

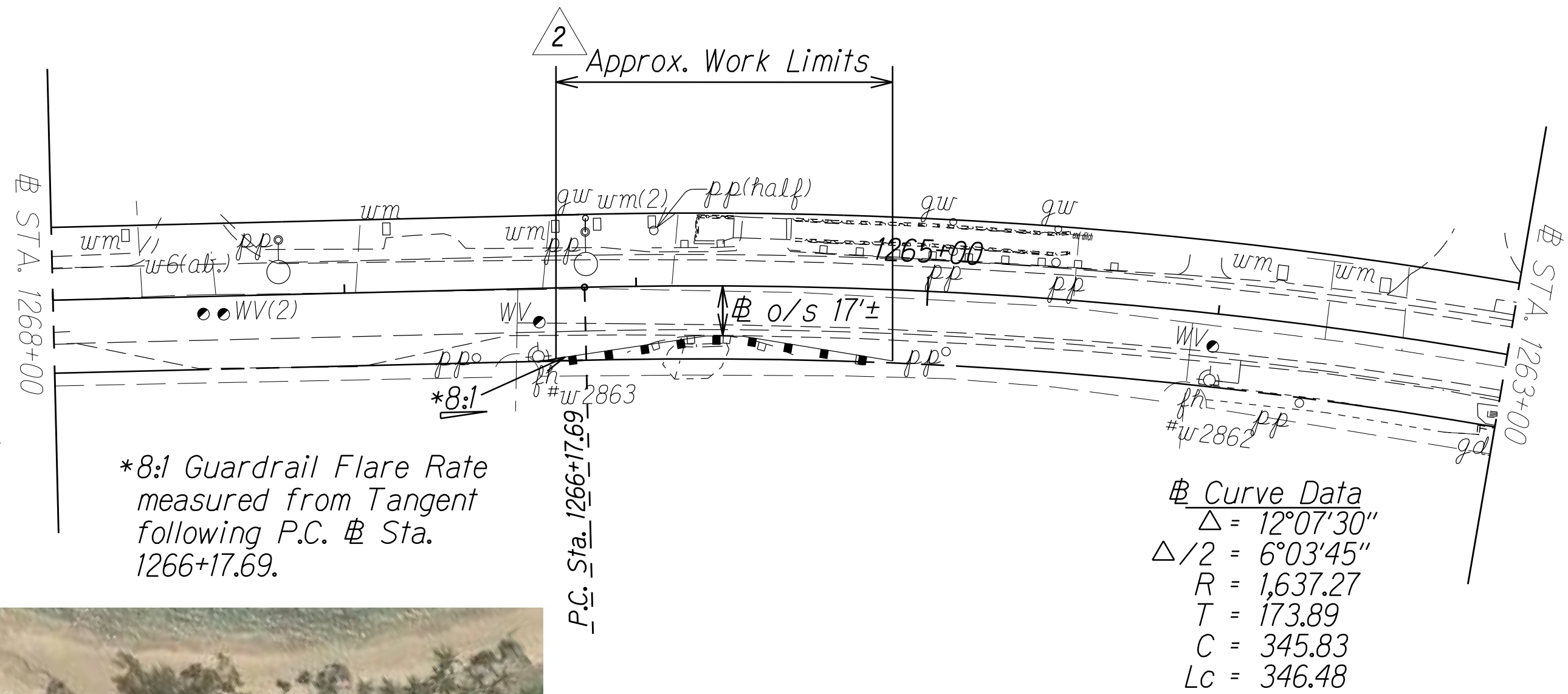
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(187)	2023	ADD. 19	27



2

2

Route 83 @ Sta. 1266+28.1 o/s 24' Lt. to @ Sta. 1265+11.1 o/s 24' Lt.
Remove existing guardrail
Install 37.5 L.F. MGS guardrail from @ Sta. 1265+88.4 o/s 19± Lt. to @ Sta. 1265+50.8 o/s 19± Lt.
Install MASH FLEAT Terminal TL-3 Standard Post System at approach and trailing end. See sheet ADD. 23S-4 for details.

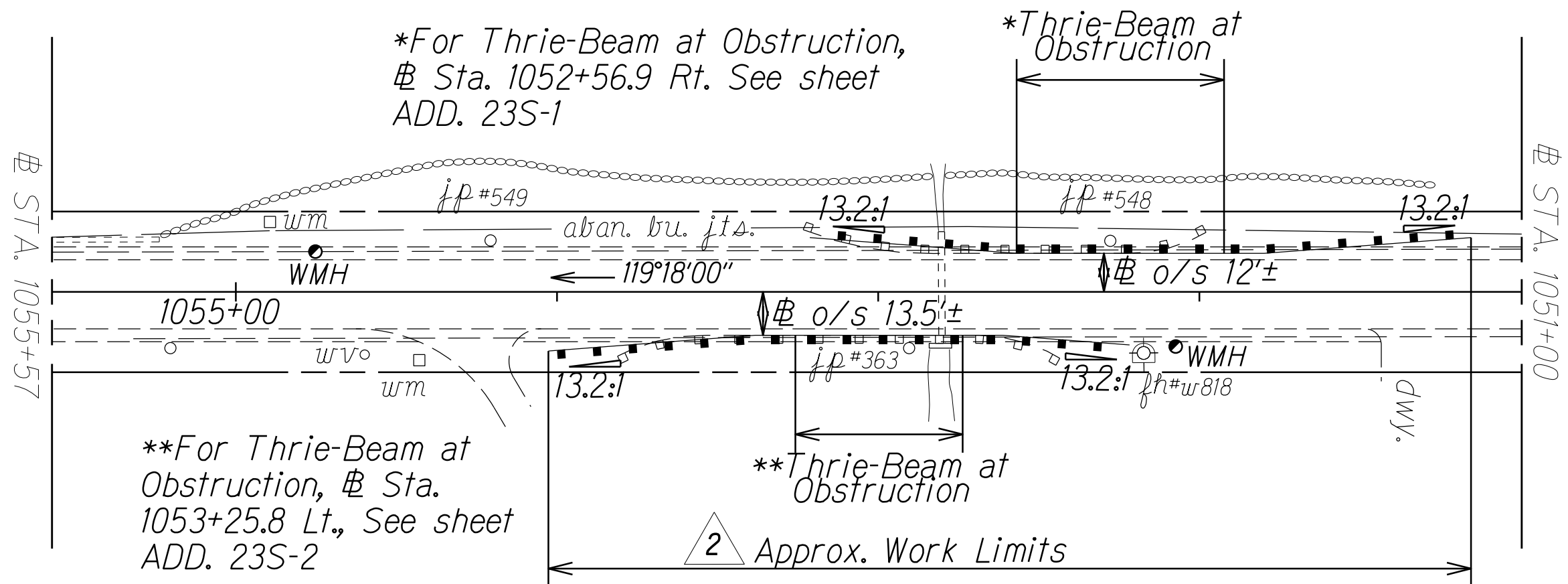


2

Route 83 @ STA. 1053+21.3 o/s 17± Rt. to STA. 1051+15.8 o/s 17± Rt.
Remove existing guardrail
Install 50 L.F. Thrie-Beam and Transition Sections at obstruction from @ Sta. 1052+56.9 o.s. 12± Rt. to @ Sta. 1051+92.7 o.s. 12± Rt.
Install 37.5 L.F. MGS guardrail from @ Sta. 1051+92.7 o.s. 12± Rt. to @ Sta. 1051+55.3 o.s. 12± Rt.
Install MASH FLEAT Terminal TL-3 Standard Post System at approach and trailing end. See sheet ADD. 23S-4 for details.

2

Route 83 @ STA. 1054+02.7 o/s 18± Lt. to STA. 1052+21.7 o/s 18± Lt.
Remove existing guardrail
Install 37.5 L.F. Thrie-Beam and Transition Sections at obstruction from @ Sta. 1053+25.8 o.s. 13.5± Lt. to @ Sta. 1052+73.7 o.s. 13.5± Lt.
Install 37.5 L.F. MGS guardrail from @ Sta. 1053+63.2 o.s. 13.5± Lt. to @ Sta. 1053+25.8 o.s. 13.5± Lt. and 12.5 L.F. from @ Sta. 1052+73.7 o.s. 13.5± Lt. to @ Sta. 1052+61.2 o.s. 13.5± Lt.
Install MASH FLEAT Terminal TL-3 Standard Post System at approach and trailing end. See sheet ADD. 23S-4 for details.



2

1

1/25/2024
Removed note and work for Route 83 @ Sta. 1265+40 to @ Sta. 1264+20
Revised Work at remaining locations on this sheet
1/10/2024
Updated note Route 83 @ Sta. 1265+40 to @ Sta. 1264+20
Update note Route 83 @ Sta. 1266+05 to @ Sta. 1265+80
Updated notes Route 83 @ Sta. 1053+25 to @ Sta. 1052+00 and Route 83 @ Sta. 1053+83 to @ Sta. 1052+44

DATE REVISION

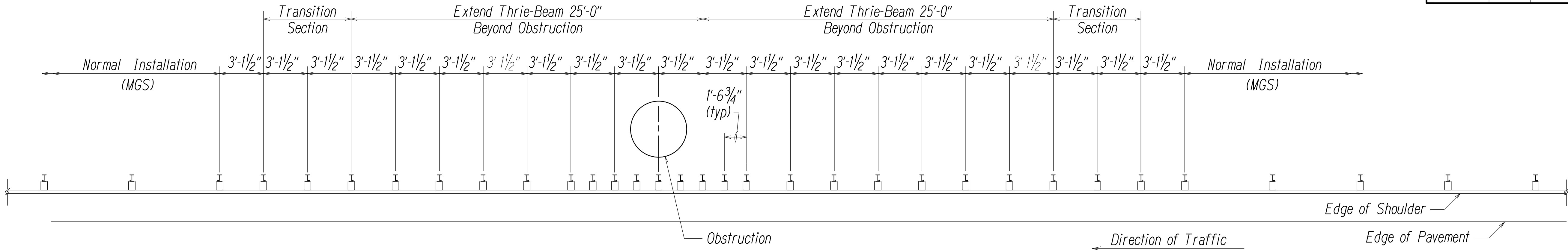
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ROADWAY PLAN
SITE 4 ROUTE 83 KAMEHAMEHA HIGHWAY 1
GUARDRAIL AND SHOULDER IMPROVEMENTS
At Various Locations, Phase 3, Oahu
Federal-Aid Project No. STP-0300(187)

Scale: 1" = 40' Date: DECEMBER, 2023

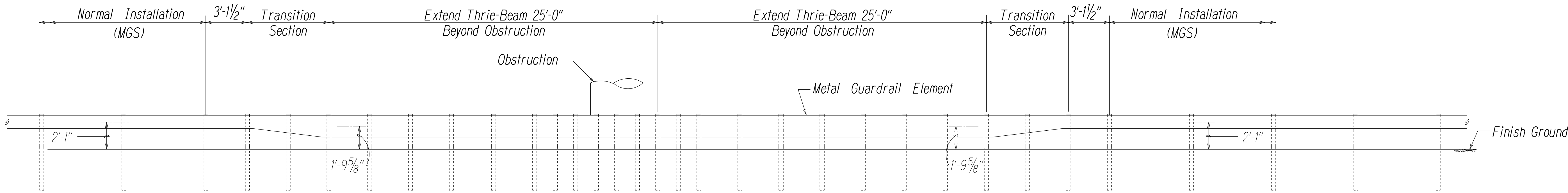
SHEET No. 12 OF 14 SHEETS

ADD. 19

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(187)	2023	ADD. 23S-1	27



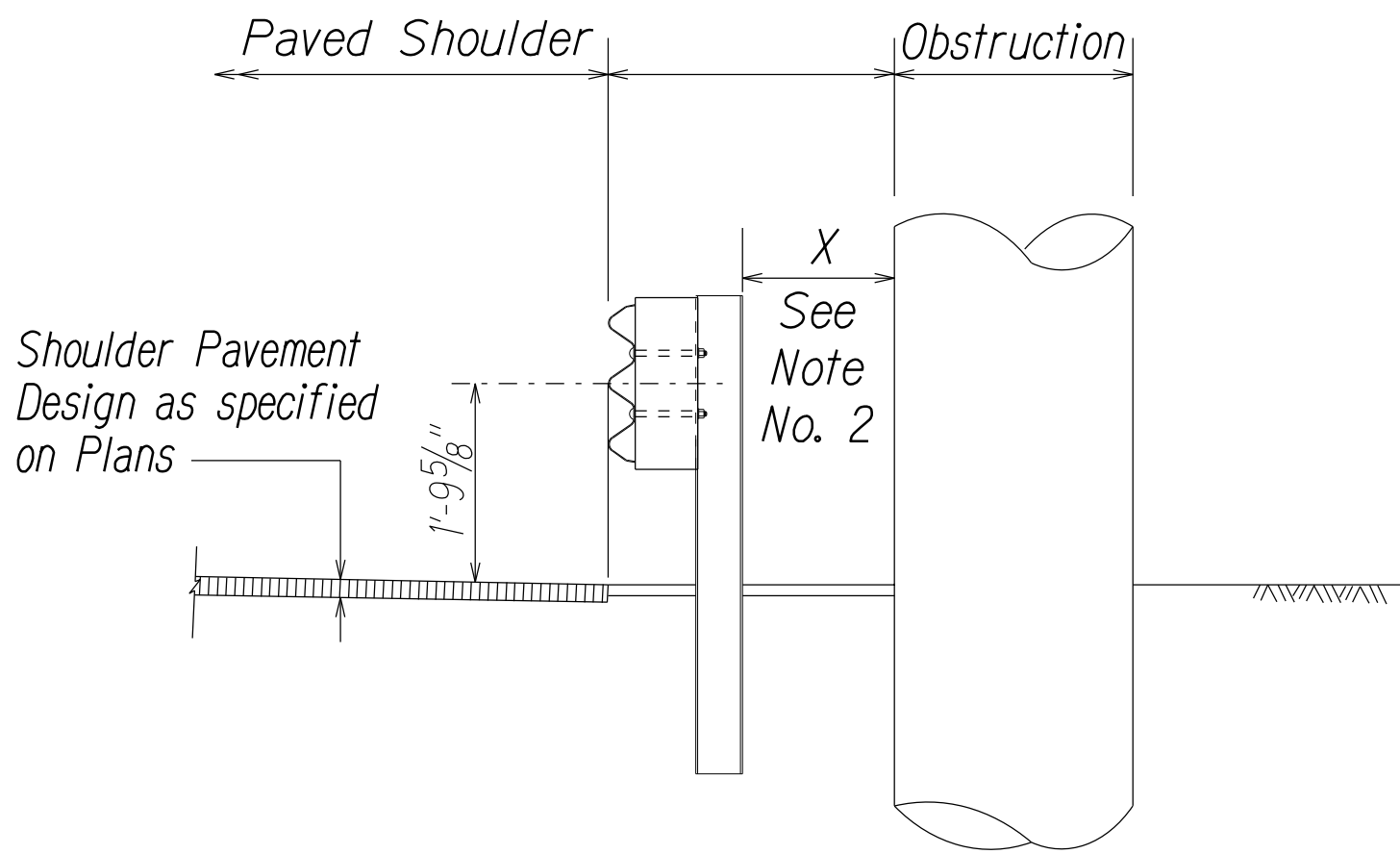
PLAN



ELEVATION

NOTES:

- All Guardrail and Concrete Barrier Designs at Obstructions shall be approved by the Engineer.
- If $X < 2'-0"$, Concrete Barrier or special guardrail design;
 $2'-0" \leq X < 4'-1"$, Strong Post Thrie-Beam with reduced post spacing;
 $4'-1" \leq X$, MGS with 6'-3" post spacing (Normal Installation).
- For Thrie-Beam and Transition Section Details, see sheet ADD. 23S-3.



TYPICAL SECTION AT OBSTRUCTION

DETAIL OF GUARDRAIL INSTALLATION AT OBSTRUCTION



1/25/2024

Added this sheet.

DATE

REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

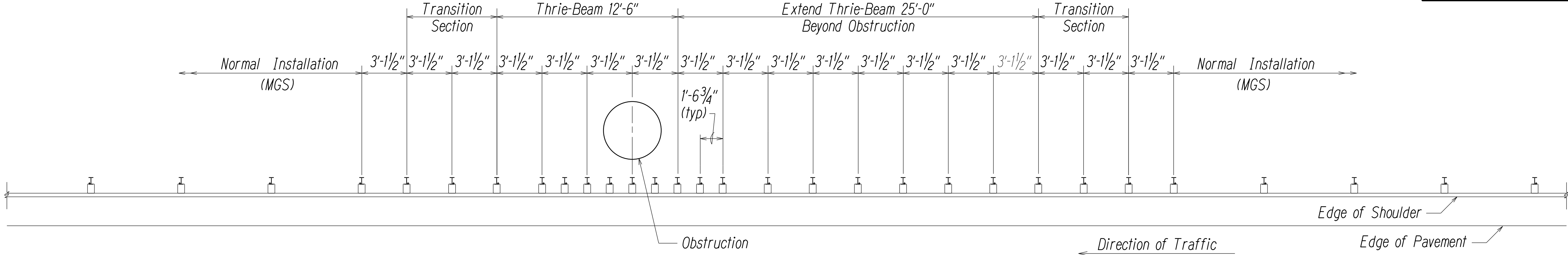
THRIE-BEAM AT OBSTRUCTION

Sta. 1052+56.9 Rt.

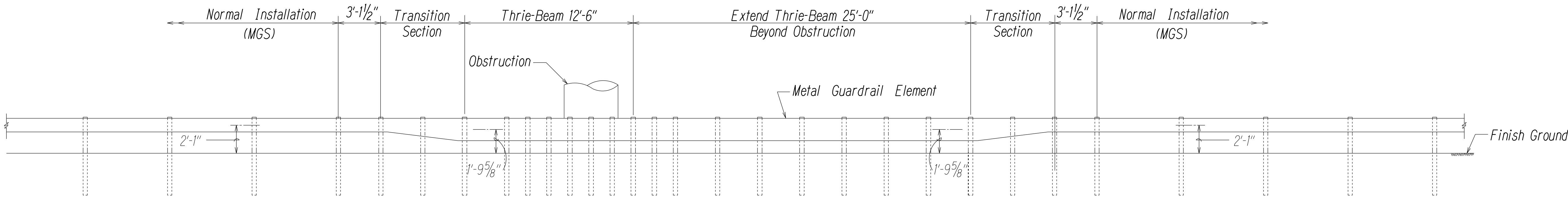
GUARDRAIL AND SHOULDER IMPROVEMENTS
At Various Locations, Phase 3, Oahu
Federal-Aid Project No. STP-0300(187)
Scale: 1" = 40' Date: DECEMBER, 2023

SHEET No. S-1 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(187)	2023	ADD. 23S-2	27



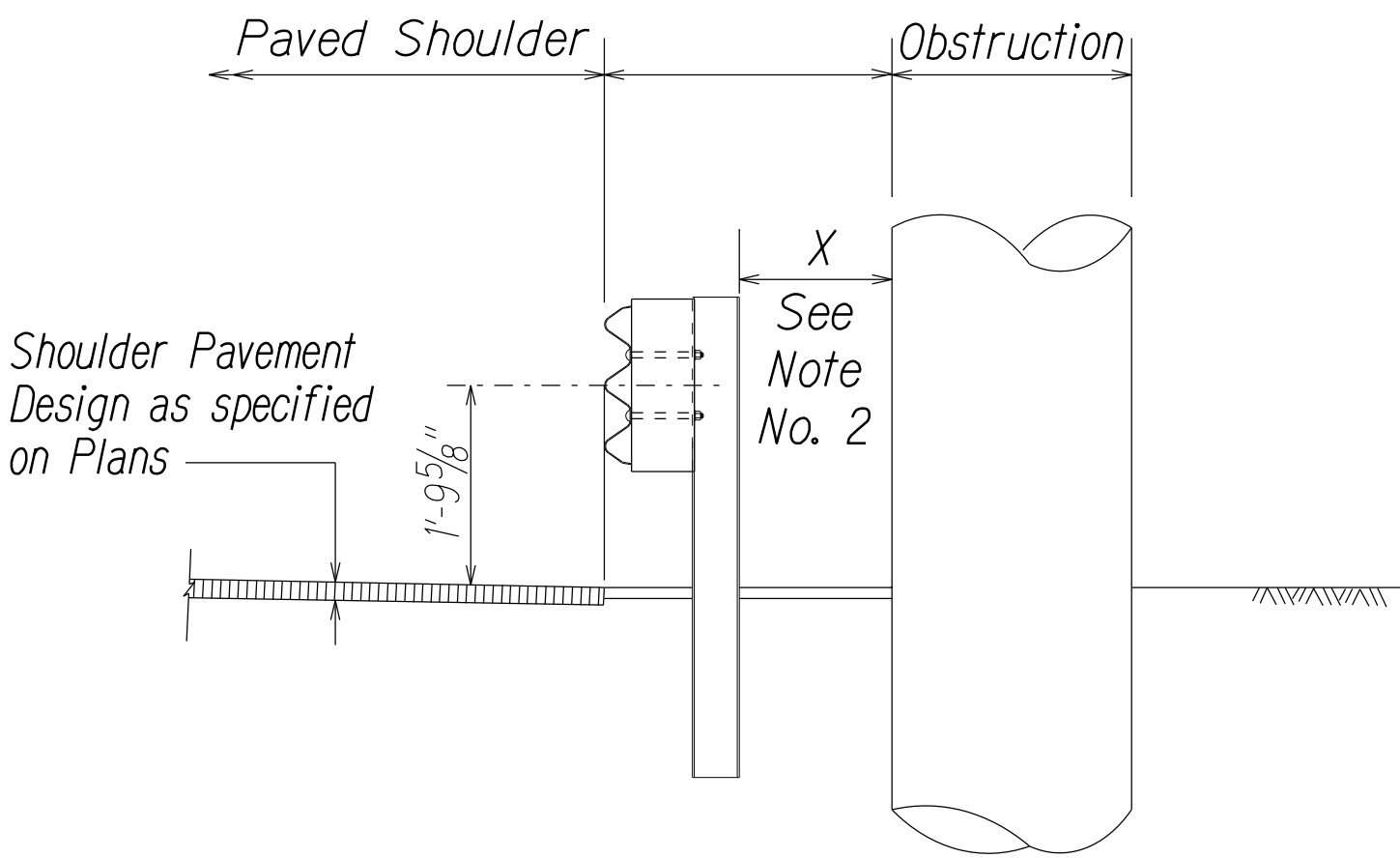
PLAN



ELEVATION

NOTES:

- All Guardrail and Concrete Barrier Designs at Obstructions shall be approved by the Engineer.
- If $X < 2'-0''$, Concrete Barrier or special guardrail design;
 $2'-0'' \leq X < 4'-1''$, Strong Post Thrie-Beam with reduced post spacing;
 $4'-1'' \leq X$, MGS with 6'-3" post spacing (Normal Installation).
- For Thrie-Beam and Transition Section Details, see sheet ADD. 23S-3.



TYPICAL SECTION AT OBSTRUCTION

DETAIL OF GUARDRAIL INSTALLATION AT OBSTRUCTION



1/25/2024 Added this sheet.

DATE

REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

THRIE-BEAM AT OBSTRUCTION

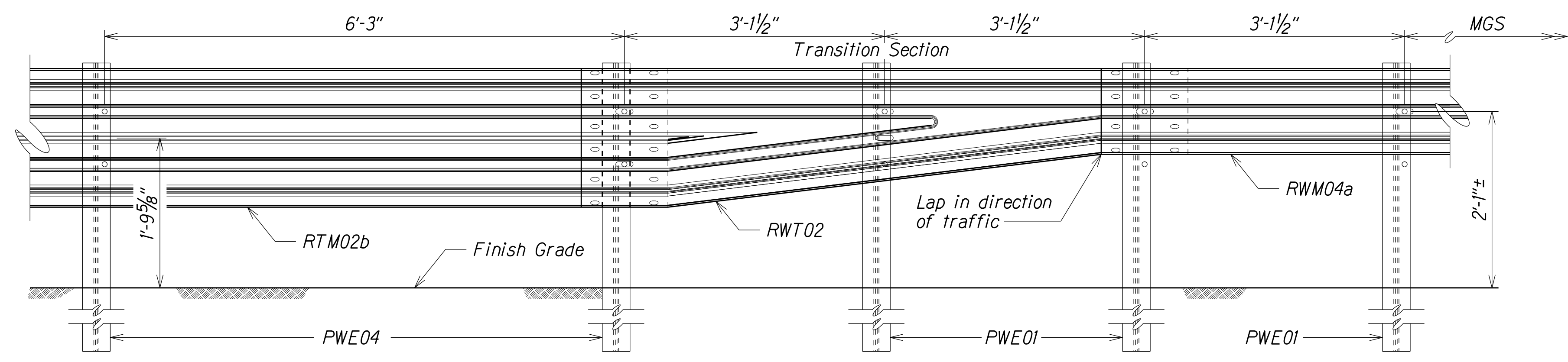
Sta. 1053+25.8 Lt.

GUARDRAIL AND SHOULDER IMPROVEMENTS
At Various Locations, Phase 3, Oahu
Federal-Aid Project No. STP-0300(187)
Scale: 1" = 40' Date: DECEMBER, 2023

SHEET No. S-2 OF 4 SHEETS

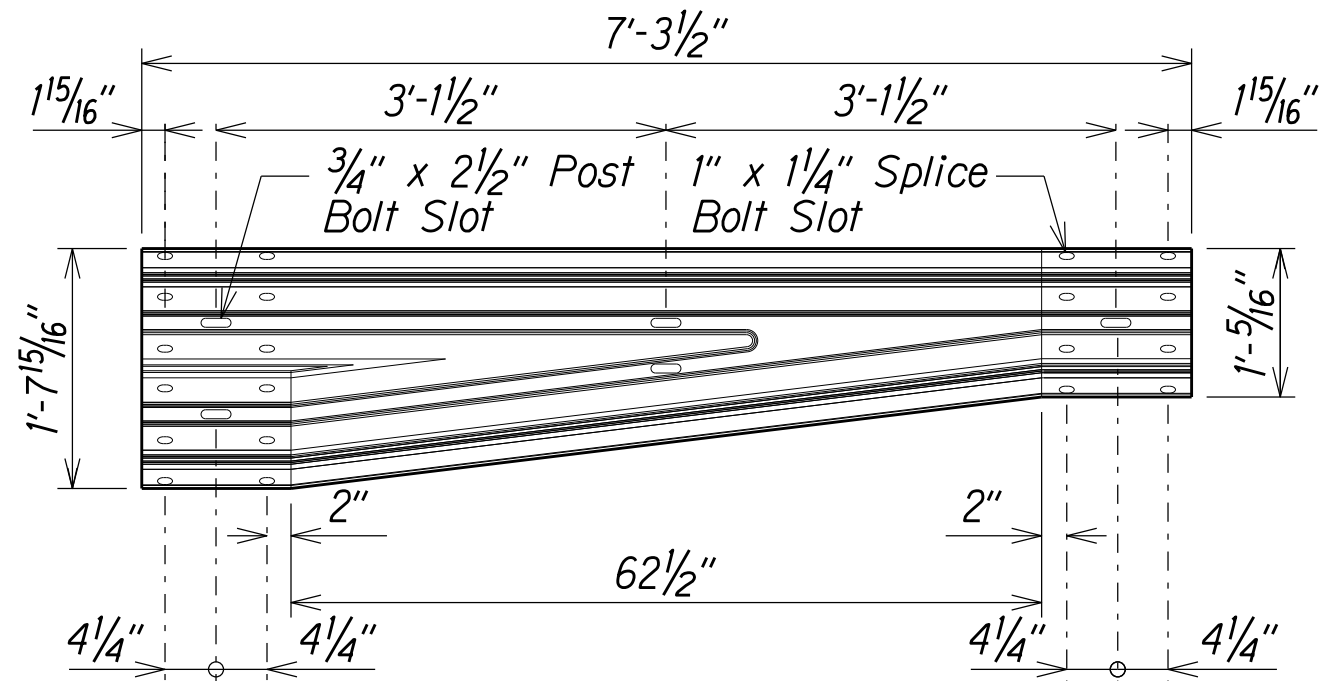
ADD. 23S-2

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(187)	2023	ADD. 23S-3	27

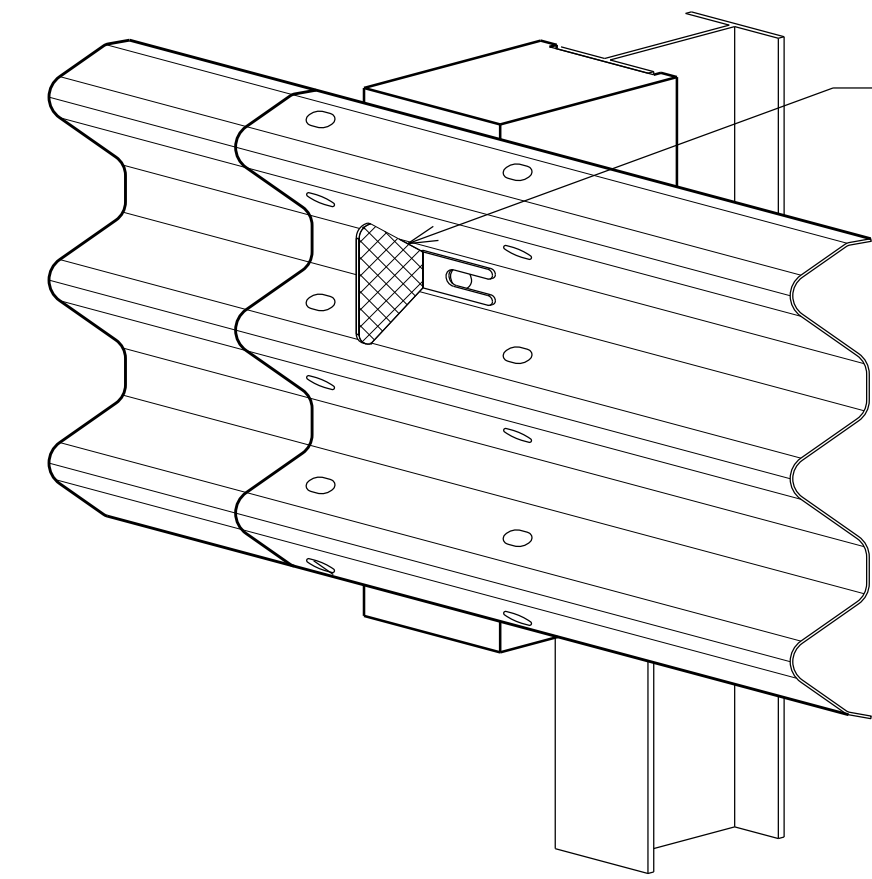


* Not to be used for Thrie Beam connection to structures.

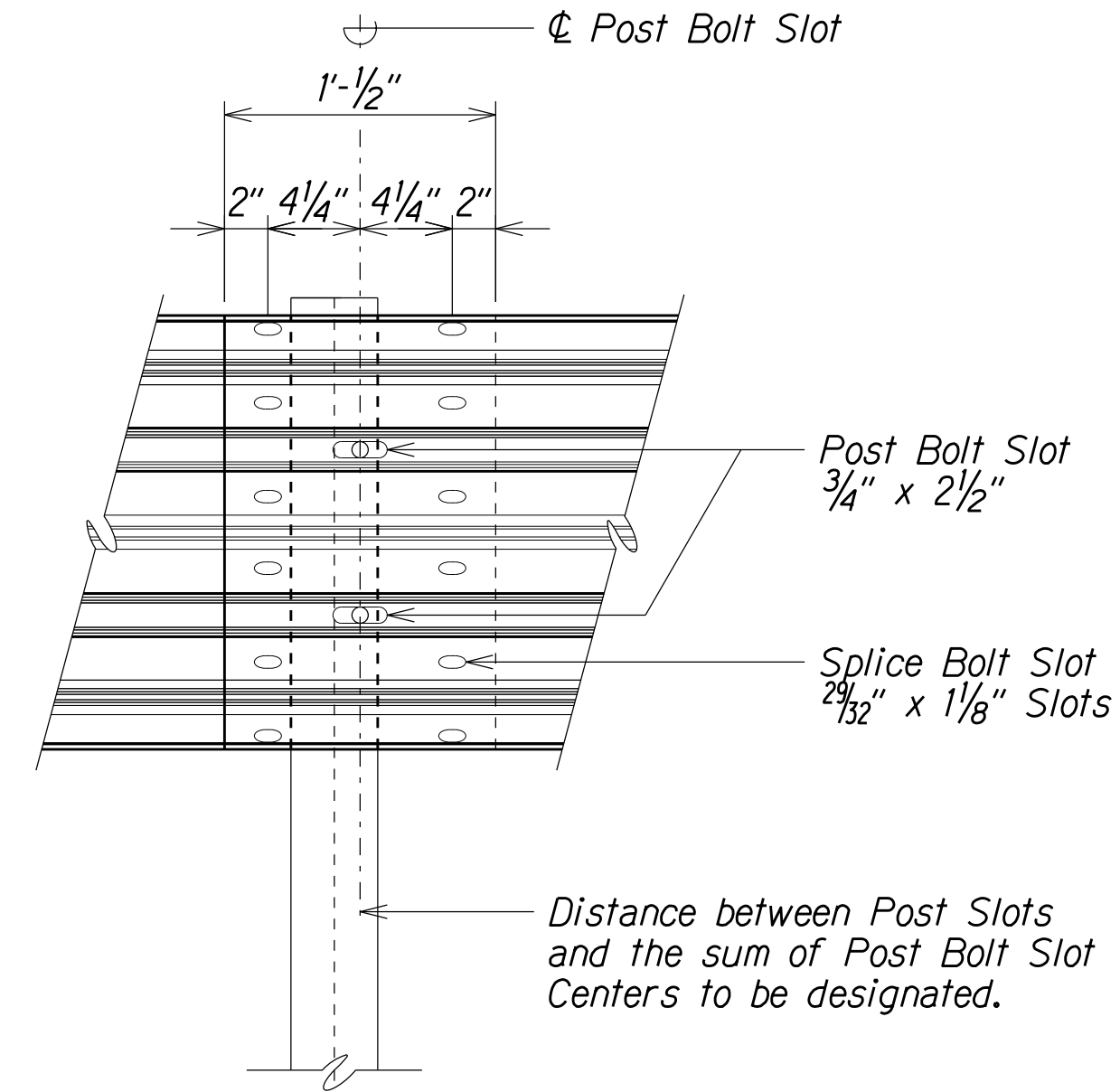
TRANSITION SECTION*



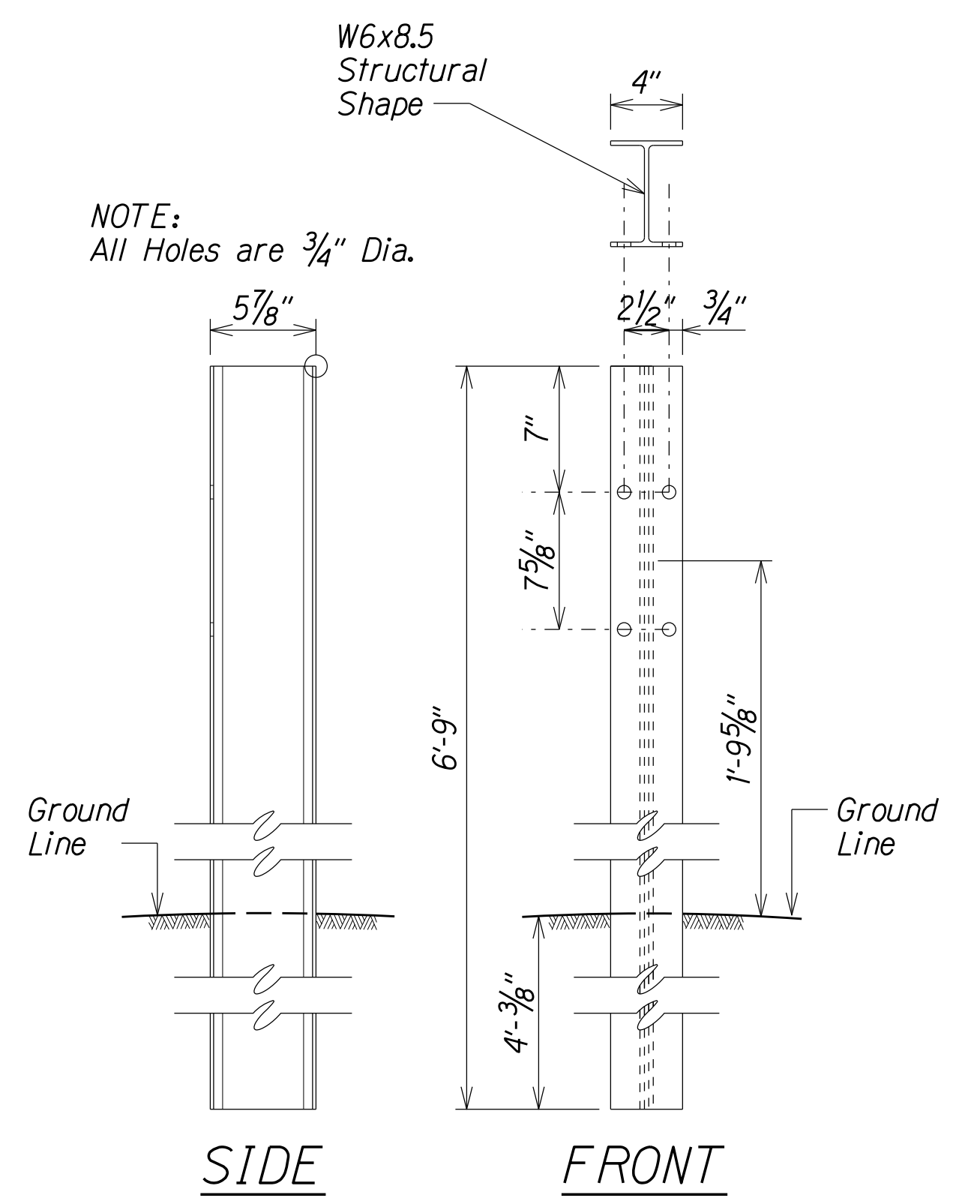
TRANSITION SECTION (RWT02)



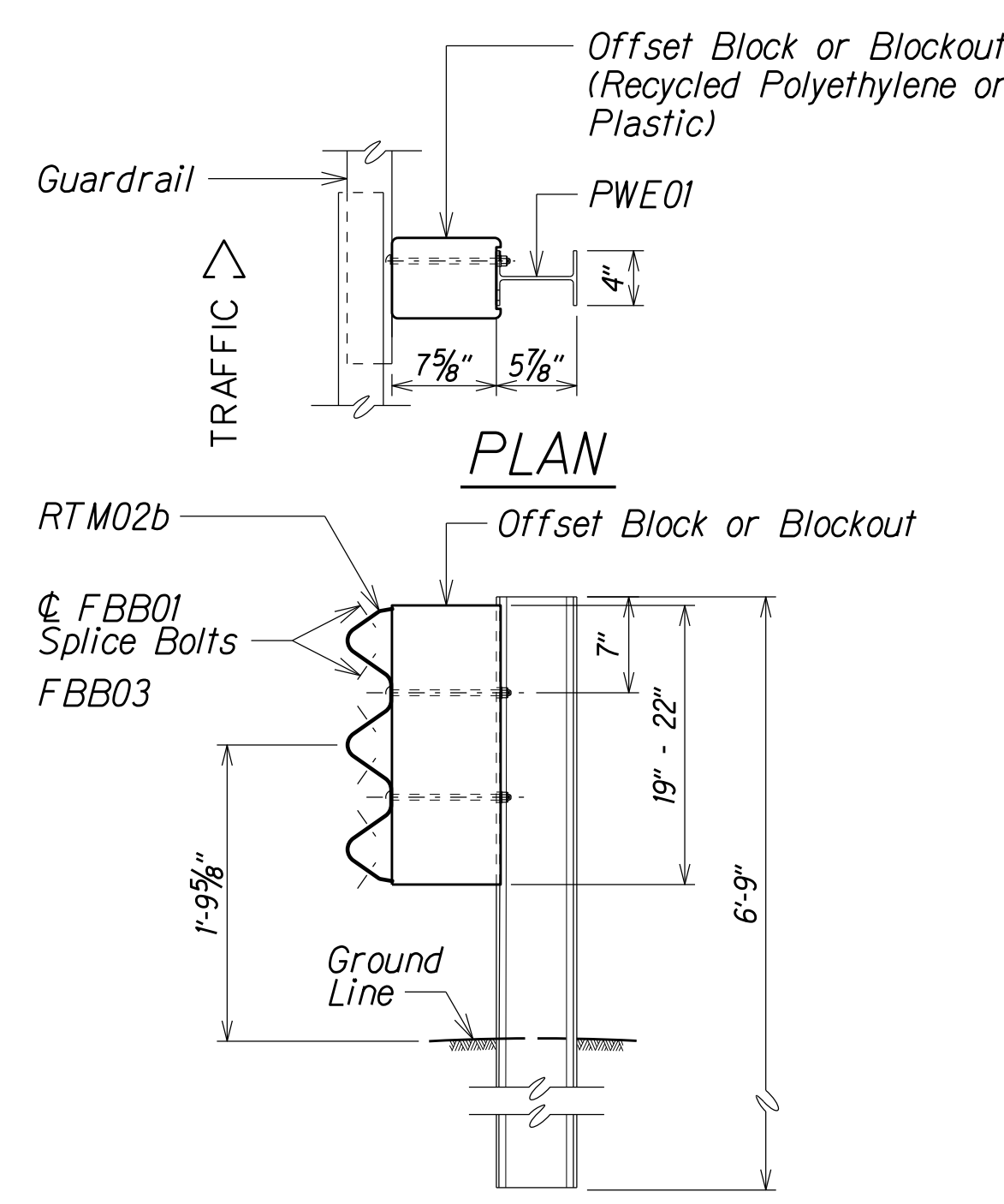
TYPICAL INSTALLATION OF REFLECTOR MARKER (RM-5)



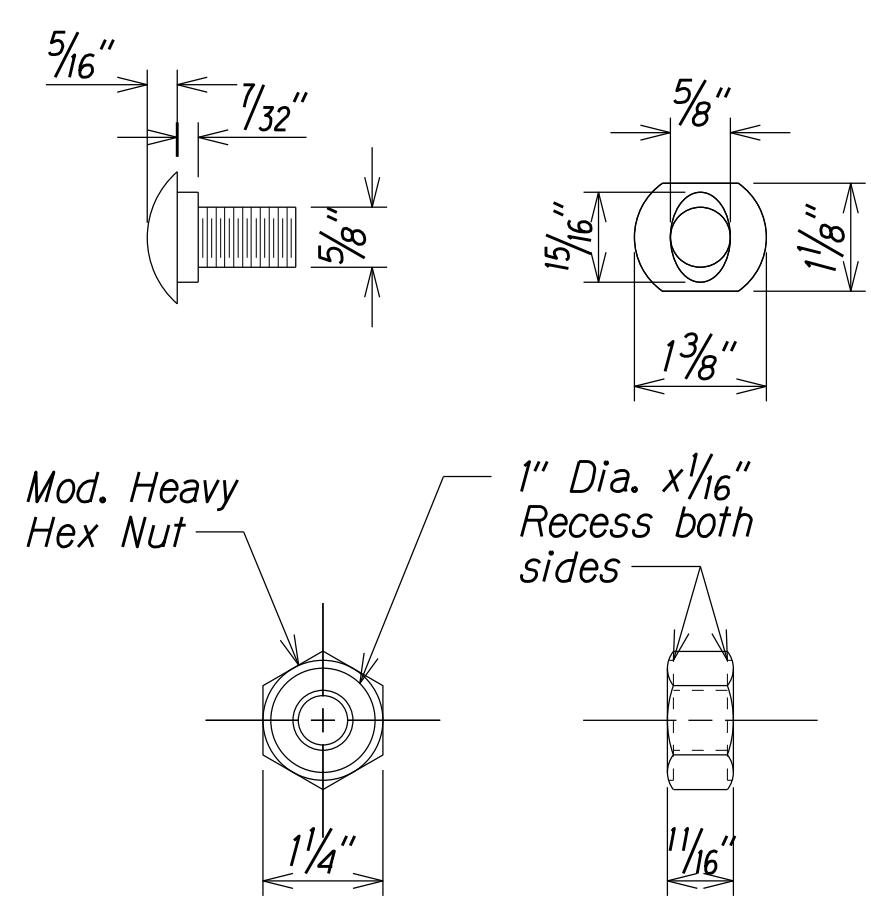
RAIL SPLICE



THRIE-BEAM STRONG POST FOR PLASTIC SPACER BLOCKS PWE04

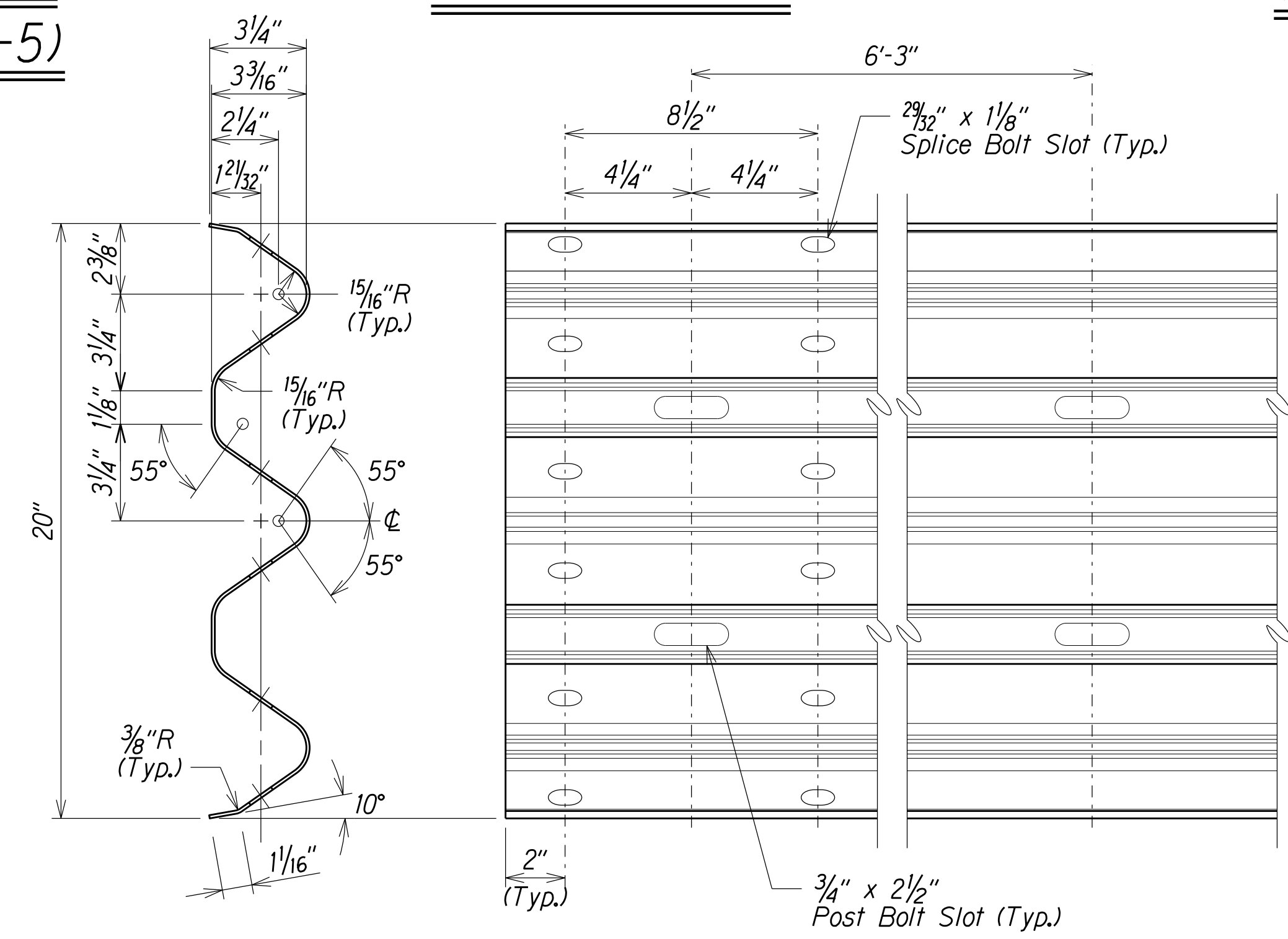


STRONG POST THRIE-BEAM GUARDRAIL (SGR09a)



GUARDRAIL BOLTS AND RECESSED NUT

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



1 & 2 SPACE THRIE-BEAM GUARDRAIL (RTM02b)

1/25/2024 Added this sheet.

DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STRONG POST THRIE-BEAM GUARDRAIL
GUARDRAIL AND SHOULDER IMPROVEMENTS
At Various Locations, Phase 3, Oahu
Federal-Aid Project No. STP-0300(187)
Scale: NTS Date: DECEMBER, 2023

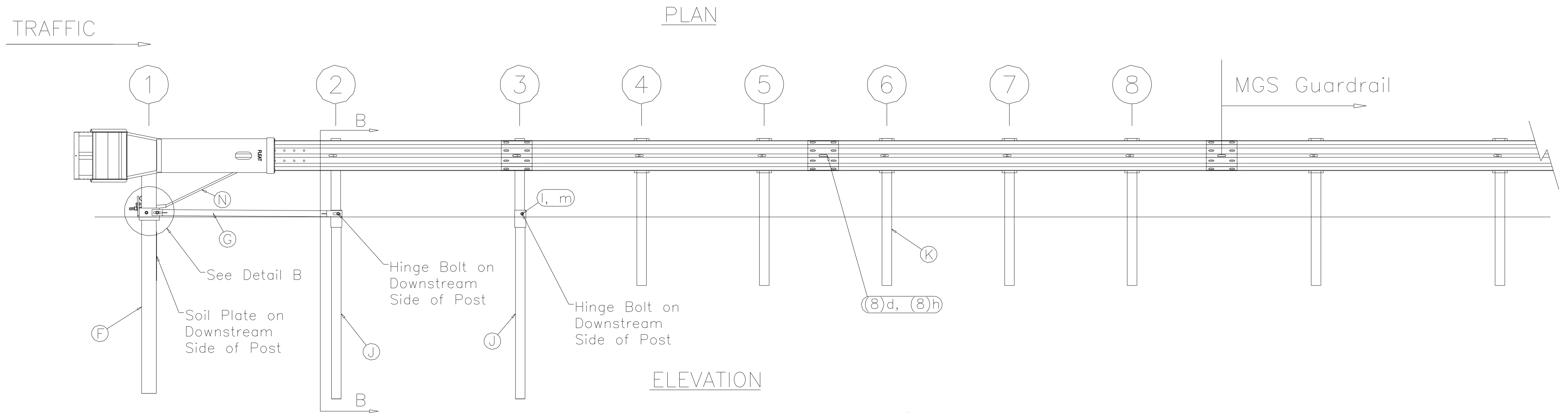
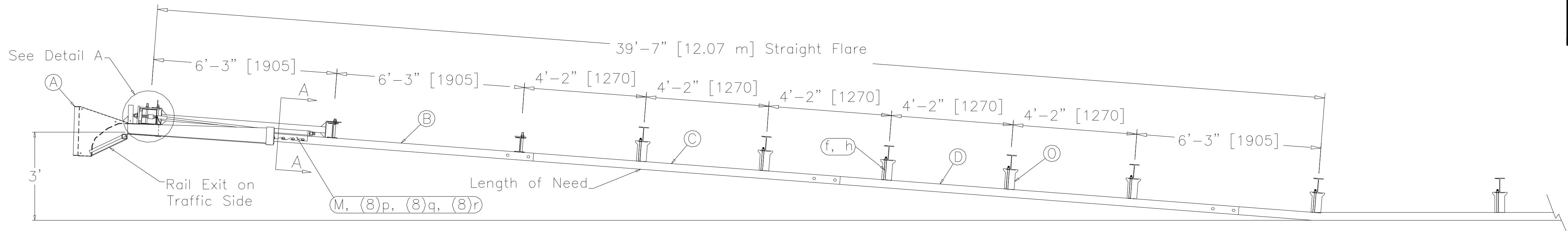
SHEET No. S-3 OF 4 SHEETS

ADD. 23S-3

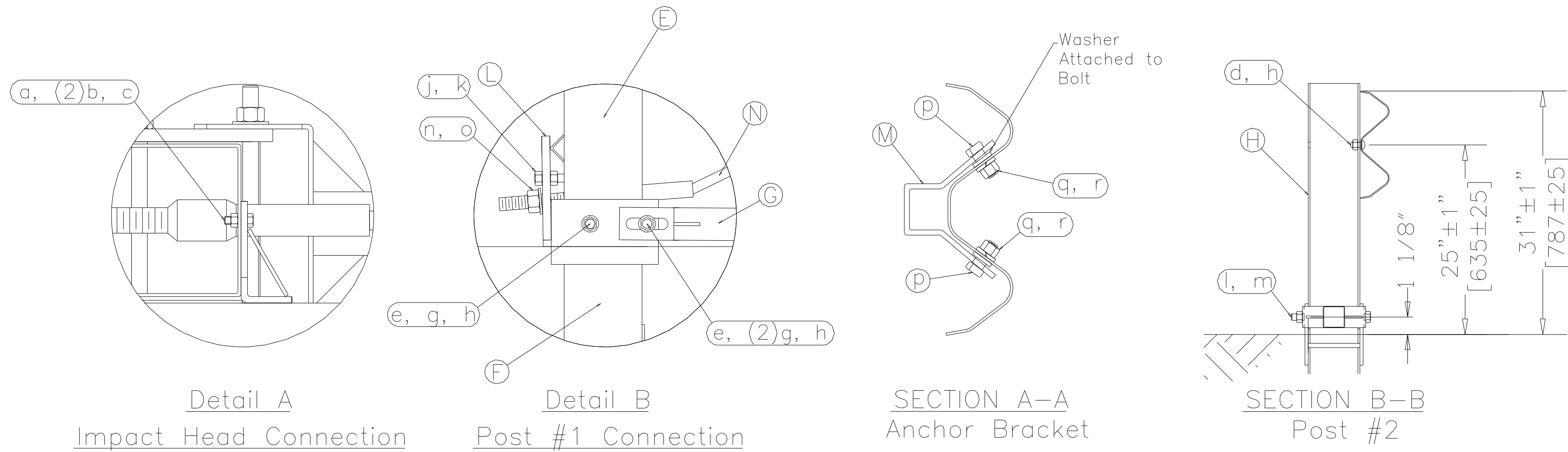
ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
CHECKED BY	

101E:\resist\standards\Traffic Guardrail Standards\thriebeam_B-5B.dgn

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(187)	2023	ADD. 23S-4	27



ITEM	QTY	BILL OF MATERIALS	ITEM NO.
A	1	FLEAT IMPACT HEAD	MF3000
B	1	FLEAT ANCHOR RAIL 12'-6"	SF1303
C	1	FLEAT SECOND RAIL 10'-5"	F1324
D	1	FLEAT THIRD RAIL 13'-6 1/2"	F1334
E	1	FIRST POST TOP (6X6X $\frac{1}{8}$ " Tube)	MP1A
F	1	FIRST POST BOTTOM (6' W6X15)	MP1B
G	1	GROUND STRUT	MS785
H	2	HINGE POST UPPER	MHP2A
J	2	HINGED POST LOWER	HP2B
K	5	STEEL LINE POST 6'	P621
L	1	MASH BEARING PLATE	ME750
M	1	CABLE ANCHOR BOX	S760
N	1	BCT CABLE ANCHOR ASSEMBLY	E770
O	5	RECYCLED PLASTIC BLOCK OR EQUIV.	CBSP-14
HARDWARE (ALL DIMENSIONS IN INCHES)			
a	2	5/16 x 1 HEX BOLT GRD 5	B5160104A
b	4	5/16 WASHER	W0516
c	2	5/16 HEX NUT	N0516
d	18	5/8 x 1 1/4 SPLICE BOLT	B580122
e	2	5/8 x 9 HEX BOLT GRD 5	B580904A
f	5	5/8 x 10 H.G.R. BOLT	B581002
g	3	5/8 WASHER	W050
h	25	5/8 H.G.R. NUT	N050
j	1	5/8 x 5" BOLT FULL THREAD GRD A449	B580504A
k	1	5/8 HEX NUT	N055
l	2	3/4 x 8 1/2 HEX BOLT GRD A449	B340854A
m	2	3/4 HEX NUT	N030
n	2	1 ANCHOR CABLE HEX NUT	N100
o	2	1 ANCHOR CABLE WASHER	W100
p	8	1/2 RSI SHOULDER BOLT W/WASHER	SB12A
q	8	1/2 STRUCTURAL NUT	N012A
r	8	1/2 STRUCTURAL WASHER	W012A



GENERAL NOTES:

- All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
- The lower sections of the Posts 1, 2 & 3 shall not protrude more than 4 in above the ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
- The lower sections of the hinged posts should not be driven with the upper post attached. If the post is placed in a drilled hole, the backfill material must be satisfactorily compacted to prevent settlement.
- When competent rock is encountered, a 12" Ø post hole, 20 in. deep cored into the rock surface may be used if approved by the engineer for Posts 1 and/or 2. Granular material will be placed in the bottom of the hole, approximately 2.5" deep to provide drainage. The first and/or second post can be field cut to length, placed in the hole and backfilled with suitable backfill. The soil plate may be trimmed if required.
- 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.



1/25/2024 Added this sheet.

DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
MASH FLEAT TERMINAL
TL-3 STANDARD POST SYSTEM
GUARDRAIL AND SHOULDER IMPROVEMENTS
At Various Locations, Phase 3, Oahu
Federal-Aid Project No. STP-0300(187)
Scale: NTS Date: DECEMBER, 2023

SHEET No. S-4 OF 4 SHEETS

ADD. 23S-4