

STATE OF MAINE DEPARTMENT OF TRANSPORTATION



AROOSTOOK AND PENOBSCOT COUNTY MADAWASKA SUBDIVISION MAINE RAILROAD BRIDGE CAPACITY PROJECT

SPECIFICATIONS

Design: "American Railway Engineering and Maintenance of Way Association"
AREMA 2018 Manual for Railway Engineering

DESIGN LOADING

Live Load (Superstructure) Cooper E-80
Live Load (Walkway) 85 psf

MATERIALS

Structural Steel:
All Material (except as noted) ASTM A709, Grade 50
(Metalized or Galvanized)
High Strength Bolts (except as noted) ASTM F3125, Grade A325, Type 1

BASIC DESIGN STRESSES

Structural Steel:
ASTM A 709/709M, Grade 50 $F_y = 50,000$ psi
ASTM F3125, Grade A325, Type 1 $F_u = 120,000$ psi

LIST OF DRAWINGS

Title Sheet	1
Notes and Quantities	2
Br. No. 7763 (M.P. 111.14) Over South Meadow Brook (1 of 2)	3
Br. No. 7763 (M.P. 111.14) Over South Meadow Brook (2 of 2)	4
Br. No. 7776 (M.P. 154.04) Over Soule Brook (1 of 2)	5
Br. No. 7776 (M.P. 154.04) Over Soule Brook (2 of 2)	6
Sheridan Truss Br. No. 7783 (M.P. 193.50) (1 of 4)	7
Sheridan Truss Br. No. 7783 (M.P. 193.50) (2 of 4)	8
Sheridan Truss Br. No. 7783 (M.P. 193.50) (3 of 4)	9
Sheridan Truss Br. No. 7783 (M.P. 193.50) (4 of 4)	10

**STEEL
PROCUREMENT
PLANS
MARCH 2021**

PROJECT LOCATION:	3 Bridges located on the Maine Northern Railway - Madawaska Subdivision from Mile Post 111.14 to 193.50, in Penobscot and Aroostook County.
PROGRAM AREA:	Multimodal Program
OUTLINE OF WORK:	Bridge Construction: Superstructure replacement and safety walk replacement.

PLANS PREPARED BY:
vhb
 500 Southborough Drive, Suite 105B
 South Portland, Maine 04106
 207 889 3150 - FAX 207 253 5596

WIN 23486.00

STATE OF MAINE DEPARTMENT OF TRANSPORTATION APPROVED: _____ COMMISSIONER: _____ DATE: 3-25-21 CHIEF ENGINEER: _____	STATE OF MAINE PROFESSIONAL ENGINEER GREGORY S. GOODRICH No. 13225 SIGNATURE: _____ 13225 P.E. NUMBER 3-12-2021 DATE
PROJECT INFORMATION PROGRAM: MULTIMODAL PROJECT MANAGER: MATE BENOIT DESIGNER: GREG GOODRICH CONSULTANT: VHB PROJECT RESIDENT: CONTRACTOR: PROJECT COMPLETION DATE:	MAINE RAILROAD BRIDGE CAPACITY PROJECT - STEEL PROCUREMENT MADAWASKA SUB. AROOSTOOK/PENOBSCOT TITLE SHEET
SHEET NUMBER <div style="font-size: 2em; font-weight: bold; margin: 0;">1</div> OF 10	

Filename: ... \001_title_01.dgn
 Division: MUL TIMODAL
 Username: JMacpherson
 Date: 3/12/2021

GENERAL NOTES

- All materials in these Plans are to be procured, under this Contract, by the Maine Department of Transportation and installed by the Railroad, unless noted otherwise (installation not included in this Contract).
- All materials shall be clearly identified, grouped, and packaged for each bridge.

STRUCTURAL STEEL NOTES

- All structural steel shall conform to Standard Specification Section 504, 506, and 713 and shall be ASTM A709, Galvanized or Metalized. See individual bridge sheets for additional notes.
- All new bolted connections shall be made using 7/8" diameter high strength bolts in a 15/16" hole, unless otherwise noted. All bolts shall be ASTM F3125, Grade A325, Type 1 and bolt threads shall be excluded from the shear plane of the connection. All bolted connections shall be Class B slip-critical connections unless otherwise noted.
- All bolts shall be installed using the method and the minimum pretension specified in Standard Specification 504.
- Working drawings shall be submitted by the Contractor in accordance with Standard Specification 504 and 105.7, prior to fabrication and for approval.
- All costs required to fabricate and deliver the structural steel for Bridge No. 7763 (MP 111.14) and Bridge No. 7776 (MP 154.04) shall be paid under Item 504.702, Structural Steel Fabricated and Delivered, Welded and Item 506.9103, Galvanizing, as appropriate.

BEARING AND ANCHOR BOLT NOTES

- Plain elastomeric bearing pads shall be made from a 60 durometer natural virgin rubber or neoprene elastomer.
- Bearing plates shall meet the requirements of ASTM A709/A709M, Grade 50 and shall be galvanized in accordance with ASTM A123 or metalized.
- Anchor bolts and threaded rod shall meet the requirements of ASTM F1554, Grade 55. Anchor bolts shall be swaged on the embedded portion of the bolt.
- Anchor bolts, threaded rod, washers, and nuts shall be galvanized to ASTM A153 or ASTM B695, Class 50, Type 1.
- Bearings shall be covered during transit.
- All necessary precautions shall be taken to protect bearing components from field weld flash and splatter. Heat from welding operations shall be controlled such that steel adjacent to the elastomer does not exceed 200°F. The temperature shall be verified by the use of temperature indicating crayons or other suitable means.
- Upset the threads on the anchor bolts after assembly of the bearings.
- Nuts for bearing anchor bolts at expansion end of bridge (north abutment) shall be drawn up finger tight and backed off a 1/4 turn before upsetting threads.
- All costs required to fabricate and deliver the bearing pads, bearing plates, anchor bolts, threaded rods, and their associated hardware shall be paid under Item 523.5403, Plain Elastomeric Bearings.

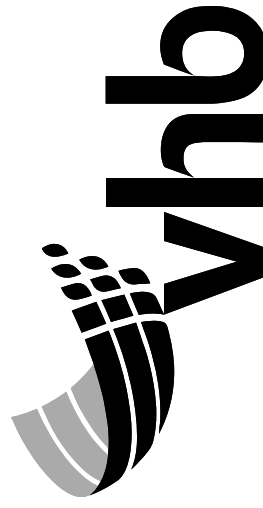
SAFETY WALK NOTES

- All A307 bolts and associated hardware shall be Grade A and galvanized in accordance with ASTM A153. A307 Timber Bolts shall have a minimum thread length of 4 inches.
- All L3x3x1/4 handrail post and braces shall conform to Standard Specification Section 504 and 713 and shall be ASTM A709, Grade 50, metalized or galvanized. Holes in the handrails shall be drilled 1/16" larger than the associated bolt, during fabrication, and prior to galvanizing or metalizing. The Railroad shall touch up any damaged galvanizing with a zinc-rich paint, to the satisfaction of the Resident.
- Exact plank grating configuration may vary from what is shown and shall be per the grating manufacturer's recommendation.
- Plank grating shall be 14 or 12 gauge galvanized steel with a diamond anti-slip pattern and a minimum depth of 2 inches. Plank grating shall be capable of supporting an 85 psf load over the clear span between outrigger ties (approach spans) or the clear span between existing spacer angles (truss spans). Plank grating shall have a maximum deflection of 1/160 of the span length under a single concentrated load of 250 pounds applied at midspan.
- Plank grating on the approach spans shall be attached using an anchor clips and lag screws, per the manufacturer's recommendation.
- The Railroad shall coordinate with the plank grating manufacturer to determine the best method of attaching the new planks to the existing spacer angles on the truss spans. Plank gratings shall be secured firmly to prevent transverse and longitudinal movement. Drilling into the existing spacer angles may be required. Care shall be taken to avoid damage to the existing top chord.
- Adjacent planks shall be attached to each other using hardware, per the manufacturer's recommendations.
- The proposed plank grating manufacturer, type, layout, and all proposed hardware types and locations shall be submitted for approval prior to fabrication.
- The loosening of the malleable iron cable clamps shall be prevented by the use of lock nuts or lock washers.
- All costs required to fabricate and deliver all walkway components shall be paid under Item 536.11, Walkways. A summary of the required walkway components is shown in the Walkway Bill of Materials.

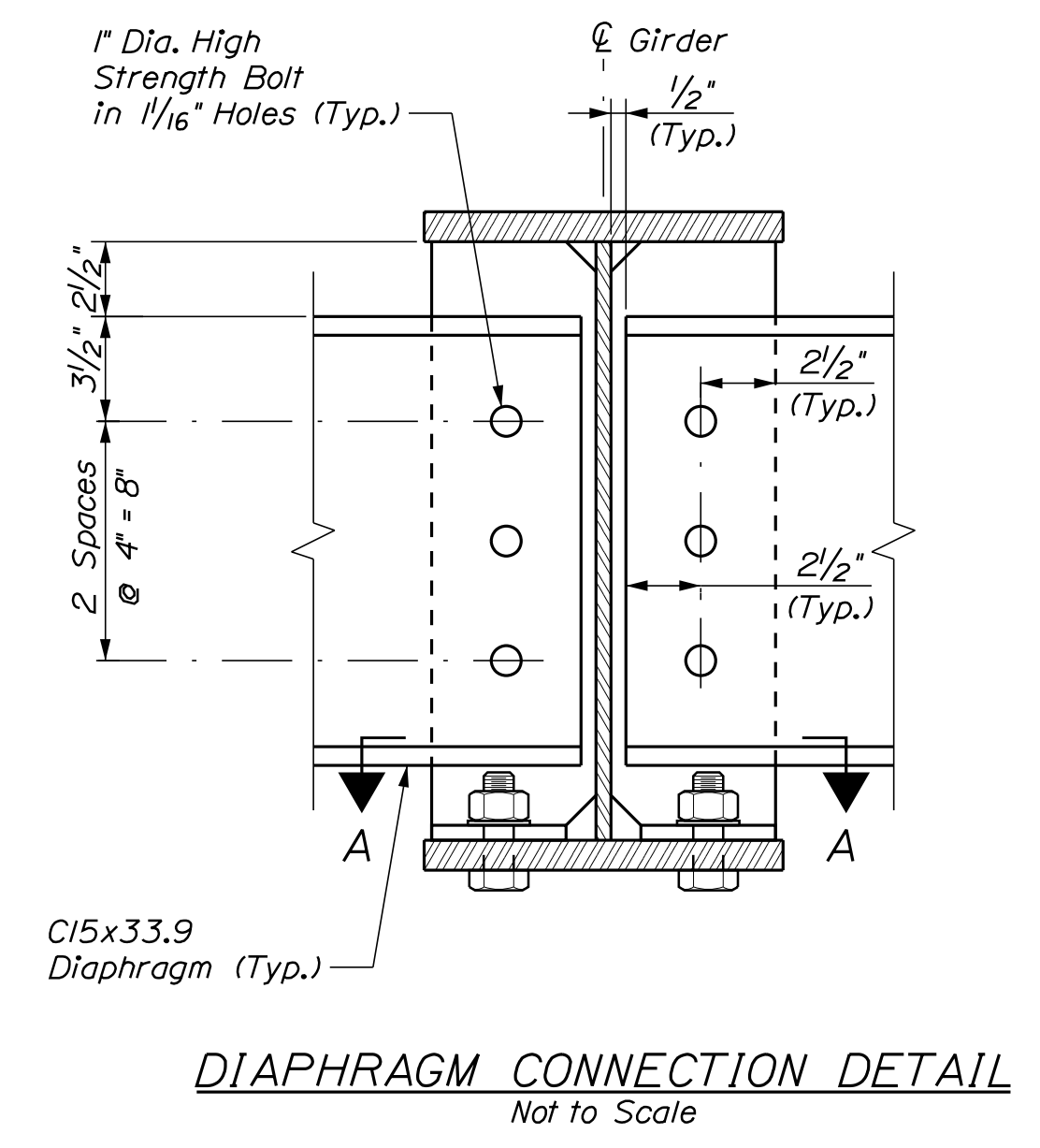
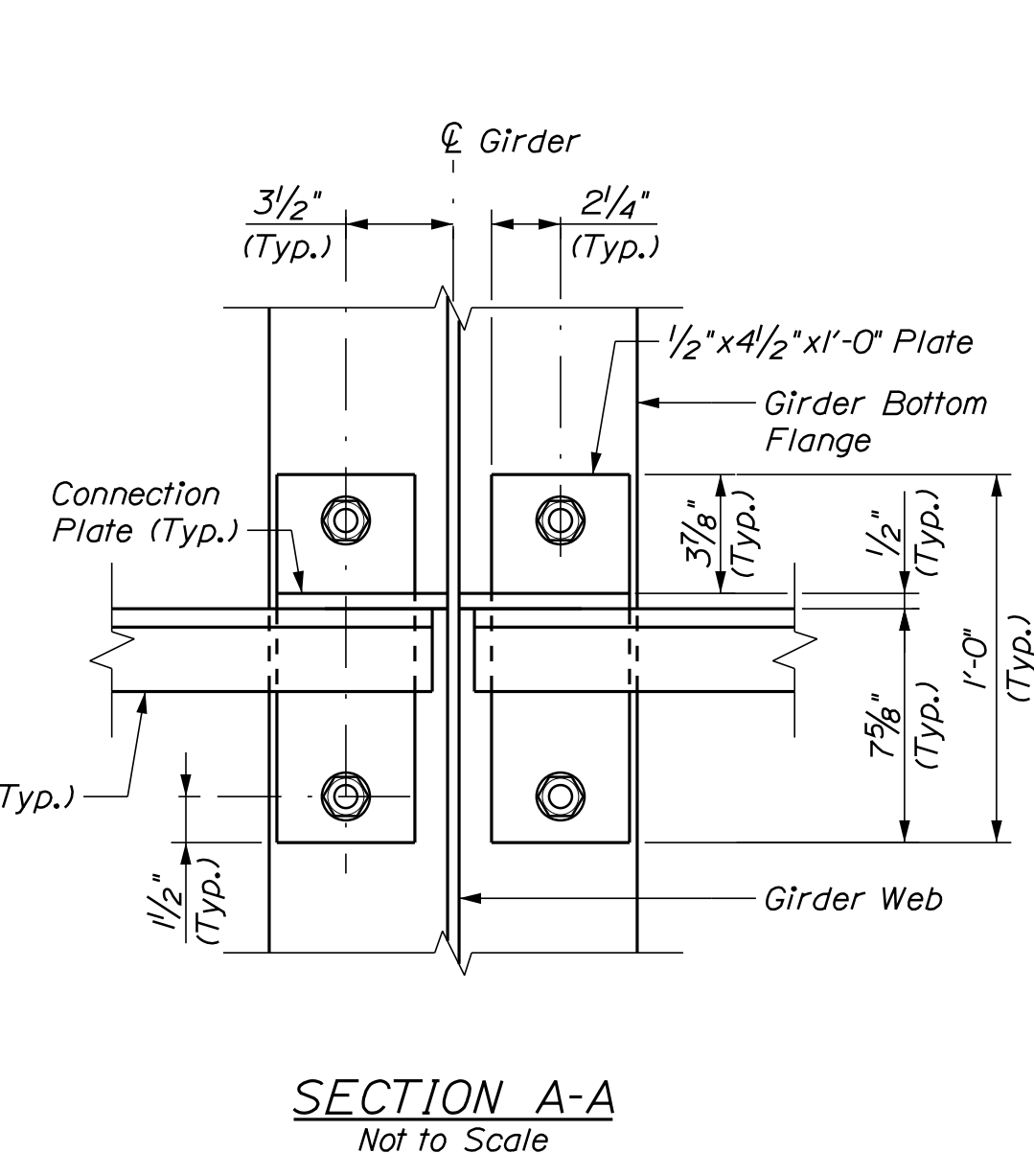
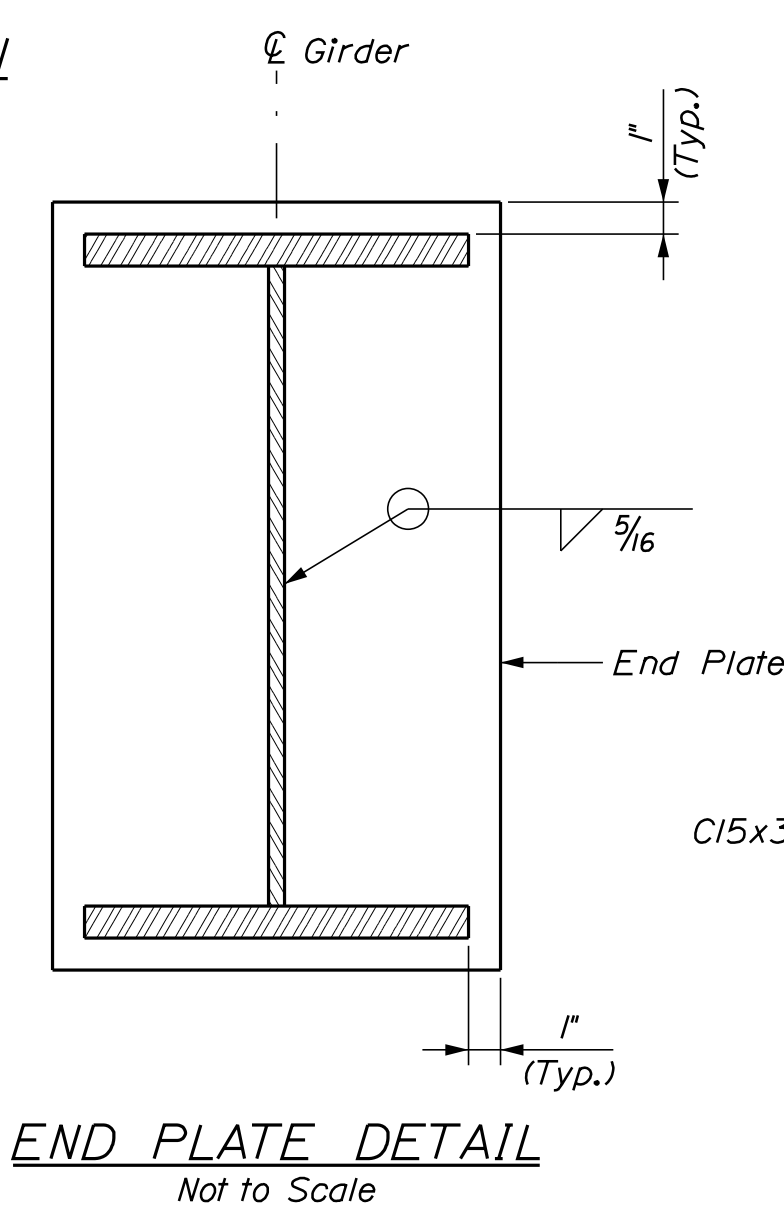
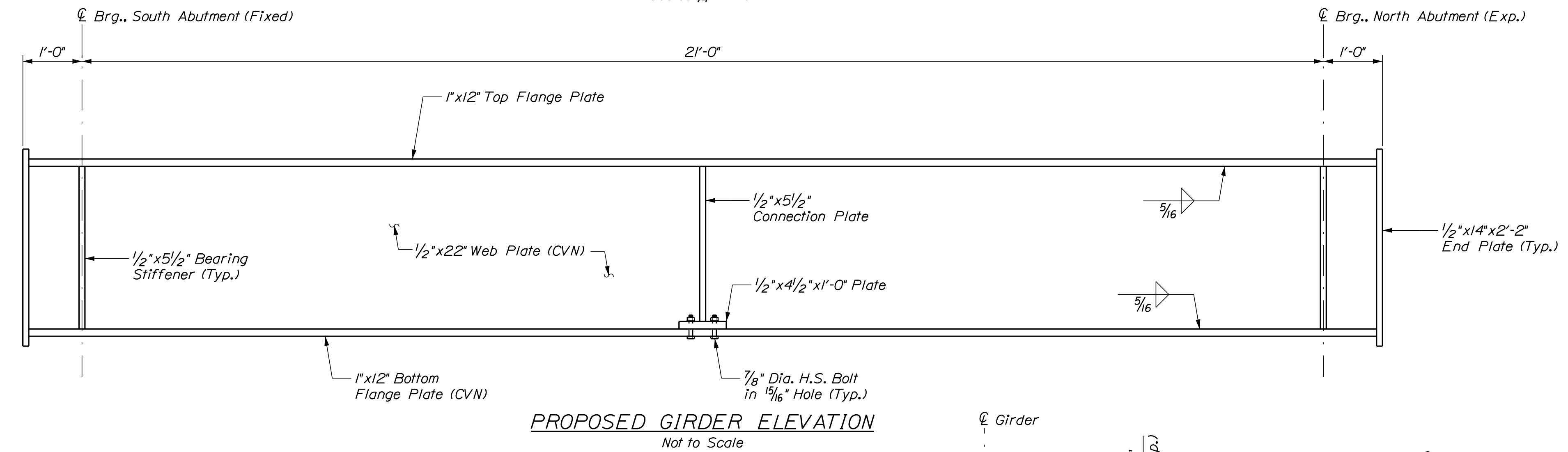
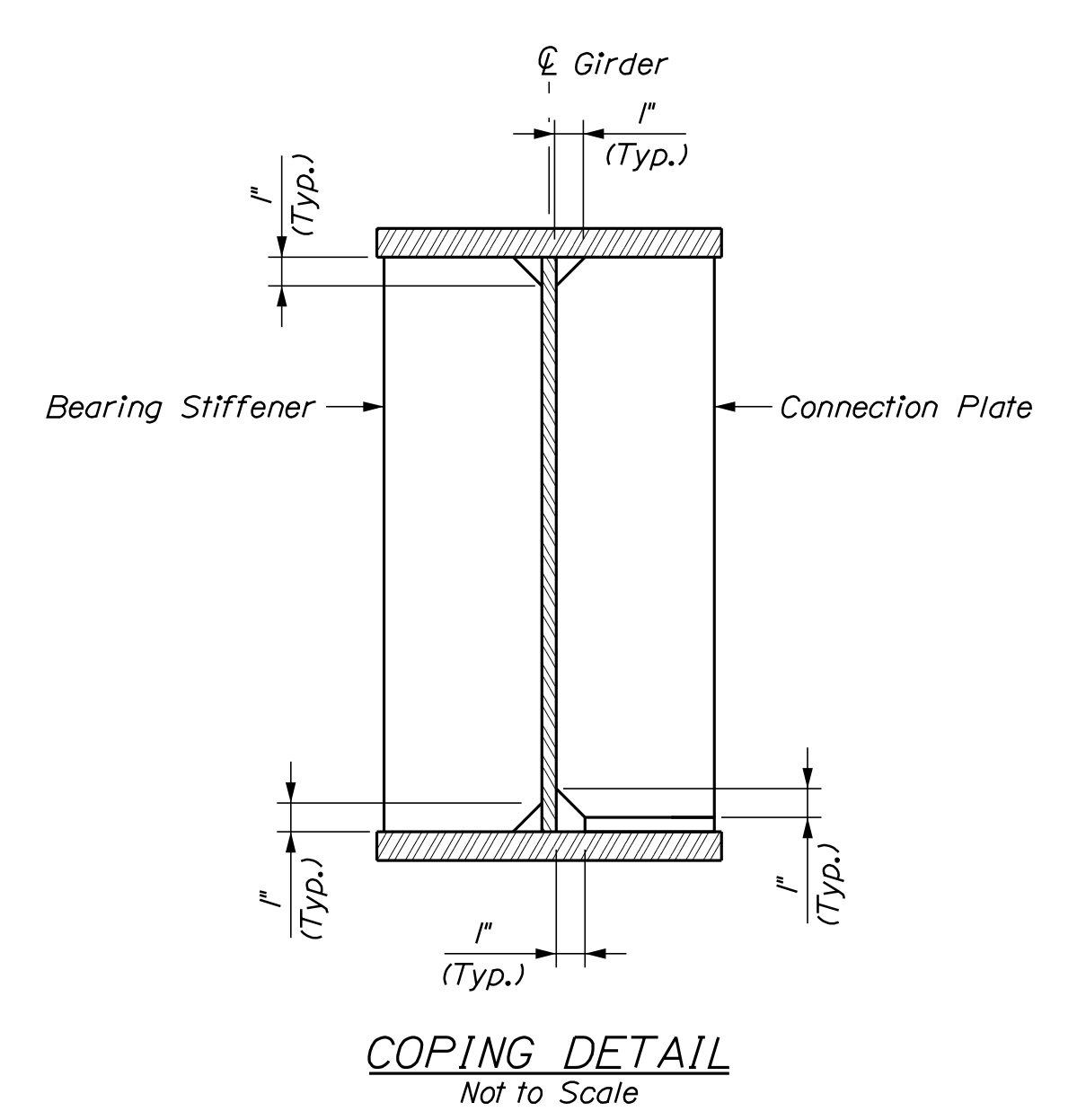
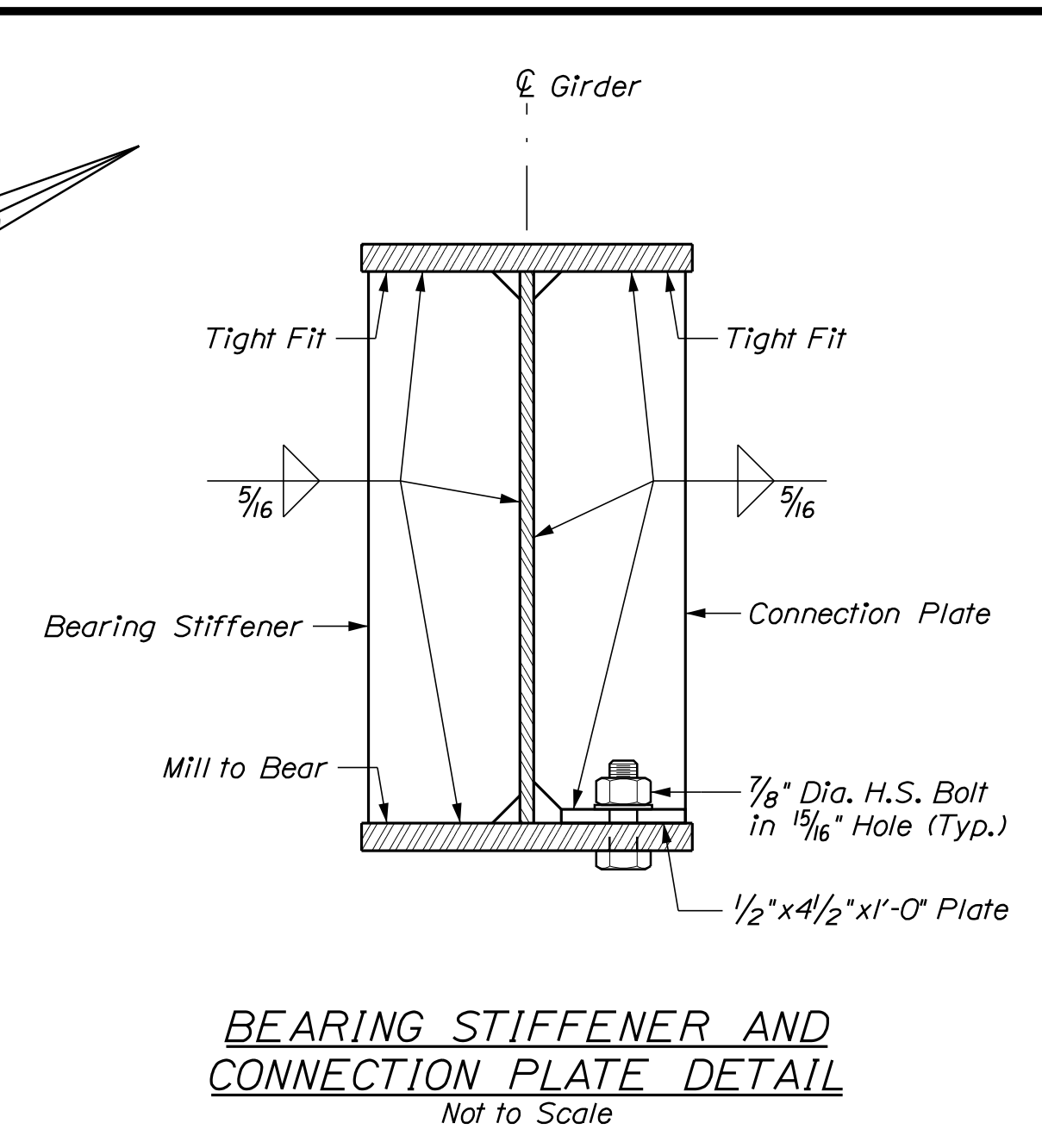
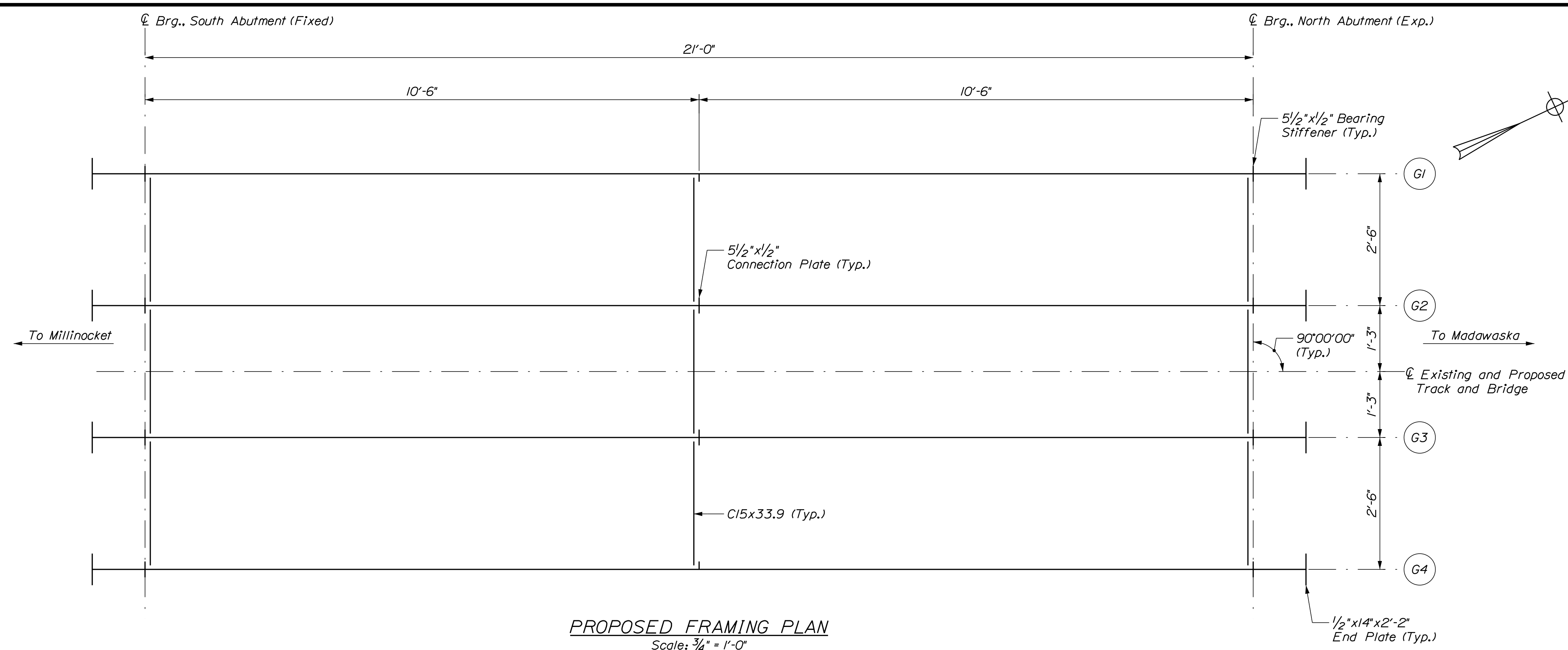
ESTIMATED QUANTITIES - STEEL						
ITEM NO.	DESCRIPTION	UNIT	Br. 7763 MP 111.14	Br. 7776 MP 154.04	Br. 7783 MP 193.50	Total
504.702	Structural Steel Fabricated and Delivered, Welded (17,700 LB)	LS	1/2	1/2		1
506.9103	Galvanizing	LS	1/2	1/2		1
523.5403	Plain Elastomeric Bearings	EA	2	2		4
*536.11	Walkways	LS			1	1

*See Item Breakdown in Bill of Materials List Provided

WALKWAY - BILL OF MATERIAL			
ITEM 536.11 - WALKWAY			
Bridge No. 7783 (M.P. 193.50)			
DESCRIPTION	QUANTITY	UNIT	REMARKS
3x3x1/4x5'-0" Hand Rail Post	32	EA	Metalized or Galvanized
3x3x1/4x6'-1" Hand Rail Brace	4	EA	Metalized or Galvanized
3/4"x1" A307 Gr. A Timber Bolt	52	EA	Galvanized
3/4" A563 Nuts	52	EA	Galvanized
3/4" F844 Washer	64	EA	Galvanized
3/4"x1" A307 Gr. A Hex Bolt	12	EA	Galvanized
3/8" Malleable Iron Cable Clamp with Lock Nuts	70	EA	Galvanized
3/8" 7x19 Aircraft Cable	480	LF	Galvanized
#9 Wire	10	LF	Galvanized
30" Wide Anti-Slip Plank Grating	180	LF	Per Manufacturer's Recommendation
24" Wide Anti-Slip Plank Grating	610	LF	Per Manufacturer's Recommendation
Zinc Rich Touch Up Paint	0.5	GAL	Per MaineDOT Standard Specification 506

	STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 23486.00 BRIDGE PLANS
MAIN RAILROAD BRIDGE CAPACITY PROJECT - STEEL PROCUREMENT MADAWASKA SUB. AROOSTOOK/PENOBSCOT	NOTES AND QUANTITIES	SHEET NUMBER 2 OF 10

Filename: ...003_frame_111.14.dgn
 Division: MUL TIMODAL
 Username: JMacpherson
 Date: 3/12/2021



- NOTES**
1. See the Notes and Quantities sheet for Structural Steel Superstructure Notes.
 2. All webs, and flanges in tension areas shall conform to notch toughness requirements, for non-fracture critical members, as specified in MaineDOT Standard Specification Section 713.01. These members have been labeled (CVN) for clarity.
 3. Flange and web plates shall be fabricated in one piece. No transverse butt welds are allowed.
 4. Bearing stiffeners and end plates shall be plumb after erection and full dead load is applied to the structure.
 5. Diaphragm connection plates may be either plumb or normal to the top flange.
 6. Girders shall be fabricated to zero camber plus tolerance.

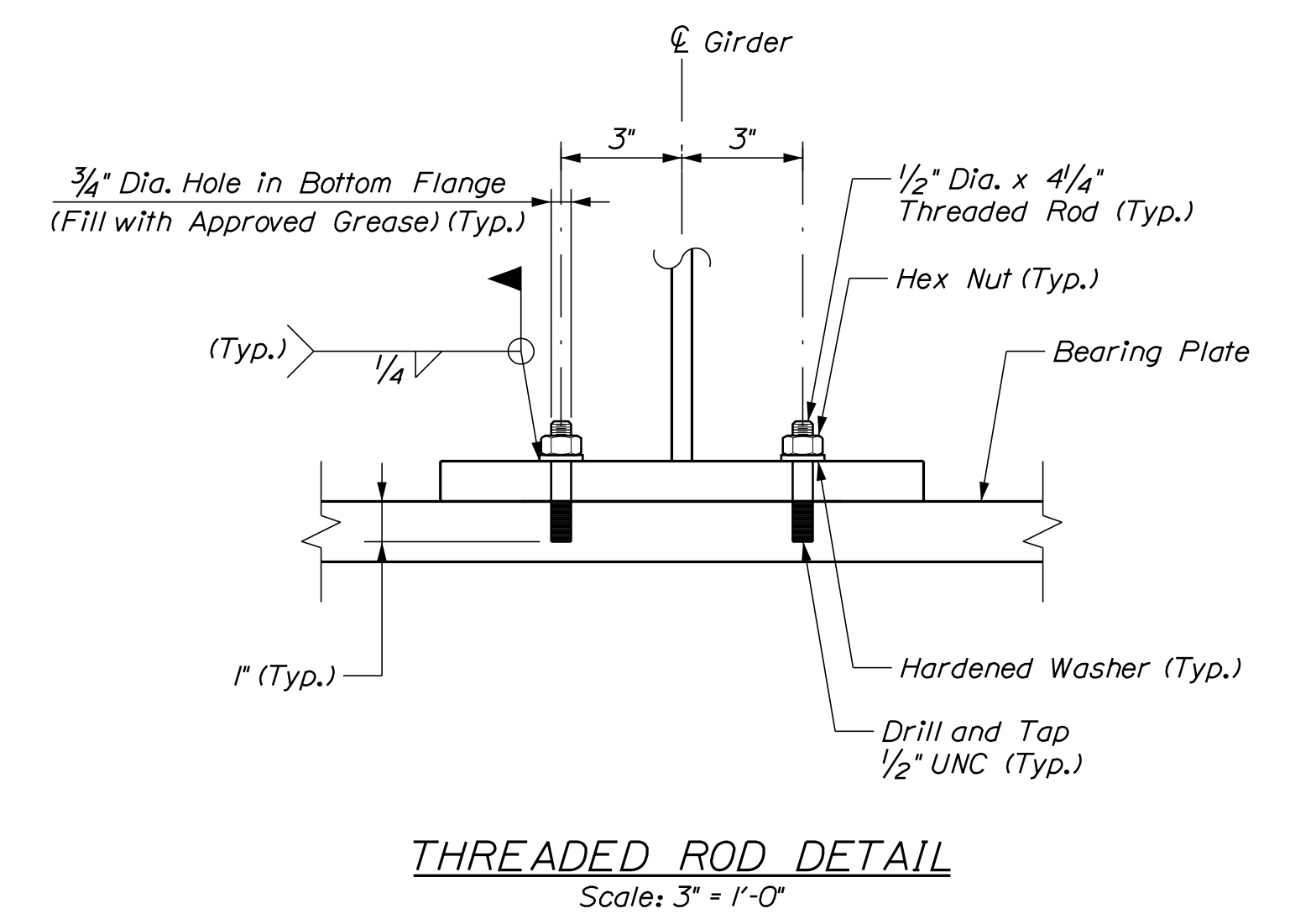
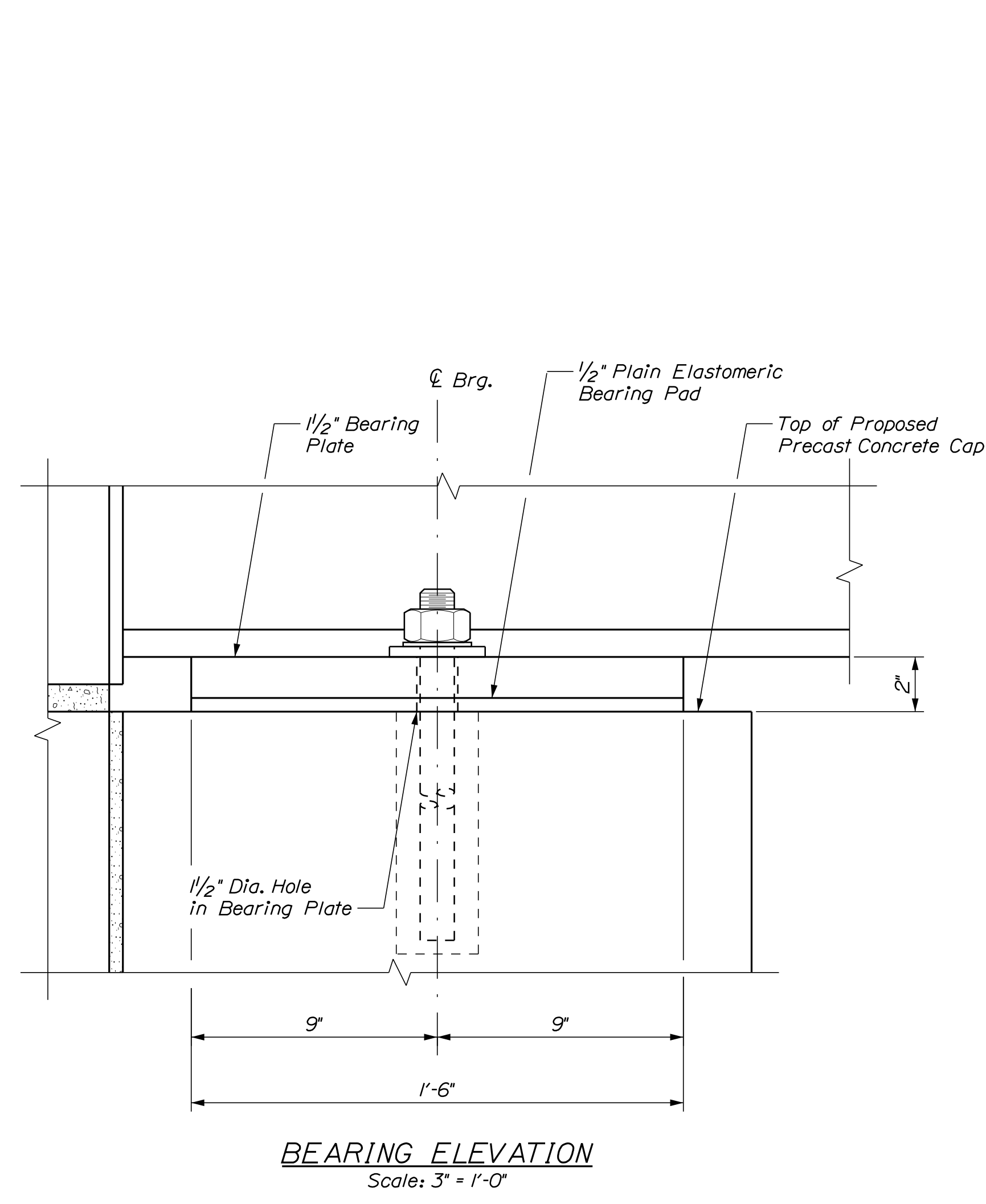
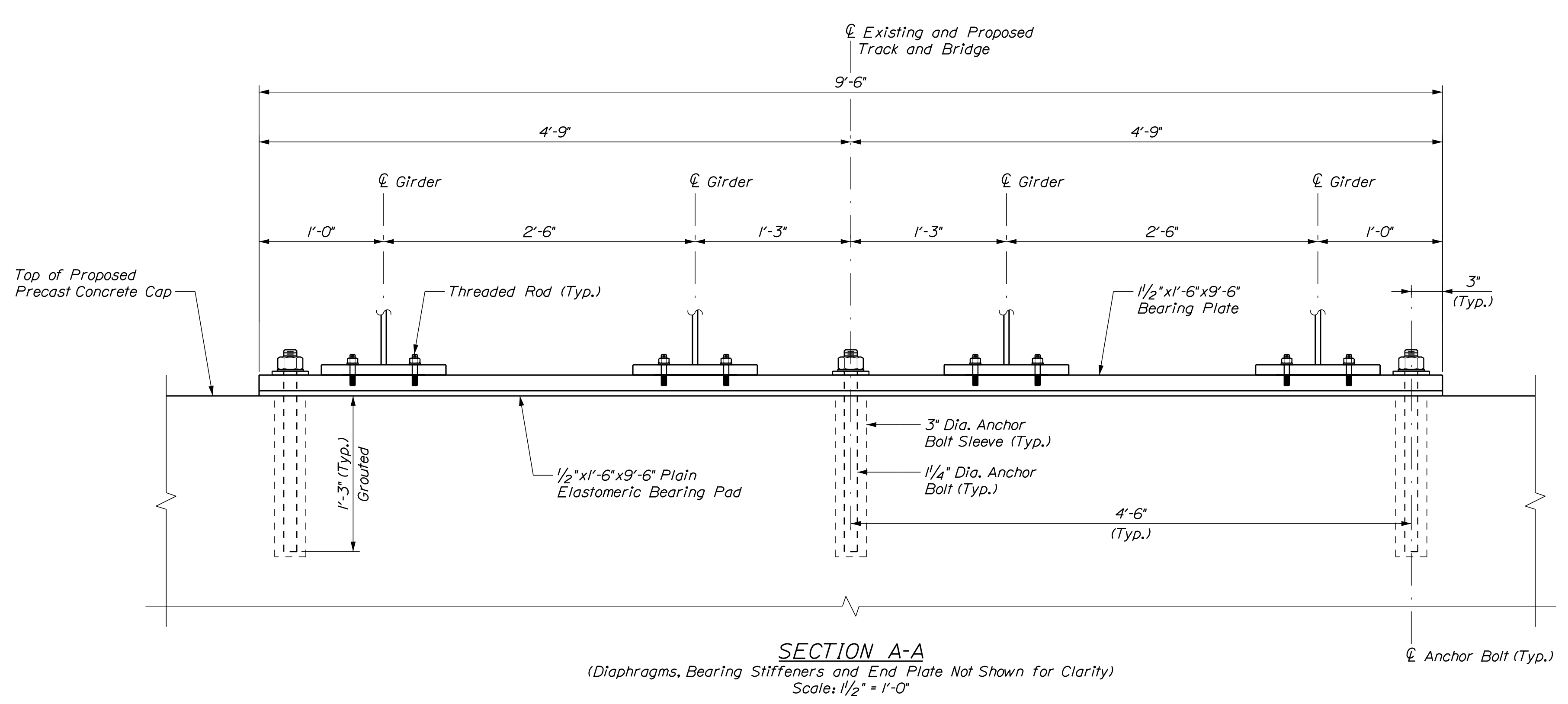
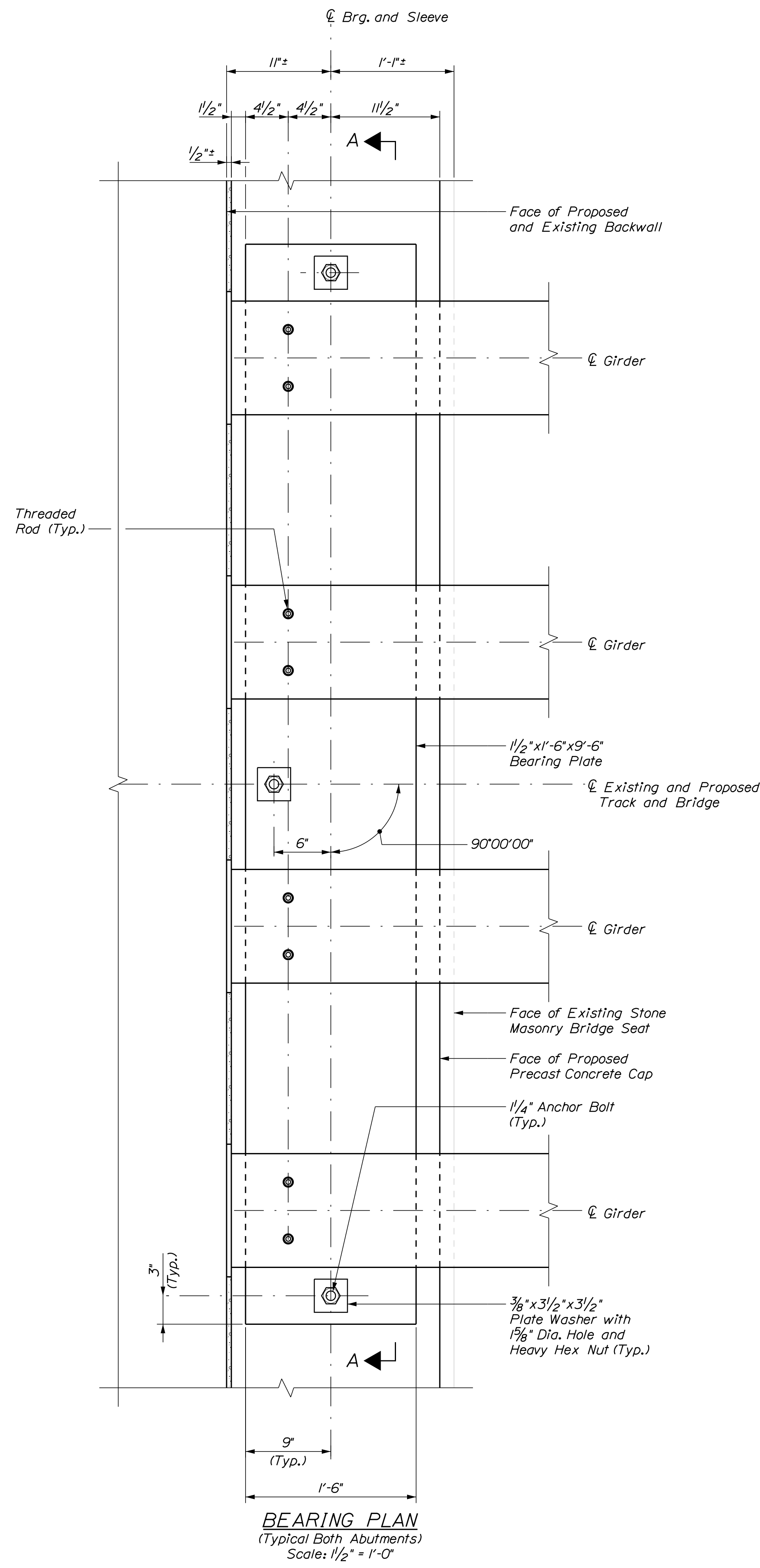
STATE OF MAINE		DEPARTMENT OF TRANSPORTATION		BRIDGE NO. 7763		WIN 23486.00		BRIDGE PLANS	
PROJ. MANAGER	NATE BENOT	DATE	2/2021	DESIGN-DETAILED	JON GSC	CHECKED-REVIEWED	GSC	DESIGN-DETAILED	REVISIONS 1
DESIGN-DETAILED	JON GSC	CHECKED-REVIEWED	GSC	DESIGN-DETAILED	REVISIONS 2	DESIGN-DETAILED	REVISIONS 3	DESIGN-DETAILED	REVISIONS 4
DESIGN-DETAILED	REVISIONS 1	DESIGN-DETAILED	REVISIONS 2	DESIGN-DETAILED	REVISIONS 3	DESIGN-DETAILED	REVISIONS 4	DESIGN-DETAILED	FIELD CHANGES
MAINE RAILROAD BRIDGE CAPACITY PROJECT - STEEL PROCUREMENT MADAWASKA SUB. AROOSTOOK/PENOBSCOT BR. NO. 7763 (M.P. 111.14) OVER SOUTH MEADOW BROOK (1 OF 2)									
SHEET NUMBER 3									
OF 10									

Date: 3/12/2021

Username: JMacpherson

Division: MUL TIMODAL

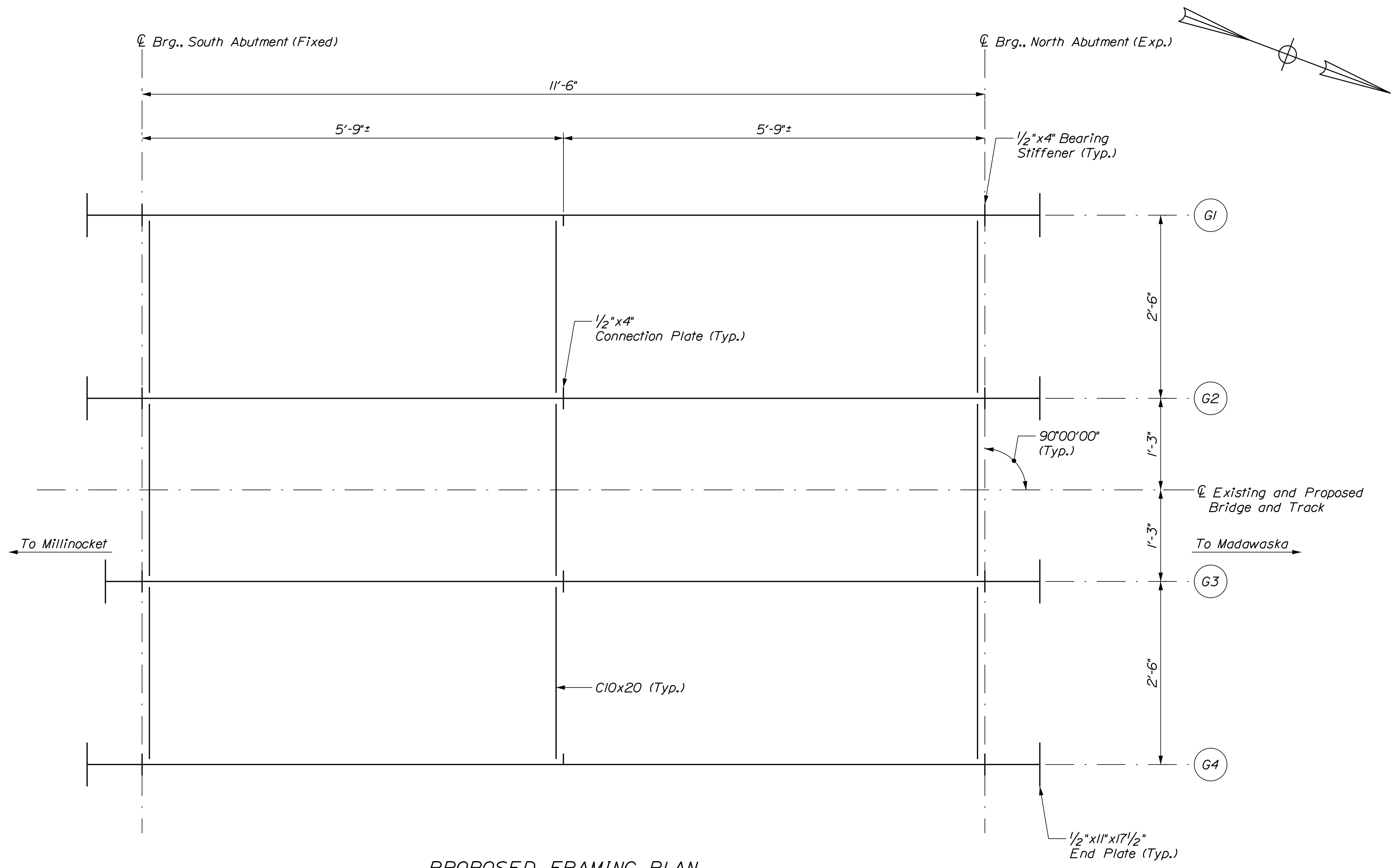
Filename: ...004_bearing_111.14.dgn



NOTES

1. See Notes and Quantities sheet for Bearing and Anchor Bolt notes.
2. The shop assembly requirements of Section 504.31 shall include attachment of the bearing plates to ensure proper fit up of the bearing plates on the assembled girder sections.

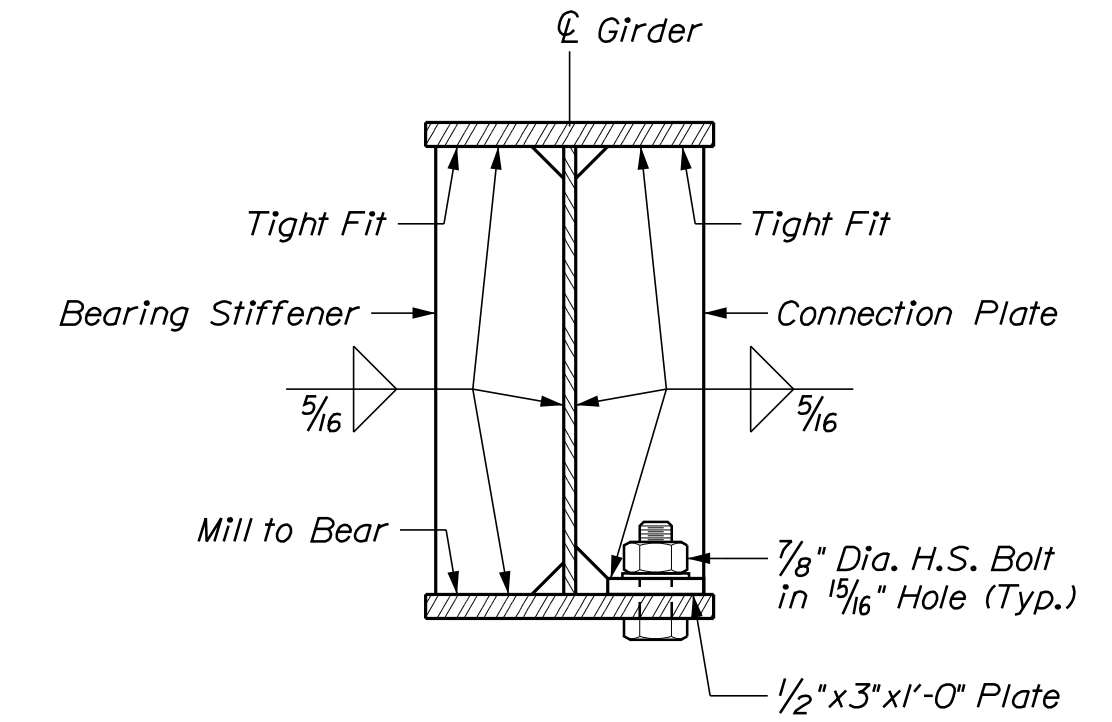
STATE OF MAINE DEPARTMENT OF TRANSPORTATION		BRIDGE NO. 7763		WIN 23486.00		BRIDGE PLANS	
PROJ. MANAGER	NATE BENNETT	DATE	2/2021	BY	BJM	DATE	2/2021
DESIGN-DETAILED	JGM	CHECKED-REVIEWED	GSC	BY	GSC	DATE	2/2021
DESIGN-DETAILED		DESIGN-DETAILED		REVISIONS	1		
		REVISIONS	2				
		REVISIONS	3				
		REVISIONS	4				
		FIELD CHANGES					
MAINE RAILROAD BRIDGE CAPACITY PROJECT - STEEL PROCUREMENT MADAWASKA SUB. AROOSTOOK/PENOBSCOT							
BR. NO. 7763 (M.P. 111.14) OVER SOUTH MEADOW BROOK (2 OF 2)							
SHEET NUMBER 4							
OF 10							



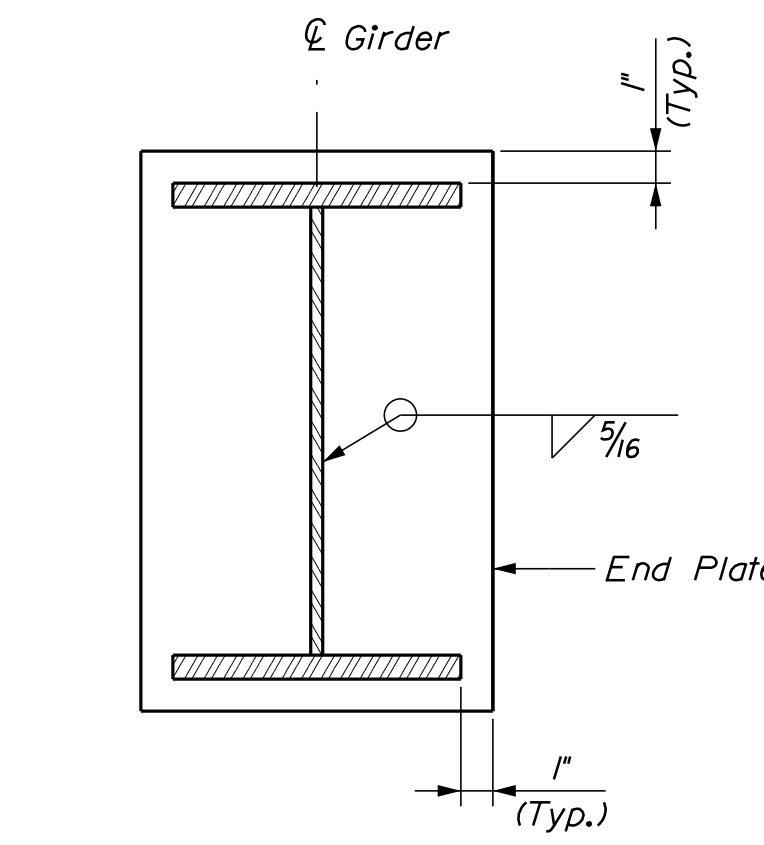
PROPOSED FRAMING PLAN
Scale: 1" = 1'-0"

NOTES

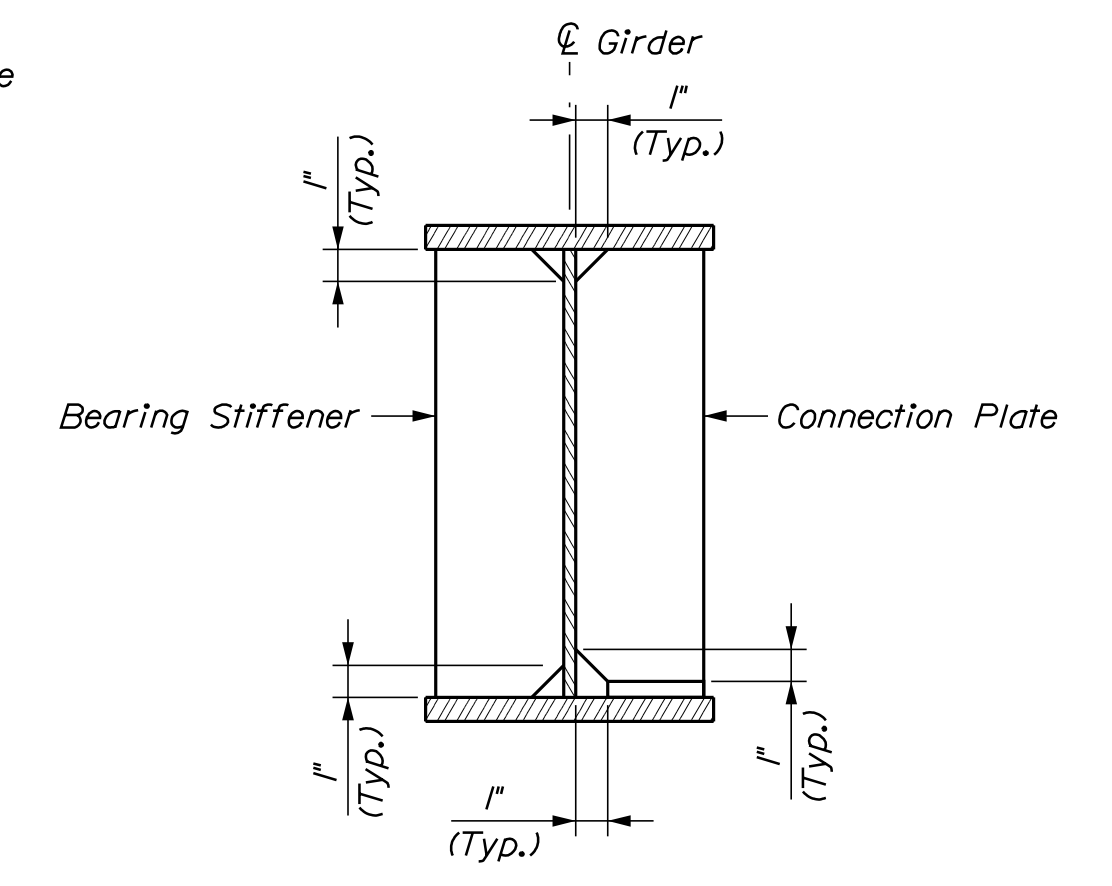
1. See the Notes and Quantities sheet for Structural Steel Superstructure Notes.
2. All webs, and flanges in tension areas shall conform to notch toughness requirements for non-fracture critical members, specified in MaineDOT Standard Specification Section 713.01. These members have been labeled (CVN) for clarity.
3. Flange and web plates shall be fabricated in one piece. No transverse butt welds are allowed.
4. Bearing stiffeners and end plates shall be plumb after erection and full dead load is applied to the structure.
5. Diaphragm connection plates may be either plumb or normal to the top flange.
6. Girders shall be fabricated to zero camber plus tolerance.



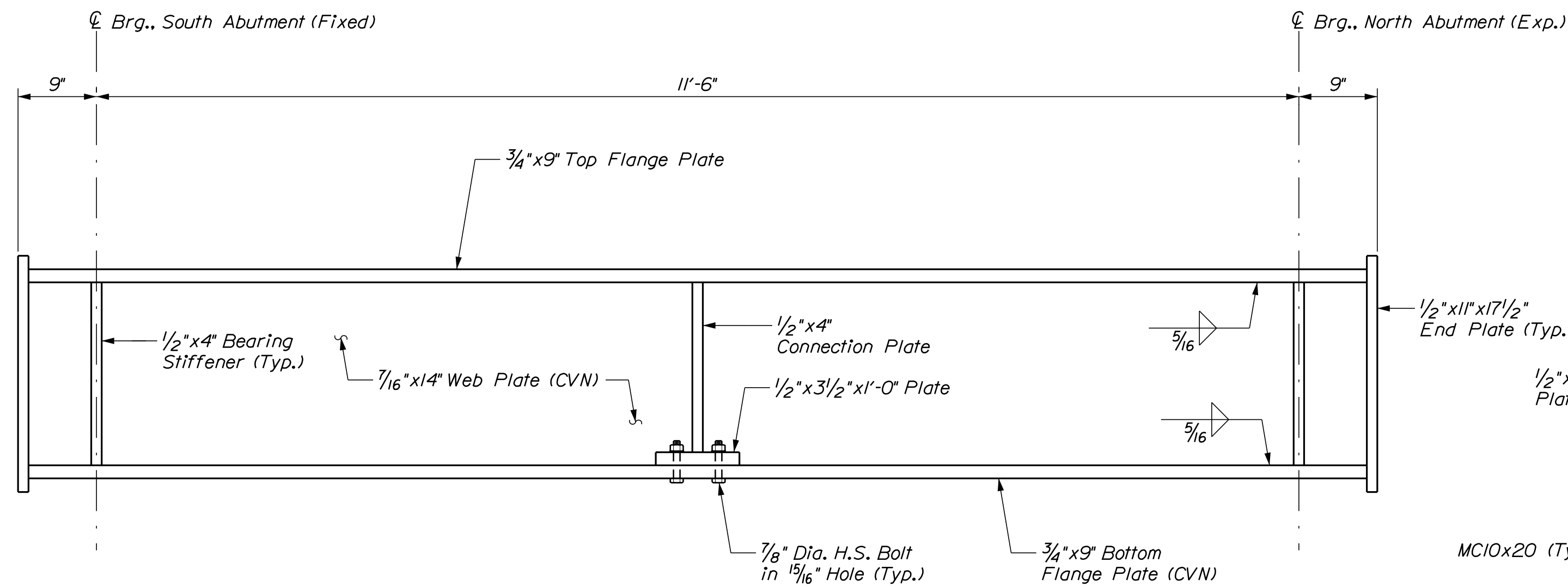
BEARING STIFFENER AND CONNECTION PLATE DETAIL
Not to Scale



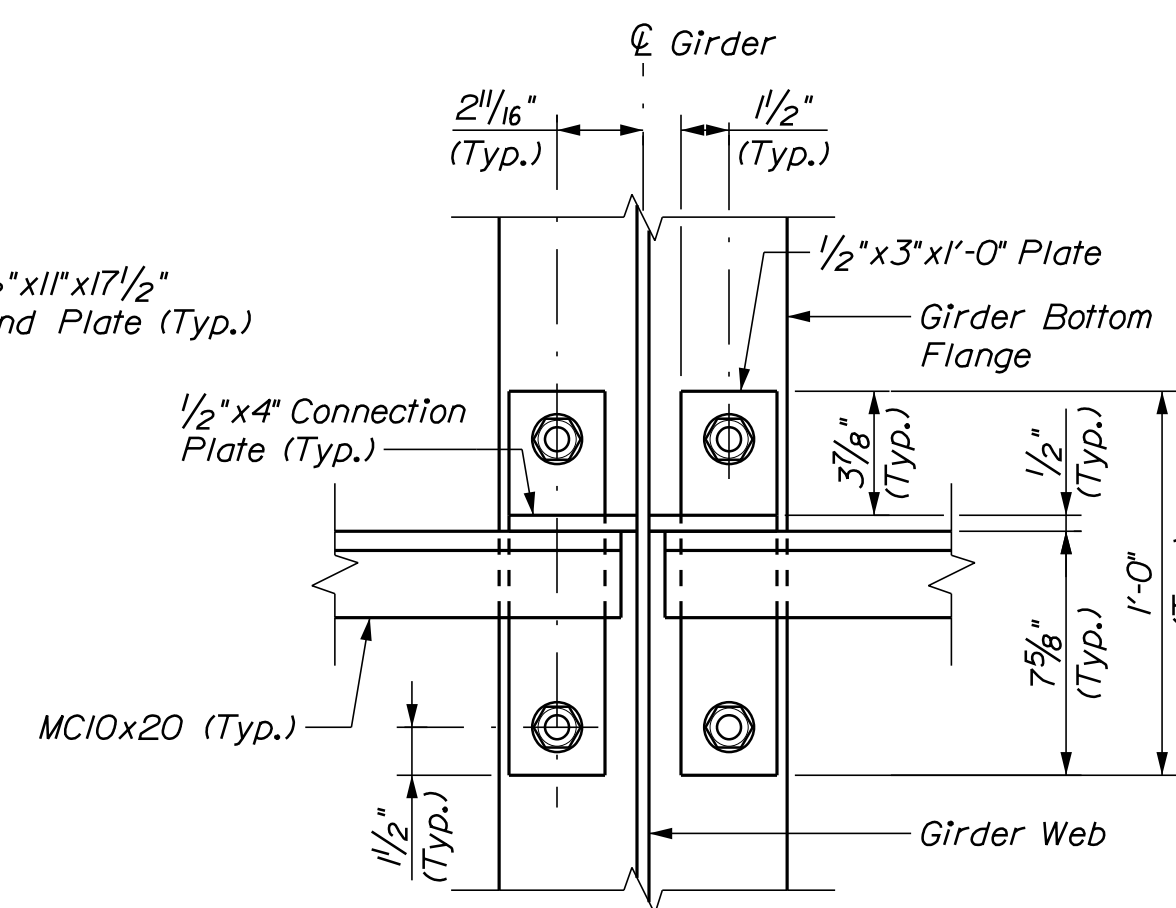
END PLATE DETAIL
Not to Scale



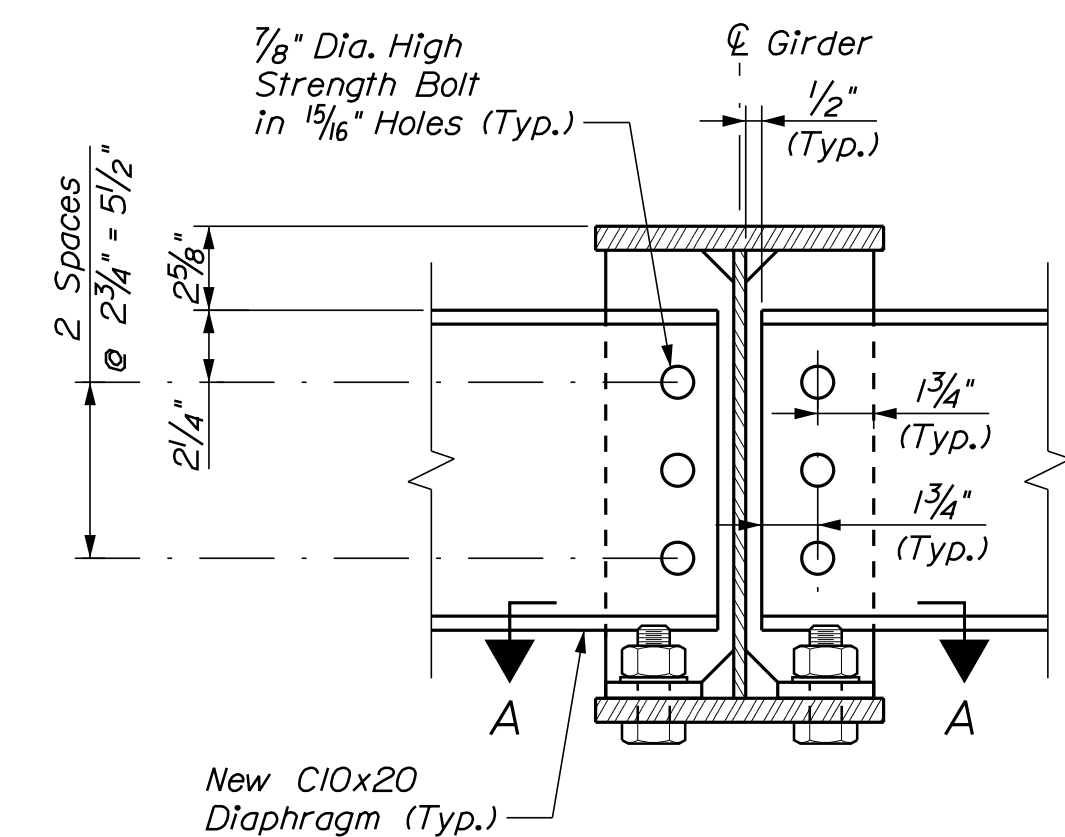
COPING DETAIL
Not to Scale



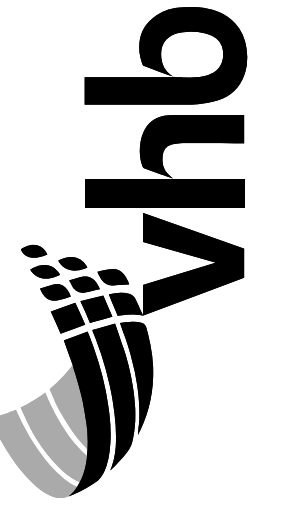
GIRDER ELEVATION
Not to Scale



SECTION A-A
Not to Scale



DIAPHRAGM CONNECTION DETAIL
Not to Scale

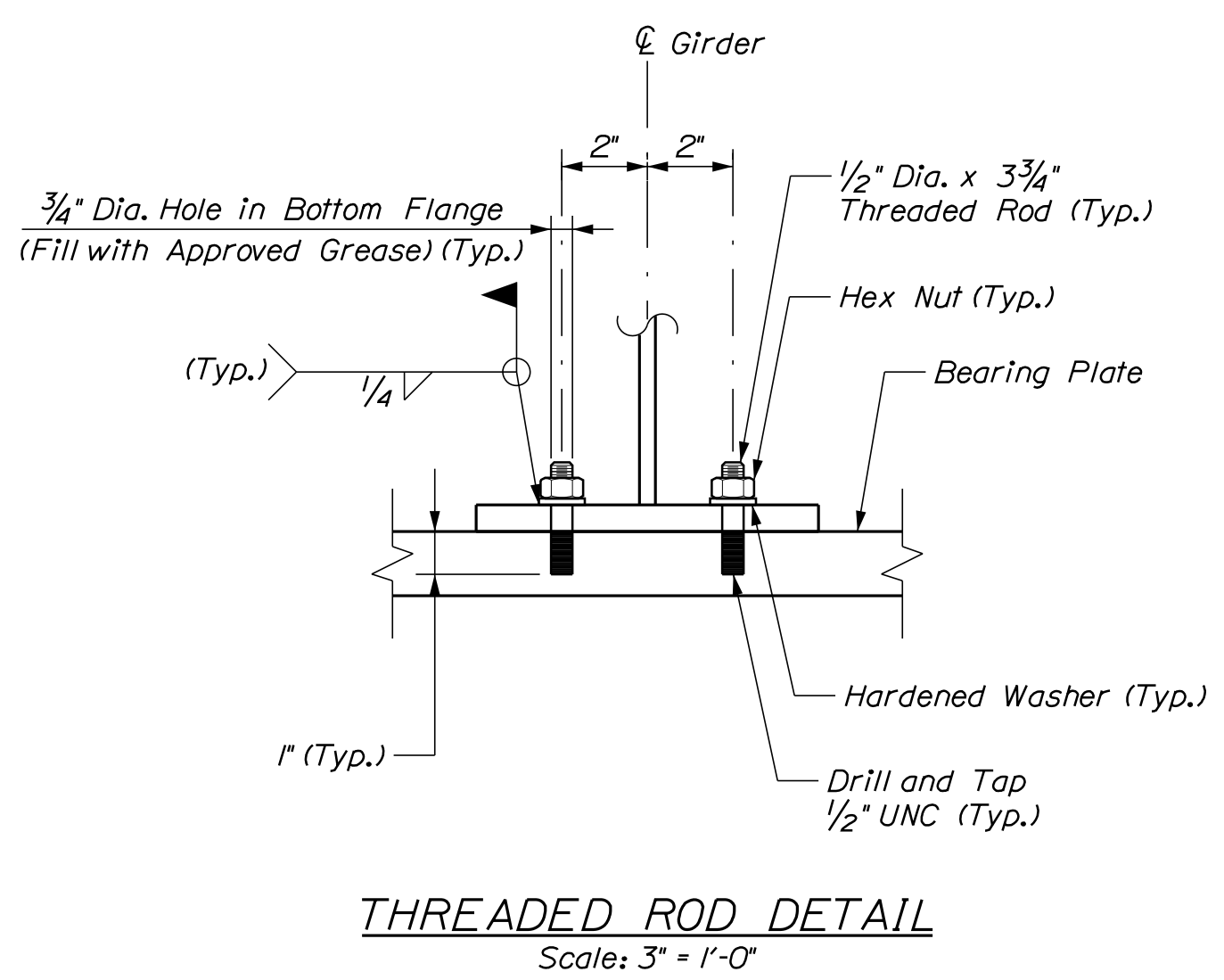
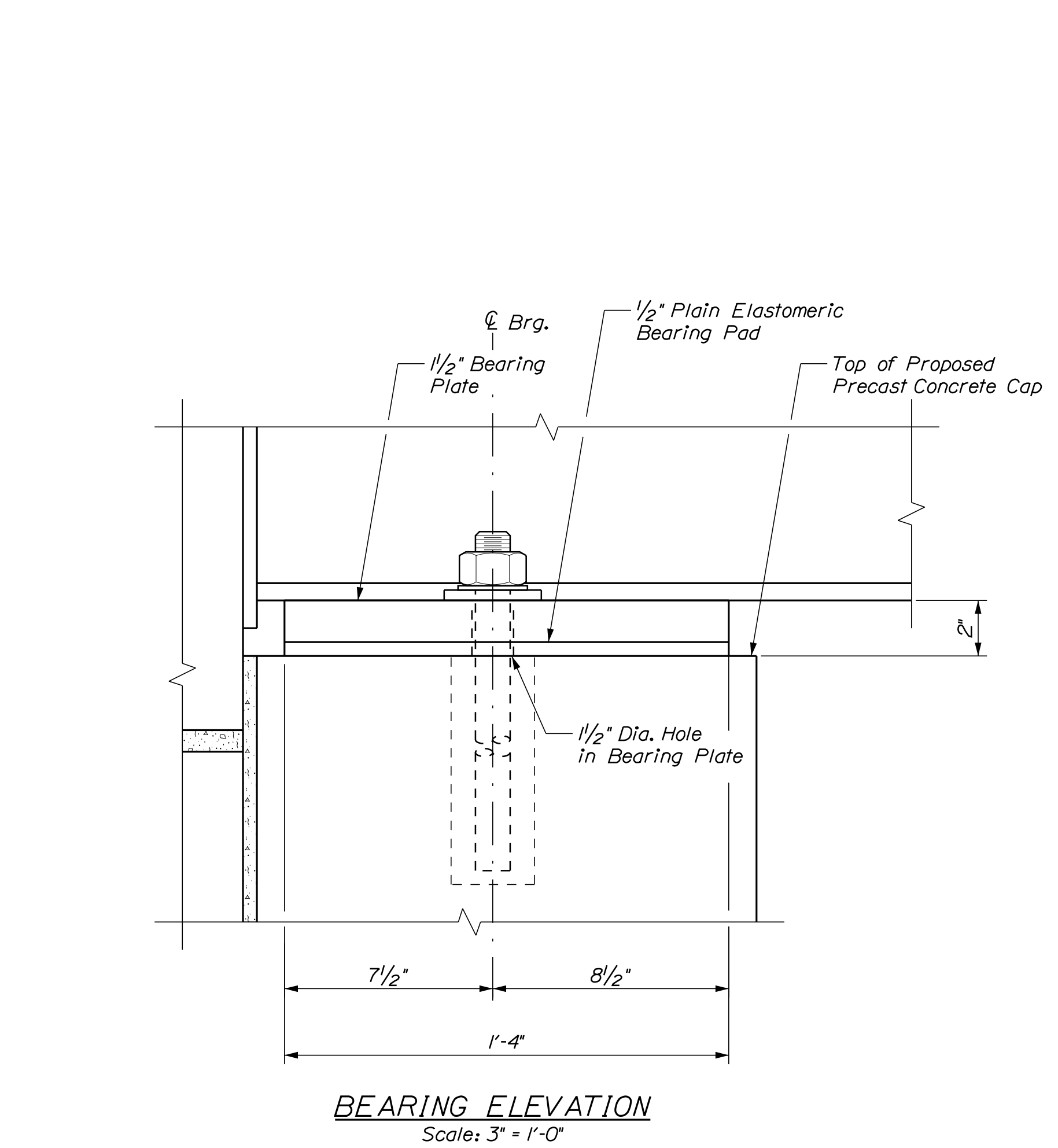
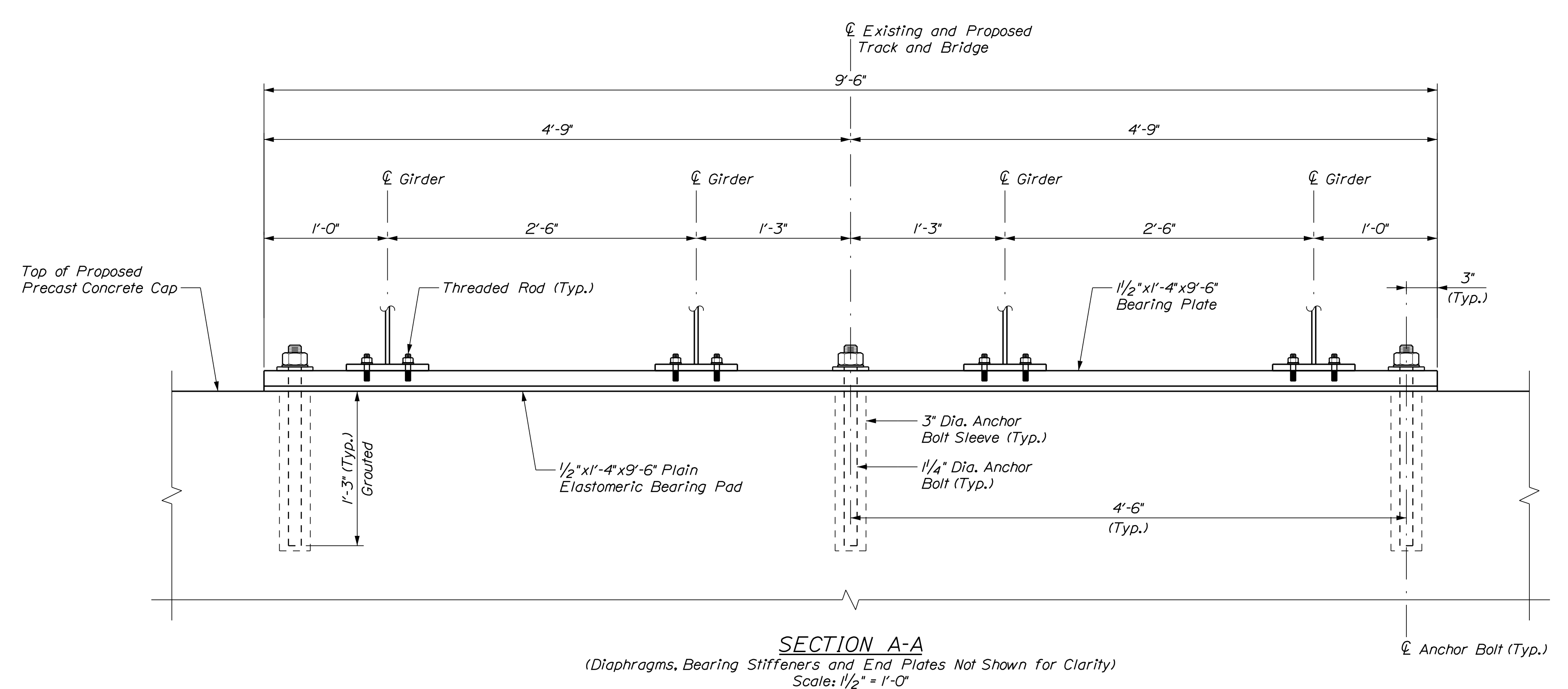
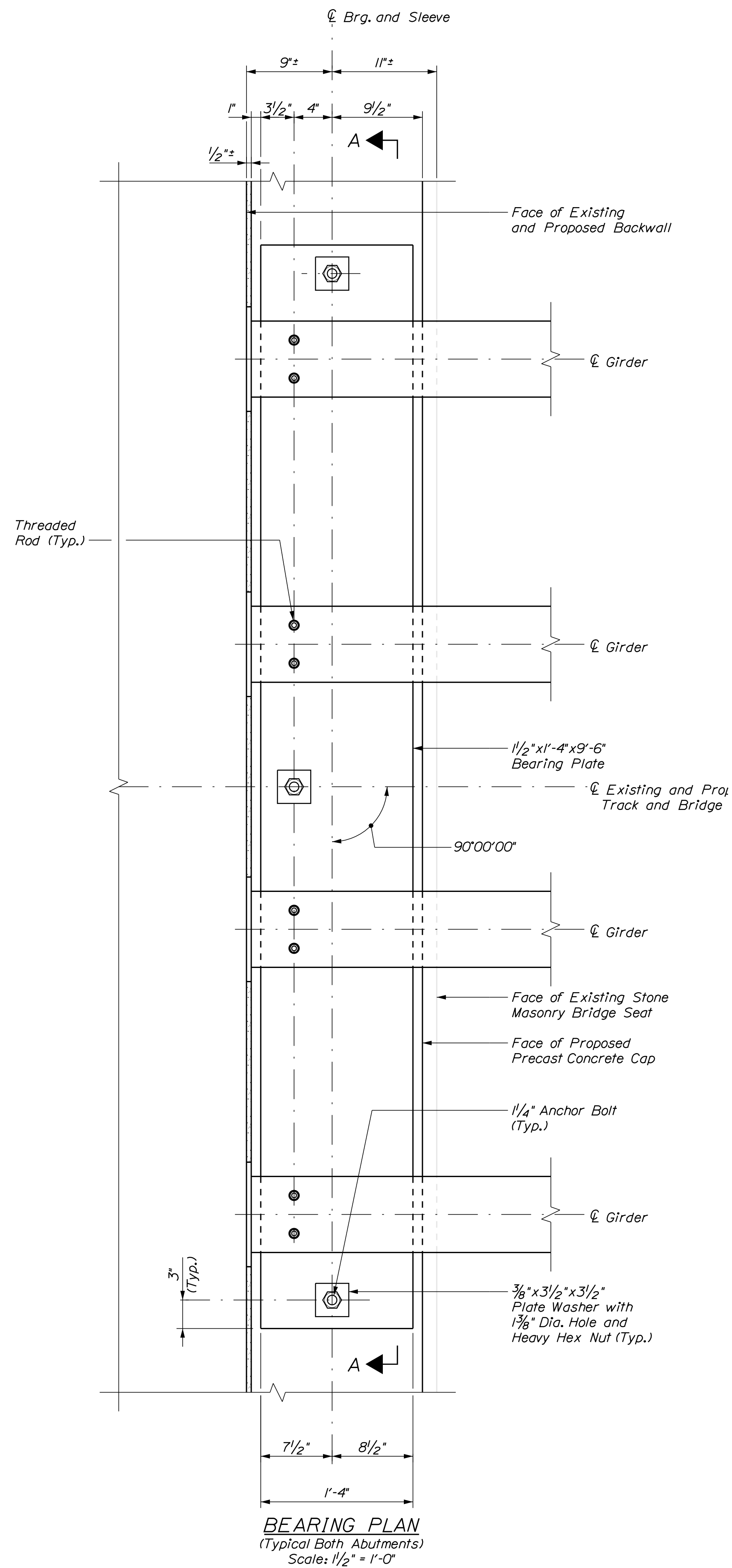


PROJ. MANAGER	NATE BENOT	DATE	BY	DATE
DESIGN-DETAILED	JOM	2/2021	BJM	2/2021
CHECKED-REVIEWED	GSC	2/2021	GSC	2/2021
DESIGN-DETAILED				
REVISIONS 1				
REVISIONS 2				
REVISIONS 3				
REVISIONS 4				
FIELD CHANGES				

MAINE RAILROAD BRIDGE CAPACITY
PROJECT - STEEL PROCUREMENT
MADAWASKA SUB. AROOSTOOK/PENOBSCOT
BR. NO. 7776 (M.P. 154.04)
OVER SOULE BROOK (1 OF 2)

SHEET NUMBER

5



NOTES

1. See Notes and Quantities sheet for Bearing and Anchor Bolt notes.
2. The shop assembly requirements of Section 504.31 shall include attachment of the bearing plates to ensure proper fit up of the bearing plates on the assembled girder sections.

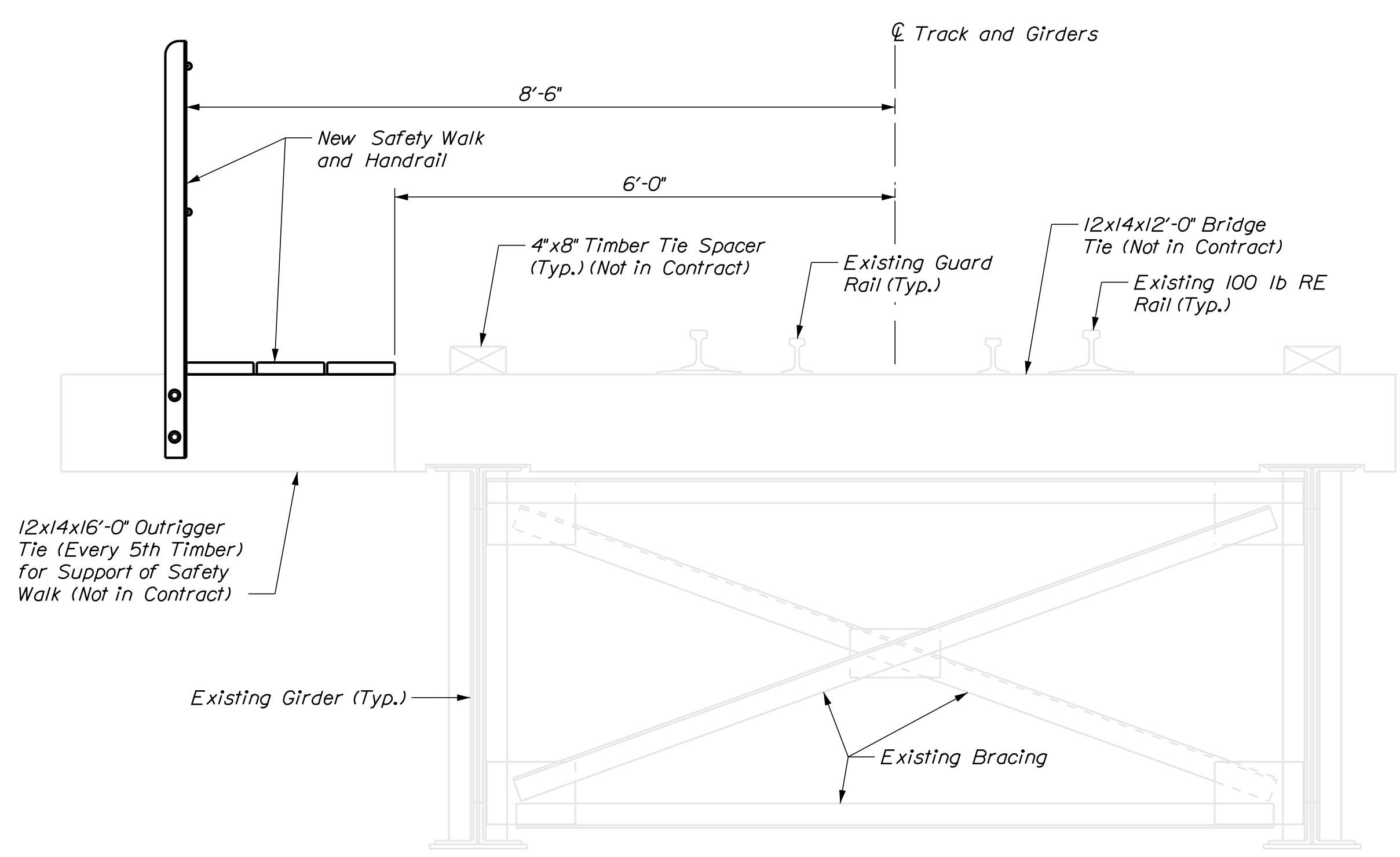
STATE OF MAINE DEPARTMENT OF TRANSPORTATION																																								
BRIDGE NO. 7776 WIN 23486.00 BRIDGE PLANS																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">PROJ. MANAGER</th> <th style="width: 15%;">DATE</th> <th style="width: 15%;">BY</th> <th style="width: 15%;">DATE</th> </tr> </thead> <tbody> <tr> <td>DESIGN-DETAILED</td> <td>JUN 27/2021</td> <td>BJM</td> <td>2/2021</td> </tr> <tr> <td>CHECKED-REVIEWED</td> <td>GSC</td> <td>GSC</td> <td>2/2021</td> </tr> <tr> <td>DESIGN-DETAILED</td> <td></td> <td></td> <td></td> </tr> <tr> <td>DESIGN-DETAILED</td> <td></td> <td></td> <td></td> </tr> <tr> <td>REVISIONS 1</td> <td></td> <td></td> <td></td> </tr> <tr> <td>REVISIONS 2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>REVISIONS 3</td> <td></td> <td></td> <td></td> </tr> <tr> <td>REVISIONS 4</td> <td></td> <td></td> <td></td> </tr> <tr> <td>FIELD CHANGES</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	PROJ. MANAGER	DATE	BY	DATE	DESIGN-DETAILED	JUN 27/2021	BJM	2/2021	CHECKED-REVIEWED	GSC	GSC	2/2021	DESIGN-DETAILED				DESIGN-DETAILED				REVISIONS 1				REVISIONS 2				REVISIONS 3				REVISIONS 4				FIELD CHANGES			
PROJ. MANAGER	DATE	BY	DATE																																					
DESIGN-DETAILED	JUN 27/2021	BJM	2/2021																																					
CHECKED-REVIEWED	GSC	GSC	2/2021																																					
DESIGN-DETAILED																																								
DESIGN-DETAILED																																								
REVISIONS 1																																								
REVISIONS 2																																								
REVISIONS 3																																								
REVISIONS 4																																								
FIELD CHANGES																																								
MAIN RAILROAD BRIDGE CAPACITY PROJECT - STEEL PROCUREMENT MADAWASKA SUB. AROOSTOOK/PENOBSCOT BR. NO. 7776 (M.P. 154.04) OVER SOULE BROOK (2 OF 2)																																								
SHEET NUMBER 6 OF 10																																								

Date: 3/12/2021

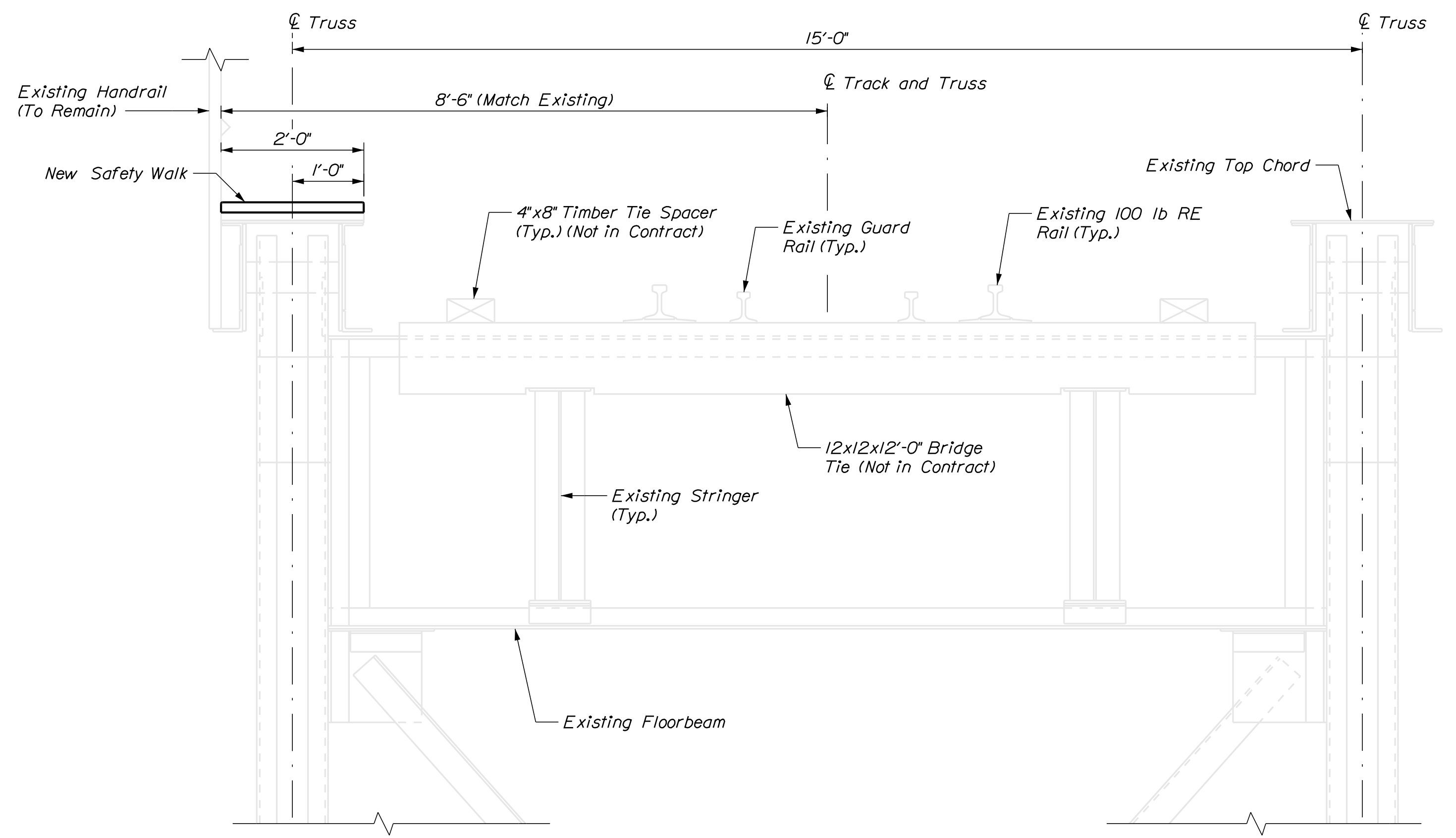
Username: JMacpherson

Division: MUL TIMODAL

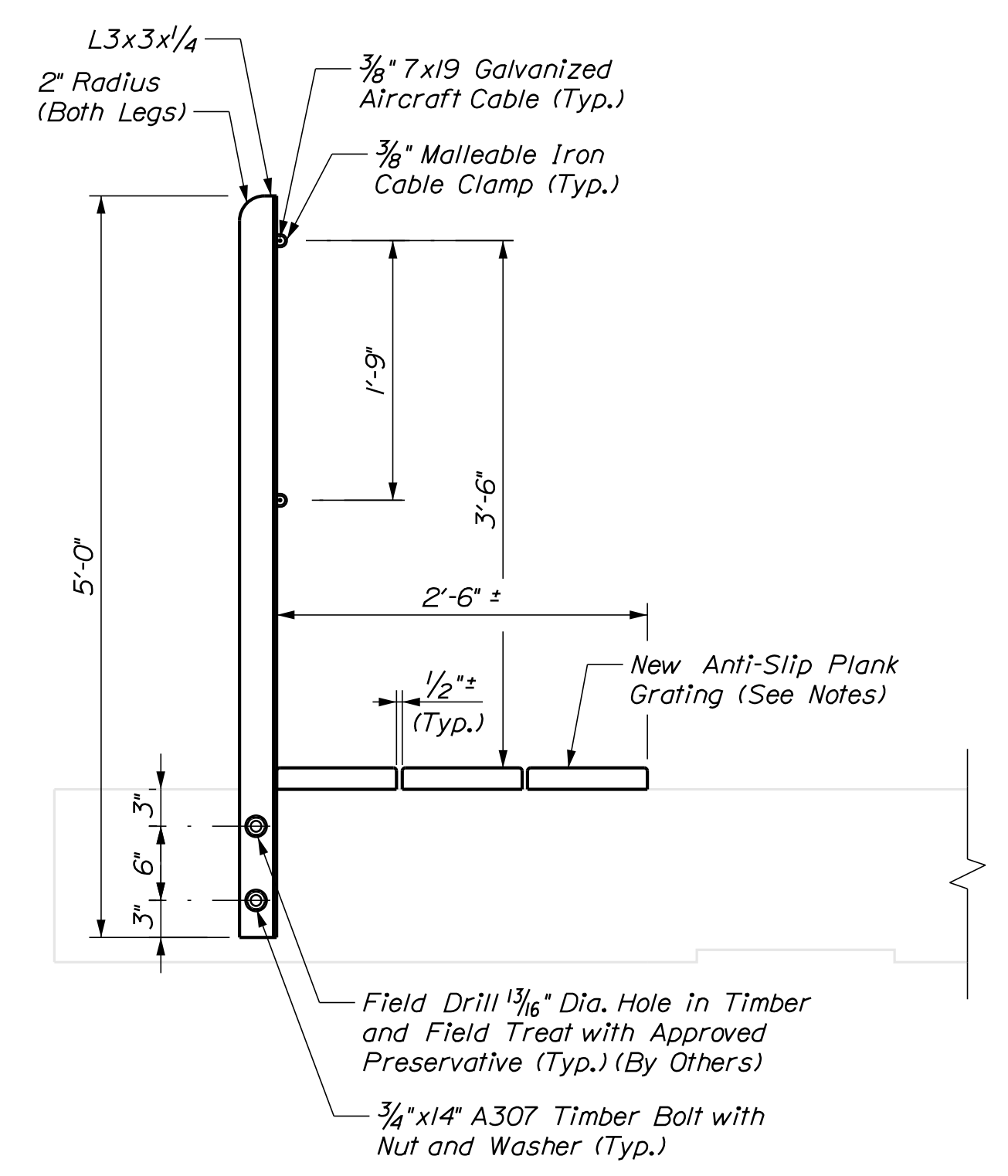
Filename: ...007_Typ.dgn



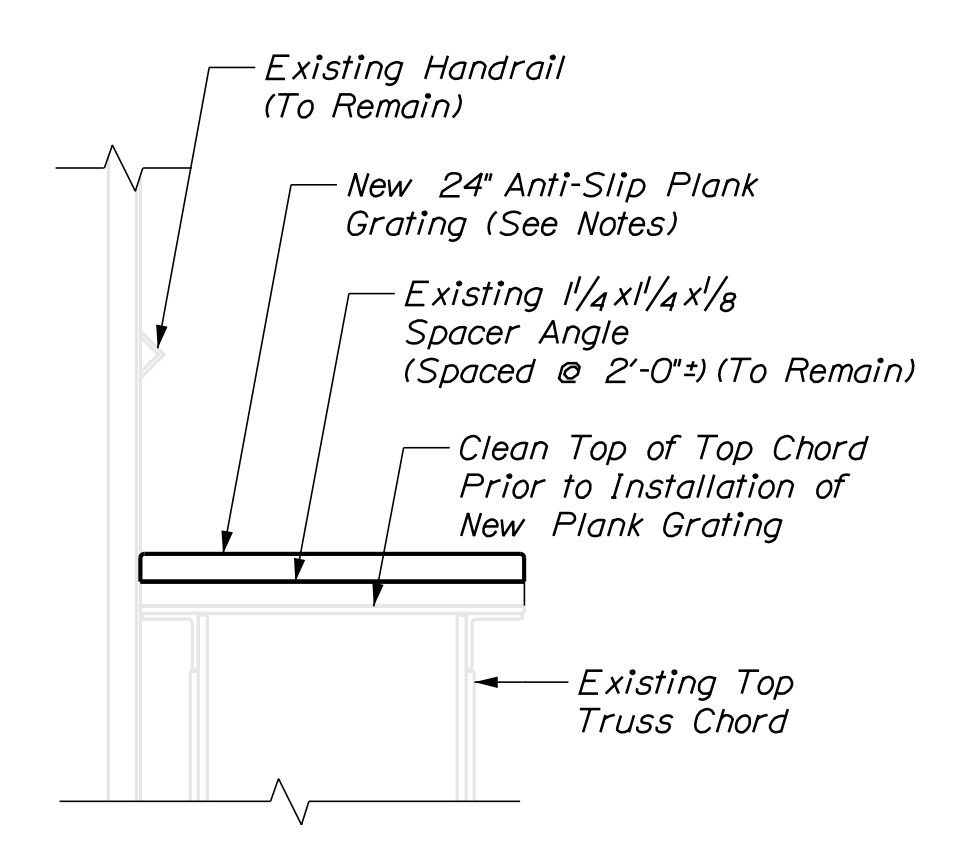
APPROACH SPAN TYPICAL SECTION
 (Spans 1, 2, 7, and 8 Similar)
 Scale: 3/4" = 1'-0"



TRUSS SPAN TYPICAL SECTION
 (Spans 3, 4, 5, and 6 Similar)
 Scale: 3/4" = 1'-0"



APPROACH SPAN SAFETY WALK DETAIL
 Scale: 1" = 1'-0"



TRUSS SPAN SAFETY WALK DETAIL
 Scale: 1" = 1'-0"

NOTES

1. See Notes and Quantities sheet for Safety Walk Notes and quantities.
2. See Sheridan Truss Br. No. 7783 (M.P. 193.50) (3 of 4) sheet for additional safety walk details.



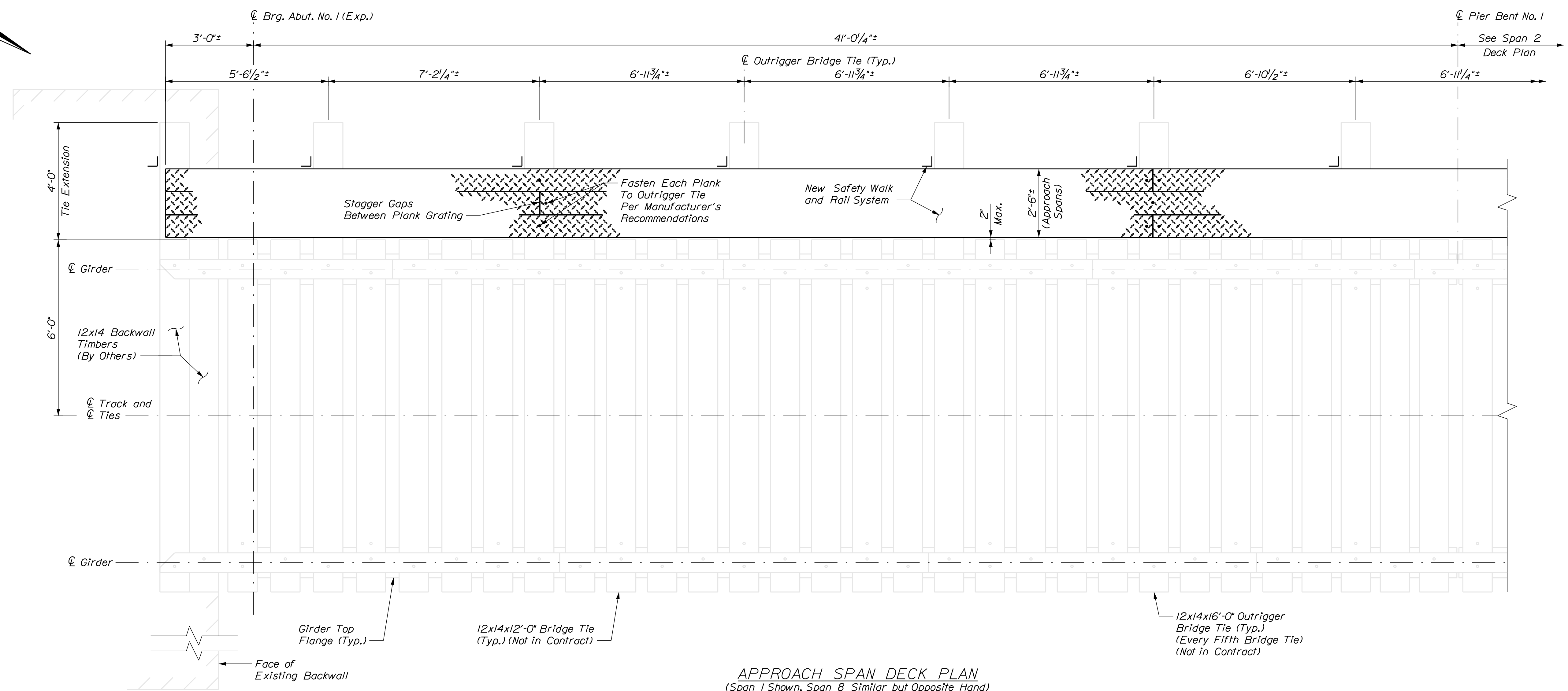
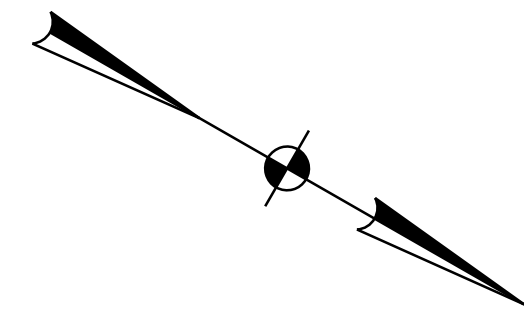
PROJ. MANAGER	NATE BENOIT	DATE
DESIGN-DETAILED	JOM	2/2021
CHECKED-REVIEWED	GSC	2/2021
DESIGN-DETAILED		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

MAINE RAILROAD BRIDGE CAPACITY
 PROJECT - STEEL PROCUREMENT
 MADAWASKA SUB. AROOSTOOK/PENOBSCOT
 SHERIDAN TRUSS
 BR. NO. 7783 (M.P. 193.50) (1 OF 4)

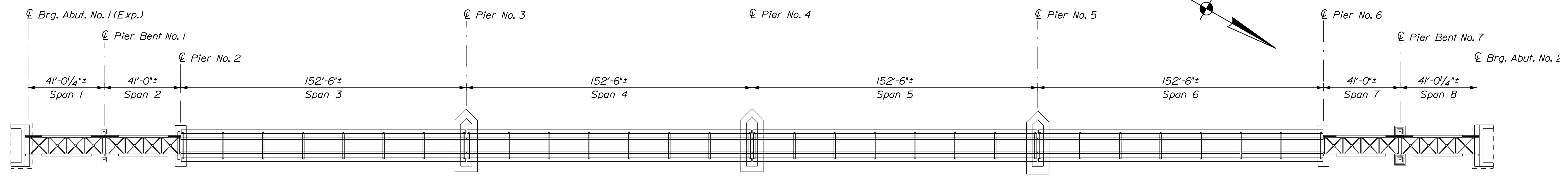
SHEET NUMBER

7

Filename: ... \008_Girder_Deck_01.dgn
 Division: MUL TIMODAL
 Username: JMacpherson
 Date: 3/12/2021



APPROACH SPAN DECK PLAN
 (Span 1 Shown, Span 8 Similar but Opposite Hand)
 (Track not Shown)
 Scale: 1/2" = 1'-0"



LAYOUT PLAN
 Not to Scale

NOTE
 1. See Notes and Quantities sheet for Safety Walk Notes and quantities.

STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 WIN
 23486.00
 BRIDGE NO. 7783
 BRIDGE PLANS



PROJ. MANAGER	NATE BENOIT	BY	DATE
DESIGN-DETAILED	JOM	BJM	2/2021
CHECKED-REVIEWED	GSC	GSC	2/2021
DESIGN-DETAILED			
REVISIONS			
REVISIONS			
REVISIONS			
REVISIONS			
FIELD CHANGES			

MAINE RAILROAD BRIDGE CAPACITY
 PROJECT - STEEL PROCUREMENT
 MADAWASKA SUB. AROOSTOOK/PENOBSCOT
 SHERIDAN TRUSS
 BR. NO. 7783 (M.P. 193.50) (2 OF 4)

SHEET NUMBER

8

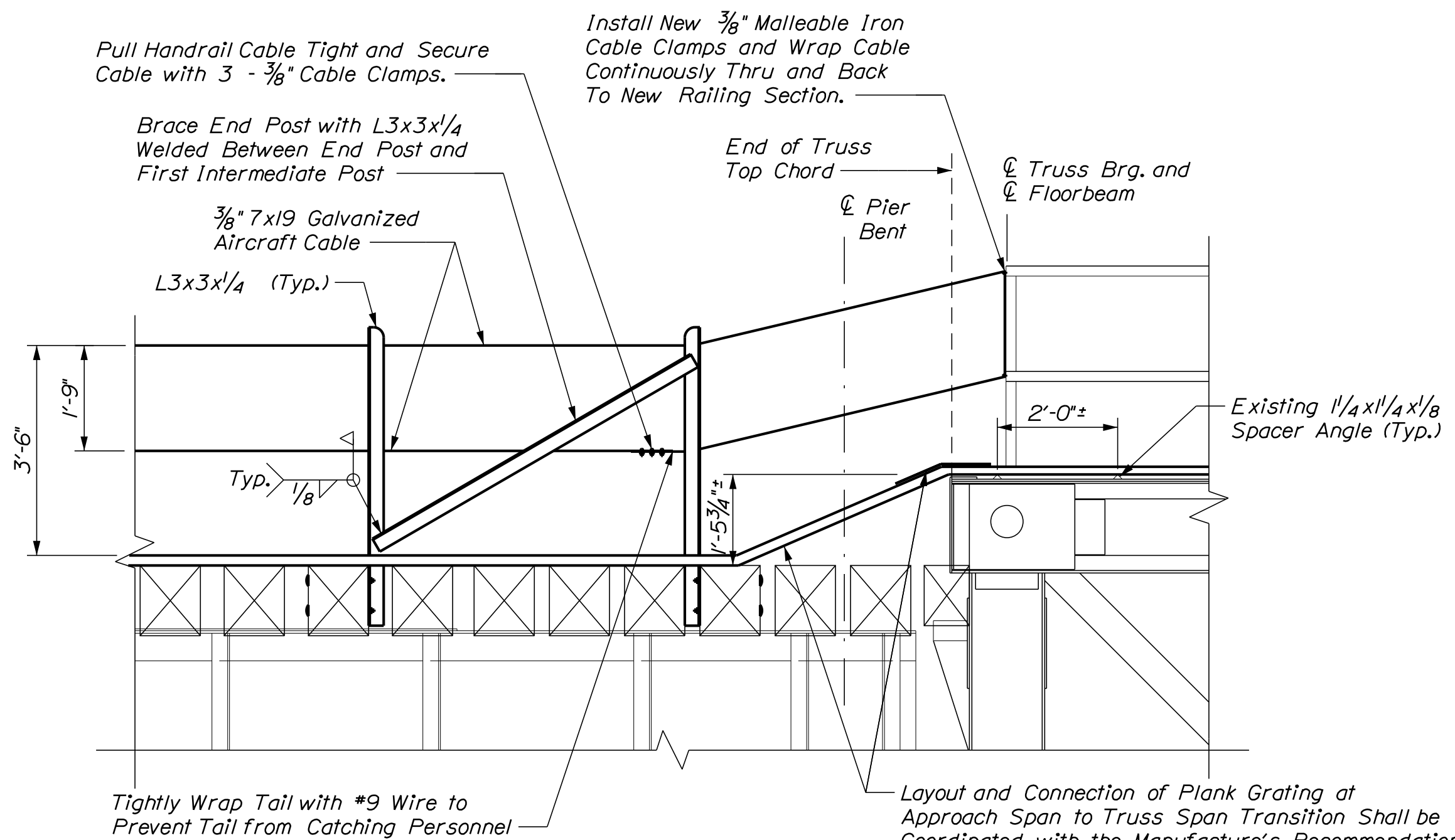
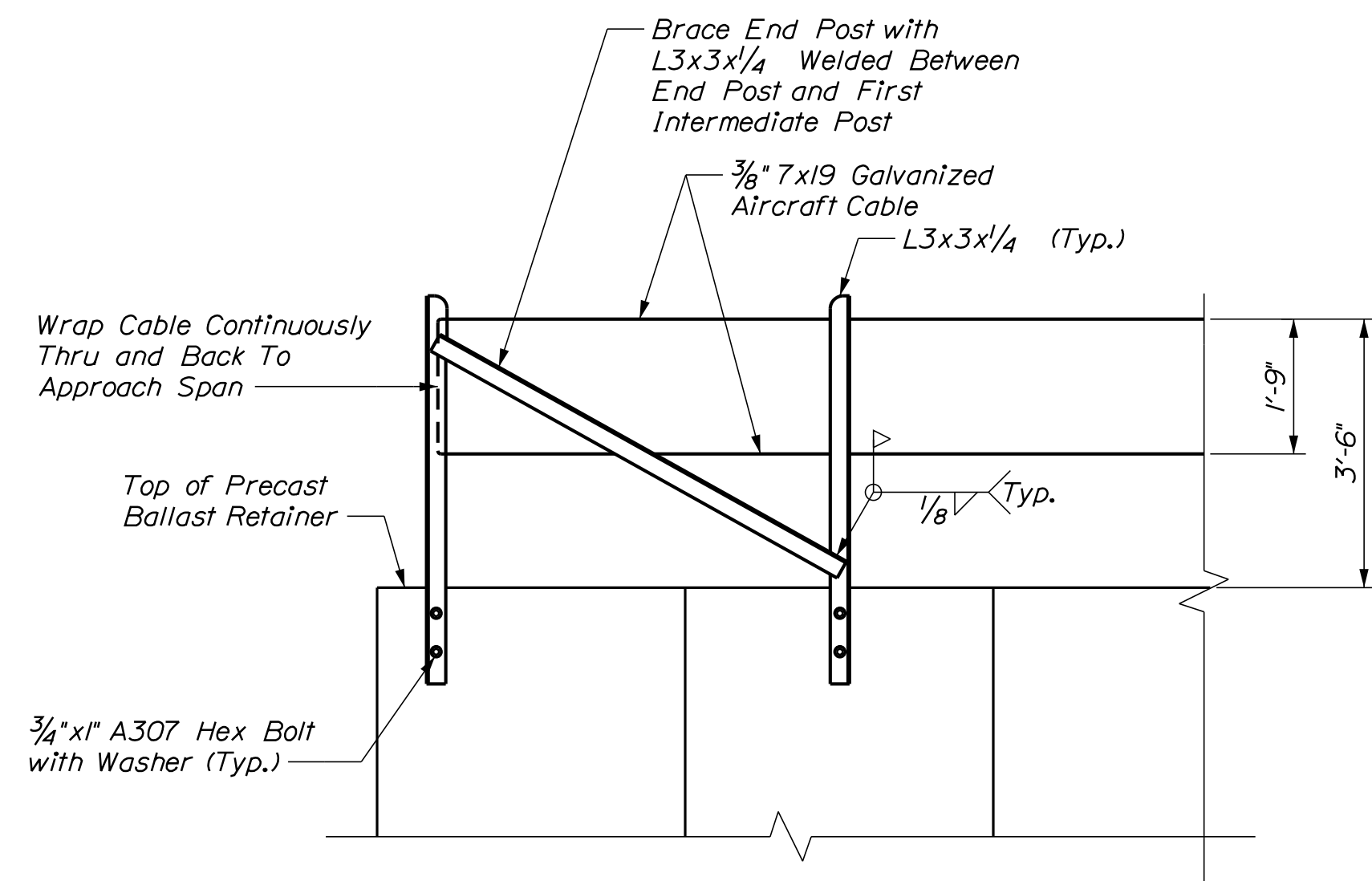
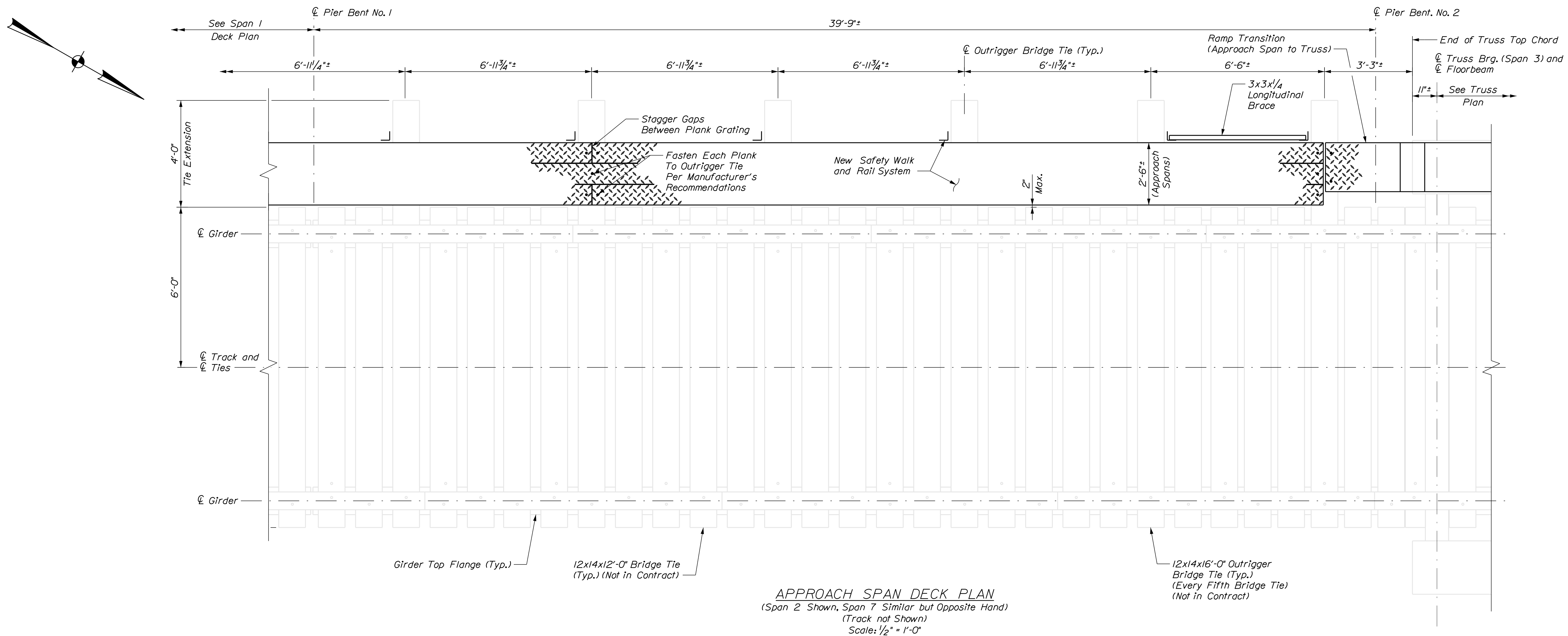
OF 10

Filename: ... \009_Girder_Deck_02.dgn

Division: MUL TIMODAL

Username: JMacpherson

Date: 3/12/2021



NOTE

1. See Notes and Quantities sheet for Safety Walk Notes and quantities.

BALLAST RETAINER TERMINATION DETAIL
(Abutment 2 Shown, Abutment 1 Similar but Opposite Hand)
Scale: 1/2" = 1'-0"

TRUSS END TERMINATION DETAIL
(Span 7 Shown, Span 2 Similar but Opposite Hand)
Scale: 1/2" = 1'-0"

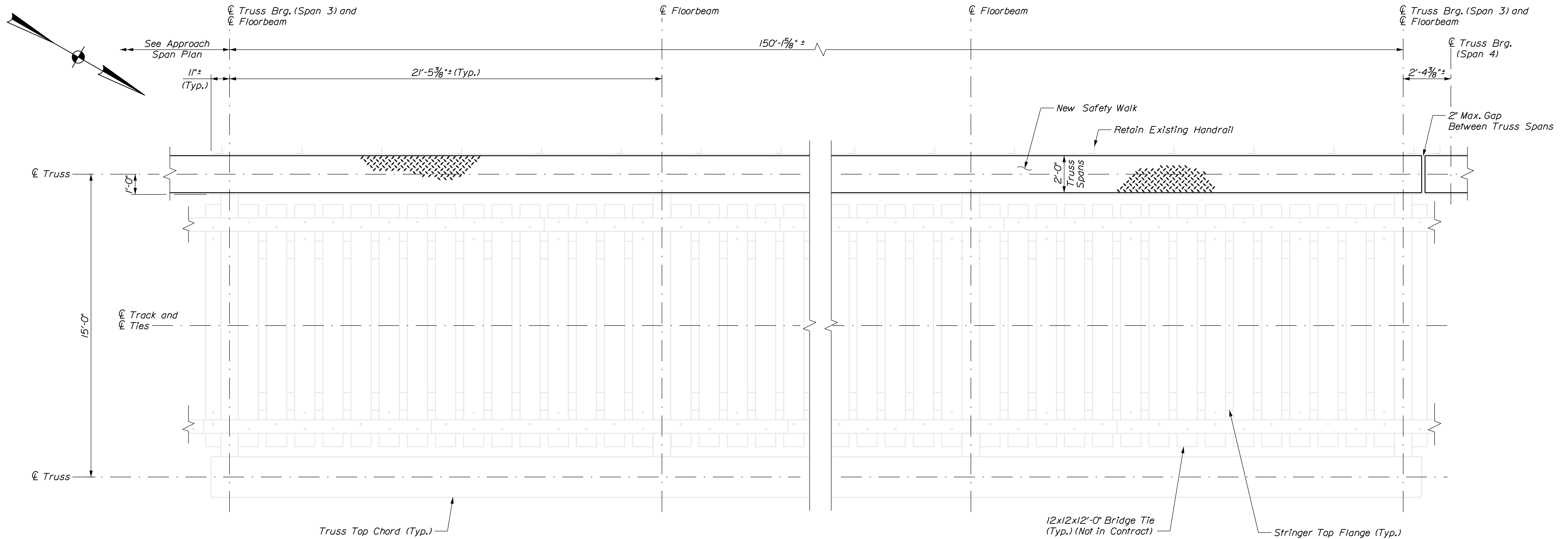


PROJ. MANAGER	NATE BENOT	DATE
DESIGN-DETAILED	JOM	2/2021
CHECKED-REVIEWED	GSC	2/2021
DESIGN-DETAILED		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SHEET NUMBER

9

OF 10



TRUSS DECK PLAN
 (Span 3 Shown, Spans 4, 5, and 6 Similar)
 (Track not Shown)
 Scale: $\frac{3}{8}" = 1'-0"$

NOTE
 1. See Notes and Quantities sheet for Safety Walk Notes and quantities.

STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 WIN
 23486.00
 BRIDGE NO. 7783
 BRIDGE PLANS



PROJ. MANAGER	NATE BENOT	BY	DATE
DESIGN-DETAILED	JOM	BJM	2/2021
CHECKED-REVIEWED	GSC	GSC	2/2021
DESIGN-DETAILED			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

MAINE RAILROAD BRIDGE CAPACITY
 PROJECT - STEEL PROCUREMENT
 MADAWASKA SUB. AROOSTOOK/PENOBSCOT
 SHERIDAN TRUSS
 BR. NO. 7783 (M.P. 193.50) (4 OF 4)

SHEET NUMBER
10
 OF 10