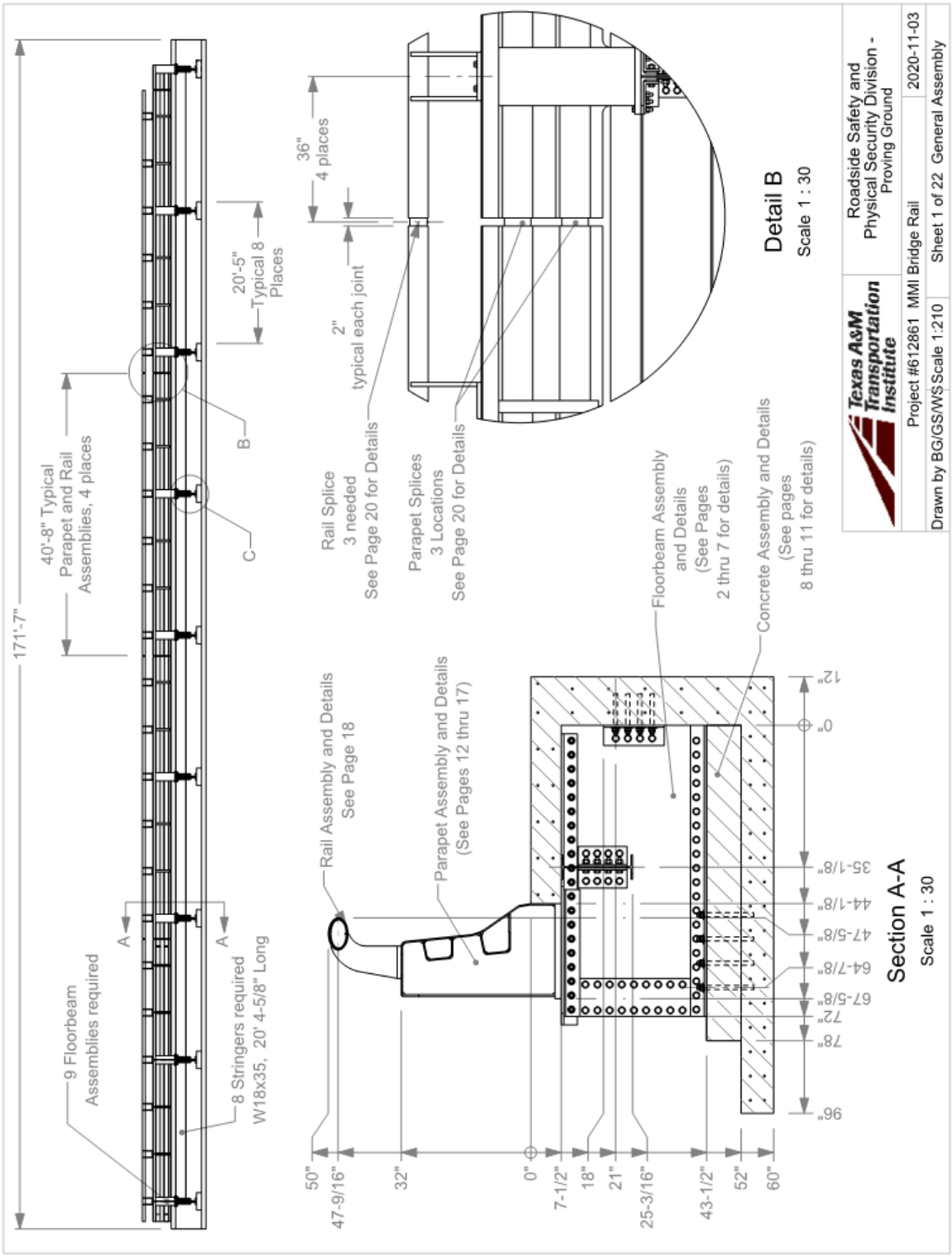
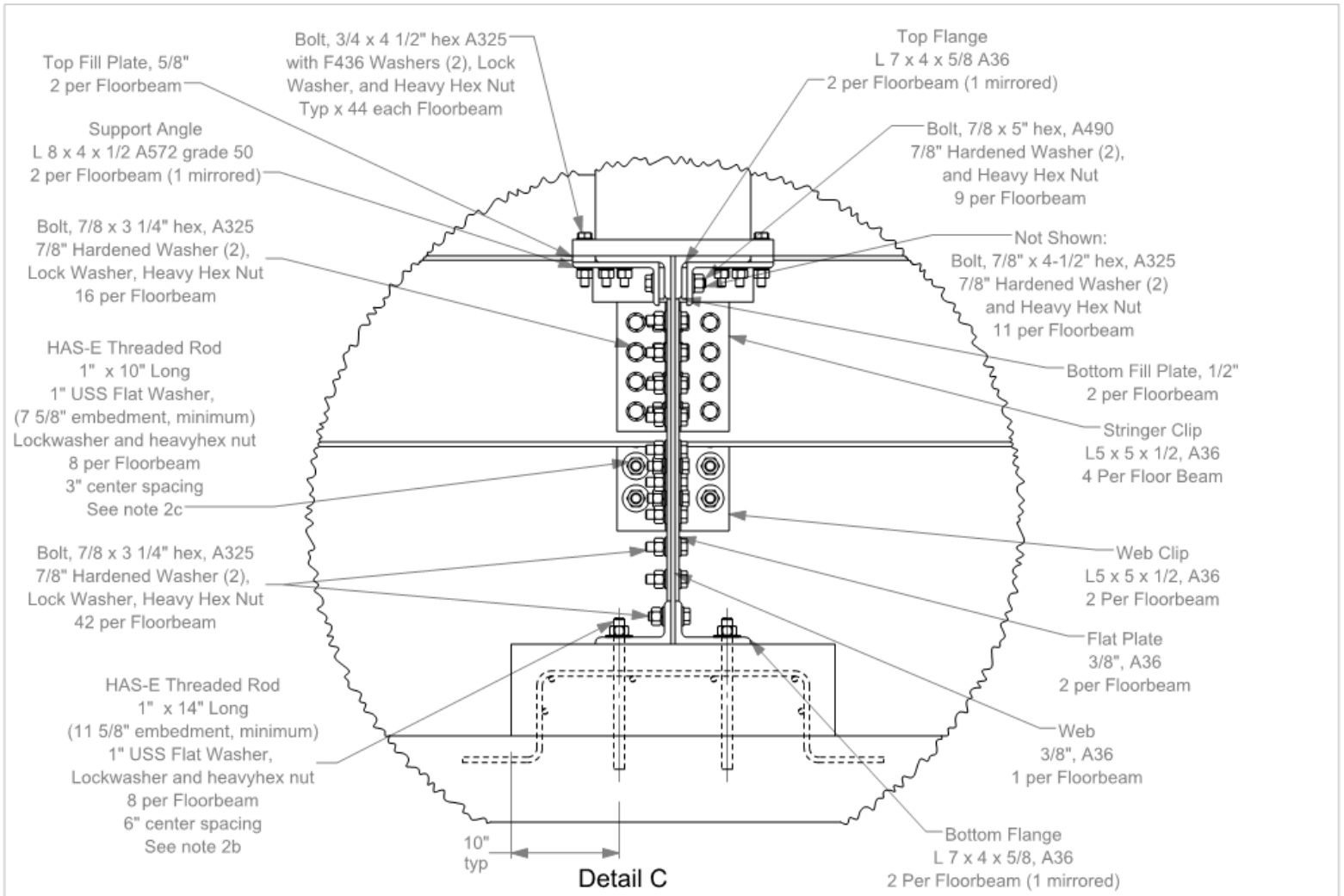
APPENDIX A. DETAILS OF MDTA CHESAPEAKE BAY BRIDGE STEEL RAIL SYSTEM




Bolt, 3/4 x 4 1/2" hex A325
with F436 Washers (2), Lock
Washer, and Heavy Hex Nut
Typ x 44 each Floorbeam
Top Fill Plate, 5/8"
2 per Floorbeam
Top Flange
L 7 x 4 x 5/8 A36
2 per Floorbeam (1 mirrored)
Support Angle
L 8 x 4 x 1/2 A572 grade 50
2 per Floorbeam (1 mirrored)
Bolt, 7/8 x 5" hex, A490
7/8" Hardened Washer (2),
and Heavy Hex Nut
9 per Floorbeam
Bolt, 7/8 x 3 1/4" hex, A325
7/8" Hardened Washer (2),
Lock Washer, Heavy Hex Nut
16 per Floorbeam
Not Shown:
Bolt, 7/8" x 4-1/2" hex, A325
7/8" Hardened Washer (2)
and Heavy Hex Nut
11 per Floorbeam
HAS-E Threaded Rod
1" x 10" Long
1" USS Flat Washer,
(7 5/8" embedment, minimum)
Lockwasher and heavyhex nut
8 per Floorbeam
3" center spacing
See note 2c
Bottom Fill Plate, 1/2"
2 per Floorbeam
Stringer Clip
L5 x 5 x 1/2, A36
4 Per Floor Beam
Bolt, 7/8 x 3 1/4" hex, A325
7/8" Hardened Washer (2),
Lock Washer, Heavy Hex Nut
42 per Floorbeam
Web Clip
L5 x 5 x 1/2, A36
2 Per Floorbeam
Flat Plate
3/8", A36
2 per Floorbeam
HAS-E Threaded Rod
1" x 14" Long
(11 5/8" embedment, minimum)
1" USS Flat Washer,
Lockwasher and heavyhex nut
8 per Floorbeam
6" center spacing
See note 2b
Web
3/8", A36
1 per Floorbeam
10"
typ
Bottom Flange
L 7 x 4 x 5/8, A36
2 Per Floorbeam (1 mirrored)
Detail C
Floorbeam, 9 required
2a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted
2b. All Anchors in concrete to be epoxied in using HIT-RE 500 V3, with Hilti instructions.
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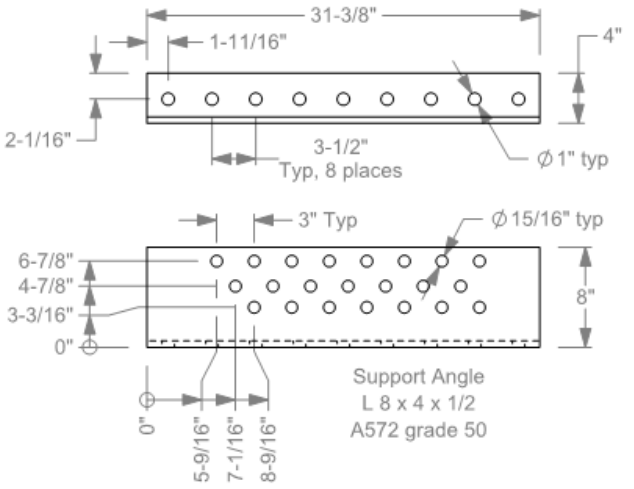
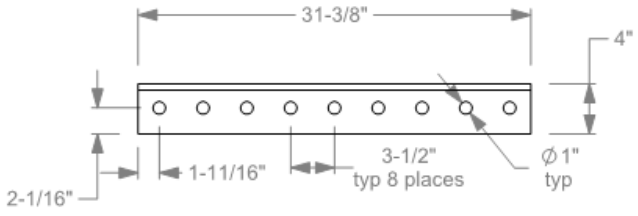
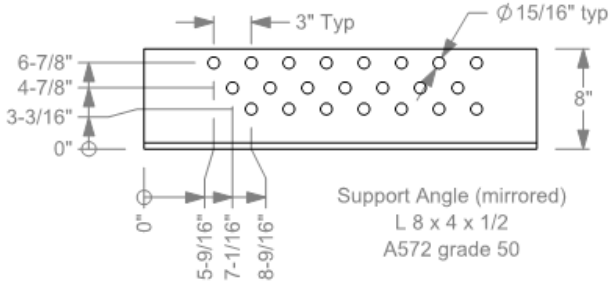
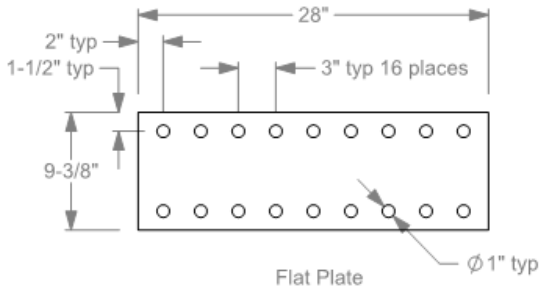
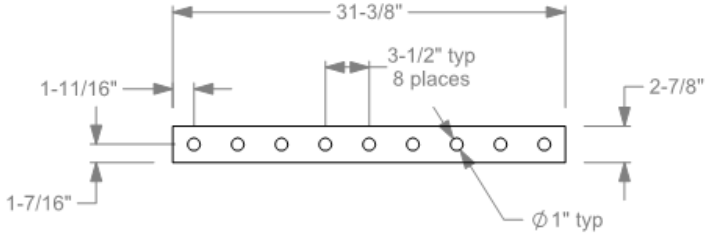
Scale 1:12
Sheet 2 of 22 Floorbeam Assembly

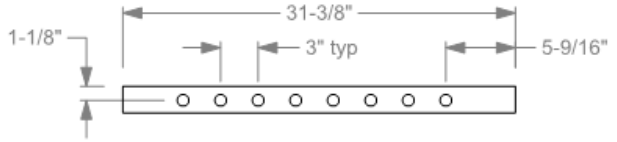












3a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted

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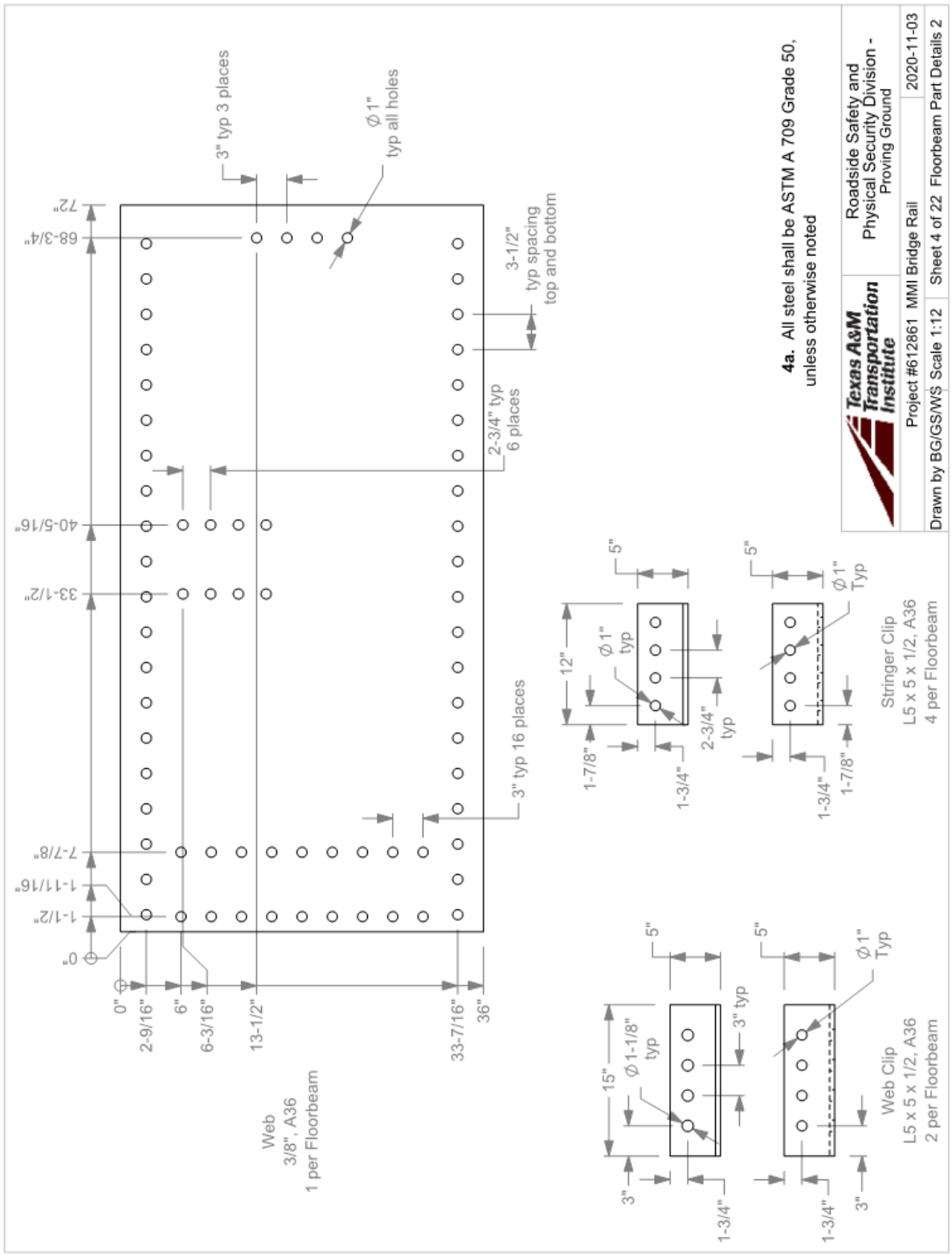
4a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted
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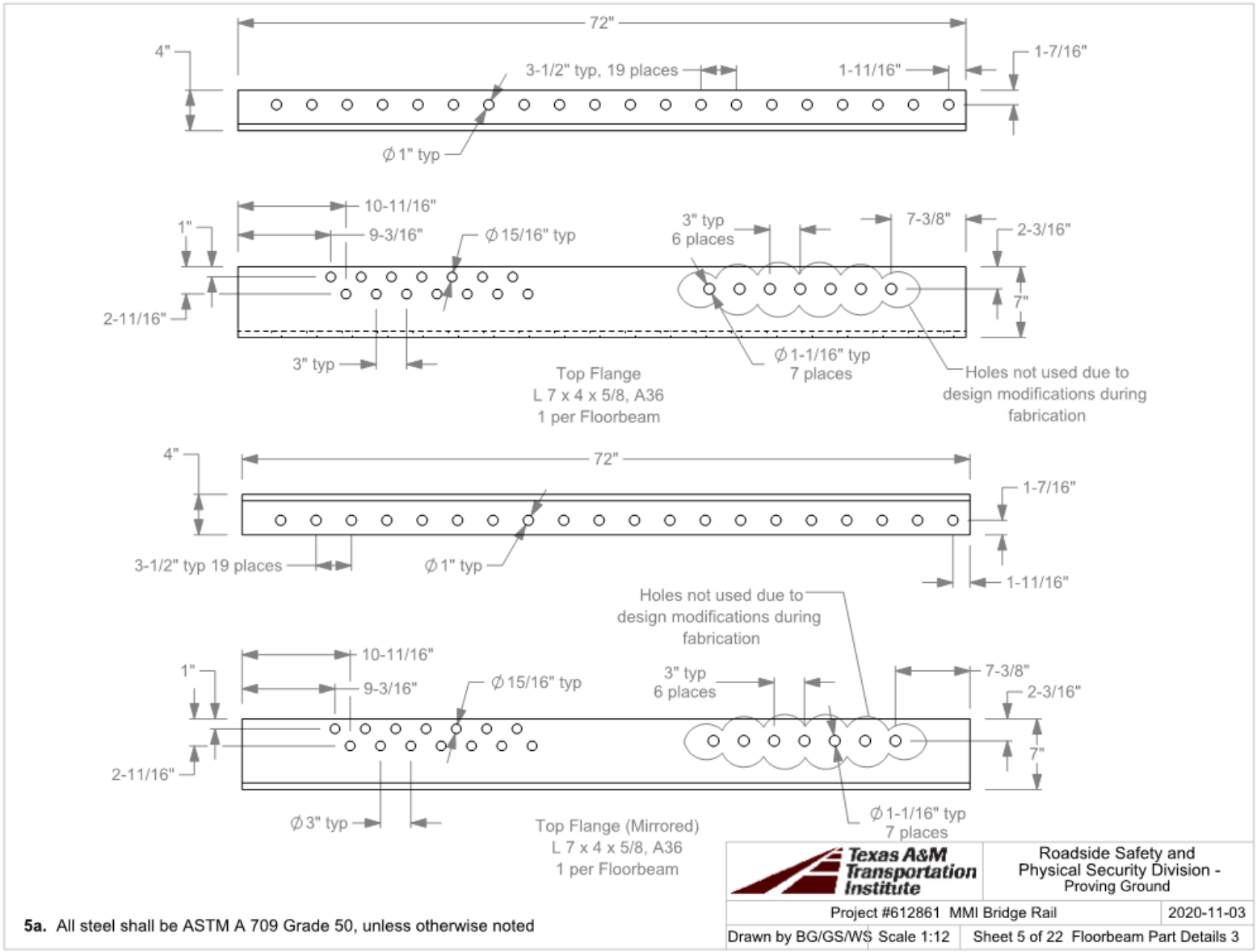
Sheet 4 of 22 Floorbeam Part Details 2
3" typ 3 places
Ø 1" typ all holes
3-1/2" typ spacing top and bottom
2-3/4" typ 6 places
3" typ 16 places
72"
68-3/4"
40-5/16"
33-1/2"
7-7/8"
1-11/16"
1-1/2"
0"
0"
2-9/16"
6"
6-3/16"
13-1/2"
33-7/16"
36"
Web 3/8", A36 1 per Floorbeam
12"
Ø 1" typ
5"
1-7/8"
1-3/4"
2-3/4" typ
Ø 1" Typ
Stringer Clip L5 x 5 x 1/2, A36 4 per Floorbeam
15"
Ø 1-1/8" typ
3" typ
3"
Web Clip L5 x 5 x 1/2, A36 2 per Floorbeam


72"
4"
3-1/2" typ, 19 places
1-11/16"
1-7/16"
Ø1" typ
10-11/16"
1"
9-3/16"
Ø15/16" typ
3" typ
6 places
7-3/8"
2-3/16"
2-11/16"
7"
3" typ
Ø1-1/16" typ
7 places
Top Flange
L 7 x 4 x 5/8, A36
1 per Floorbeam
Holes not used due to
design modifications during
fabrication
4"
72"
1-7/16"
3-1/2" typ 19 places
Ø1" typ
1-11/16"
Holes not used due to
design modifications during
fabrication
10-11/16"
1"
9-3/16"
Ø15/16" typ
3" typ
6 places
7-3/8"
2-3/16"
2-11/16"
7"
Ø3" typ
Ø1-1/16" typ
7 places
Top Flange (Mirrored)
L 7 x 4 x 5/8, A36
1 per Floorbeam
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Physical Security Division -
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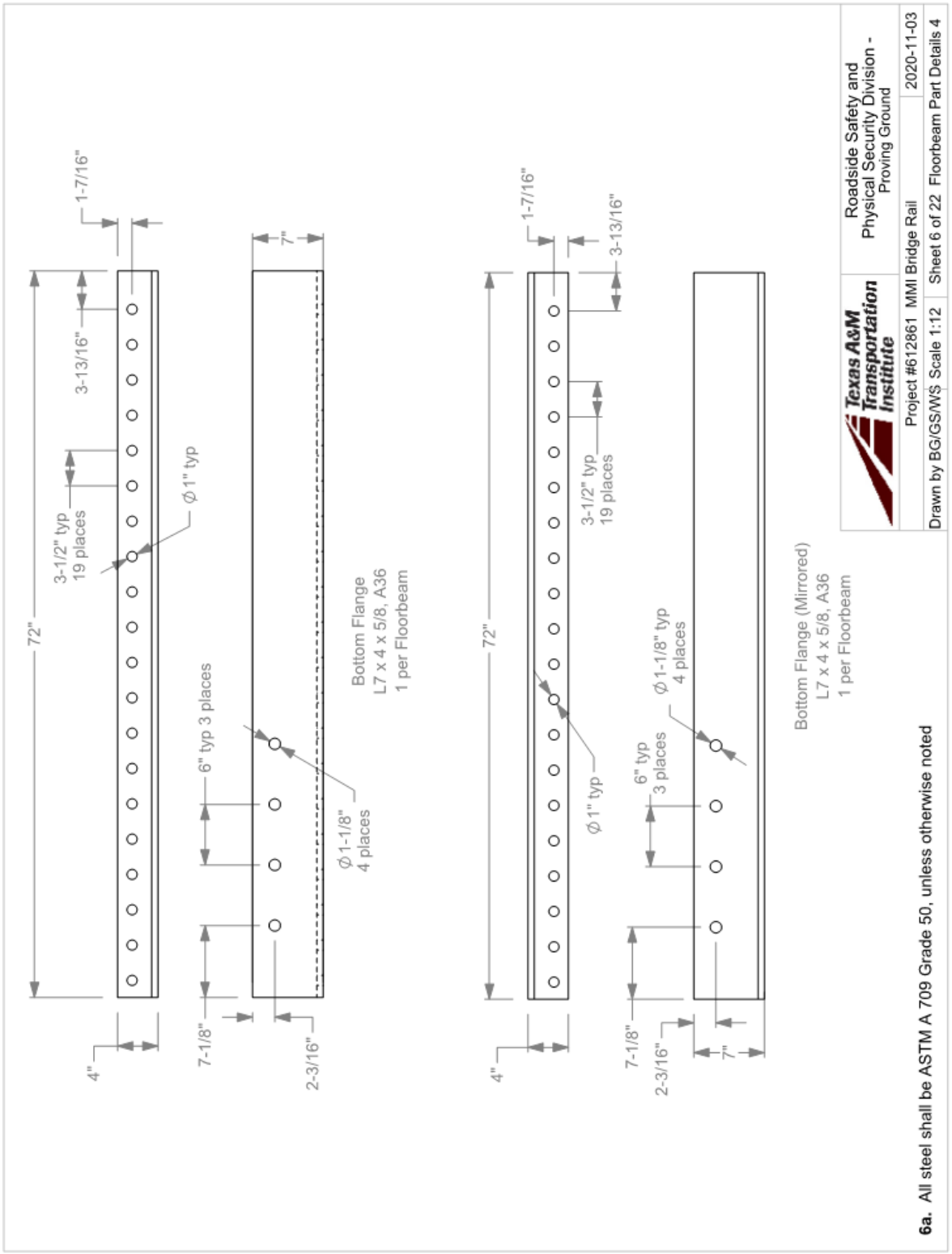
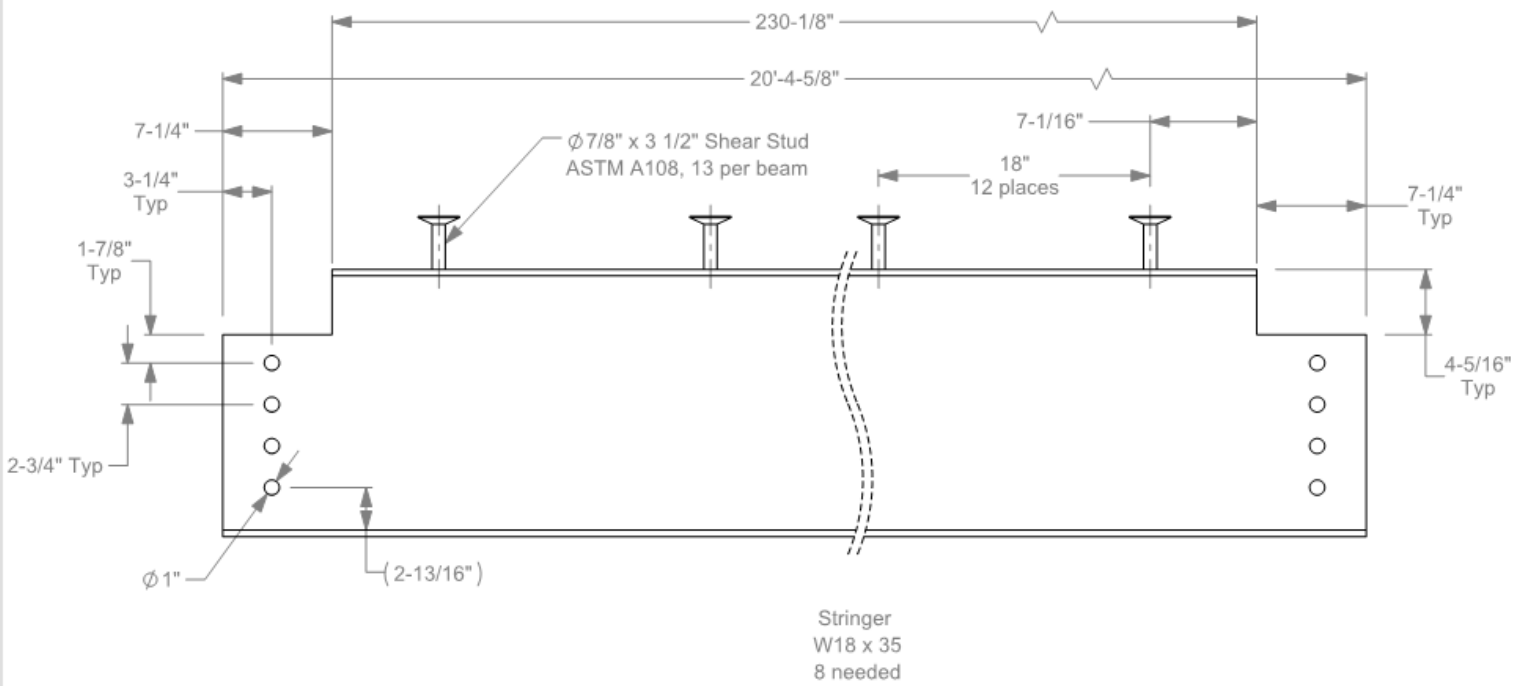
Sheet 5 of 22 Floorbeam Part Details 3
5a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted



6a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted

Stringer Detail



7a. All steel shall be ASTM A572 Grade 50, unless otherwise noted

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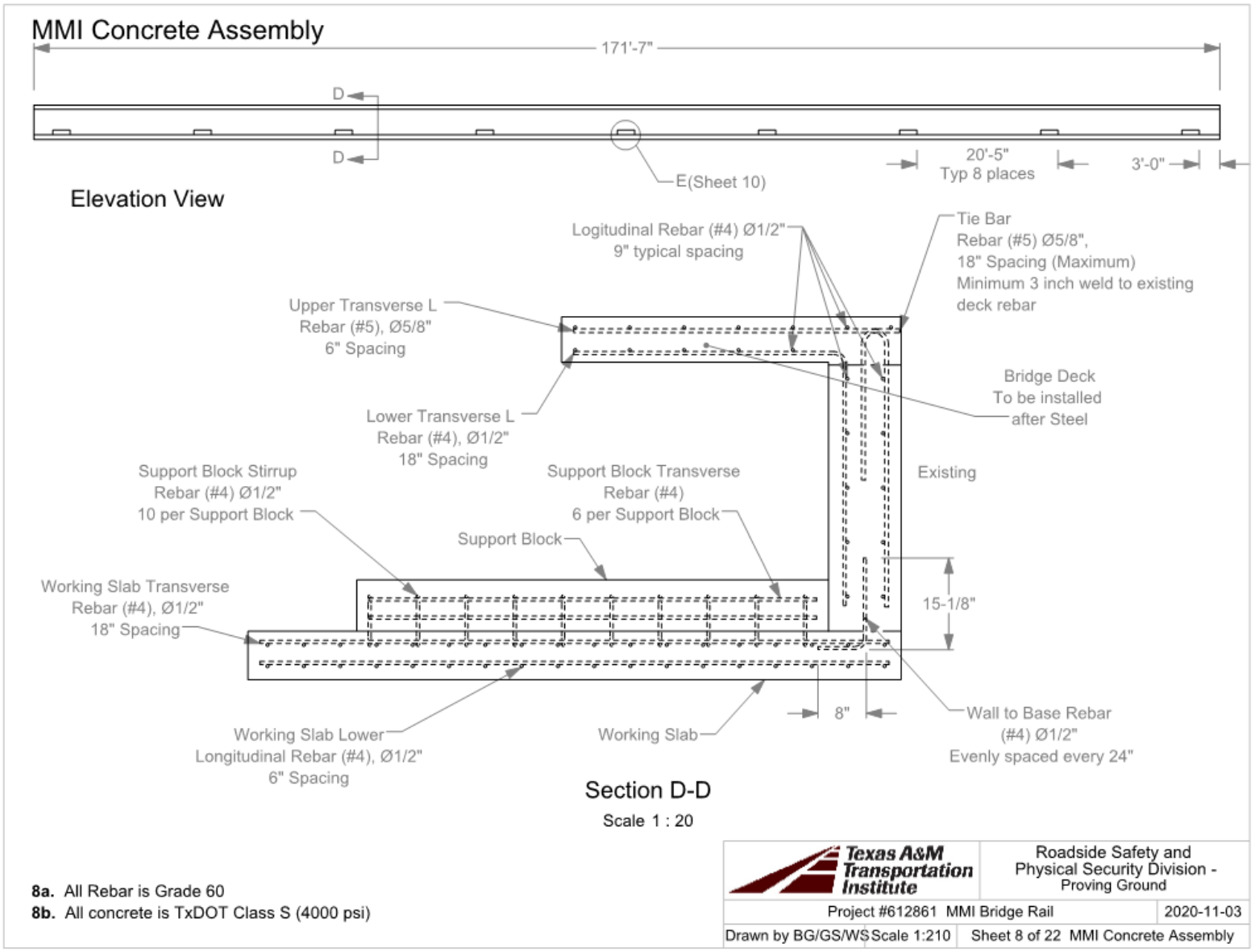
Drawn by BG/GS/WS Scale 1:10	Sheet 7 of 22 Stringer Detail	



8a. All Rebar is Grade 60
8b. All concrete is TxDOT Class S (4000 psi)

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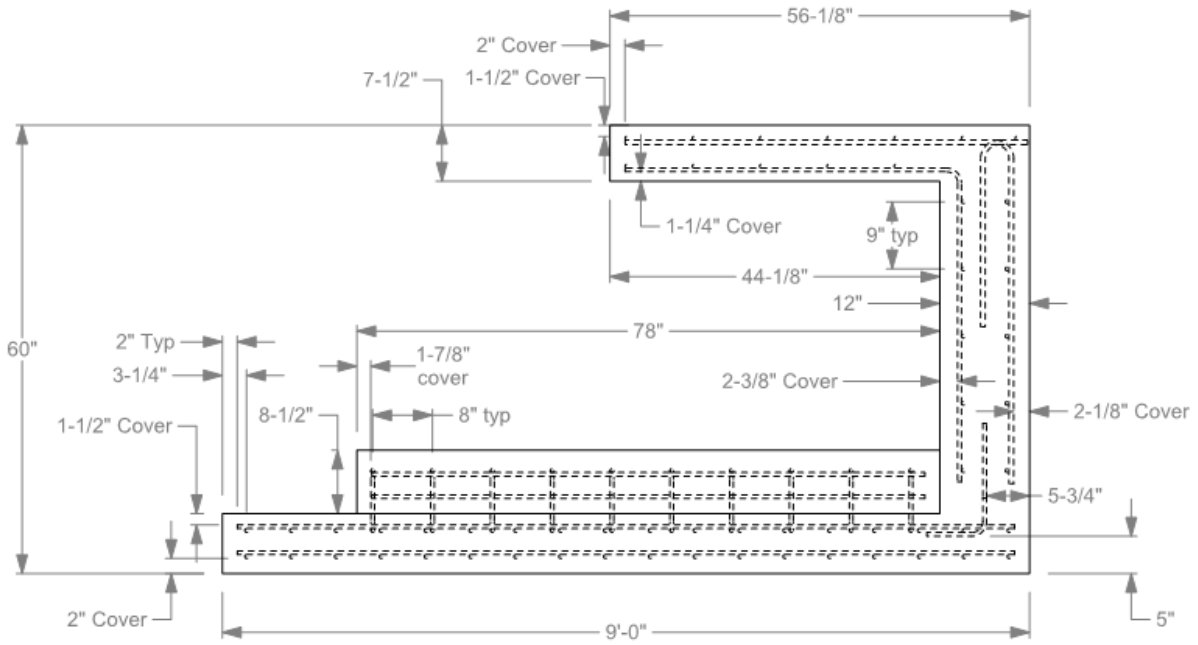
Concrete Dimensional Details



9a. All Rebar is Grade 60
9b. All concrete is TxDOT Class S (4000 psi)

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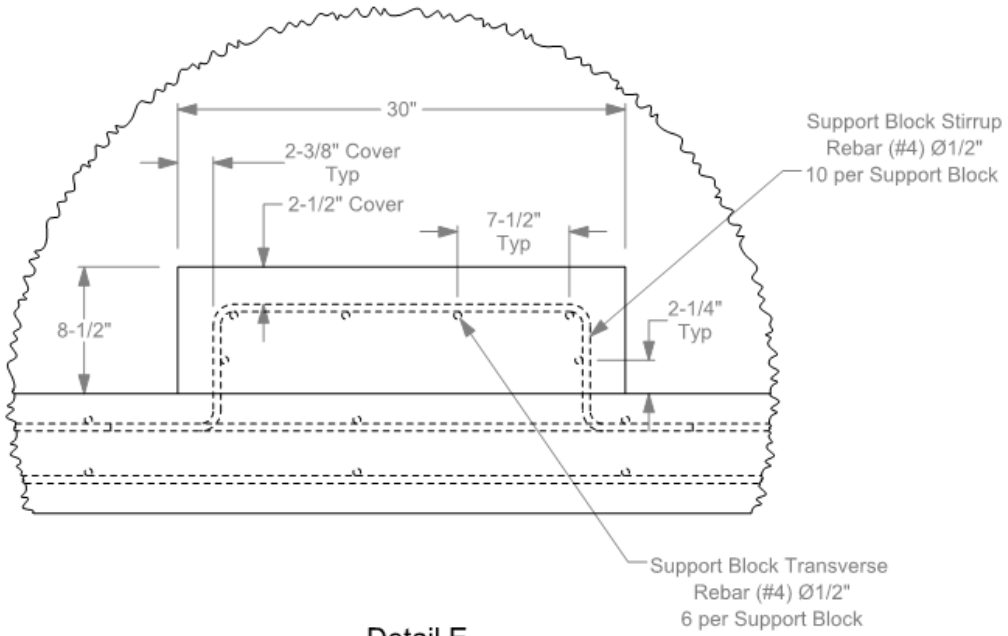
Drawn by BG/GS/WS	Scale 1:20	Sheet 9 of 22 Concrete Dim. Details

Support Block Detail



Detail E
Support Block Detail
Typical 9 locations

10a. All Rebar is Grade 60
10b. All concrete is TxDOT Class S (4000 psi)

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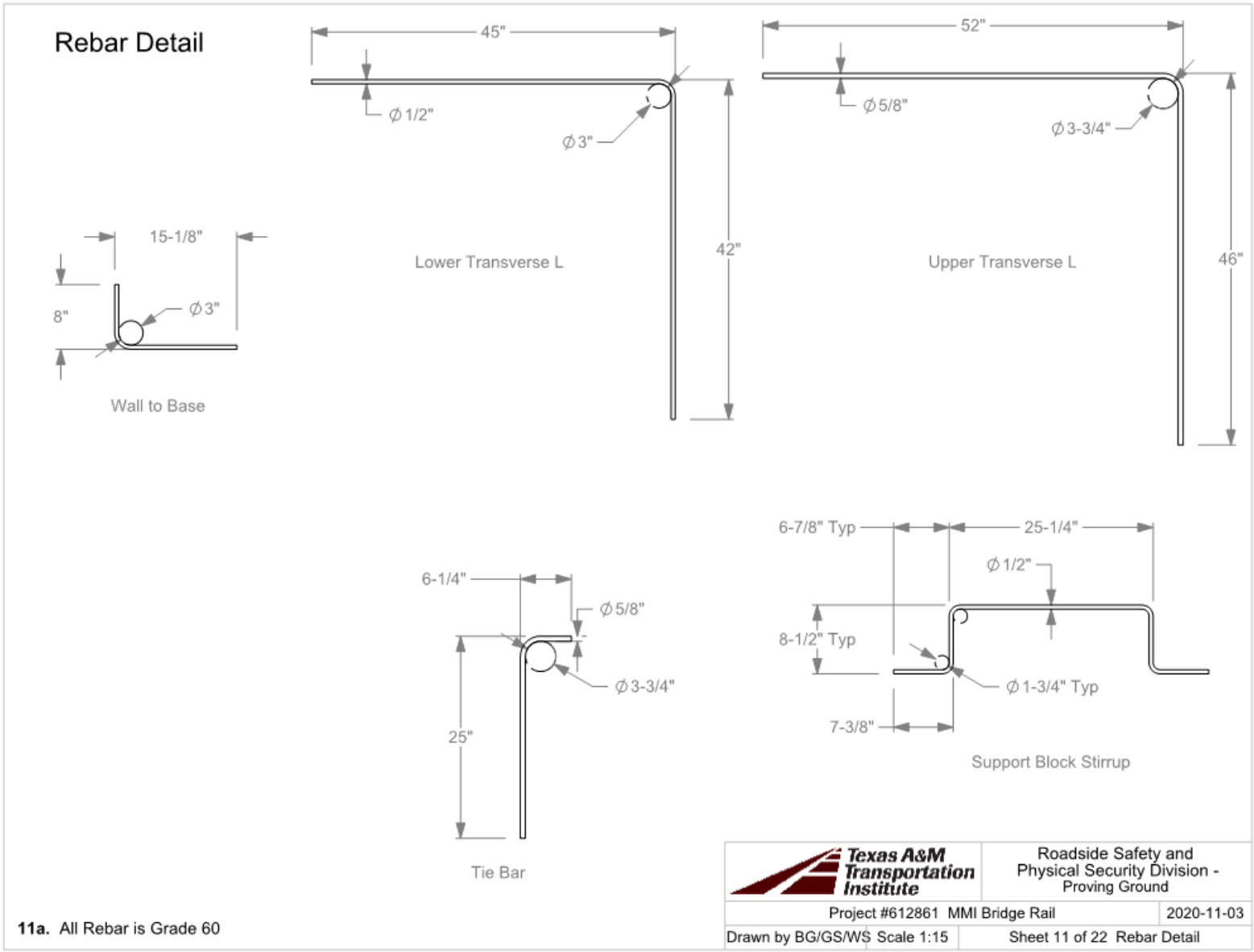
Drawn by BG/GS/WS	Scale 1:10	Sheet 10 of 22 Support Block Detail


Rebar Detail
45"
Ø1/2"
Ø3"
42"
Lower Transverse L
52"
Ø5/8"
Ø3-3/4"
46"
Upper Transverse L
15-1/8"
8"
Ø3"
Wall to Base
6-1/4"
Ø5/8"
Ø3-3/4"
25"
Tie Bar
6-7/8" Typ
25-1/4"
Ø1/2"
8-1/2" Typ
Ø1-3/4" Typ
7-3/8"
Support Block Stirrup
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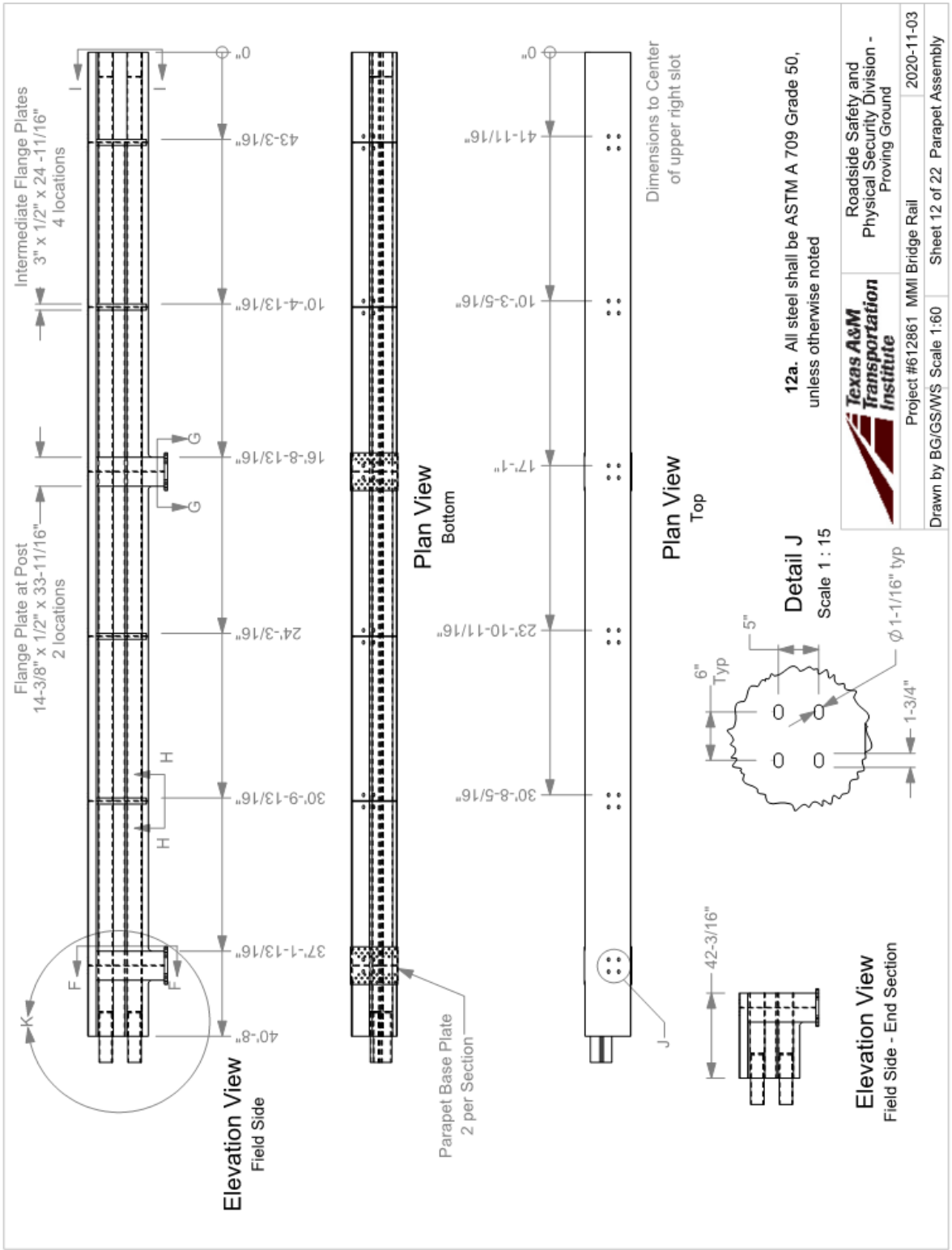
Drawn by BG/GS/WS Scale 1:15
Sheet 11 of 22 Rebar Detail
11a. All Rebar is Grade 60


Intermediate Flange Plates
3" x 1/2" x 24 -11/16"
4 locations
Flange Plate at Post
14-3/8" x 1/2" x 33-11/16"
2 locations
0"
43-3/16"
10'-4-13/16"
16'-8-13/16"
24'-3/16"
30'-9-13/16"
37'-1-13/16"
40'-8"
Elevation View
Field Side
Plan View
Bottom
Parapet Base Plate
2 per Section
Plan View
Top
Dimensions to Center
of upper right slot
41-11/16"
10'-3-5/16"
17'-1"
23'-10-11/16"
30'-8-5/16"
J
42-3/16"
Elevation View
Field Side - End Section
Detail J
Scale 1 : 15
6" Typ
5"
Ø 1-1/16" typ
1-3/4"
12a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted
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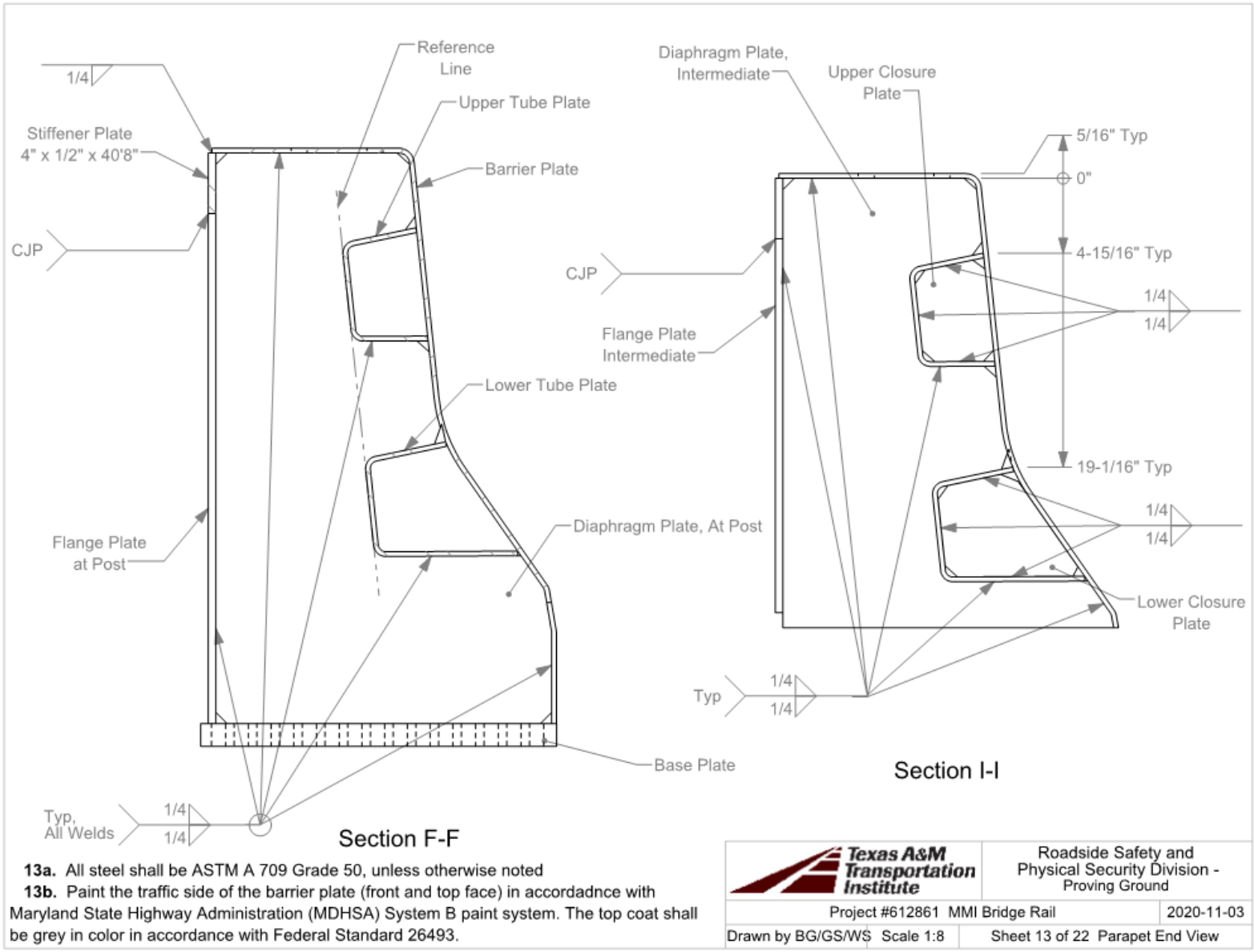
Drawn by BG/GS/WS Scale 1:60
Sheet 12 of 22 Parapet Assembly



13a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted

13b. Paint the traffic side of the barrier plate (front and top face) in accordadnce with Maryland State Highway Administration (MDHSA) System B paint system. The top coat shall be grey in color in accordance with Federal Standard 26493.

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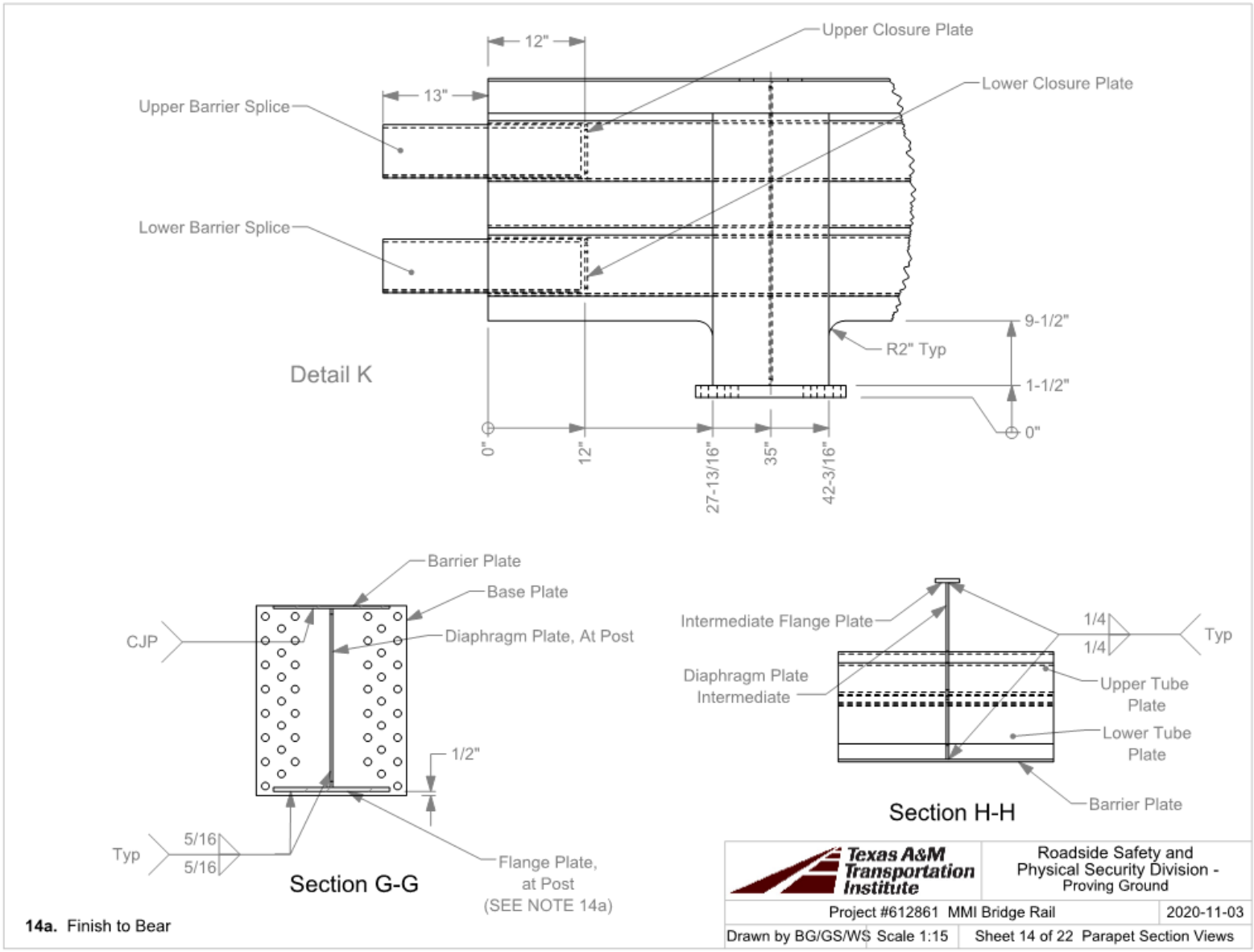
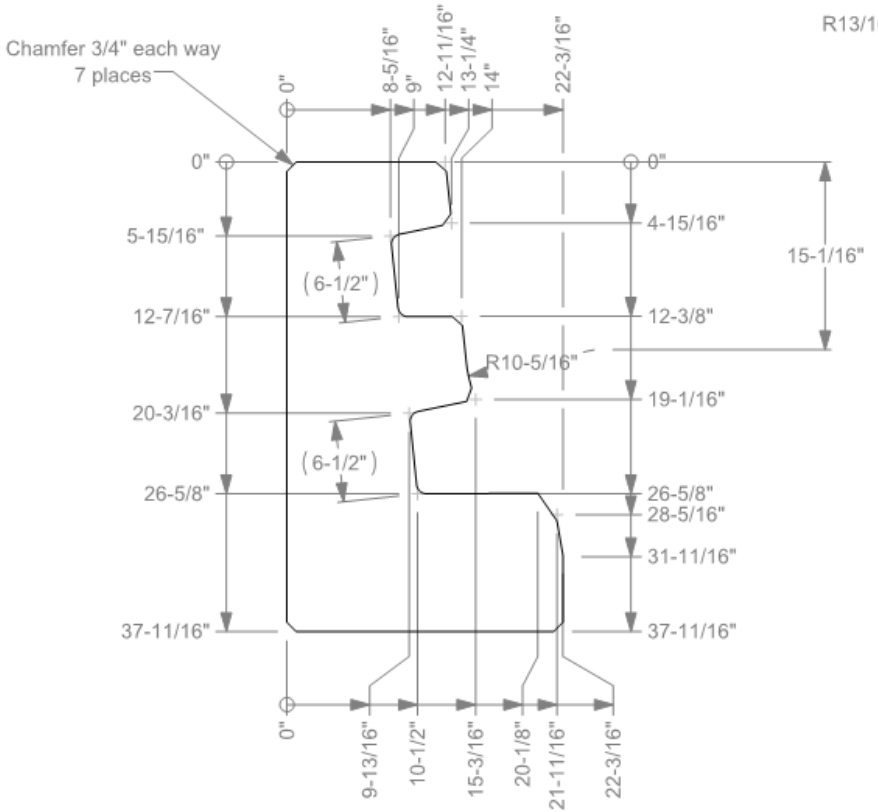
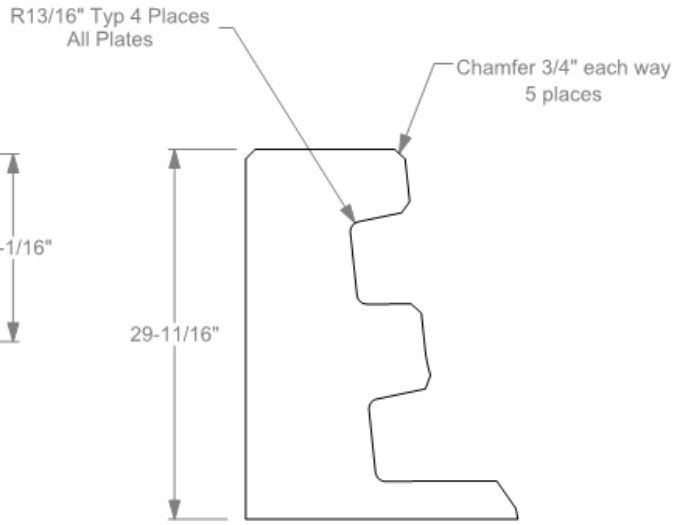
Drawn by BG/GS/W$ Scale 1:8	Sheet 13 of 22 Parapet End View	



14a. Finish to Bear



Diaphragm Plate at Post
3/8" Plate, 2 Per Section



Diaphragm Plate, Intermediate
3/8" Plate, 4 Per Section

See Note 15b

15a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted
15b. See Diaphragm at Post for Dimensional details

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16a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted

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Barrier Plate, at Post
5/16" Thick
40' 8" long

Barrier Plate, away from posts
5/16" Thick, Dimensions identical
to those of Barrier Plate at Post
Unless noted otherwise

Base Plate
Plate, 18 5/8" x 1 1/2"
A709 grade 50
2 per Section

17a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted

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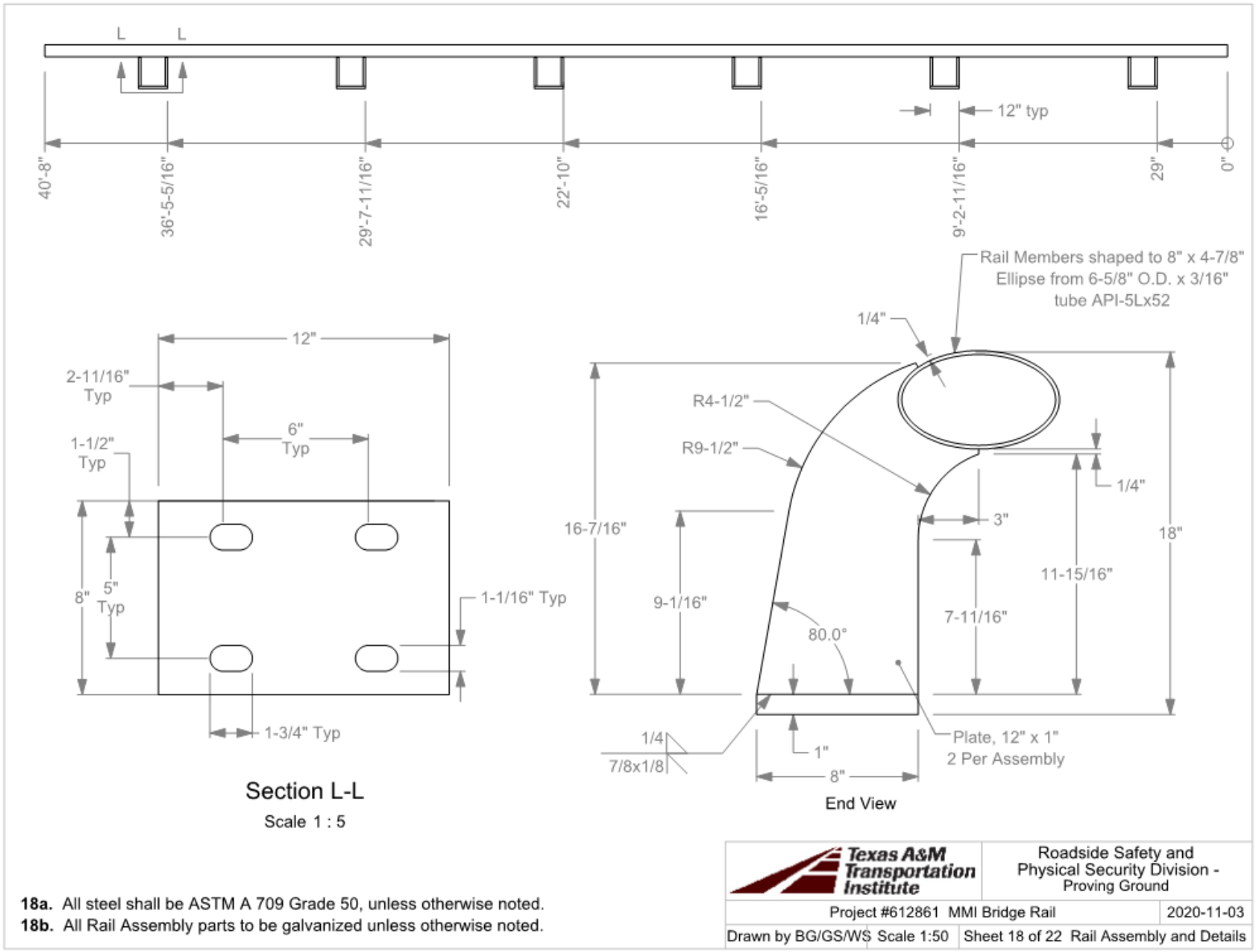

18a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted.
18b. All Rail Assembly parts to be galvanized unless otherwise noted.

19a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted.
19b. All Rail Assembly parts to be galvanized unless otherwise noted.

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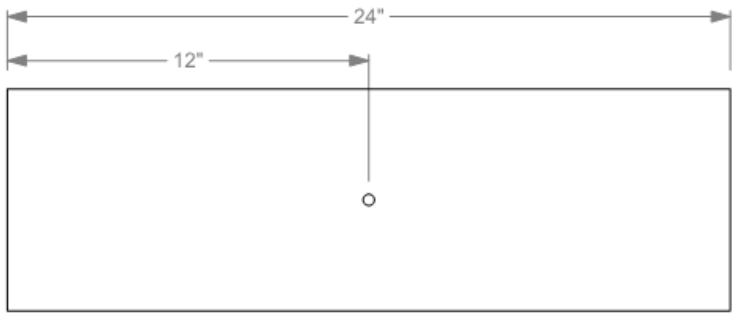
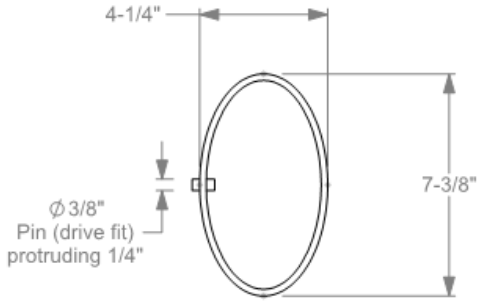
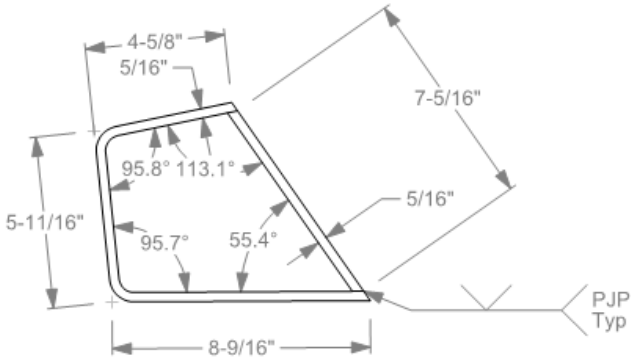


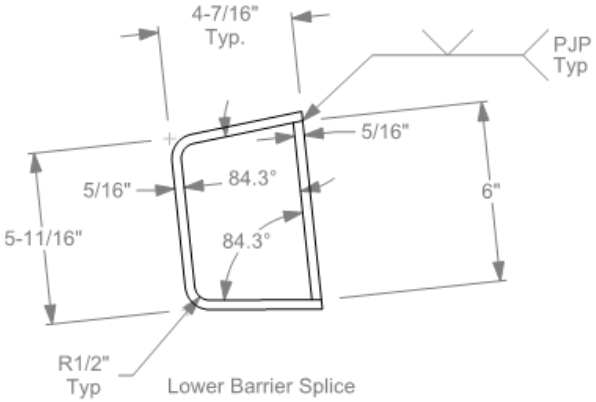
Rail Splice
3/16" tube API-5Lx52, galvanized
1 required per joint



End View



Upper Barrier Splice
24" Long
1 required per joint



Lower Barrier Splice
24" Long
1 required per joint

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20a. All steel shall be ASTM A 709 Grade 50, unless otherwise noted

Instrumentation Location
shown from Field Side
LVDT locations for TL-5
LVDT locations for TL-4
M
1
2
3
4
5
6
7
8
9
Parapet Post numbers
Diaphragm Plates with Strain Gauges at three parapet posts (2 - 4) TL-5
Diaphragm Plates with Strain Gauges at three parapet posts (4-6) TL-4
LVDT located at top of Stiffener Plates at the four rail posts and two joints indicated above.
Single Strain Gauge (Typ)
Both sides of Diaphragm Plate
4 required at 5 locations
Strain Gauge Rosettes
Typical each side of Diaphragm Plate.
See next sheet for dimensions and orientation.
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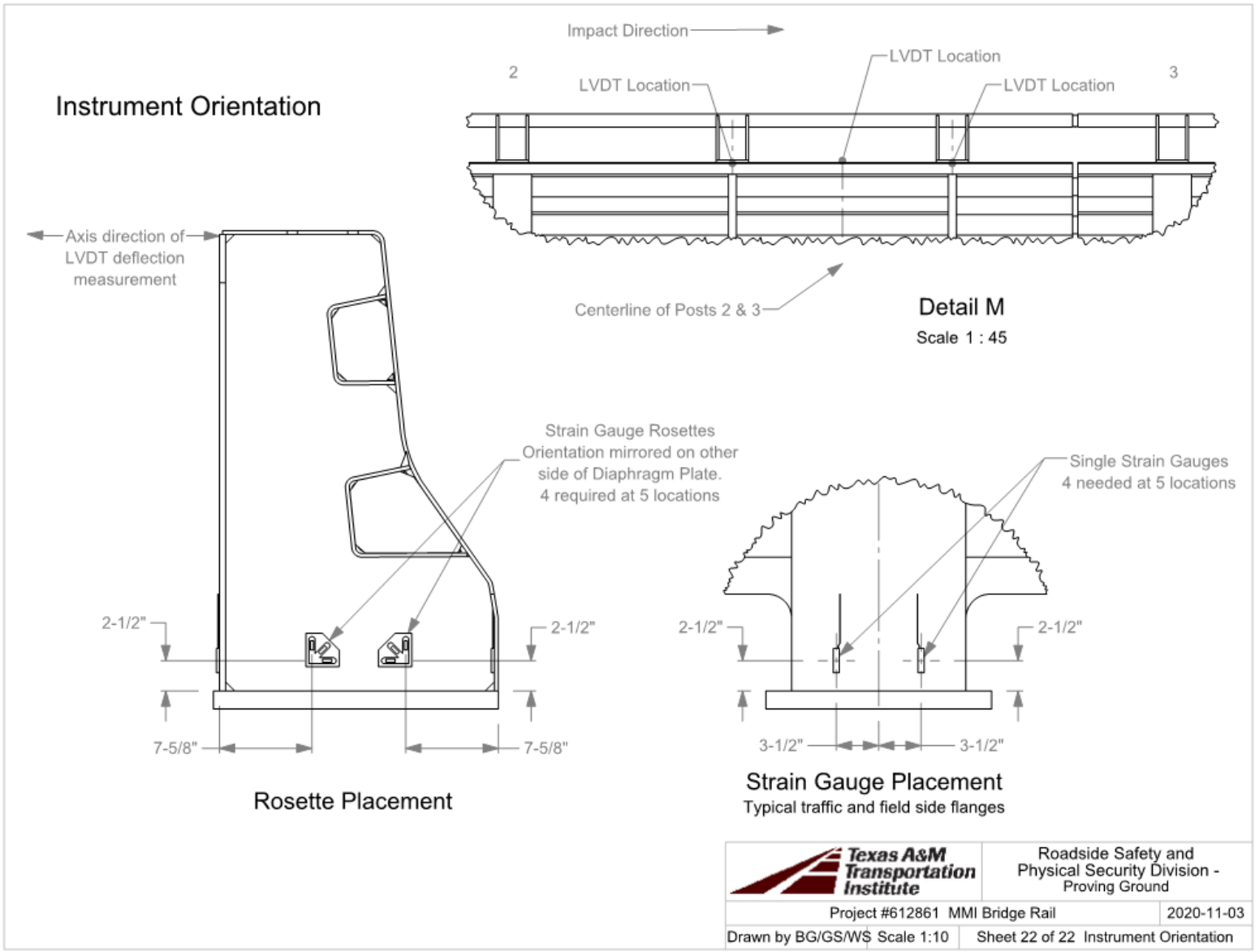
Scale 1:8
Sheet 21 of 22 Instrumentation Location


Instrument Orientation
Impact Direction
2
3
LVDT Location
LVDT Location
LVDT Location
Centerline of Posts 2 & 3
Detail M
Scale 1 : 45
Axis direction of LVDT deflection measurement
Strain Gauge Rosettes Orientation mirrored on other side of Diaphragm Plate. 4 required at 5 locations
2-1/2"
2-1/2"
7-5/8"
7-5/8"
Rosette Placement
Single Strain Gauges 4 needed at 5 locations
2-1/2"
2-1/2"
3-1/2"
3-1/2"
Strain Gauge Placement
Typical traffic and field side flanges
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Roadside Safety and Physical Security Division - Proving Ground
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2020-11-03
Drawn by BG/GS/WS Scale 1:10
Sheet 22 of 22 Instrument Orientation