

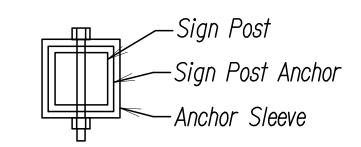
<u>1 - POST</u> "A" or "A₁" less than 36"

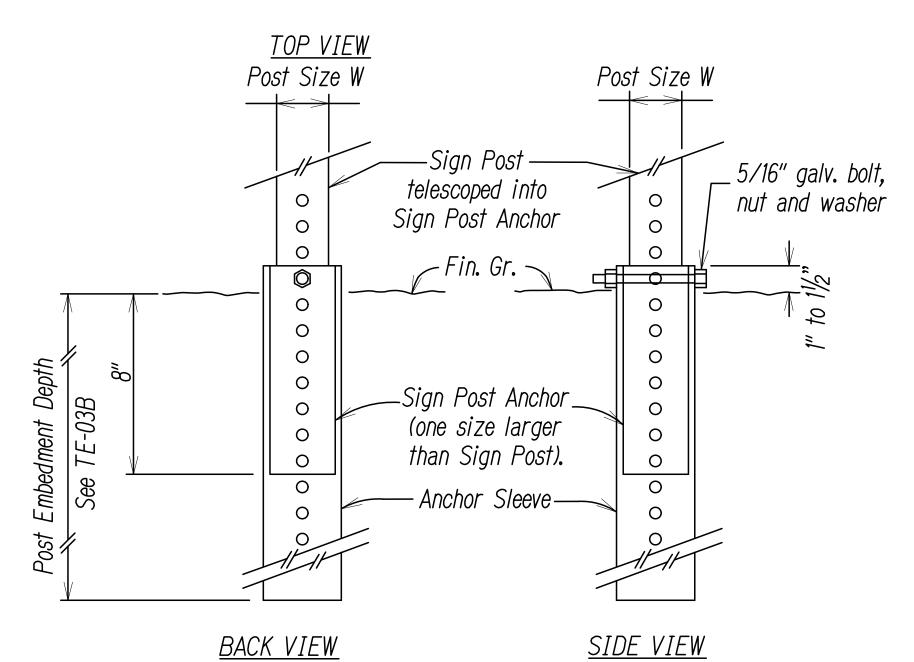
2 - POST "A" or "A₁" less than 60"

"A" or "A ₁ "	<i>"C</i> "	"C ₁ "
Less than 36"	6"	1
Greater than 36" and less than 48"	9"	19"
Greater than 48"	12"	24"

NOTE: Frame stiffeners are required when D is greater than 24"
See General Notes.

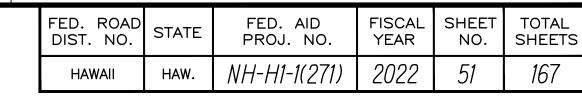
TYPICAL INSTALLATION





SIGN POST INSTALLATION

ANCHOR BASE DETAIL



GENERAL NOTES

1. <u>Design Specifications:</u>

- (A) Design shall conform w/ the latest AASHTO Standard Specifications for the Structural Supports for Highway Signs, Luminaires & Traffic Signals and its interim supplements and modifications by the Highways Division, Department of Transportation State of Hawaii.
- (B) Latest HDOT Memorandum with subject title "Design Criteria for Bridges and Structures."

2. <u>Loads:</u>

- (A) Basic Wind Speed: 105 mph.
- (B) Recurrence Interval of 10 years.

3. <u>Materials:</u>

- (A) Post shall conform to the Standard Specifications.
- (B) All connection bolts shall be AASHTO M164 bolts and anchor bolts shall be AASHTO M314-105 bolt.
- (C) Lap splice nuts and bolts shall be M180, with an ultimate tensile strength of 180 ksi, min.
- (D) Aluminum members and surfaces in contact with structural steel shall be isolated with neoprene material as approved by the Engineer.

4. General:

- (A) See General Notes on B-01, TE-01, and TE-03B for additional information.
- (B) All posts shall be 12 gage unless otherwise specified or shown on the plans.
- (C) Square tube posts shall be perforated with 7/16"\$\phi\$ holes, 1" o.c., 4 sides, along entire length of post.
- (D) All accessories, fittings and stiffener details (as required) shall be submitted to the Engineer for approval 20 days prior to installation.
- (E) Alternate designs in accordance with the plans and specifications shall use the Service Load Design Method and shall be stamped by a registered structural engineer of the State of Hawaii and submitted to the Engineer for approval.
- (F) All sign support posts shall be outside of the clear zone or shielded by an appropriate traffic barrier system. The traffic barrier system shall be submitted to the Engineer for his approval.
- (G) The Contractor shall use templates while installing the anchor bolts. Anchor bolts shall be vertical.
- (H) Excavation and backfill shall be considered incidental to the cost of the sign foundation.



Christ Bull 4/30/2024

IITSUNAGA & ASSOCIATES, INC. EXP. DATE

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

<u>GALVANIZED SQUARE TUBE SIGN</u> <u>POST MOUNTING</u>

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 3
Federal Aid Project No. NH-H1-1(271)

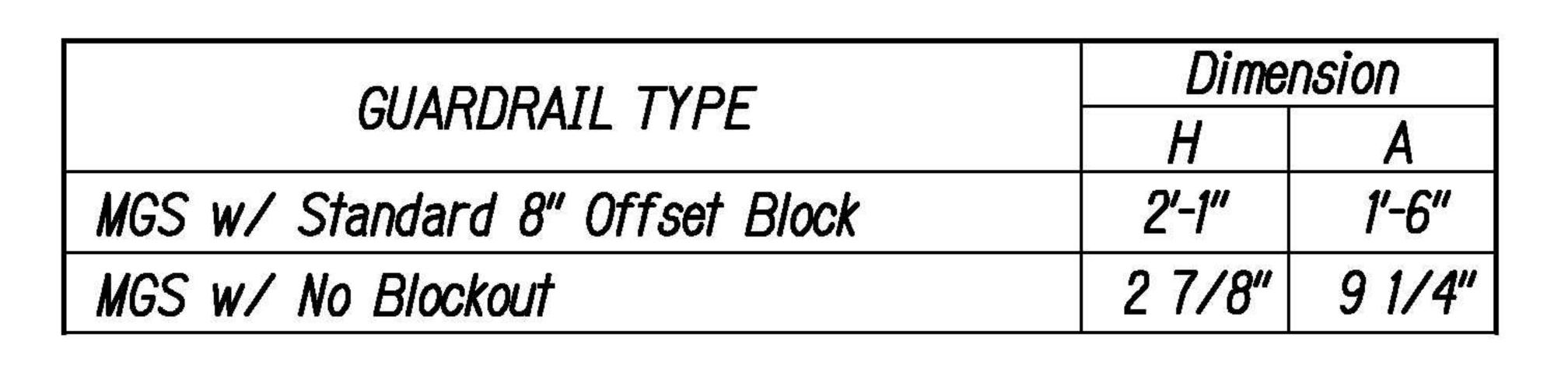
Scale: As Noted Date: August 2022

SHEET No. R-15 OF 167 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL
HAWAII	HAW.	NH-H1-1(271)	2022	ADD. 52	167

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.
- 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 fasteners, 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.
- 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").
- 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 adjacent guardrail system.



Additional Paved Area*

Guardrail-

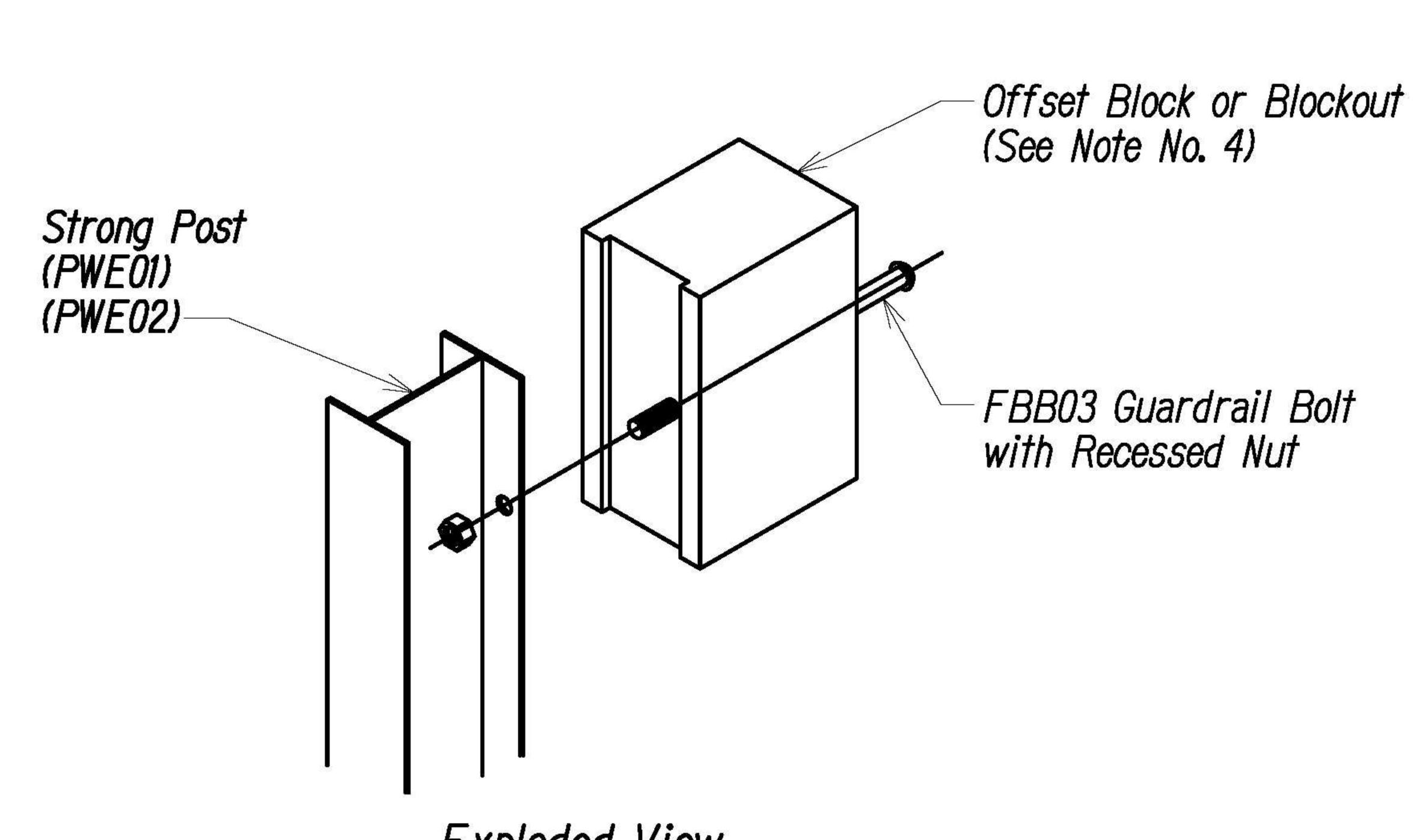
Paved Shoulder

-Offset Block or Blockout

-Fill/seal around post

(See Note No. 6)

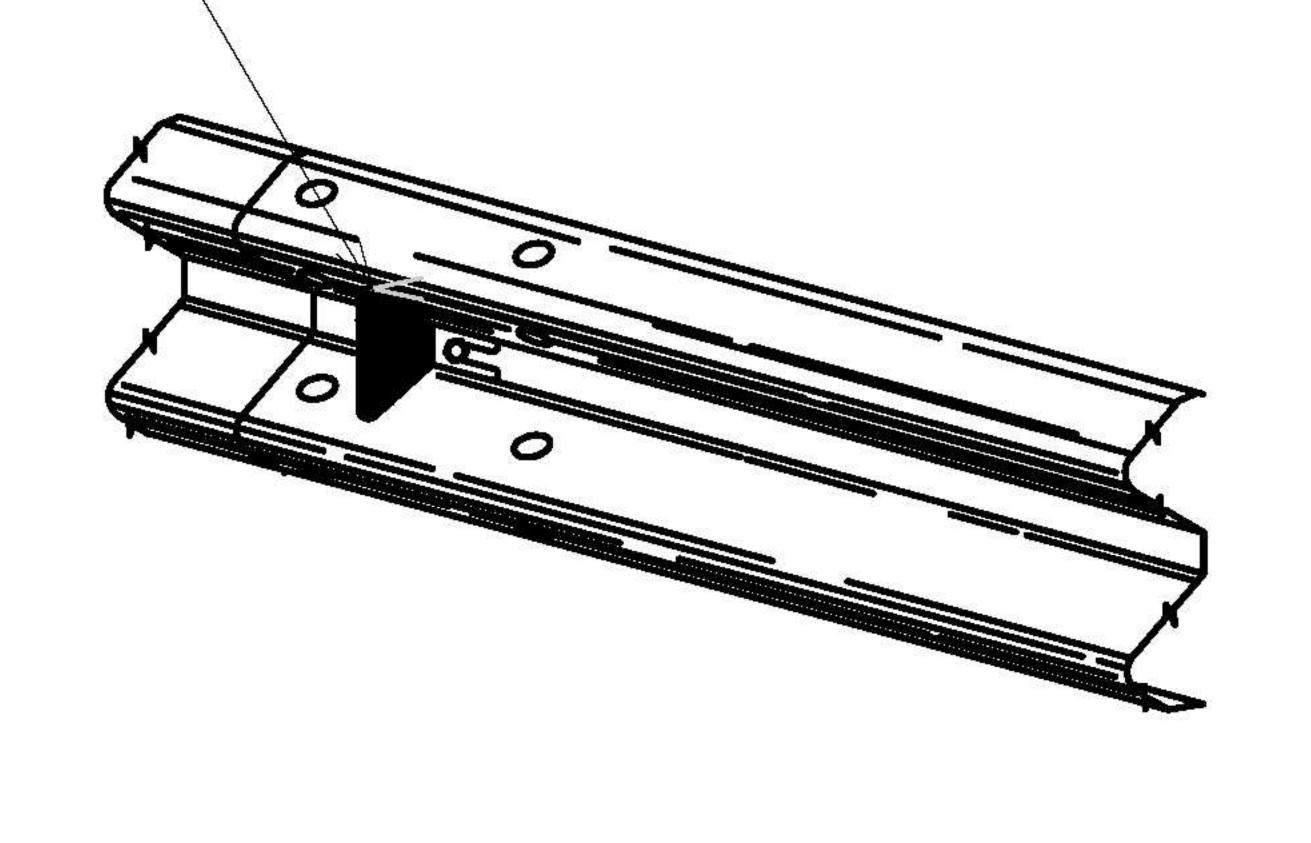
-Guardrail Post

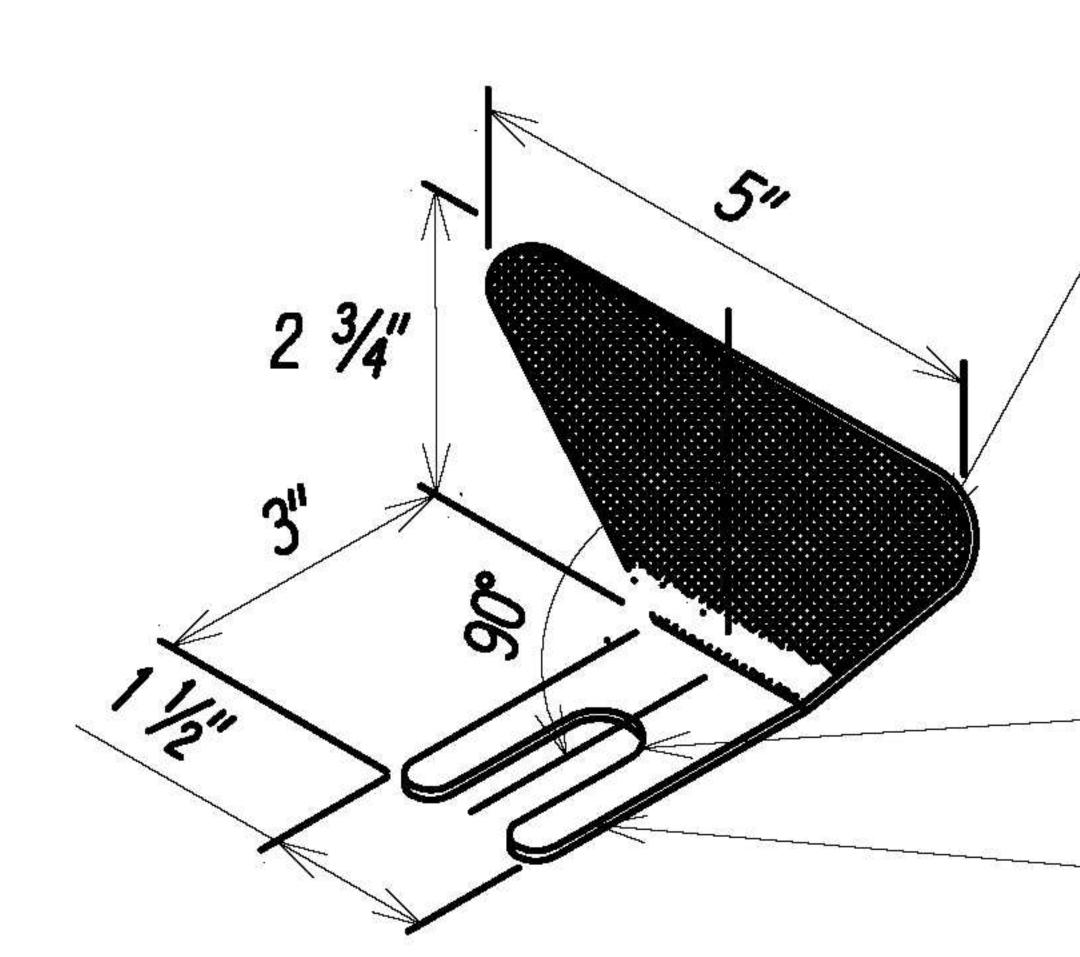


Exploded View (Rail \$ Washer Not Shown)

STEEL POST AND BLOCK DETAIL

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

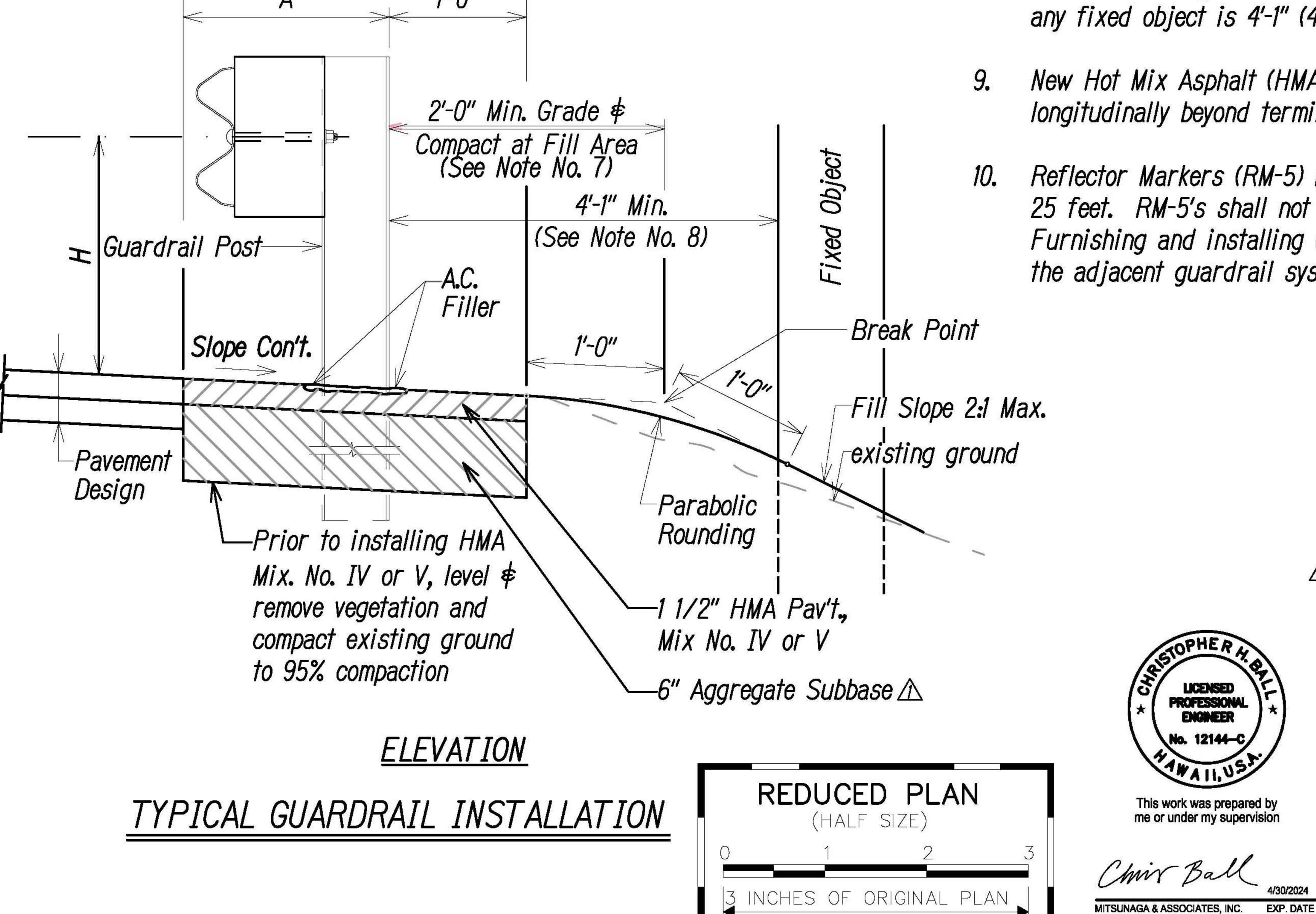


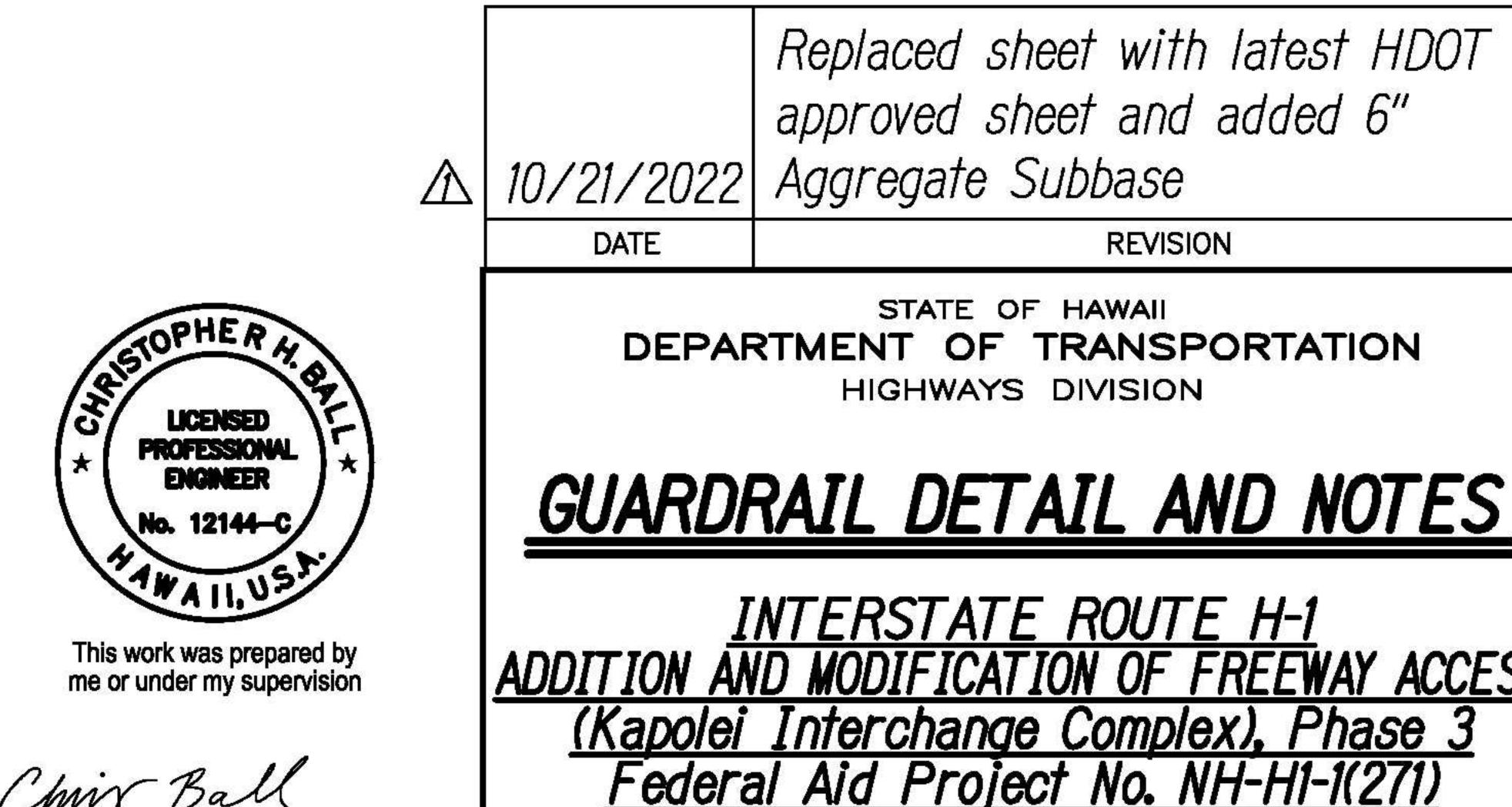


-Type III or IV Retroreflective Sheeting (High Intensity); Color of Retroreflective Sheeting shall conform to the color of the adjacent edge line

-Slot 11/16" X 2" -Approved Plastic Product

REFLECTOR MARKER (RM-5) DETAIL & TYPICAL INSTALLATION



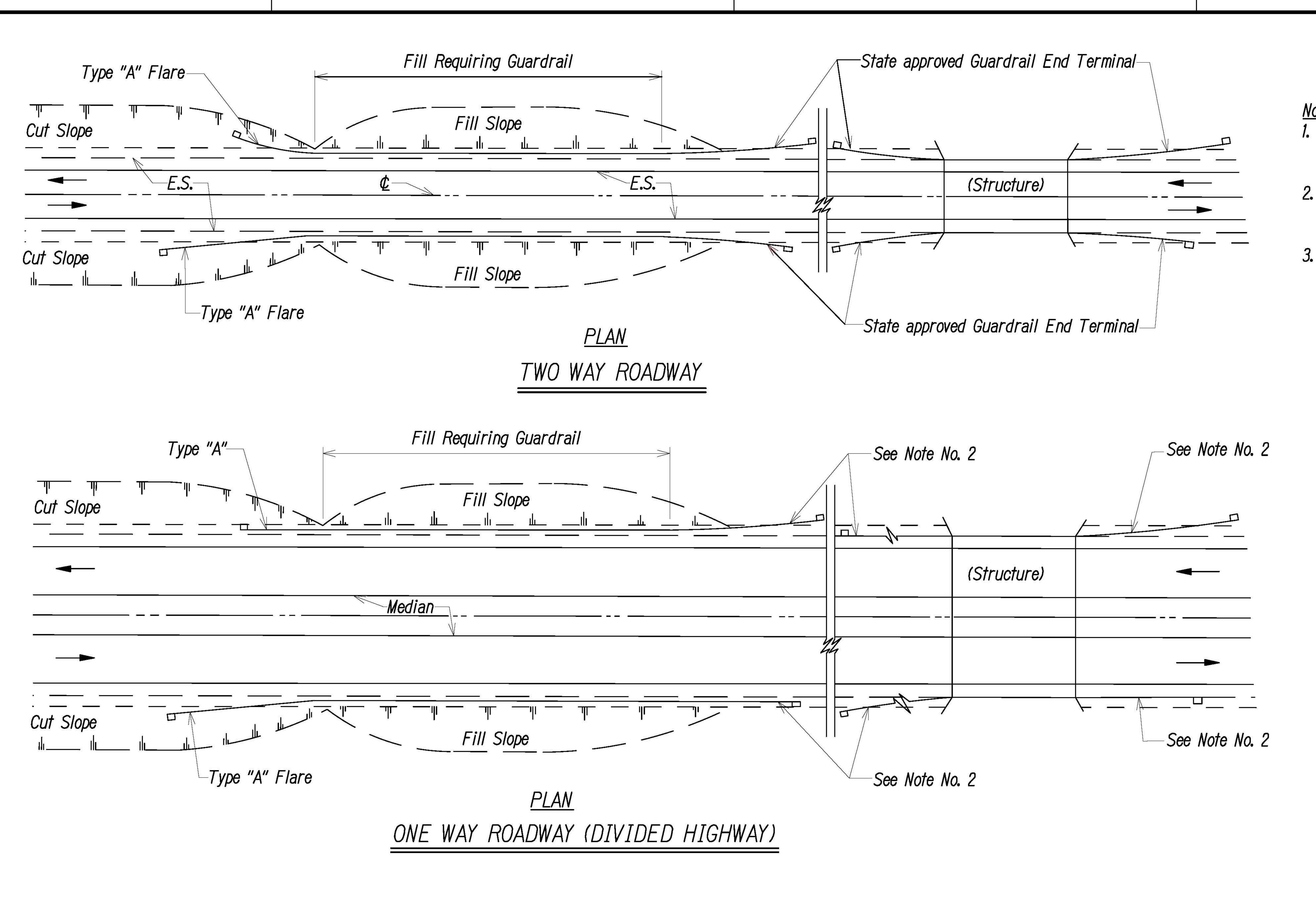


approved sheet and added 6" 10/21/2022 Aggregate Subbase STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

GUARDRAIL DETAIL AND NOTES

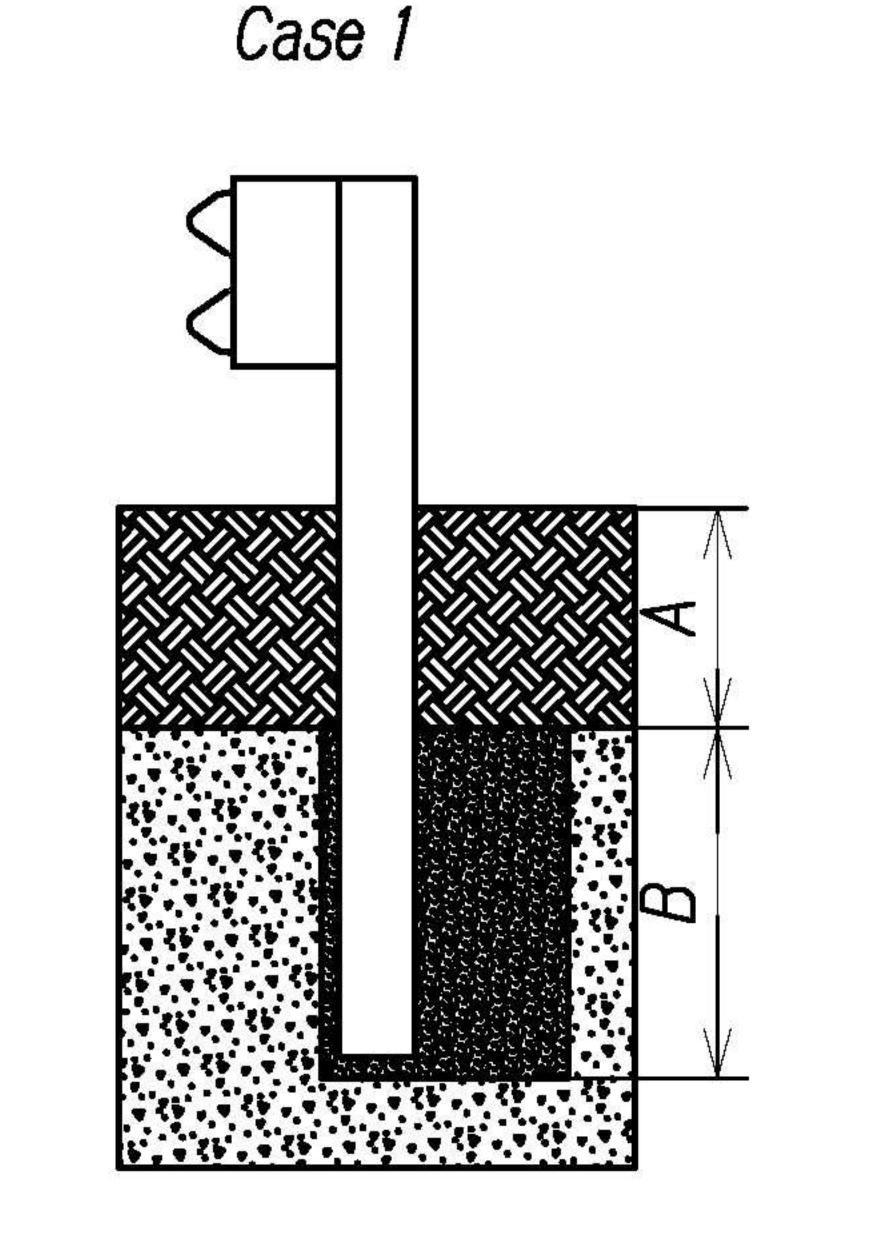
INTERSTATE ROUTE H-1 ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 3 Federal Aid Project No. NH-H1-1(271)

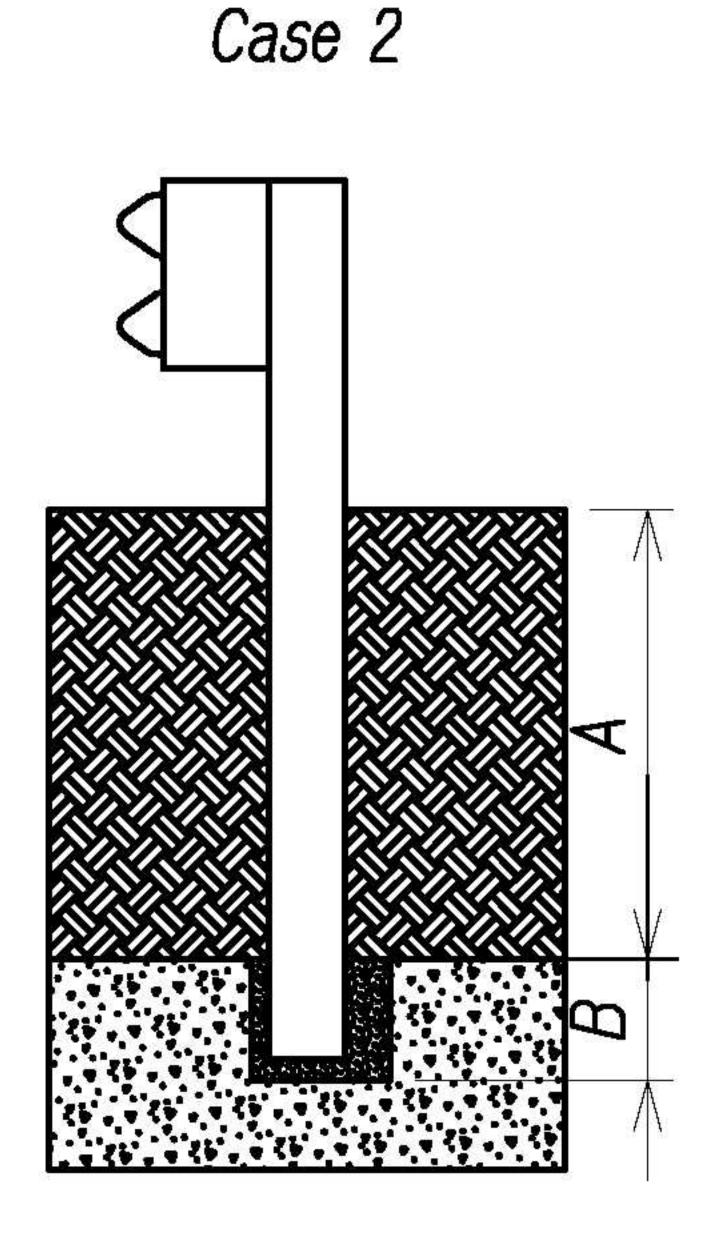
Date: August 2022 R-16 OF 167 SHEETS SHEET No.



HAW. NH-H1-1(271) 2022 ADD. 53 167

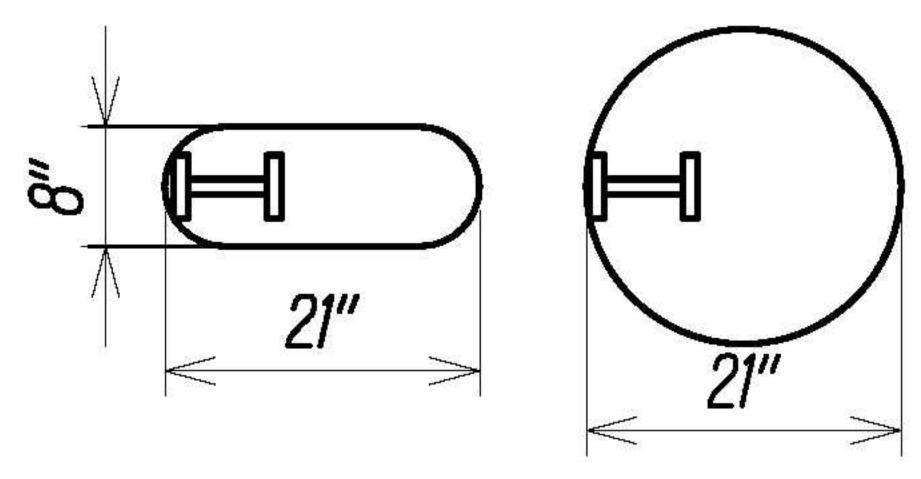
- Metal Guardrail connection to concrete structures requires End Post Connection. See Structure Plans.
- 2. Depending on the existing field conditions, the Engineer shall determine which guardrail end terminal should be installed.
- 3. Refer to State's most current approved Product List for MASH approved Guardrail End Terminals.

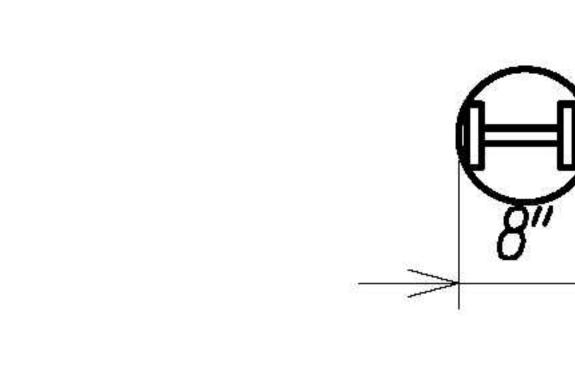




Rock Soil

ASTM C33 Coarse Aggregate, Size No. 57





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

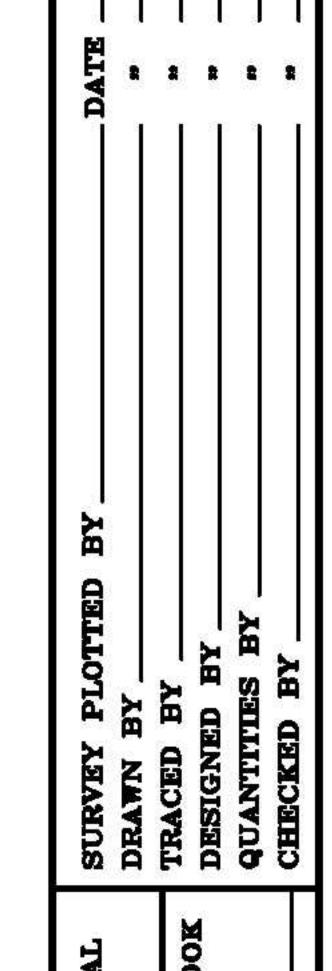
(A) ranging from 18-inches to the embedment depth of the post, depth of required drilling (B) is equal to either 12-inches or the

desired embedment depth minus the depth of soil whichever is less.

Overlying Soil Depths of 18 to 42-inches

10/21/2022 Revised note 3 to MASH

Strong Post W-Beam Guardrail In Rock



This work was prepared by me or under my supervision

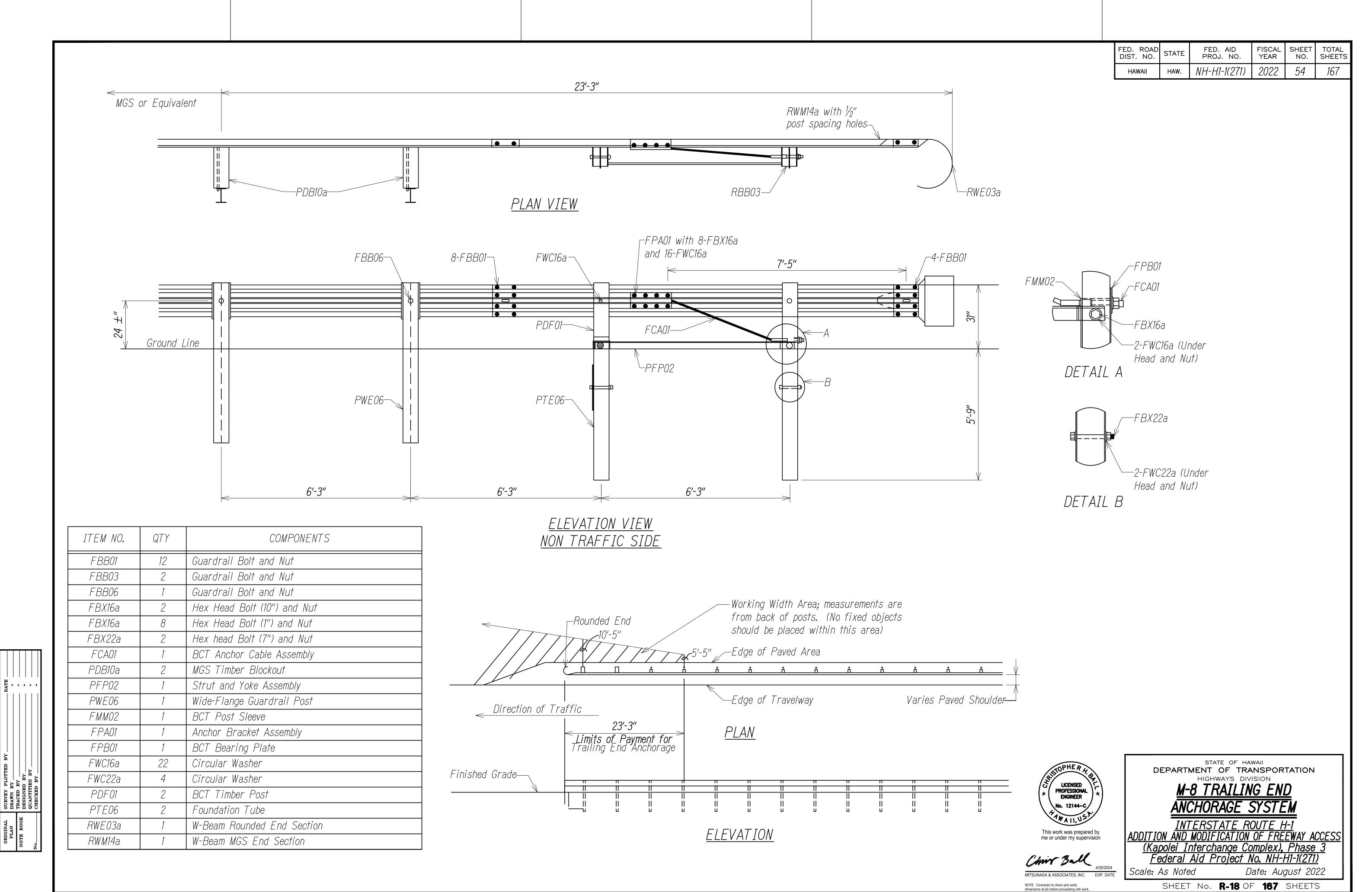
GUARDRAIL DETAILS 1 INTERSTATE ROUTE H-1

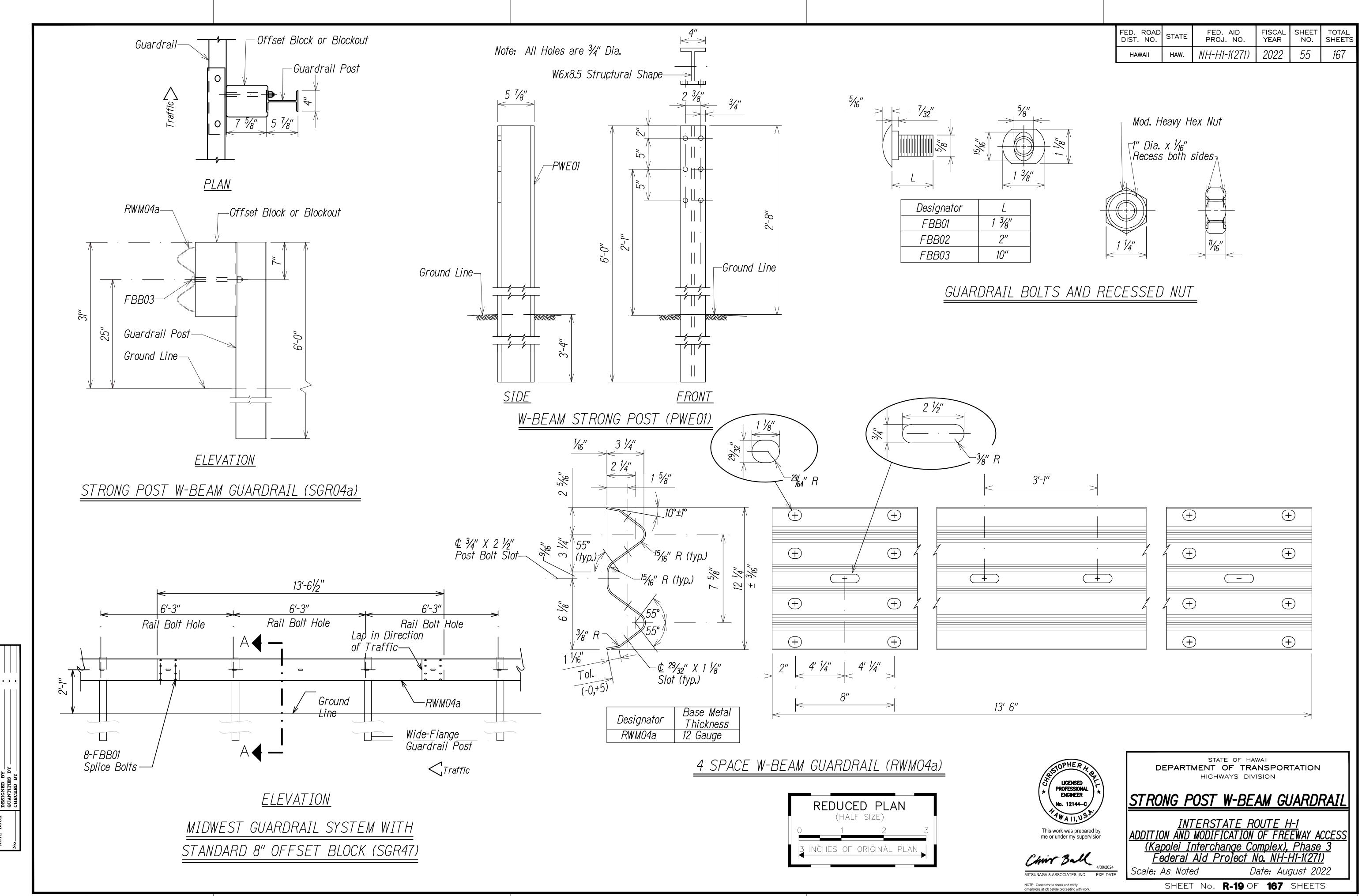
STATE OF HAWAII


DEPARTMENT OF TRANSPORTATION

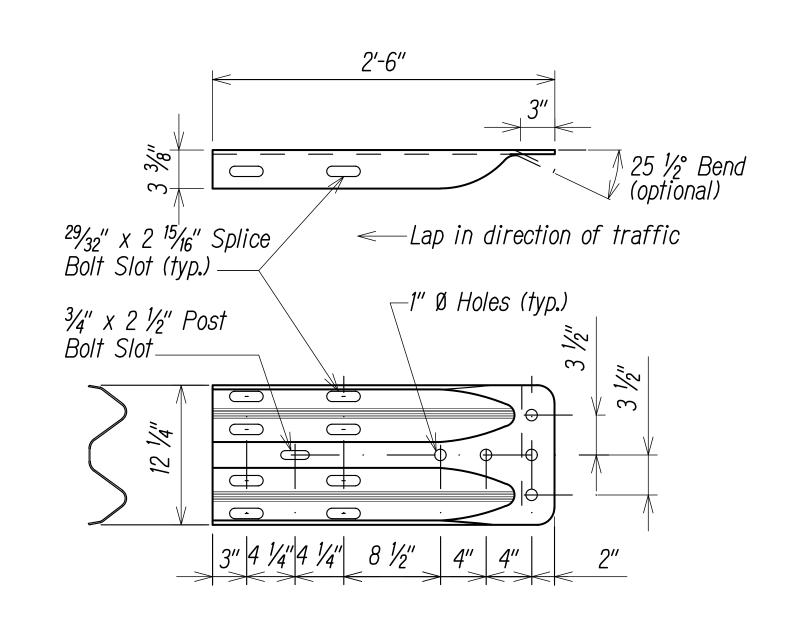
HIGHWAYS DIVISION

Date: August 2022 SHEET No. R-17 OF 167 SHEETS





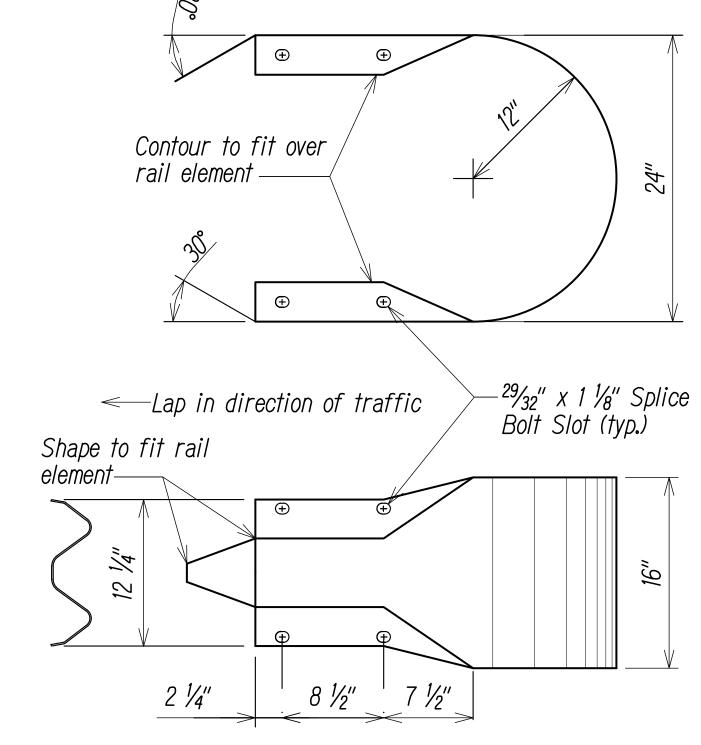




The cross-sectional dimensions for this part are to fit over part RWMO2a on the approach end and under part RWM02a on the trailing end.

DESIGNATOR	BASE METAL THICKNESS
RWE02b	10 Gauge

W-BEAM TERMINAL CONNECTOR (RWE02b)

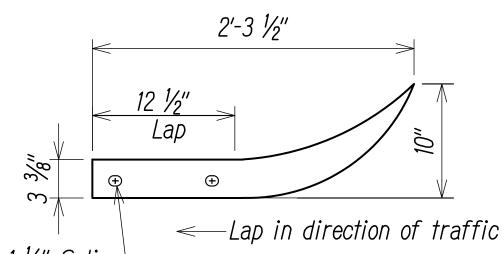


dimensions for this part are to fit over part RWMO2a

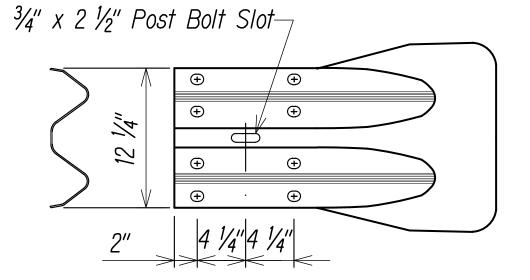
The cross-sectional

DESIGNATOR	BASE METAL THICKNESS
	THICKNESS
RWF06a	12 Gauge

W-BEAM END SECTION (BUFFER RWE06a)



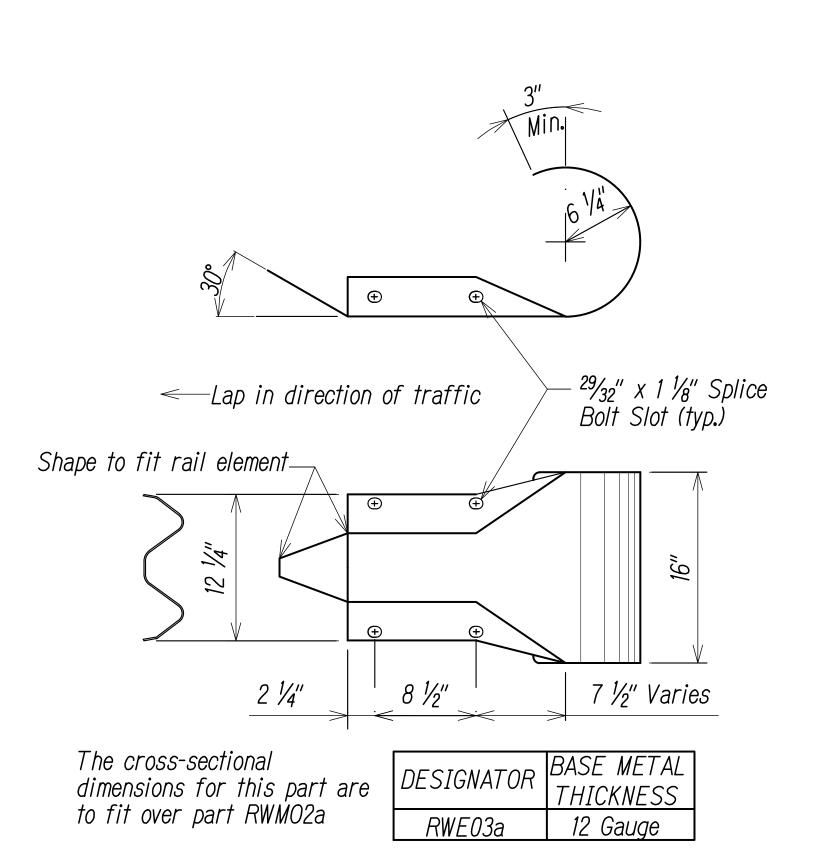
²⁹/₃₂" x 1 ½" Splice Bolt Slot (typ.)



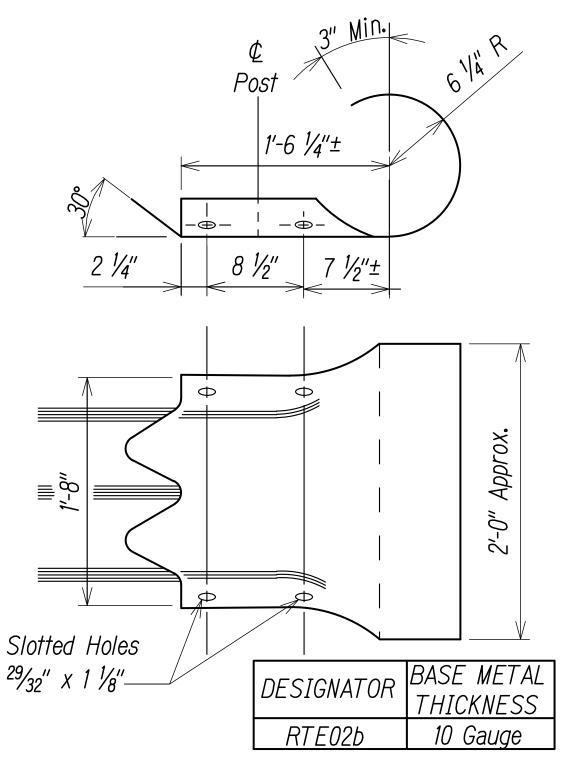
The cross-sectional dimensions for this part are to fit over part RWM02a on the approach end and under part RWM02a on the trailing end.

DESIGNATOR	BASE METAL THICKNESS
	THICKNESS
RWE01a	12 Gauge

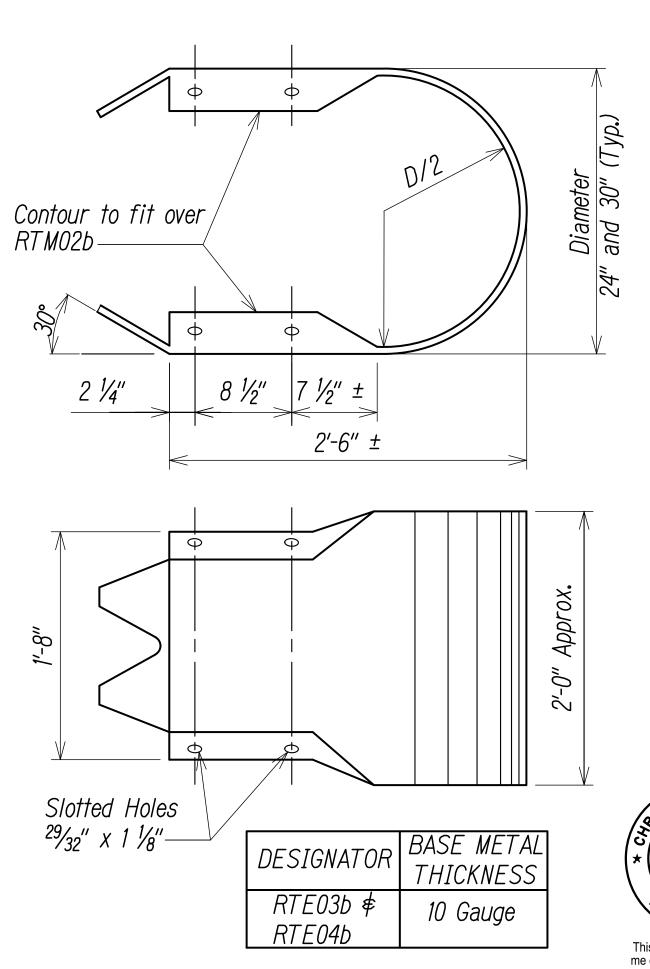
W-BEAM END SECTION (FLARED RWE01a)



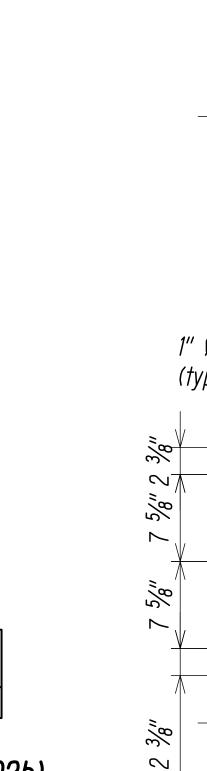
W-BEAM END SECTION (ROUNDED RWE03a)

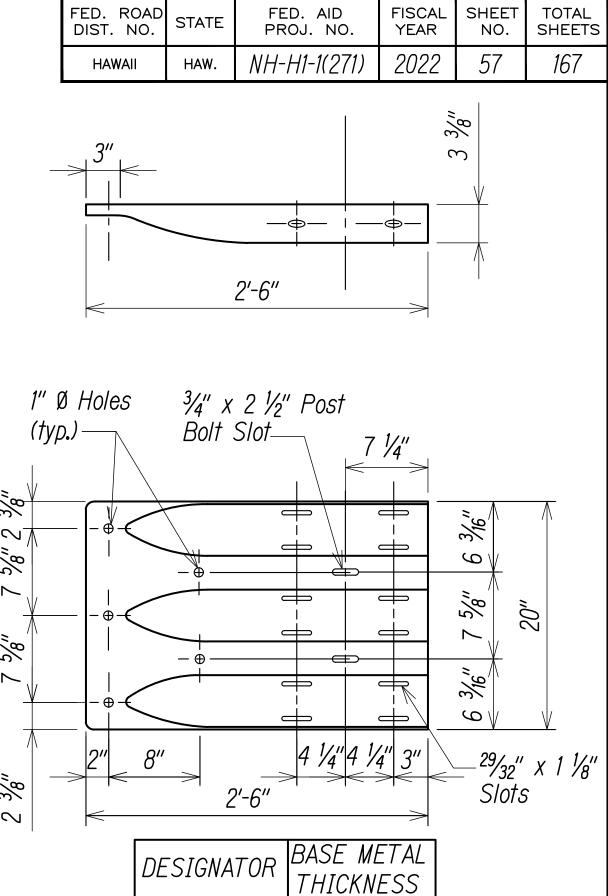


THRIE-BEAM SECTION (ROUNDED) (RTE02b)



THRIE-BEAM END SECTION (BUFFER RTE03b or RTE04b)





THRIE-BEAM TERMINAL CONNECTOR (RTE01b)

10 Gauge

RTE01b





Chir Bell 4/30/2024

MITSUNAGA & ASSOCIATES, INC. EXP. DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

GUARDRAIL TERMINAL CONNECTORS AND END SECTIONS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 3 Federal Aid Project No. NH-H1-1(271)

Scale: As Noted

Date: August 2022 SHEET No. R-21 OF 167 SHEETS

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