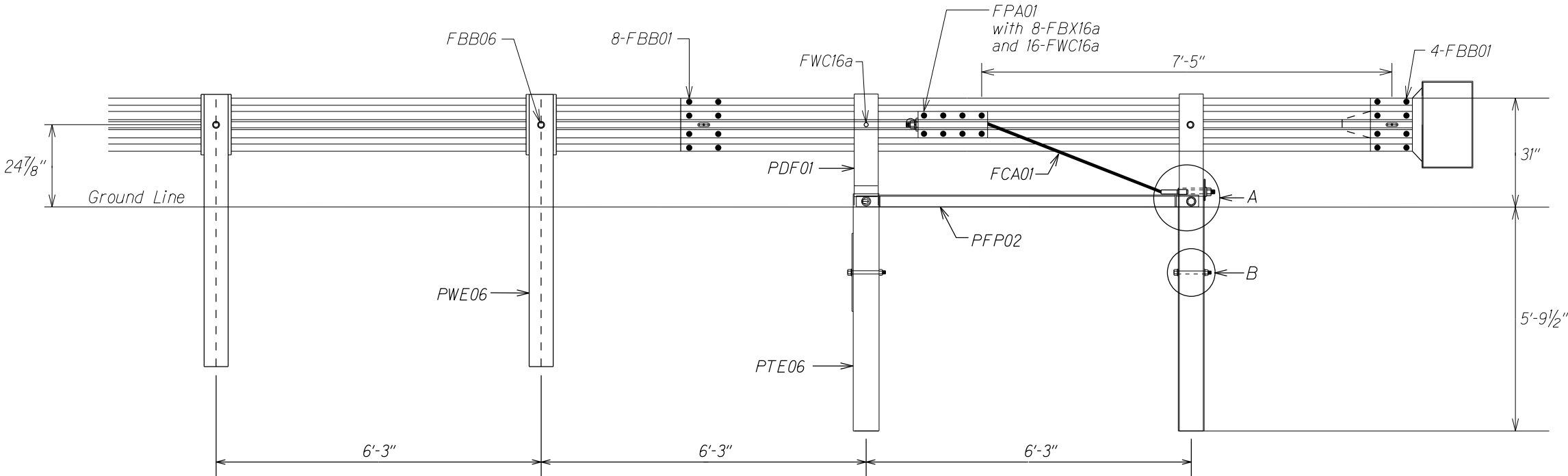
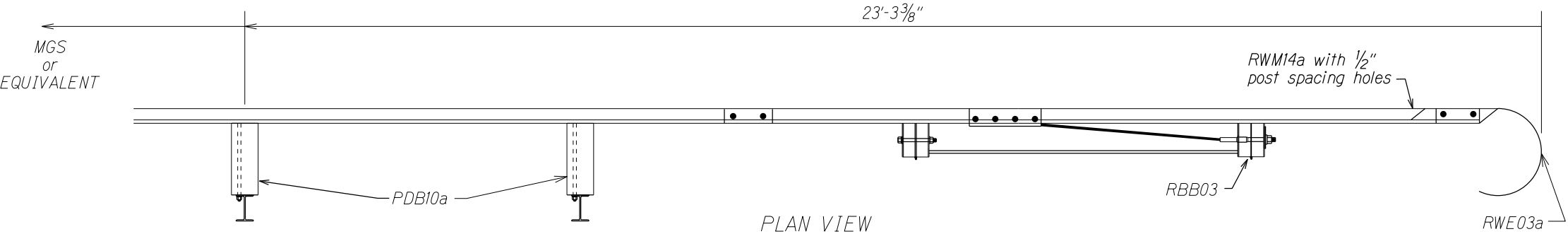
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**GUARDRAIL TERMINAL CONNECTORS
AND END SECTIONS**

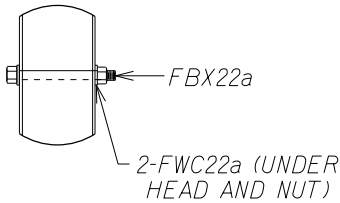
KULA HWY. & PIILANI HWY. GDRAIL. & SHLDR. IMPROV'TS.
Vicinity of Aapueo Pkwy. to Omaopio Rd. & N. Kihei Rd. to Lipoa Pkwy.
Federal-Aid Project No. STP-0900(100)
Scale: NTS Date: April, 2020

SHEET No. 4 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(100)	2020	11	28

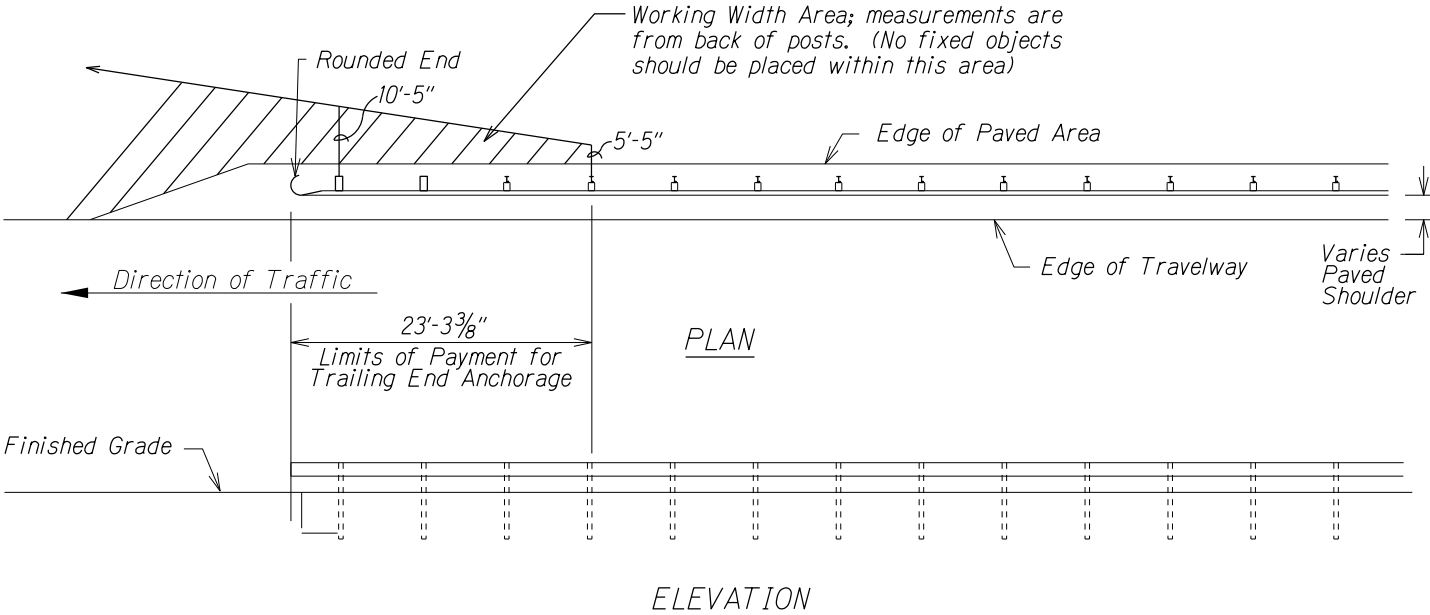


DETAIL A



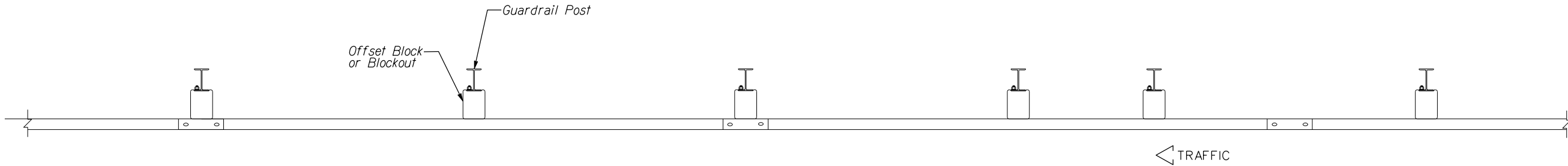
DETAIL B

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

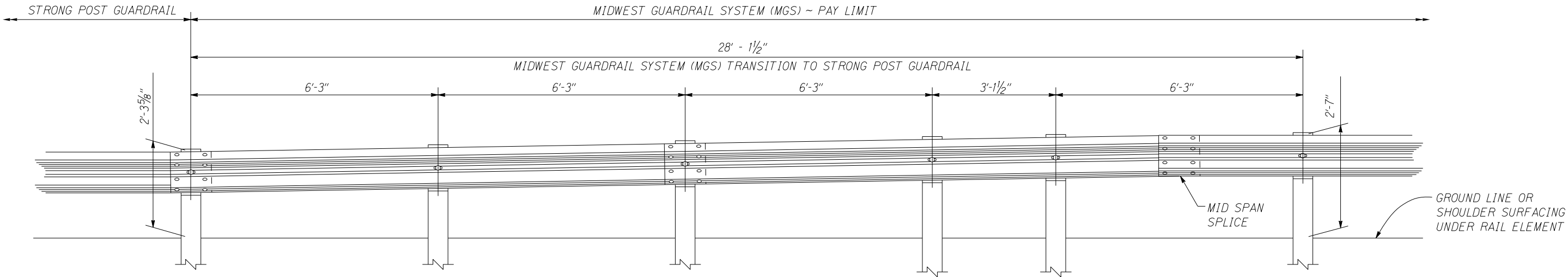


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**TRAILING-END ANCHORAGE
SYSTEM**
KULA HWY. & PIILANI HWY. GDRAIL. & SHLDR. IMPROV'TS.
Vicinity of A'apueo Pkwy. to Omaopio Rd. & N. Kihei Rd. to Lipoa Pkwy.
Federal-Aid Project No. STP-0900(100)
Scale: NTS Date: April, 2020
SHEET No. 5 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(100)	2020	12	28



PLAN



ELEVATION

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

r09/06/16 D:\st2\Ernest\standards\Traffic Guardrail Standards\ml7_midwest.dgn

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**MGS TRANSITION TO
STRONG POST GUARDRAIL**

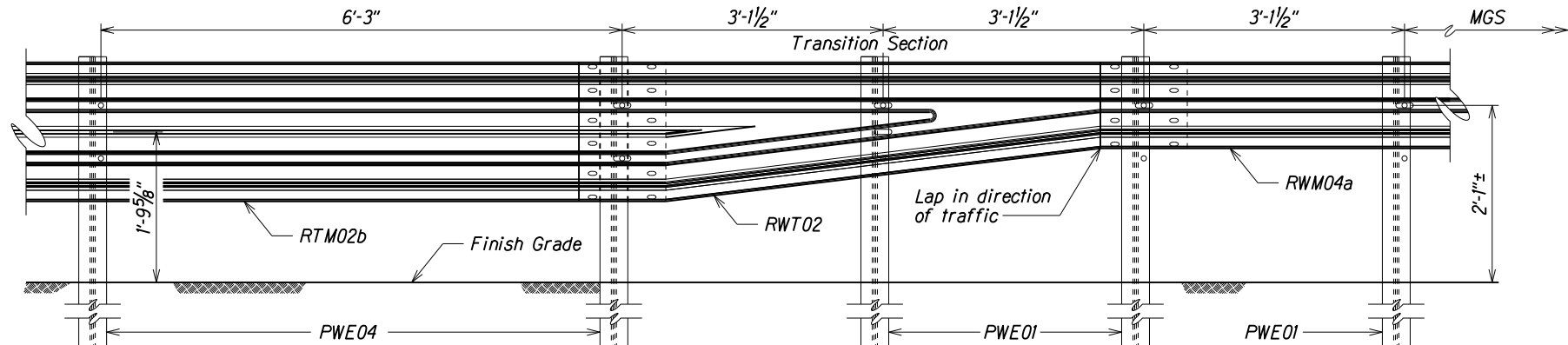
KULA HWY. & PIILANI HWY. GDRAIL. & SHLDR. IMPROV'TS.
Vicinity of A'apueo Pkwy. to Omaopio Rd. & N. Kihei Rd. to Lipoa Pkwy.

Federal-Aid Project No. STP-0900(100)

Scale: NTS Date: April, 2020

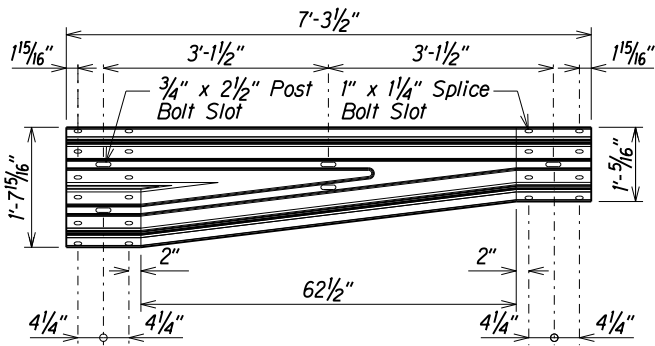
SHEET No. 6 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(100)	2020	13	28

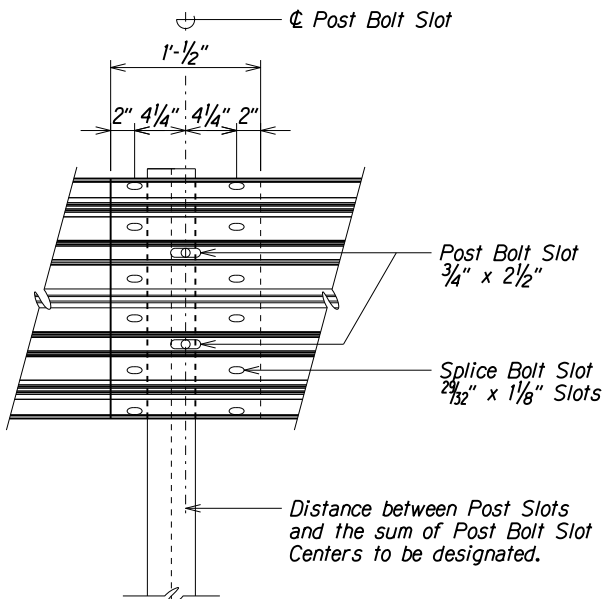
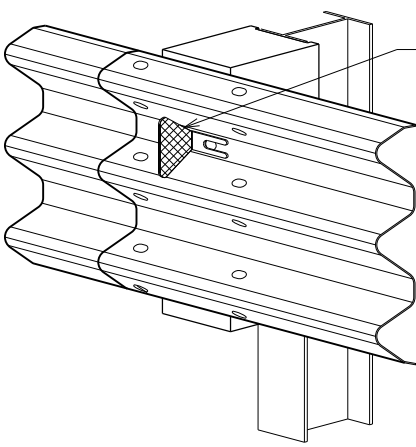


* Not to be used for Thrie Beam connection to structures.

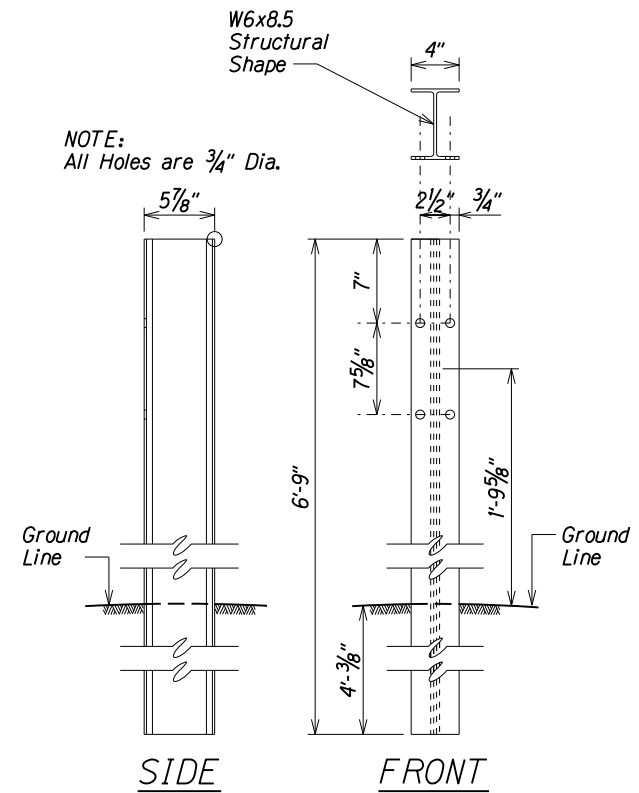
TRANSITION SECTION*



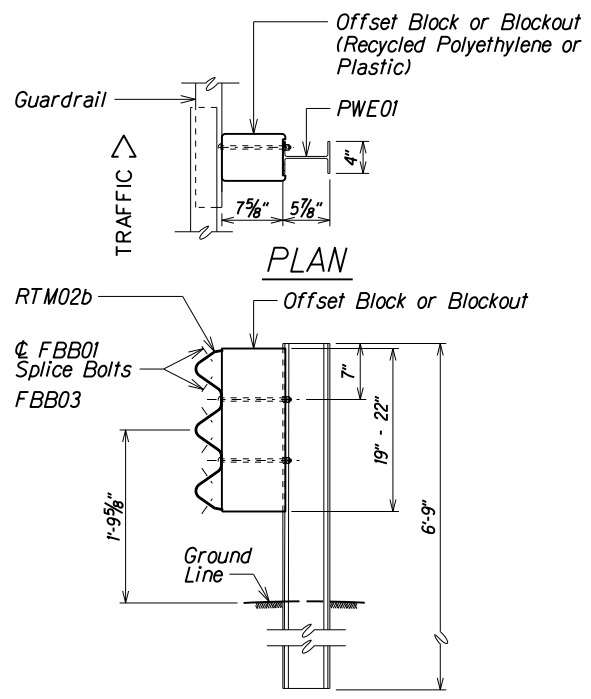
TRANSITION SECTION (RWT02)



RAIL SPLICE

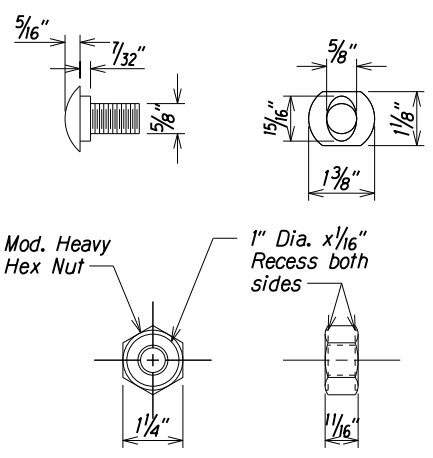


THRIE-BEAM STRONG POST FOR PLASTIC SPACER BLOCKS PWE04



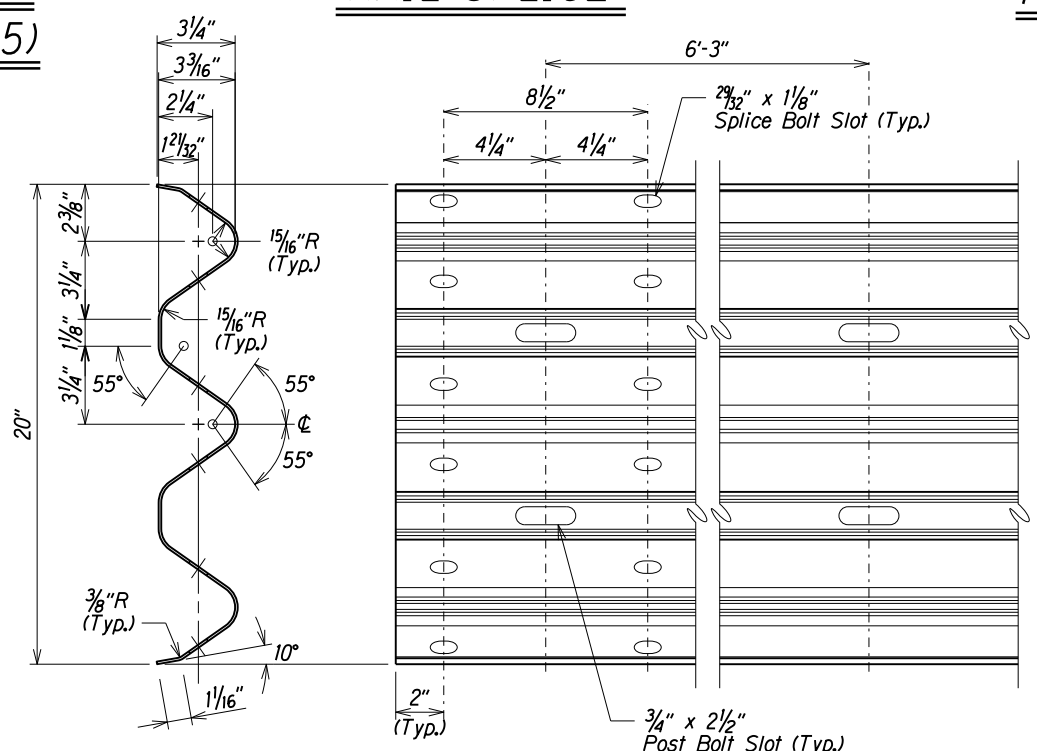
STRONG POST THRIE-BEAM GUARDRAIL (SGR09a)

TYPICAL INSTALLATION OF REFLECTOR MARKER (RM-5)



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

GUARDRAIL BOLTS AND RECESSED NUT



1 & 2 SPACE THRIE-BEAM GUARDRAIL (RTM02b)



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STRONG POST
THRIE-BEAM GUARDRAIL
KULA HWY. & PIILANI HWY. GDRAIL. & SHLDR. IMPROV'TS.
Vicinity of A'apueo Pkwy. to Omaopio Rd. & N. Kihei Rd. to Lipoa Pkwy.
Federal-Aid Project No. STP-0900(100)
Scale: NTS Date: April, 2020

SHEET No. 7 OF 7 SHEETS

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

rdErnest/standards/Traffic Guardrail Standards/thriebeam_B-5B.dgn r11/30/17