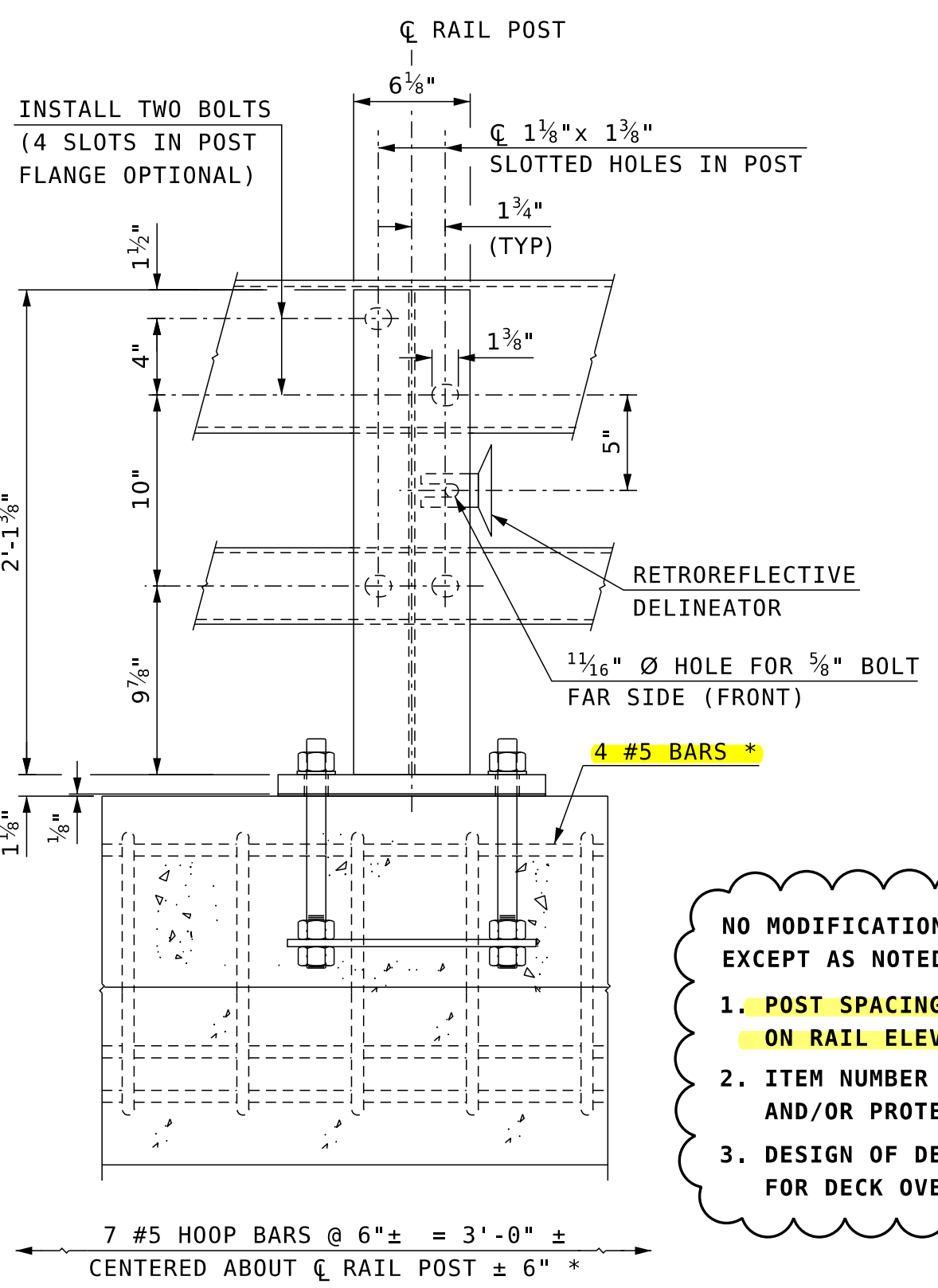


SECTION VIEW

POST ASSEMBLY

SCALE: 1 1/2" = 1'-0"



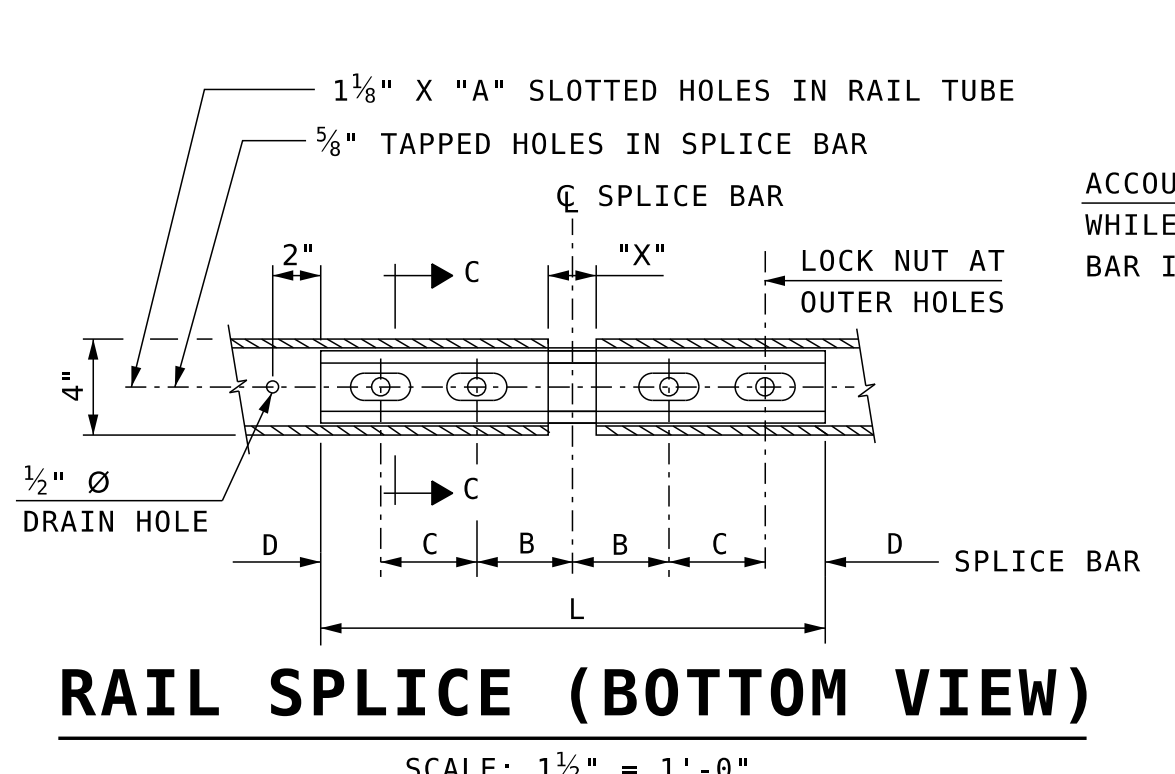
BACK ELEVATION VIEW

NHDOT Bridge Design
7/31/2023

Revisions made to Bridge Detail Sheet are highlighted.
Go to website for current Detail Sheet.

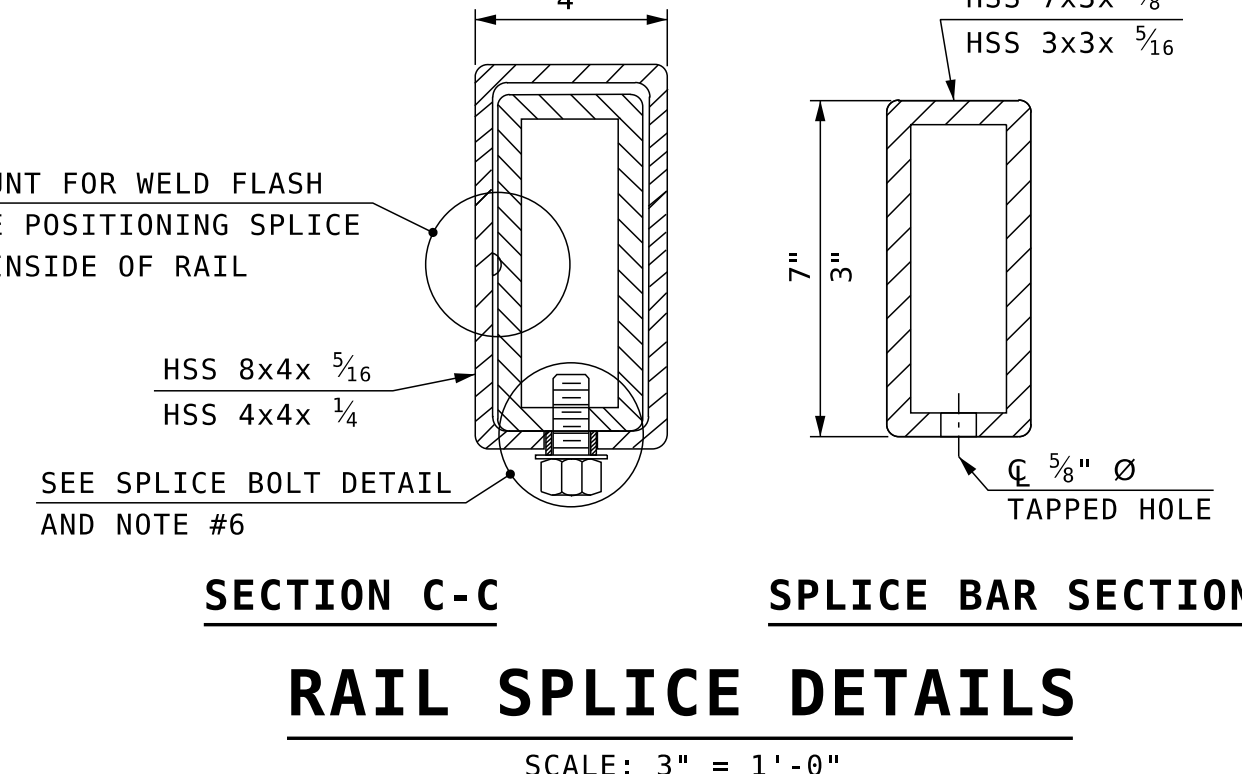
NO MODIFICATIONS PERMITTED TO THIS SHEET, EXCEPT AS NOTED BELOW:

1. **POST SPACING; DISTANCE FROM LAST POST TO CONCRETE ON RAIL ELEVATION.**
2. **ITEM NUMBER AND DESCRIPTION IF SNOW SCREENING AND/OR PROTECTIVE SCREENING WILL BE USED.**
3. **DESIGN OF DECK OVERHANG REINFORCING IS REQUIRED FOR DECK OVERHANG DISTANCE GREATER THAN 3'-6".**



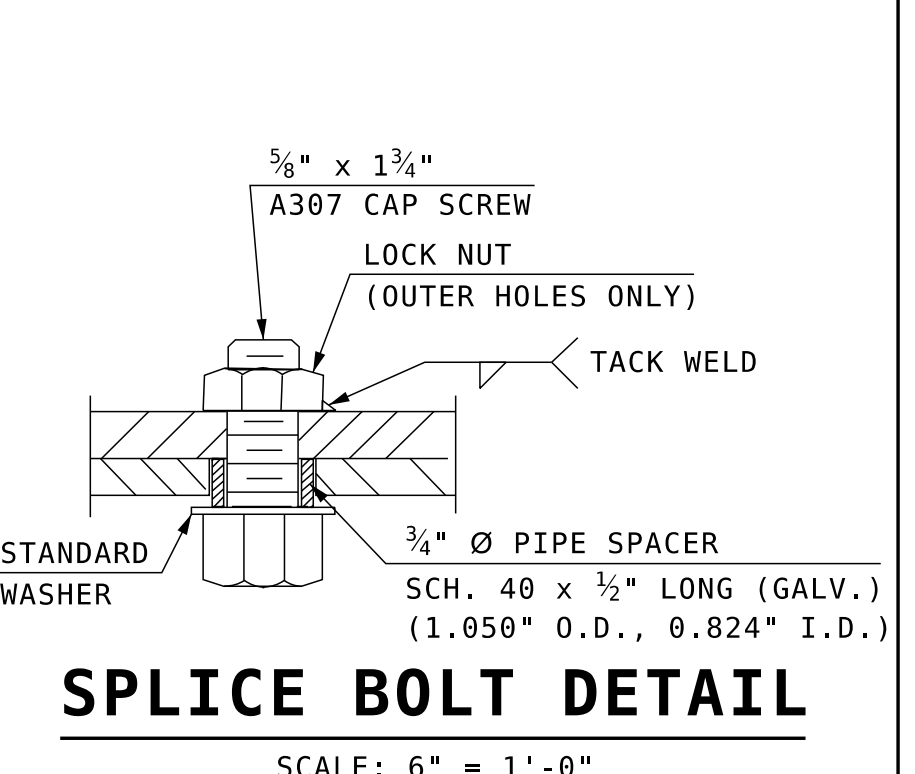
RAIL SPLICE (BOTTOM VIEW)

SCALE: 1 1/2" = 1'-0"



RAIL SPLICE DETAILS

SCALE: 3" = 1'-0"

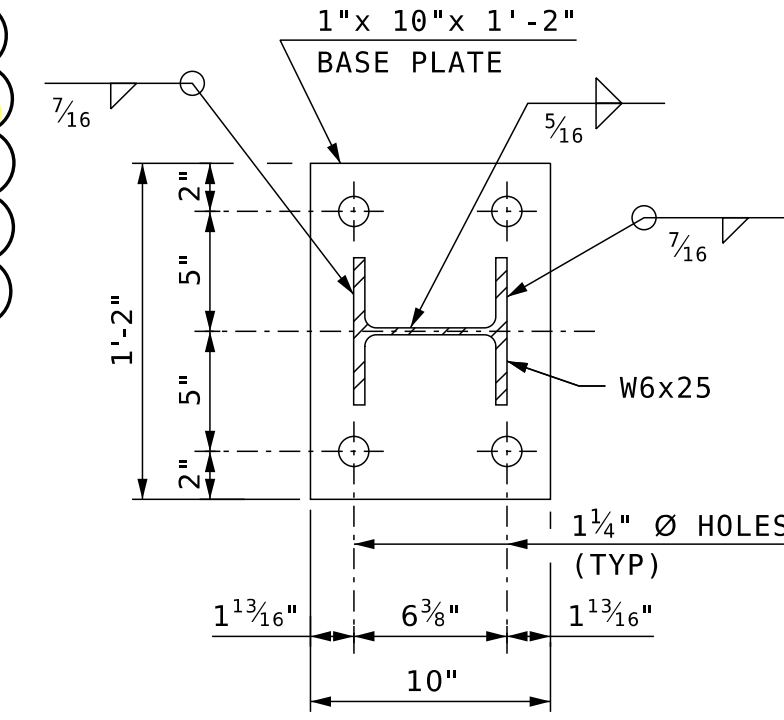


SPLICE BOLT DETAIL

SCALE: 6" = 1'-0"

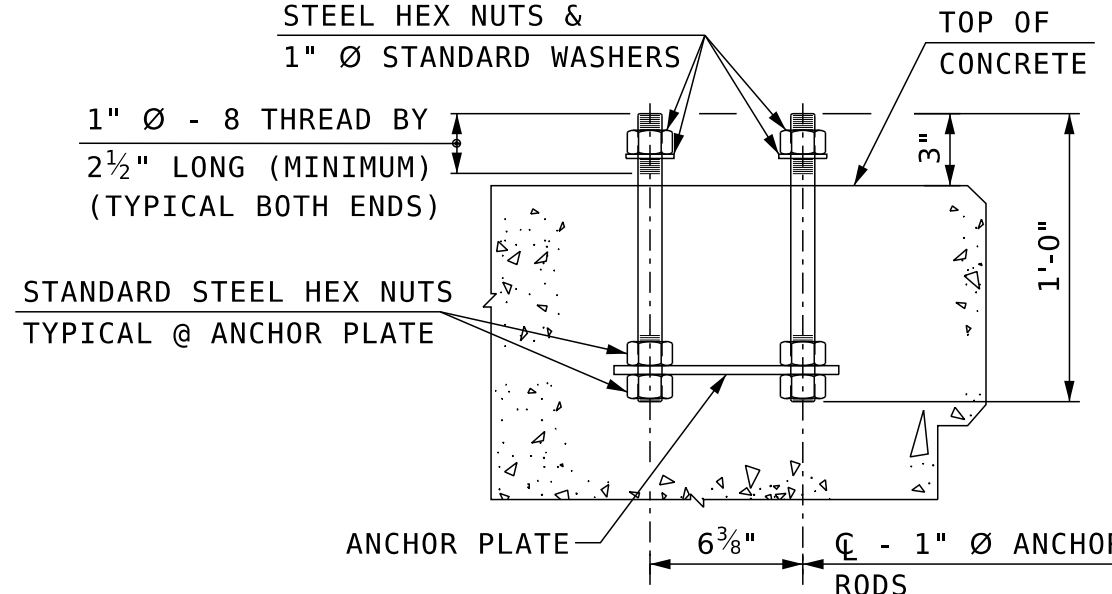
RAIL NOTES

1. FOR USE ON LOCAL CONNECTORS AND LOCAL ROADS WITH POSTED SPEEDS ≤ 45 MPH.
2. MEETS MASH TL-3 BY LS-DNYA SIMULATION: "DEVELOPMENT OF MASH COMPUTER SIMULATED STEEL BRIDGE RAIL AND TRANSITION DETAILS" (NETC), APRIL 2020. FIELD PERFORMANCE CRASHWORTHINESS (29 YEARS): "IN-SERVICE PERFORMANCE EVALUATION OF NETC BRIDGE RAILING", JUNE 2022. CRASH TESTED (NETC 1994) AND ACCEPTED AS NCHRP 350 TL-4 (FHWA LETTER: HMHS-B50, MARCH 1999).
3. ITEM 563.22, BRIDGE RAIL T2, SHALL INCLUDE POSTS, BASE PLATES, ANCHOR PLATES, ANCHOR RODS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STUDS STRUCTURAL TUBING, SPLICE BARS, PIPE SPACERS, ALL APPURTENANCES, AND GALVANIZING.
4. BRIDGE RAIL POSTS SHALL BE SET NORMAL (90 DEGREES) TO THE PROFILE GRADE, EXCEPT ON GRADES OVER 5% WHERE POSTS SHALL BE SET VERTICAL.
5. ENDS OF RAIL TUBE SECTIONS SHALL BE SAWED OR MILLED AND SHALL BE TRUE AND SMOOTH. ALL CUT EDGES OF ALL MATERIAL SHALL BE GROUND SMOOTH.
6. EACH PIECE OF RAIL TUBING SHALL BE ATTACHED TO A MINIMUM OF THREE (3) POSTS.
7. BOLT HOLES SHALL BE DRILLED OR PUNCHED. FLAME CUTTING MAY BE USED TO FINISH SLOTTED HOLES IF MECHANICALLY GUIDED.
8. AT INTERIOR SPLICES, PIPE SPACERS SHALL BE USED ON ONLY ONE SIDE OF THE SPLICE TO ALLOW MOVEMENT ON THAT SIDE. AT EXPANSION SPLICES, AND AT AT END SPLICES, PIPE SPACERS SHALL BE USED ON BOTH SIDES OF THE SPLICE TO ALLOW MOVEMENT ON EACH SIDE. ALL RAILS IN A SPLICE SHALL RECEIVE THE SAME TREATMENT.
9. MILL OR SHOP TRANSVERSE WELDS SHALL NOT BE PERMITTED ON ANY RAIL ELEMENT. RAIL ELEMENTS USED ON CURVES SHALL USE 3/8" WALL TUBES AND SHALL BE SHOP FORMED TO THE REQUIRED CURVATURE (SEE SECTION 563.3.2.1).
10. NO PUNCHING, DRILLING, CUTTING OR WELDING SHALL BE PERMITTED AFTER GALVANIZING, EXCEPT AS ALLOWED IN DETAIL A, AND FOR INSTALLATION OF DELINEATORS. DAMAGED AREAS OF GALVANIZING SHALL BE THOROUGHLY CLEANED, PRETREATED, AND PAINTED WITH TWO COATS OF ORGANIC ZINC-RICH GALVANIZING REPAIR PAINT, HAVING A MINIMUM 92% ZINC BY WEIGHT, TO A THICKNESS EQUAL TO THE ORIGINAL COATING, ACCORDING TO SECTION 550.2.9.1 AND ASTM A780.
11. NUTS FOR 1" Ø THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.
12. THREADS FOR ANCHOR RODS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED, BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, ROD DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.



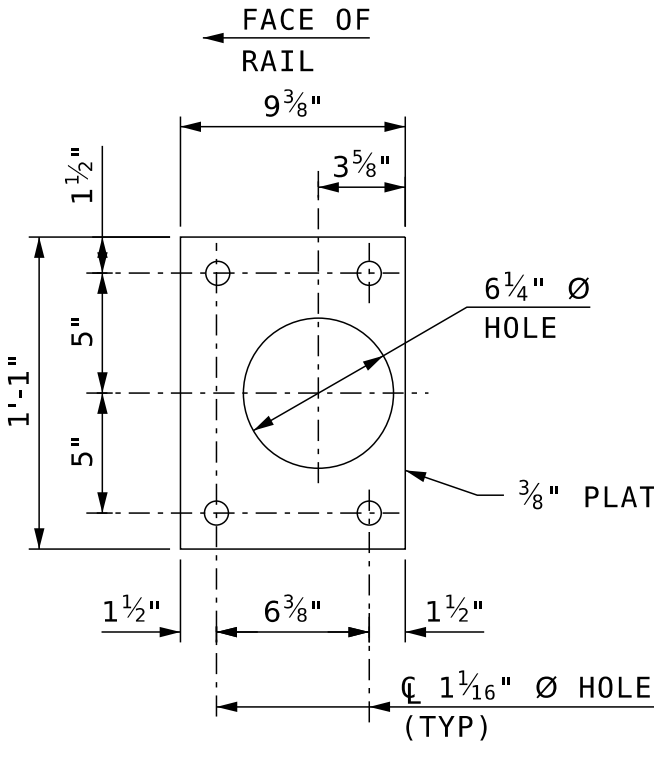
POST BASE PLATE

SCALE: 1 1/2" = 1'-0"



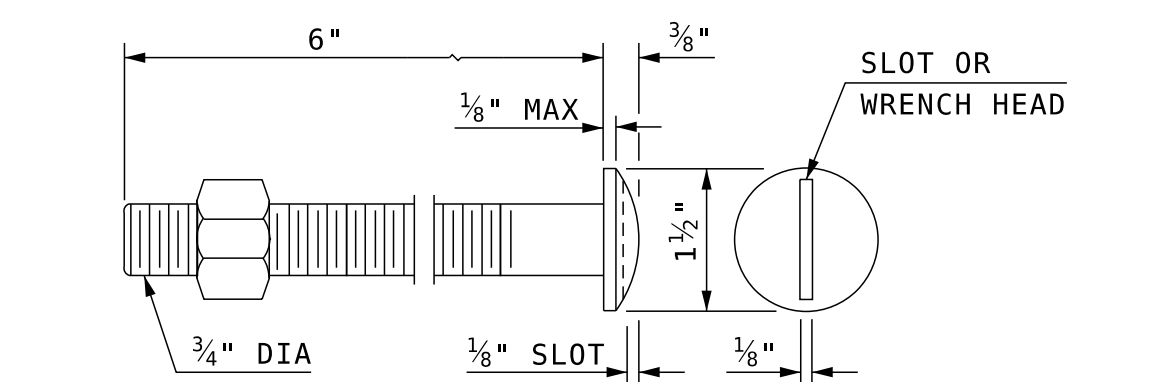
POST ANCHOR ASSEMBLY

SCALE: 1 1/2" = 1'-0"



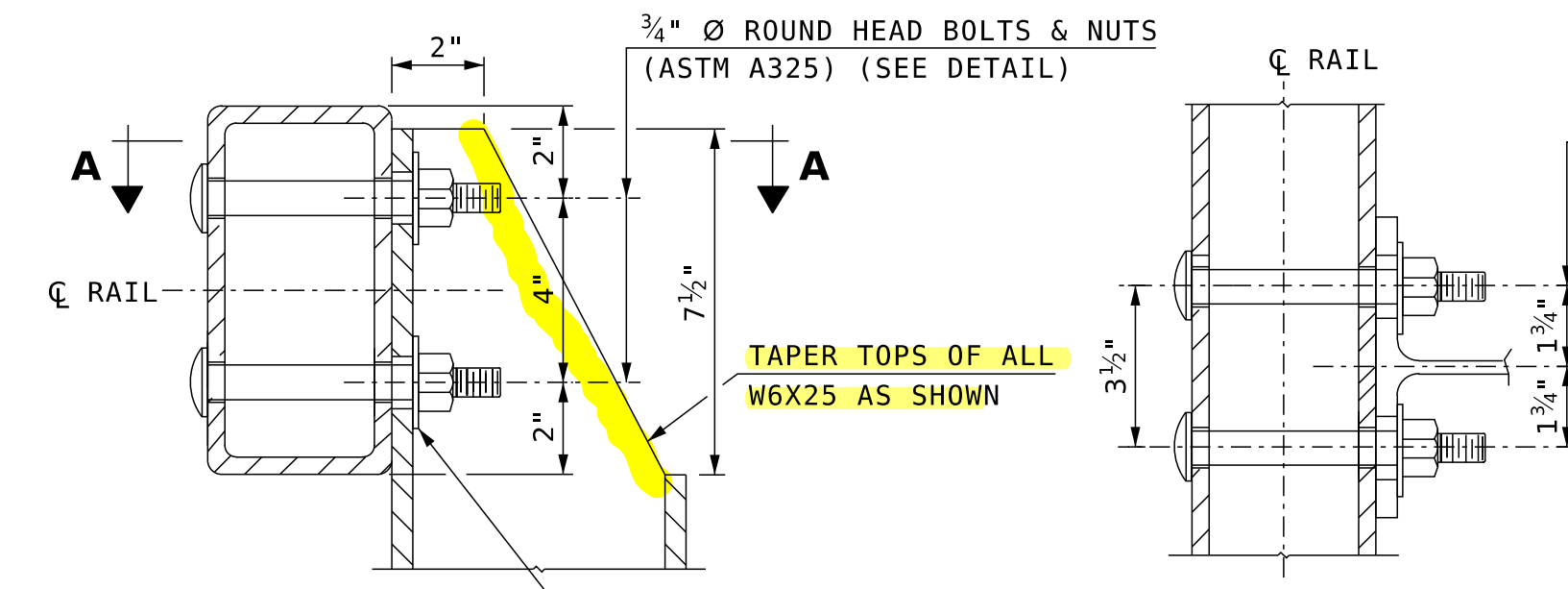
ANCHOR PLATE

SCALE: 1 1/2" = 1'-0"



A325 ROUND HEAD BOLT DETAIL

SCALE: 6" = 1'-0"



DETAIL A

SCALE: 3" = 1'-0"

SECTION A-A

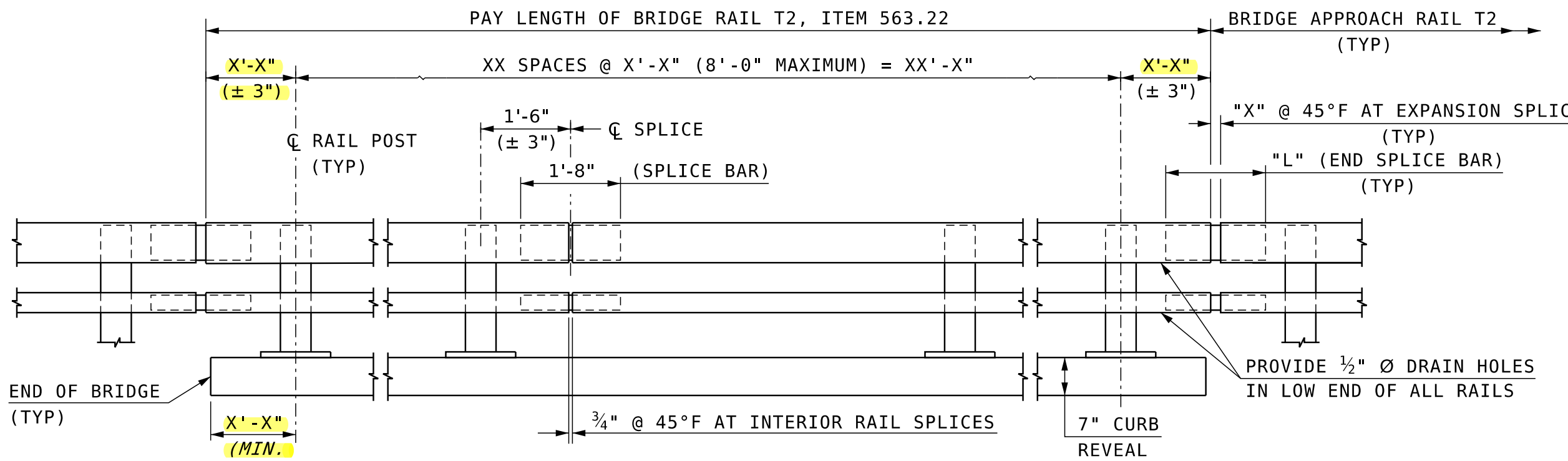
SCALE: 3" = 1'-0"

DELINEATOR MOUNTING

NOT TO SCALE

SPLICE BAR DIMENSION TABLE						
T	A	B	C	D	X	L
INTERIOR	2 1/2"	4"	4"	2"	3/4"	1'-8"
** ≤ 3 1/4"	2 1/2"	4"	4"	2"	2"	1'-8"
** 3 1/4" < T ≤ 5 1/4"	3 1/2"	5"	5"	2 1/2"	3"	2'-1"

T = TOTAL MOVEMENT OF BRIDGE
** = END SPLICE BAR



RAIL ELEVATION

SCALE: 1/2" = 1'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

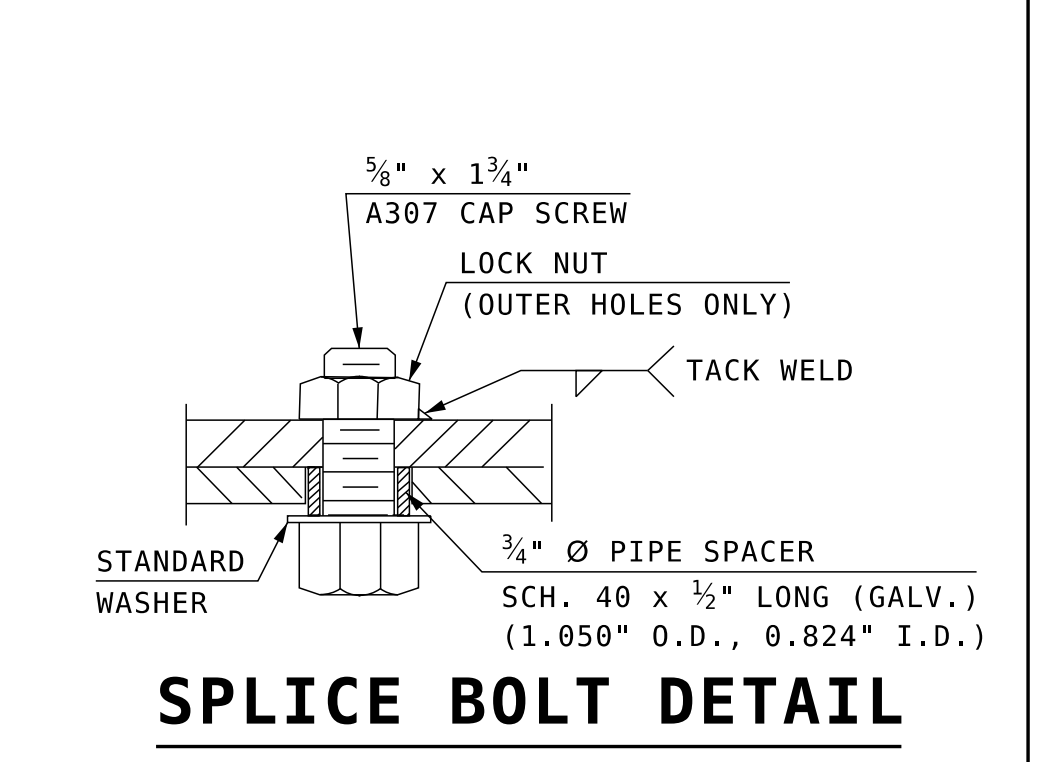
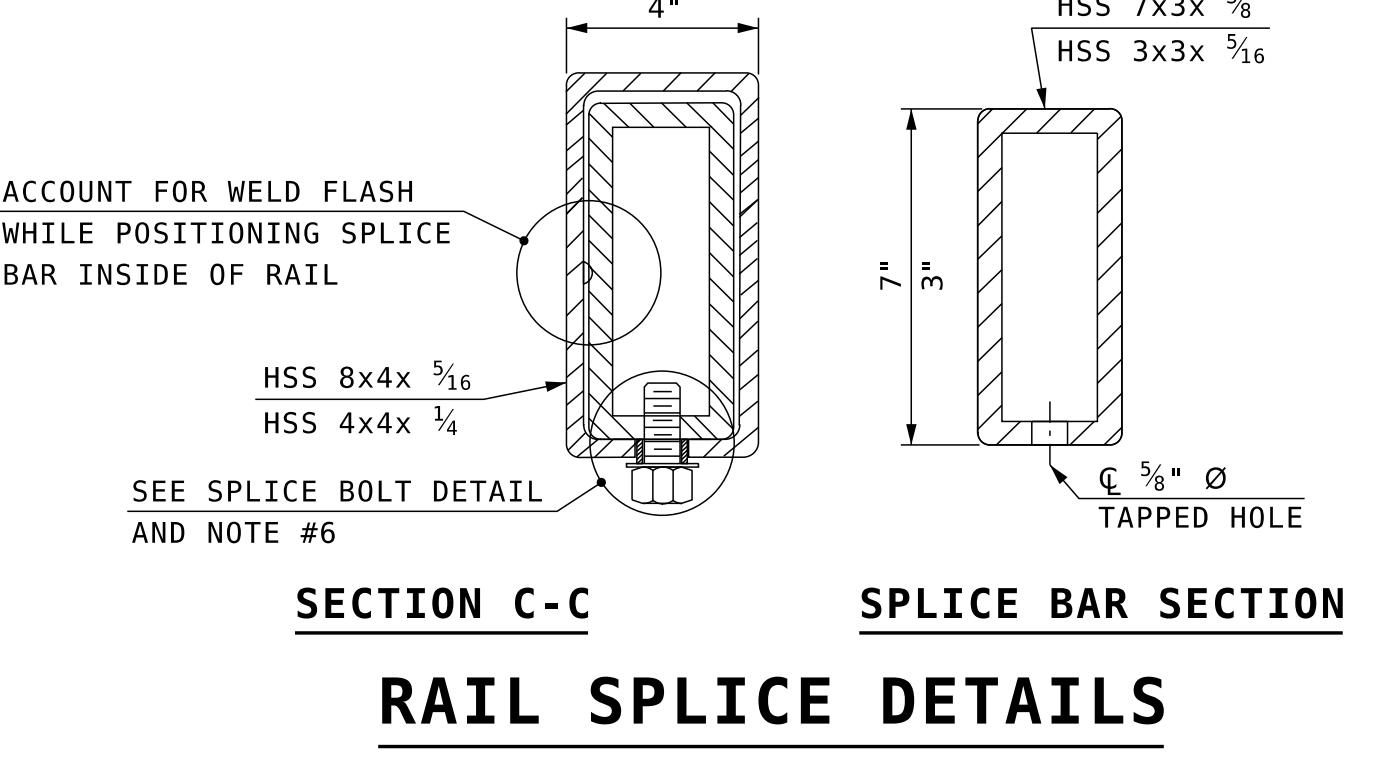
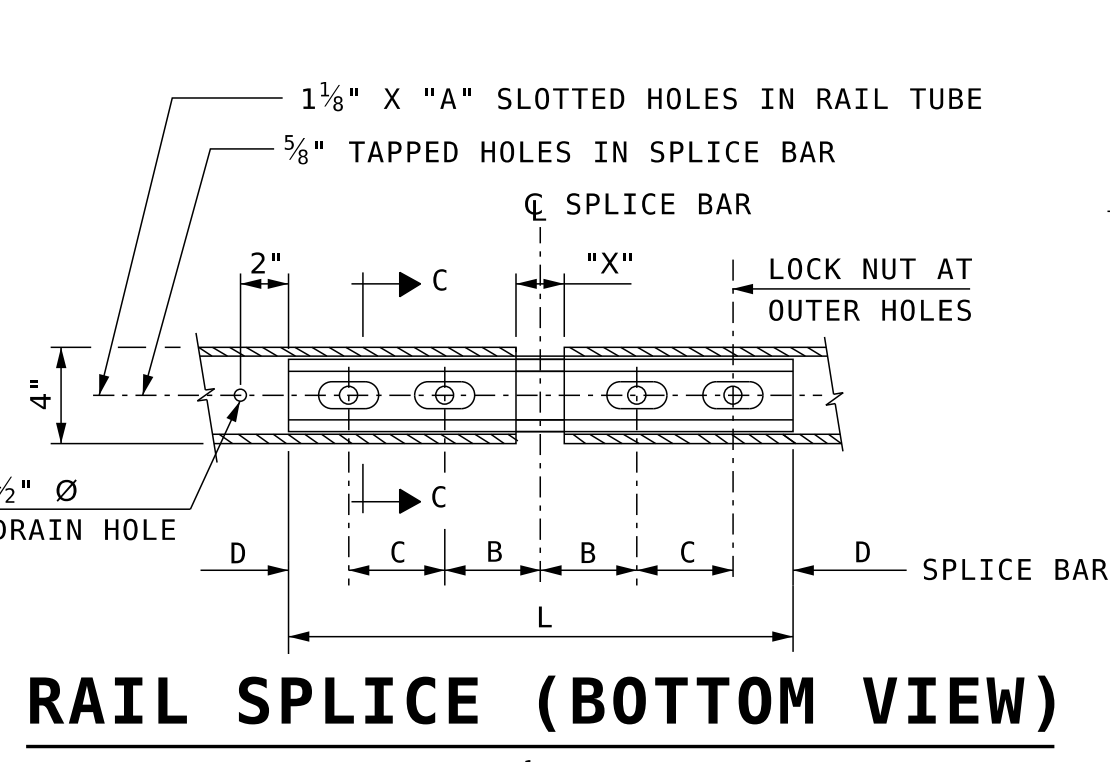
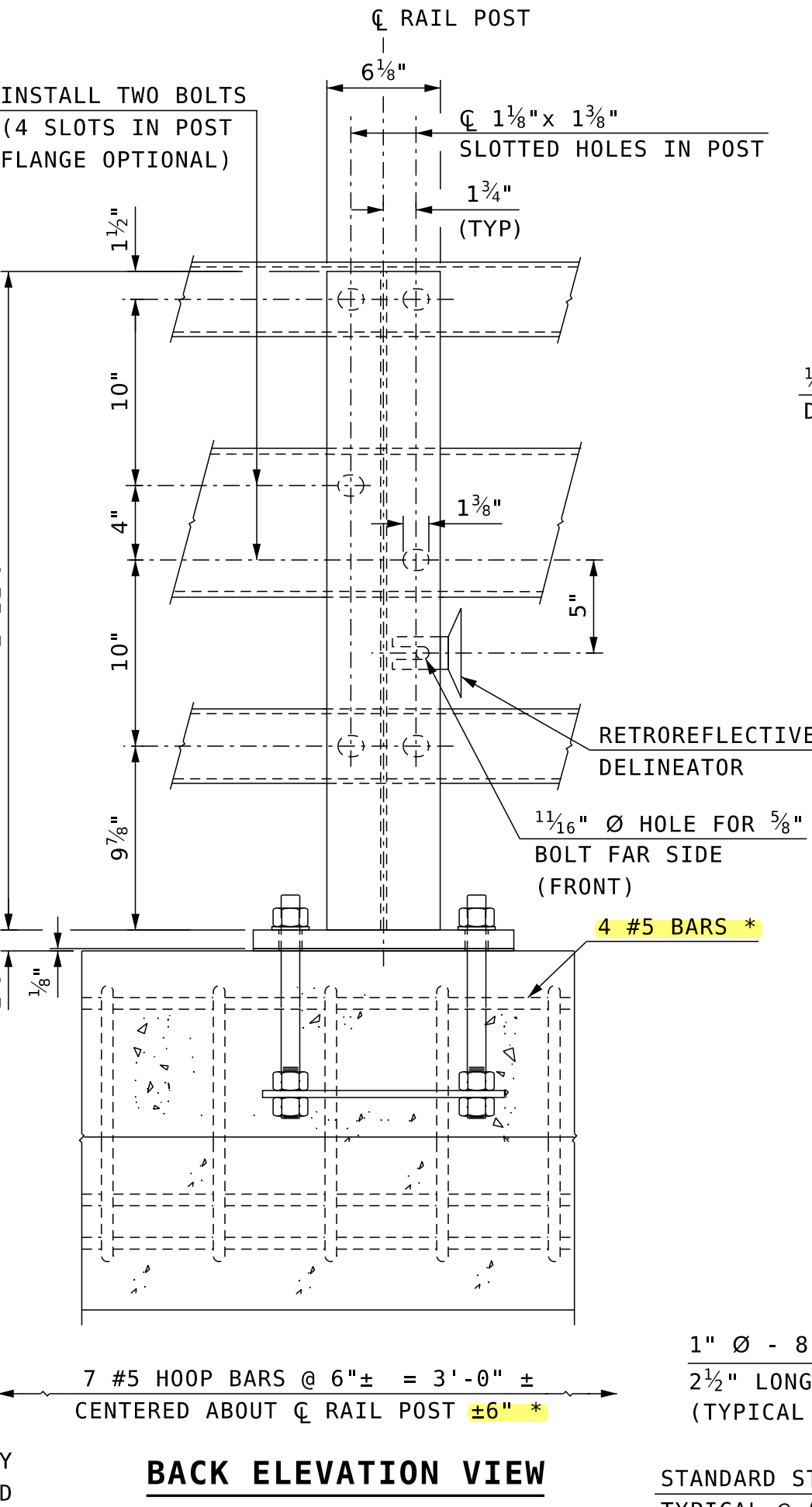
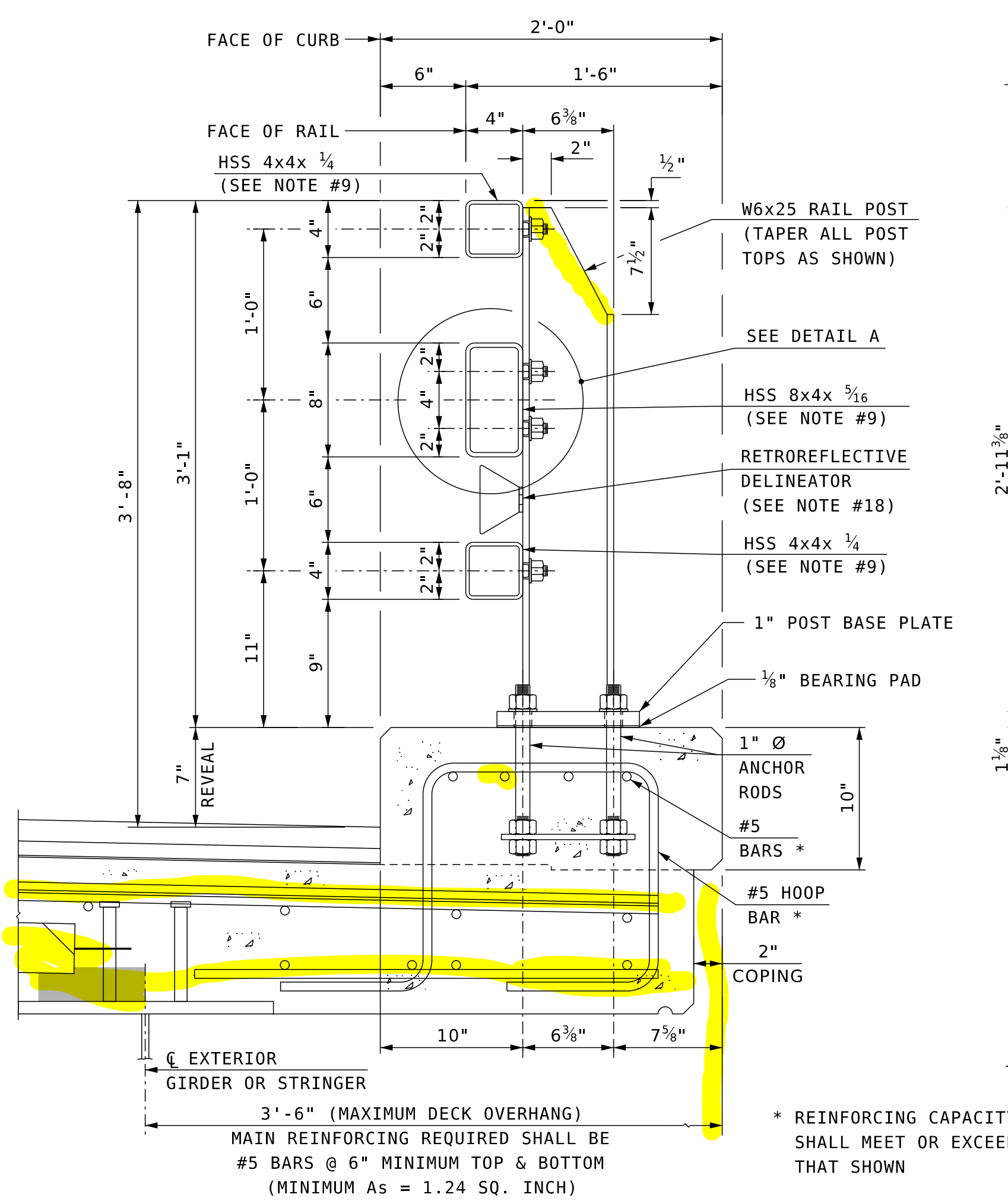
TOWN: _____ BRIDGE NO.: _____ STATE PROJECT: _____

LOCATION: _____

T2 STEEL BRIDGE RAIL

REVISIONS AFTER PROPOSAL	BY	DATE	CHECKED	DATE	BY	DATE	BRIDGE SHEET
	DESIGNED	NETC/JSZ	3/02	CHECKED	NHDOT		XX OF
	DRAWN	PJP	10/05	CHECKED	JSZ	10/05	FILE NUMBER
	QUANTITIES	xxx	xx/xx	CHECKED	xxx	xx/xx	
	ISSUE DATE	11/15/05	FEDERAL PROJECT NO.		SHEET NO.		TOTAL SHEETS
	REV. DATE	7/31/23					

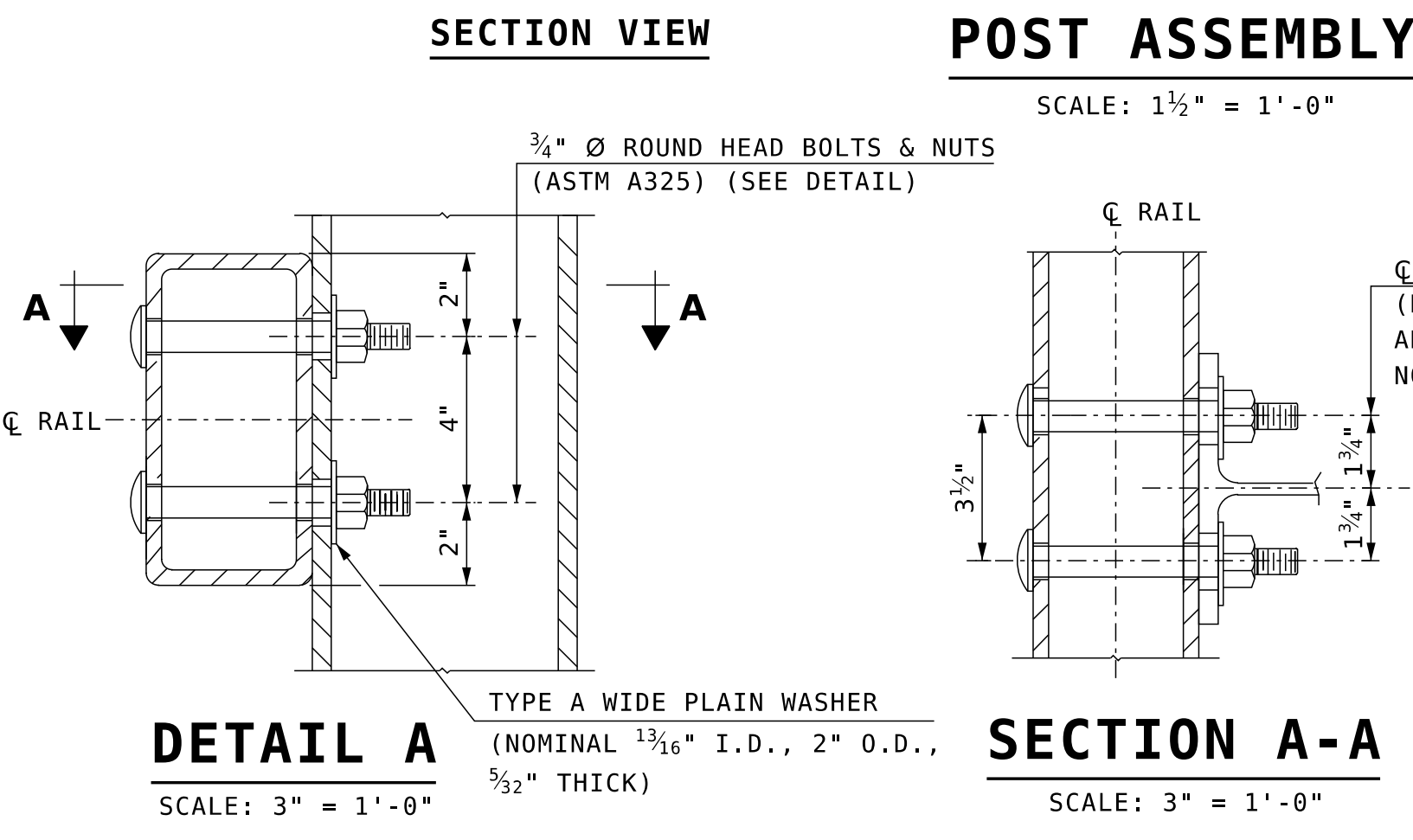
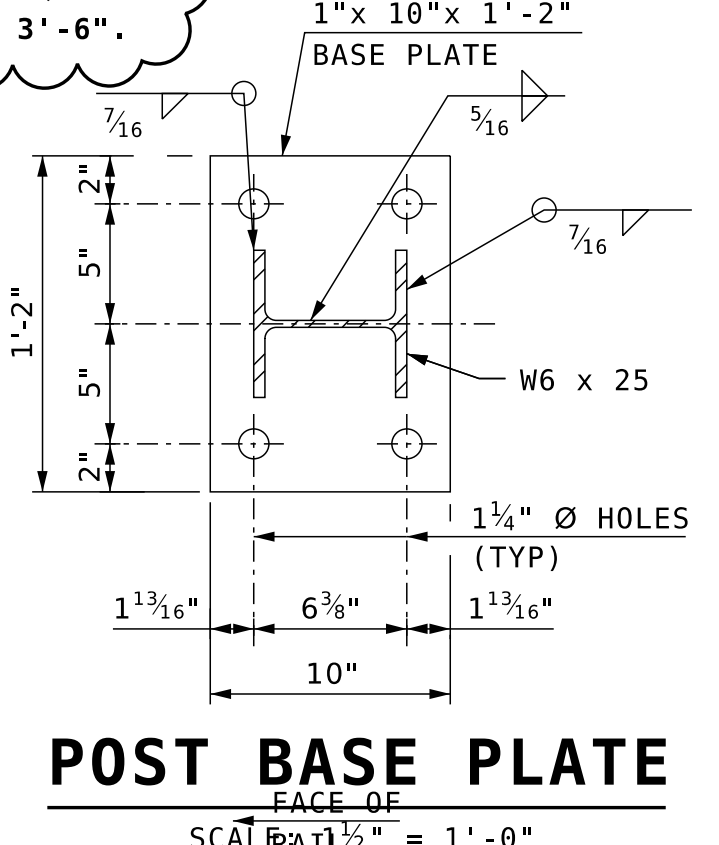
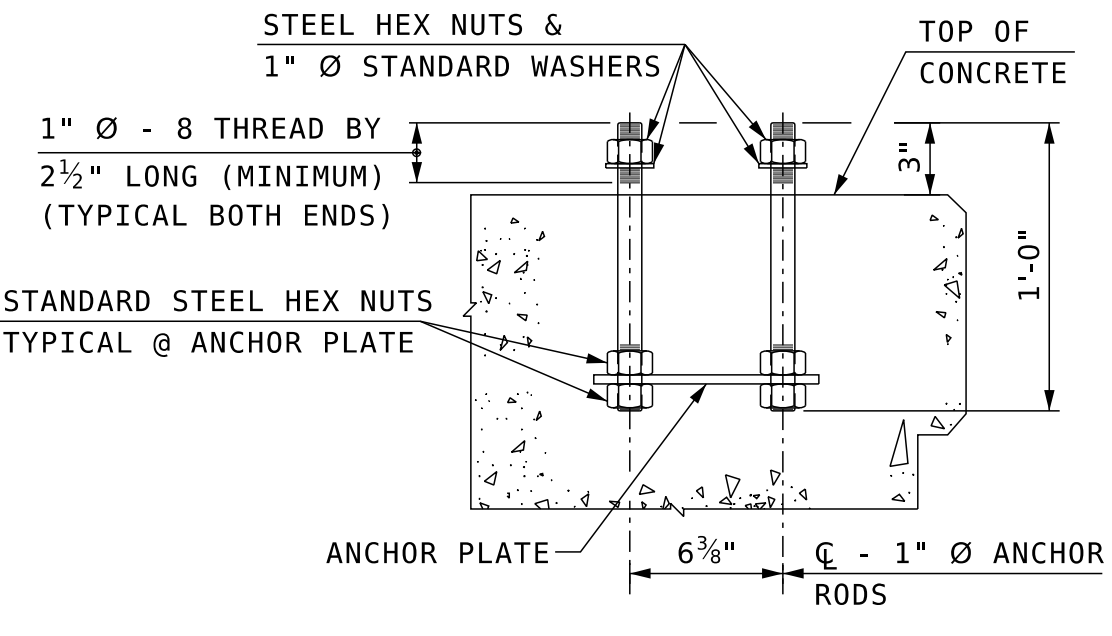
SUBDIRECTORY: BR-RAIL-ST .DGN LOCATOR: T2 BR-RAIL SHEET SCALE: AS NOTED



RAIL NOTES

NO MODIFICATIONS PERMITTED TO THIS SHEET, EXCEPT AS NOTED BELOW:

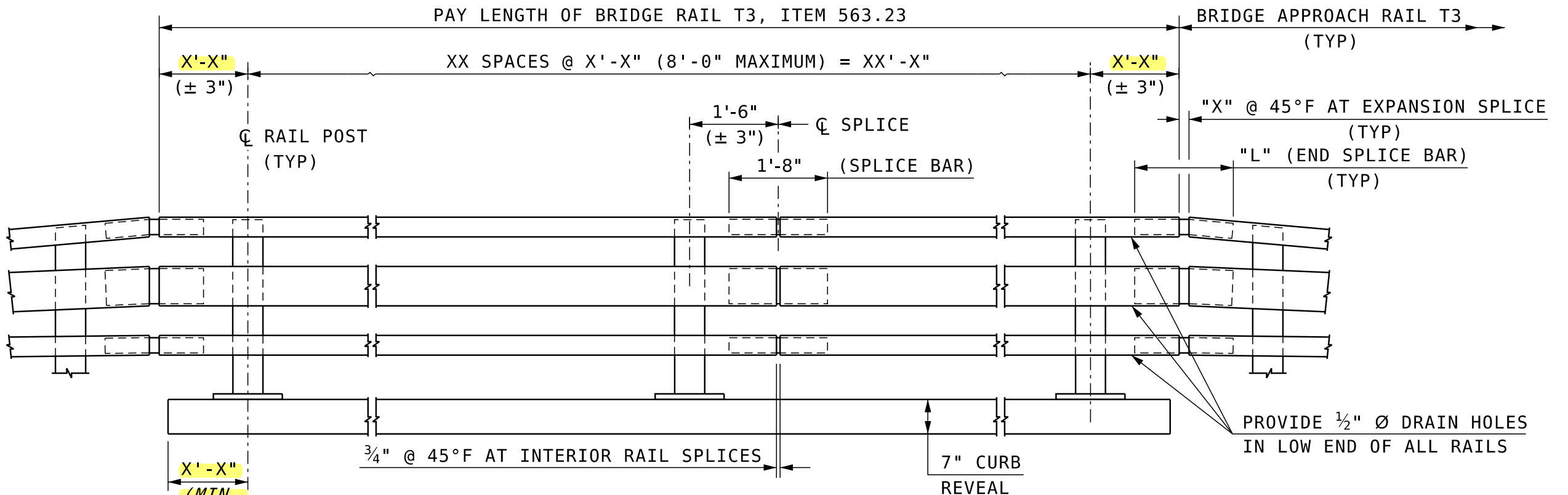
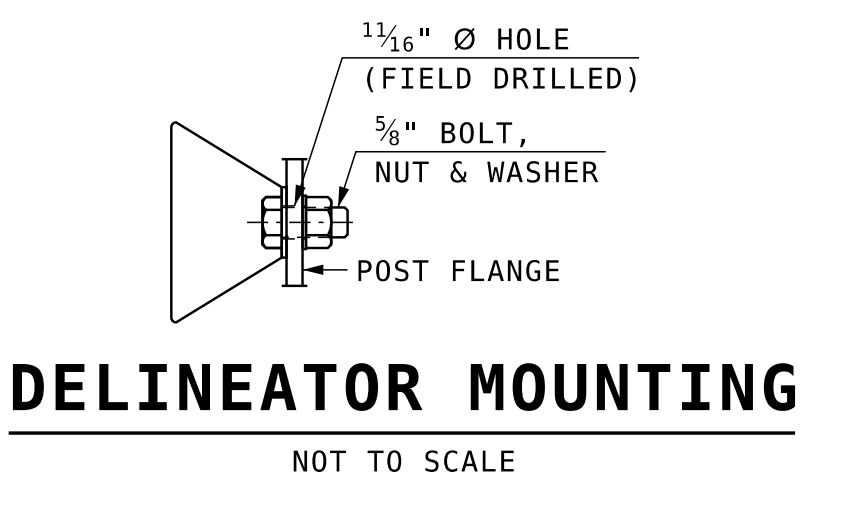
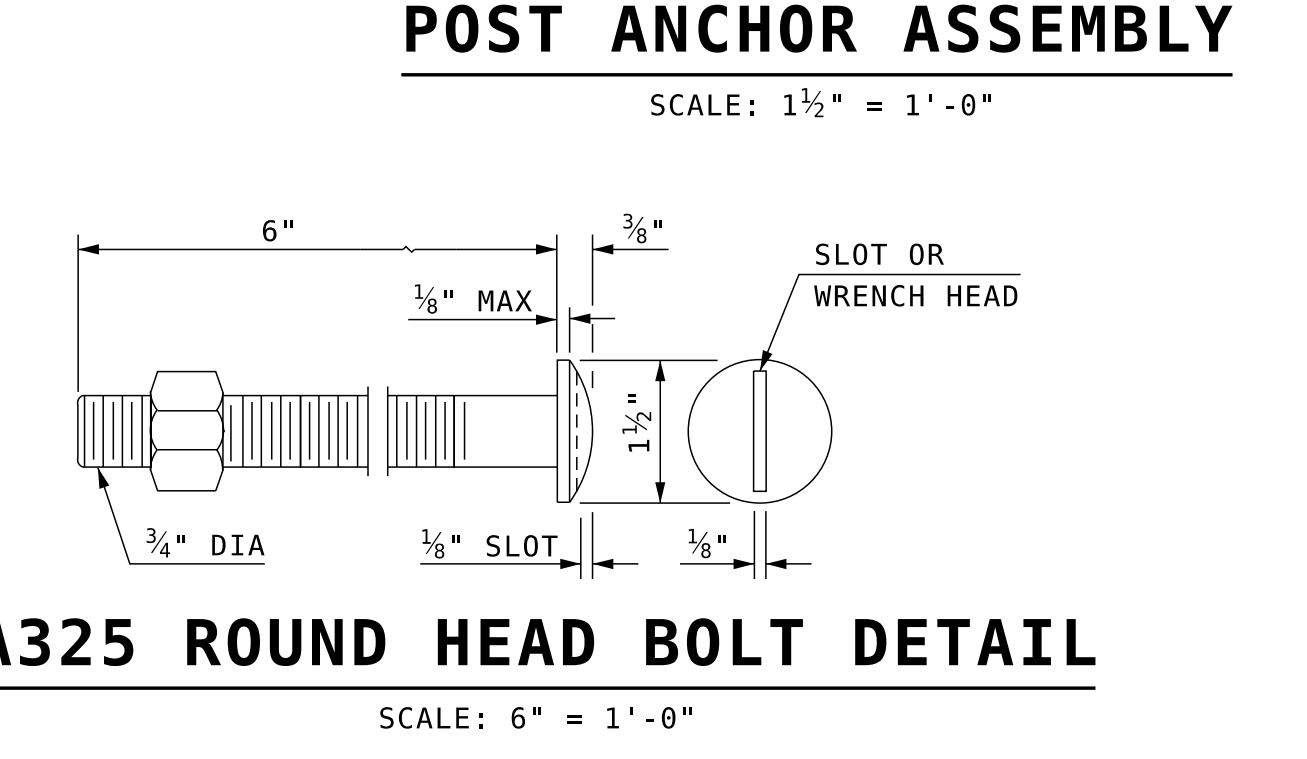
1. POST SPACING; DISTANCE FROM LAST POST TO CONCRETE ON RAIL ELEVATION.
2. ITEM NUMBER AND DESCRIPTION IF SNOW SCREENING AND/OR PROTECTIVE SCREENING WILL BE USED.
3. DESIGN OF DECK OVERHANG REINFORCING IS REQUIRED FOR DECK OVERHANG DISTANCE GREATER THAN 3'-6".



A325 ROUND HEAD BOLT DETAIL
SCALE: 6" = 1'-0"

6"
3/8"
1 1/2"
1 1/2" SLOT
3/8" DIA
3/8" SLOT
3/8"

SLOT OR WRENCH HEAD



SPLICE BAR DIMENSION TABLE

T	A	B	C	D	X	L
INTERIOR	2 1/2"	4"	4"	2"	3/4"	1'-8"
** ≤ 3 1/4"	2 1/2"	4"	4"	2"	2"	1'-8"
** 3 1/4" < T ≤ 5 1/4"	3 1/2"	5"	5"	2 1/2"	3"	2'-1"

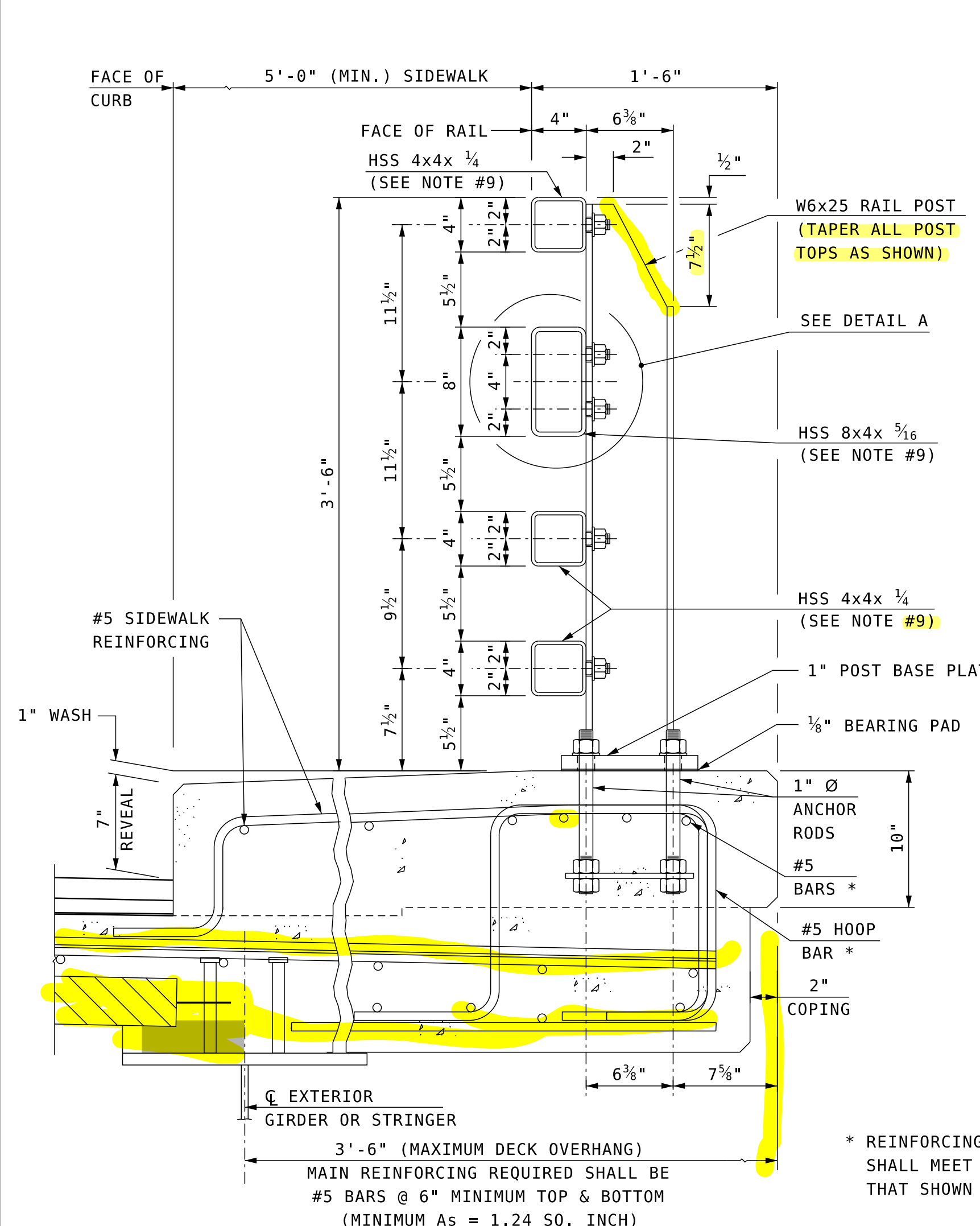
T = TOTAL MOVEMENT OF BRIDGE
** = END SPLICE BAR

- RAIL NOTES**
1. FOR USE ON ALL INTERSTATE, STATE, AND LOCAL ROADS.
 2. MEETS MASH TL-4 BY LS-DNYA SIMULATION: "DEVELOPEMENT OF MASH COMPUTER SIMULATED STEEL BRIDGE RAIL AND TRANSITION DETAILS" (NETC), APRIL 2020. FIELD PERFORMANCE CRASHWORTHINESS (29 YEARS): "IN-SERVICE PERFORMANCE EVALUATION OF NETC BRIDGE RAILING", JUNE 2022. HAS THE SAME GEOMETRICS AS T2 WITH AN ADDED 4-IN TOP RAIL. T2 WAS CRASH TESTED (NETC 1994) AND ACCEPTED AS NCHRP 350 TL-4 (FHWA LETTER: HMHS-B50, MARCH 1999).
 3. ITEM 563.23, BRIDGE RAIL T3, SHALL INCLUDE POSTS, BASE PLATES, ANCHOR PLATES, ANCHOR RODS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STUDS STRUCTURAL TUBING, SPLICE BARS, PIPE SPACERS, ALL APPURTENANCES, AND GALVANIZING.
 4. BRIDGE RAIL POSTS SHALL BE SET NORMAL (90 DEGREES) TO THE PROFILE GRADE, EXCEPT ON GRADES OVER 5% WHERE POSTS SHALL BE SET VERTICAL.
 5. ENDS OF RAIL TUBE SECTIONS SHALL BE SAWED OR MILLED AND SHALL BE TRUE AND SMOOTH. ALL CUT EDGES OF ALL MATERIAL SHALL BE GROUND SMOOTH.
 6. EACH PIECE OF RAIL TUBING SHALL BE ATTACHED TO A MINIMUM OF THREE (3) POSTS.
 7. BOLT HOLES SHALL BE DRILLED OR PUNCHED. FLAME CUTTING MAY BE USED TO FINISH SLOTTED HOLES IF MECHANICALLY GUIDED.
 8. AT INTERIOR SPLICES, PIPE SPACERS SHALL BE USED ON ONLY ONE SIDE OF THE SPLICE TO ALLOW MOVEMENT ON THAT SIDE. AT EXPANSION SPLICES, AND AT AT END SPLICES, PIPE SPACERS SHALL BE USED ON BOTH SIDES OF THE SPLICE TO ALLOW MOVEMENT ON EACH SIDE. ALL RAILS IN A SPLICE SHALL RECEIVE THE SAME TREATMENT.
 9. MILL OR SHOP TRANSVERSE WELDS SHALL NOT BE PERMITTED ON ANY RAIL ELEMENT. RAIL ELEMENTS USED ON CURVES SHALL USE 3/8" WALL TUBES AND SHALL BE SHOP FORMED TO THE REQUIRED CURVATURE (SEE SECTION 563.3.2.1).
 10. NO PUNCHING, DRILLING, CUTTING OR WELDING SHALL BE PERMITTED AFTER GALVANIZING, EXCEPT AS ALLOWED IN DETAIL A, AND FOR INSTALLATION OF DELINEATORS. DAMAGED AREAS OF GALVANIZING SHALL BE THOROUGHLY CLEANED, PRETREATED, AND PAINTED WITH TWO COATS OF ORGANIC ZINC-RICH GALVANIZING REPAIR PAINT, HAVING A MINIMUM 92% ZINC BY WEIGHT, TO A THICKNESS EQUAL TO THE ORIGINAL COATING, ACCORDING TO SECTION 550.2.9.1 AND ASTM A780.
 11. NUTS FOR 1" Ø THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.
 12. THREADS FOR ANCHOR RODS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED, BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, ROD DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.
- MATERIAL NOTES**
13. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500, GRADE B, STRUCTURAL STEEL TUBING. RAIL TUBING SHALL MEET THE LONGITUDINAL CHАРY V-NOTCH REQUIREMENTS OF 15 FT-LBS AT 0°F. FOR ASTM A500, GRADE B, THE TEST SAMPLES SHALL BE TAKEN AFTER FORMING THE TUBES. CHАРY V-NOTCH IS NOT REQUIRED FOR SPLICE TUBES.
 14. RAIL POSTS AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A572 GR 50, EXCEPT ANCHOR PLATES MAY BE ASTM A36.
 15. DETAIL A BOLTS SHALL BE ASTM A325 OR A449. ALL OTHER BOLTS AND NUTS SHALL CONFORM TO ASTM A307 AND ASTM 563 GRADE A RESPECTIVELY OR BETTER, EXCEPT THAT ASTM A307 NUTS MAY BE USED ON THE BOTTOM OF ANCHOR ASSEMBLY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN WIDE WASHERS AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF A.N.S.I. B18.22. ANCHOR RODS SHALL CONFORM TO ASTM A449.
 16. ALL STEEL COMPONENTS (EXCEPT STAINLESS) SHALL BE GALVANIZED AFTER FABRICATION IN COMPLIANCE WITH AASHTO M232 (ASTM A153) AND AASHTO M111 (ASTM A123). THE GALVANIZING KETTLE SHALL HAVE 0.05 TO 0.09 PERCENT NICKEL. GALVANIZED SURFACES SHALL HAVE A UNIFORM APPEARANCE AND GALVANIZED MATERIAL SHALL BE PROPERLY STORED. IF PAINTING IS REQUIRED SEE SPECIAL PROVISIONS FOR 708.
 17. PREFORMED BEARING PADS (1/8" THICK) SHALL CONFORM TO AASHTO M251.
 18. RETROREFLECTIVE DELINEATORS, BOLTS, NUTS, WASHERS AND FIELD DRILLING OF POSTS, INCLUDING GALVANIZING TOUCH-UP, SHALL BE SUBSIDIARY TO ITEM 563.23. SEE STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION (DL-1) FOR ADDITIONAL DETAILS AND SPACING.

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN	BRIDGE NO.	STATE PROJECT
LOCATION		
T3 STEEL BRIDGE RAIL		
DESIGNED	NETC/JSZ	3/02
CHECKED	NHDOT	
DRAWN	PJP	10/05
CHECKED	JSZ	10/05
QUANTITIES	xxx	xx/xx
CHECKED	xxx	xx/xx
ISSUE DATE	11/15/05	FEDERAL PROJECT NO.
REV. DATE	7/31/23	SHEET NO.
BRIDGE SHEET		XX OF
FILE NUMBER		
TOTAL SHEETS		

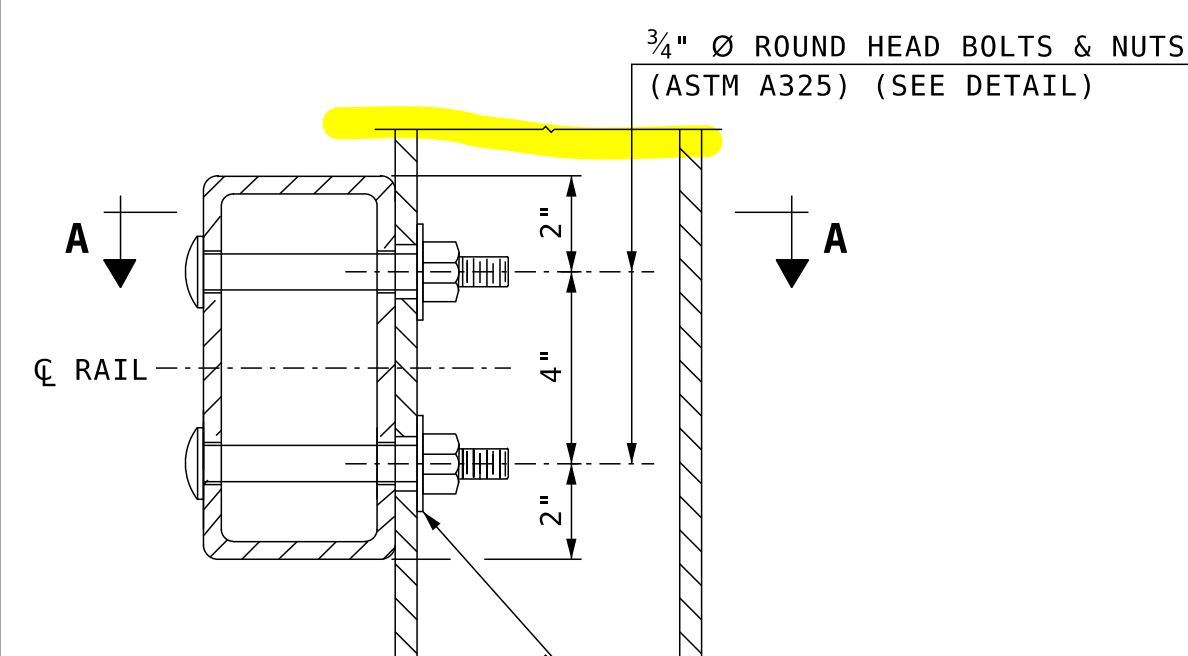
SUBDIRECTORY: BR-RAIL-ST
DGN LOCATOR: T3 BR-RAIL
SHEET SCALE: AS NOTED



SECTION VIEW

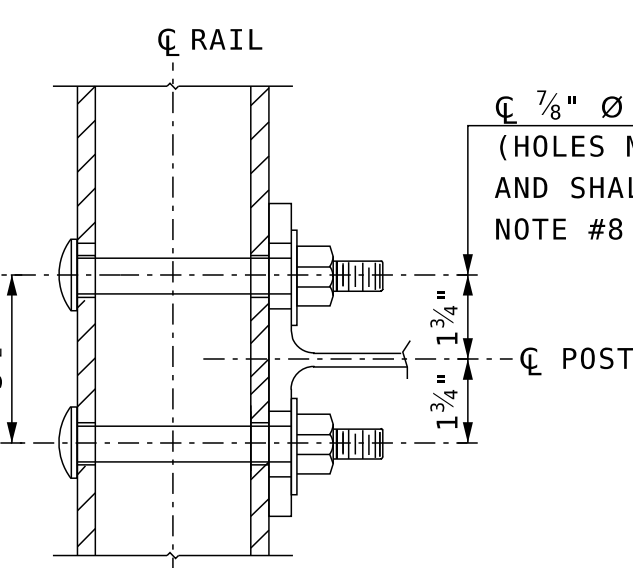
POST ASSEMBLY

SCALE: 1 1/2" = 1'-0"



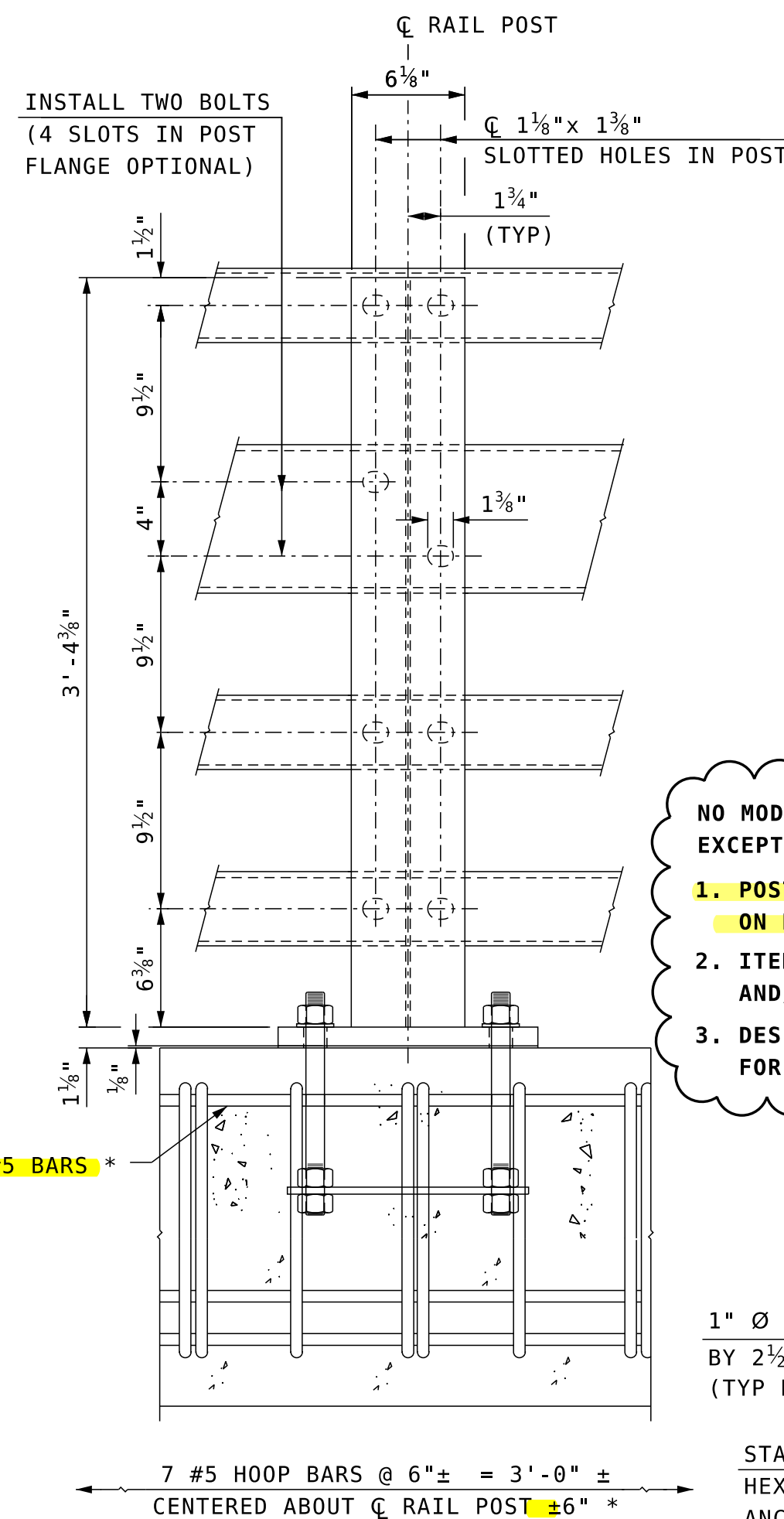
DETAIL A

SCALE: 3" = 1'-0"



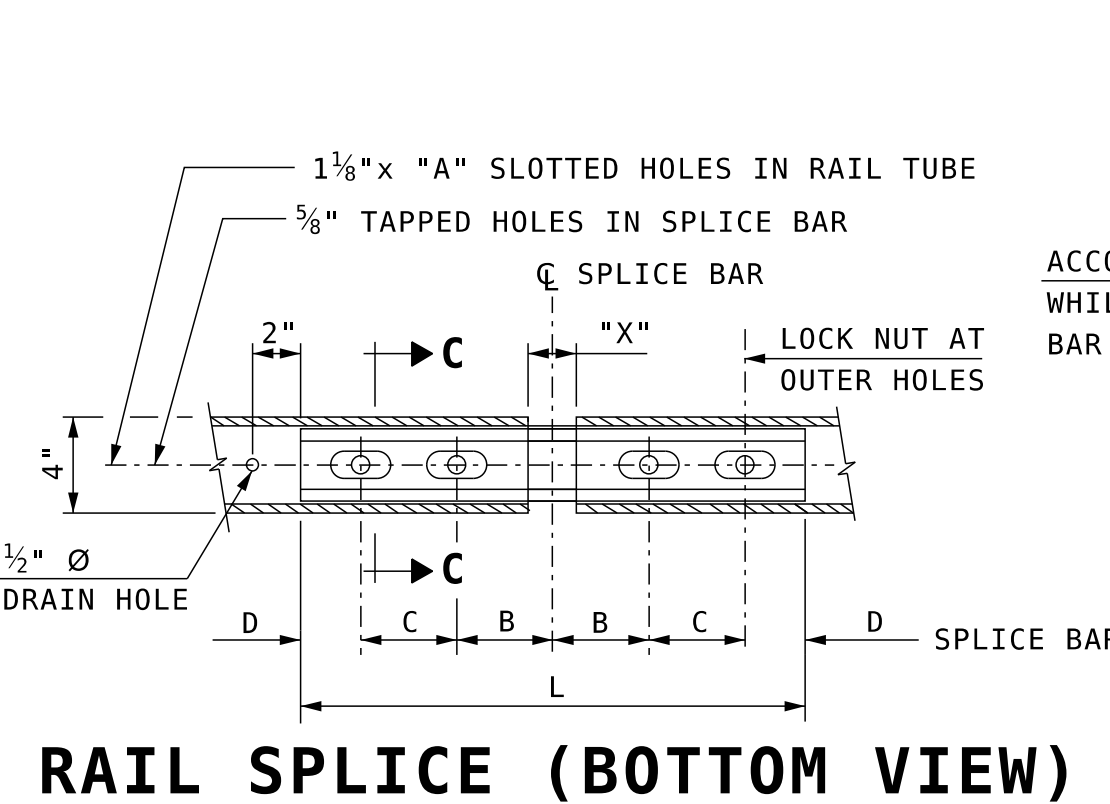
SECTION A-A

SCALE: 3" = 1'-0"



BACK ELEVATION VIEW

NHDOT Bridge Design
7/31/2023
Revisions made to Bridge Detail Sheet are highlighted.
Go to website for current Detail Sheet.

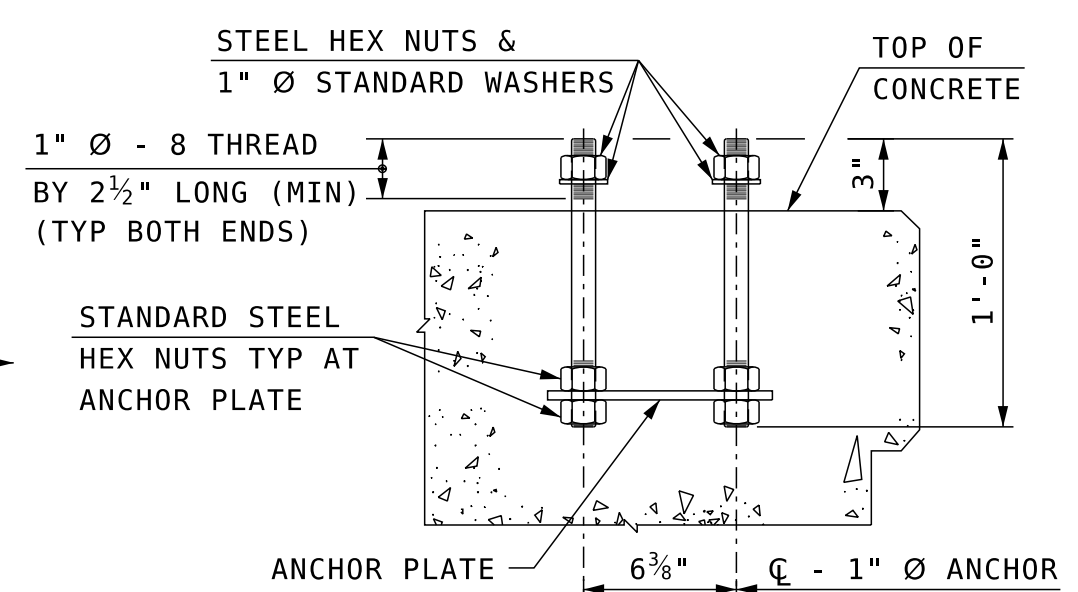


RAIL SPLICE (BOTTOM VIEW)

SCALE: 1 1/2" = 1'-0"

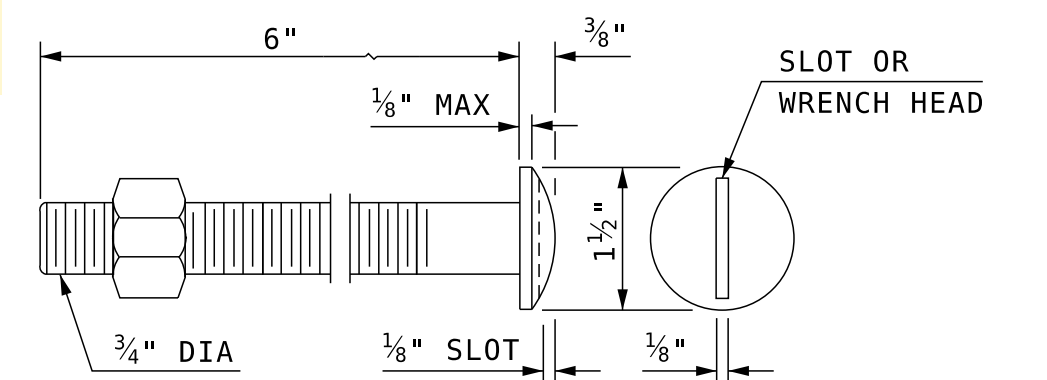
NO MODIFICATIONS PERMITTED TO THIS SHEET, EXCEPT AS NOTED BELOW:

1. POST SPACING; DISTANCE FROM LAST POST TO CONCRETE ON RAIL ELEVATION.
2. ITEM NUMBER AND DESCRIPTION IF SNOW SCREENING AND/OR PROTECTIVE SCREENING WILL BE USED.
3. DESIGN OF DECK OVERHANG REINFORCING IS REQUIRED FOR DECK OVERHANG DISTANCE GREATER THAN 3'-6".



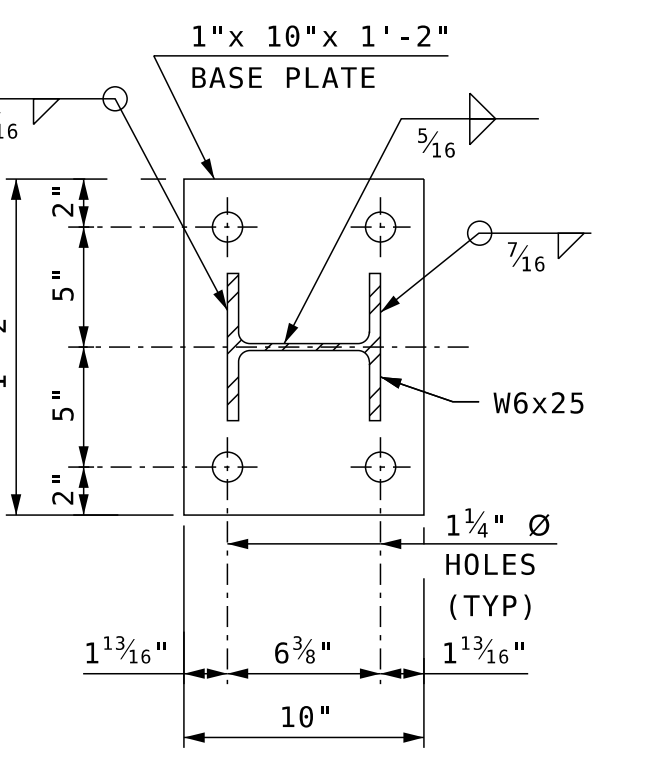
POST ANCHOR ASSEMBLY

SCALE: 1 1/2" = 1'-0"



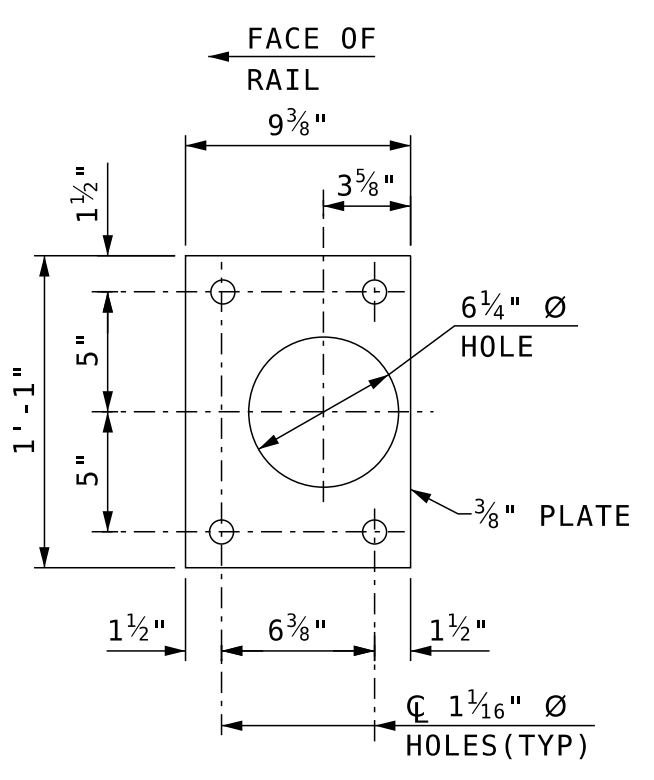
A325 ROUND HEAD BOLT DETAIL

SCALE: 6" = 1'-0"



POST BASE PLATE

SCALE: 1 1/2" = 1'-0"

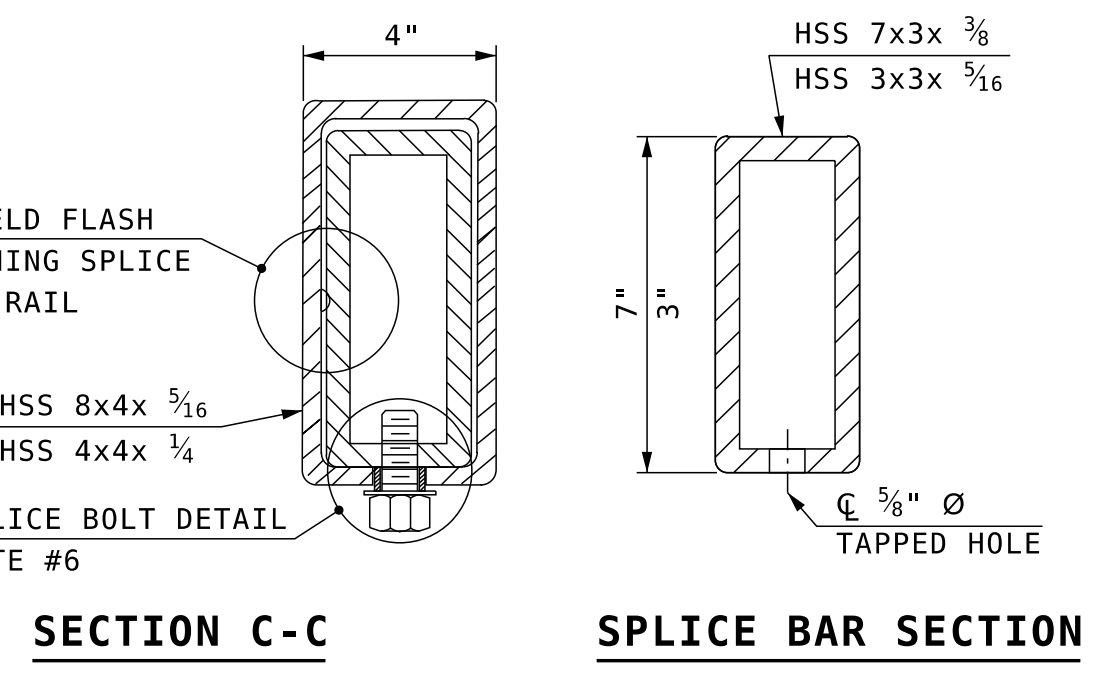


ANCHOR PLATE

SCALE: 1 1/2" = 1'-0"

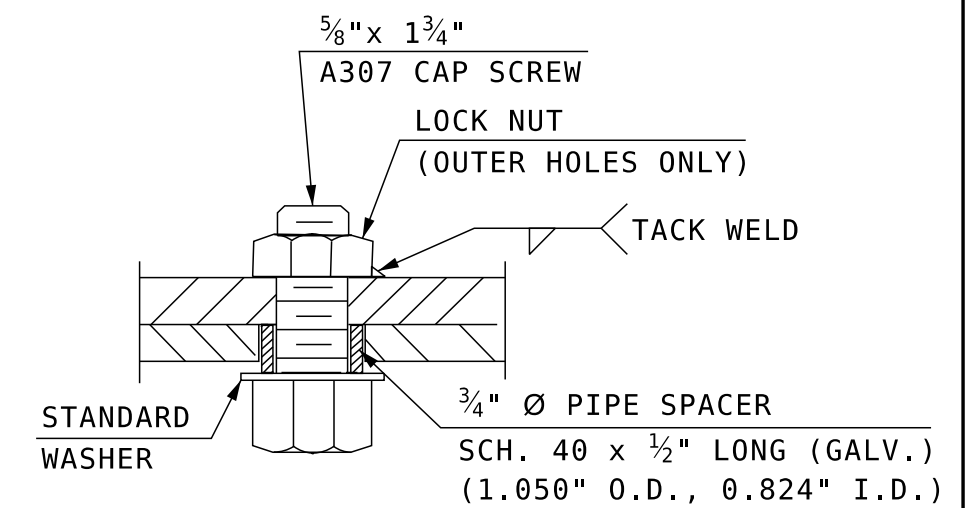
RAIL NOTES

1. FOR USE ON STATE, REGIONAL AND LOCAL CONNECTORS, AND LOCAL ROADS WITH POSTED SPEEDS ≤ 45 MPH.
 2. MEETS MASH TL-4 BY LS-DNVA SIMULATION: "DEVELOPMENT OF MASH COMPUTER SIMULATED STEEL BRIDGE RAIL AND TRANSITION DETAILS" (NETC), APRIL 2020. FIELD PERFORMANCE CRASHWORTHINESS (29 YEARS): "IN-SERVICE PERFORMANCE EVALUATION OF NETC BRIDGE RAILING", JUNE 2022. CRASH TESTED (NETC 1999) AND ACCEPTED AS NCHRP 350 TL-4 (FHWA LETTER: HMHS-B50, MARCH 1999).
 3. ITEM 563.24, BRIDGE RAIL T4, SHALL INCLUDE POSTS, BASE PLATES, ANCHOR PLATES, ANCHOR RODS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STUDS STRUCTURAL TUBING, SPLICE BARS, PIPE SPACERS, ALL APPURTENANCES, AND GALVANIZING.
 4. BRIDGE RAIL POSTS SHALL BE SET NORMAL (90 DEGREES) TO THE PROFILE GRADE, EXCEPT ON GRADES OVER 5% WHERE POSTS SHALL BE SET VERTICAL.
 5. ENDS OF RAIL TUBE SECTIONS SHALL BE SAWED OR MILLED AND SHALL BE TRUE AND SMOOTH. ALL CUT EDGES OF ALL MATERIAL SHALL BE GROUND SMOOTH.
 6. EACH PIECE OF RAIL TUBING SHALL BE ATTACHED TO A MINIMUM OF THREE (3) POSTS.
 7. BOLT HOLES SHALL BE DRILLED OR PUNCHED. FLAME CUTTING MAY BE USED TO FINISH SLOTTED HOLES IF MECHANICALLY GUIDED.
 8. AT INTERIOR SPLICES, PIPE SPACERS SHALL BE USED ON ONLY ONE SIDE OF THE SPLICE TO ALLOW MOVEMENT ON THAT SIDE. AT EXPANSION SPLICES, AND AT AT END SPLICES, PIPE SPACERS SHALL BE USED ON BOTH SIDES OF THE SPLICE TO ALLOW MOVEMENT ON EACH SIDE. ALL RAILS IN A SPLICE SHALL RECEIVE THE SAME TREATMENT.
 9. MILL OR SHOP TRANSVERSE WELDS SHALL NOT BE PERMITTED ON ANY RAIL ELEMENT. RAIL ELEMENTS USED ON CURVES SHALL USE 3/8" WALL TUBES AND SHALL BE SHOP FORMED TO THE REQUIRED CURVATURE (SEE SECTION 563.3.2.1).
 10. NO PUNCHING, DRILLING, CUTTING OR WELDING SHALL BE PERMITTED AFTER GALVANIZING, EXCEPT AS ALLOWED IN DETAIL A, AND FOR INSTALLATION OF DELINEATORS. DAMAGED AREAS OF GALVANIZING SHALL BE THOROUGHLY CLEANED, PRETREATED, AND PAINTED WITH TWO COATS OF ORGANIC ZINC-RICH GALVANIZING REPAIR PAINT, HAVING A MINIMUM 92% ZINC BY WEIGHT, TO A THICKNESS EQUAL TO THE ORIGINAL COATING, ACCORDING TO SECTION 550.2.9.1 AND ASTM A780.
 11. NUTS FOR 1" Ø THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.
 12. THREADS FOR ANCHOR RODS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED, BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, ROD DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.
- MATERIAL NOTES**
13. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500, GRADE B, STRUCTURAL STEEL TUBING. RAIL TUBING SHALL MEET THE LONGITUDINAL CHARY V-NOTCH REQUIREMENTS OF 15 FT-LBS AT 0°F. FOR ASTM A500, GRADE B, THE TEST SAMPLES SHALL BE TAKEN AFTER FORMING THE TUBES. CHARY V-NOTCH IS NOT REQUIRED FOR SPLICE TUBES.
 14. RAIL POSTS AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A572 GR 50, EXCEPT ANCHOR PLATES MAY BE ASTM A36.
 15. DETAIL A BOLTS SHALL BE ASTM A325 OR A449. ALL OTHER BOLTS AND NUTS SHALL CONFORM TO ASTM A307 AND ASTM 563 GRADE A RESPECTIVELY OR BETTER, EXCEPT THAT ASTM A307 NUTS MAY BE USED ON THE BOTTOM OF ANCHOR ASSEMBLY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN WIDE WASHERS AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF A.N.S.I. B18.22. ANCHOR RODS SHALL CONFORM TO ASTM A449.
 16. ALL STEEL COMPONENTS (EXCEPT STAINLESS) SHALL BE GALVANIZED AFTER FABRICATION IN COMPLIANCE WITH AASHTO M232 (ASTM A153) AND AASHTO M111 (ASTM A123). THE GALVANIZING KETTLE SHALL HAVE 0.05 TO 0.09 PERCENT NICKEL. GALVANIZED SURFACES SHALL HAVE A UNIFORM APPEARANCE AND GALVANIZED MATERIAL SHALL BE PROPERLY STORED. IF PAINTING IS REQUIRED SEE SPECIAL PROVISIONS FOR 708.
 17. PREFORMED BEARING PADS (1/8" THICK) SHALL CONFORM TO AASHTO M251.



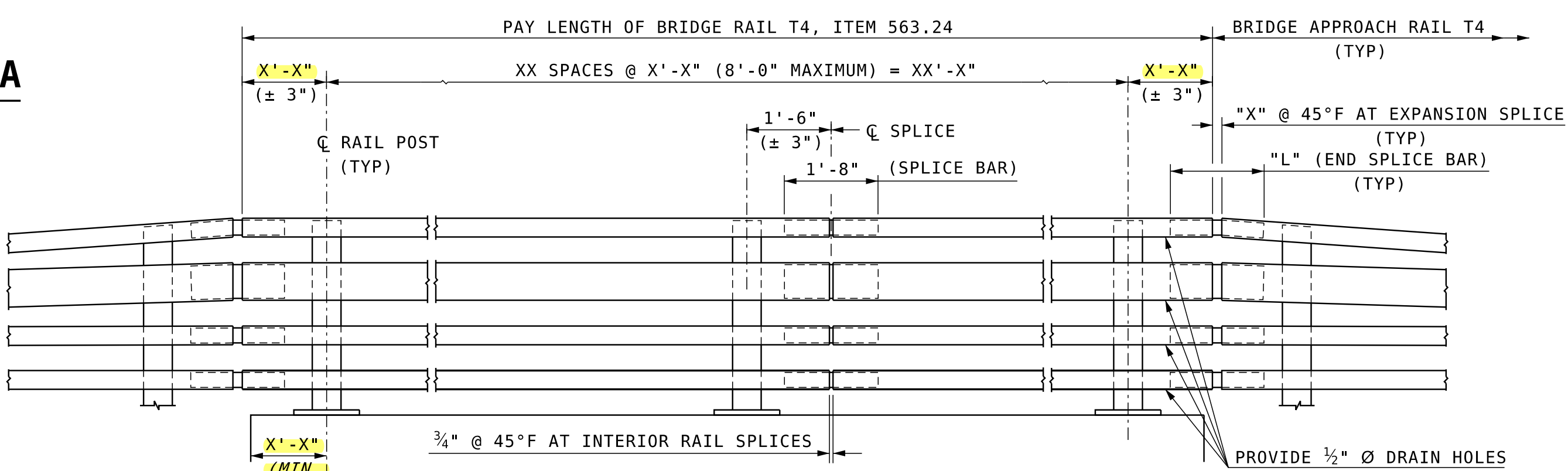
SECTION C-C

SPLICE BAR SECTION



SPLICE BOLT DETAIL

SCALE: 6" = 1'-0"



RAIL ELEVATION

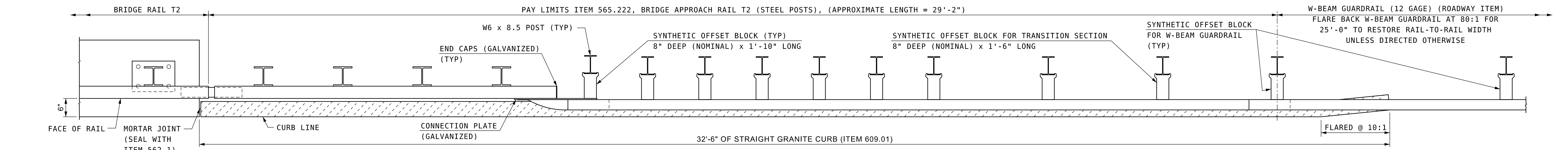
SCALE: 1/2" = 1'-0"

SPLICE BAR DIMENSION TABLE						
T	A	B	C	D	X	L
INTERIOR	2 1/2"	4"	4"	2"	3/4"	1'-8"
** ≤ 3 1/4"	2 1/2"	4"	4"	2"	2"	1'-8"
** 3 1/4" < T ≤ 5 1/4"	3 1/2"	5"	5"	2 1/2"	3"	2'-1"

T = TOTAL MOVEMENT OF BRIDGE
** = END SPLICE BAR

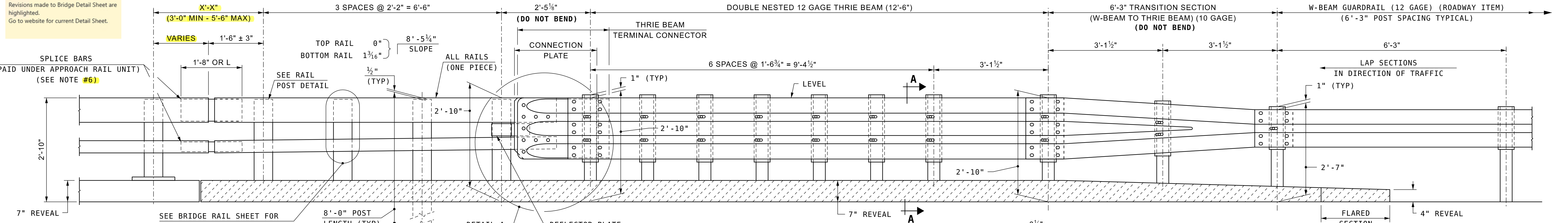
STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN						
TOWN		BRIDGE NO.		STATE PROJECT		
LOCATION						
T4 STEEL BRIDGE RAIL						BRIDGE SHEET
REVISIONS AFTER PROPOSAL	BY	DATE	CHECKED	NHDOT	DATE	XX OF
	DESIGNED	NETC/JSZ	3/02	CHECKED	JSZ	10/05
	DRAWN	PJP	10/05	CHECKED	JSZ	10/05
	QUANTITIES	xxx	xx/xx	CHECKED	xxx	xx/xx
	ISSUE DATE	11/15/05	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS	
	REV. DATE	7/31/23				

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BR-RAIL-ST	T4 BR-RAIL	AS NOTED



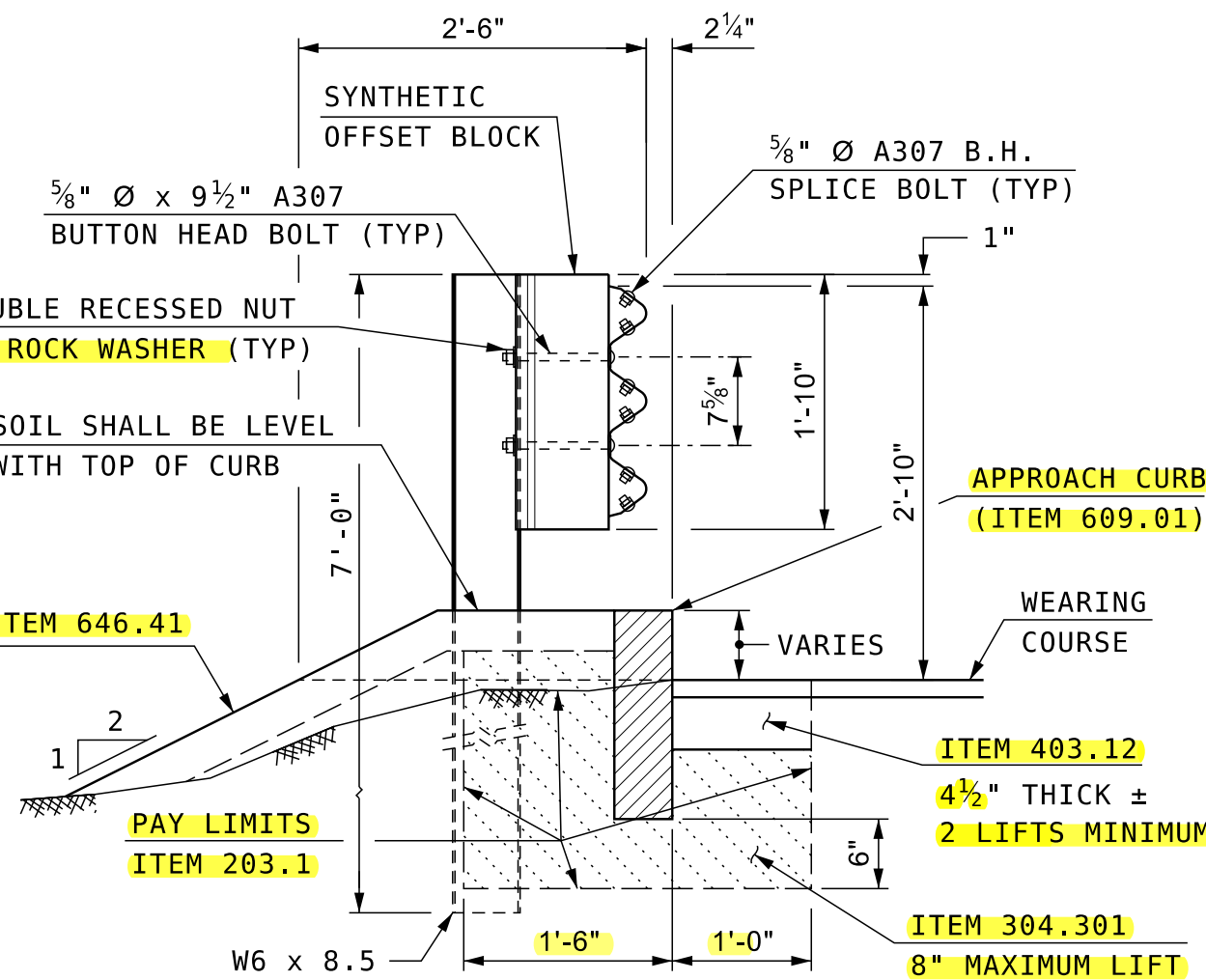
PLAN VIEW - APPROACH RAIL

SCALE: 3/4" = 1'-0"



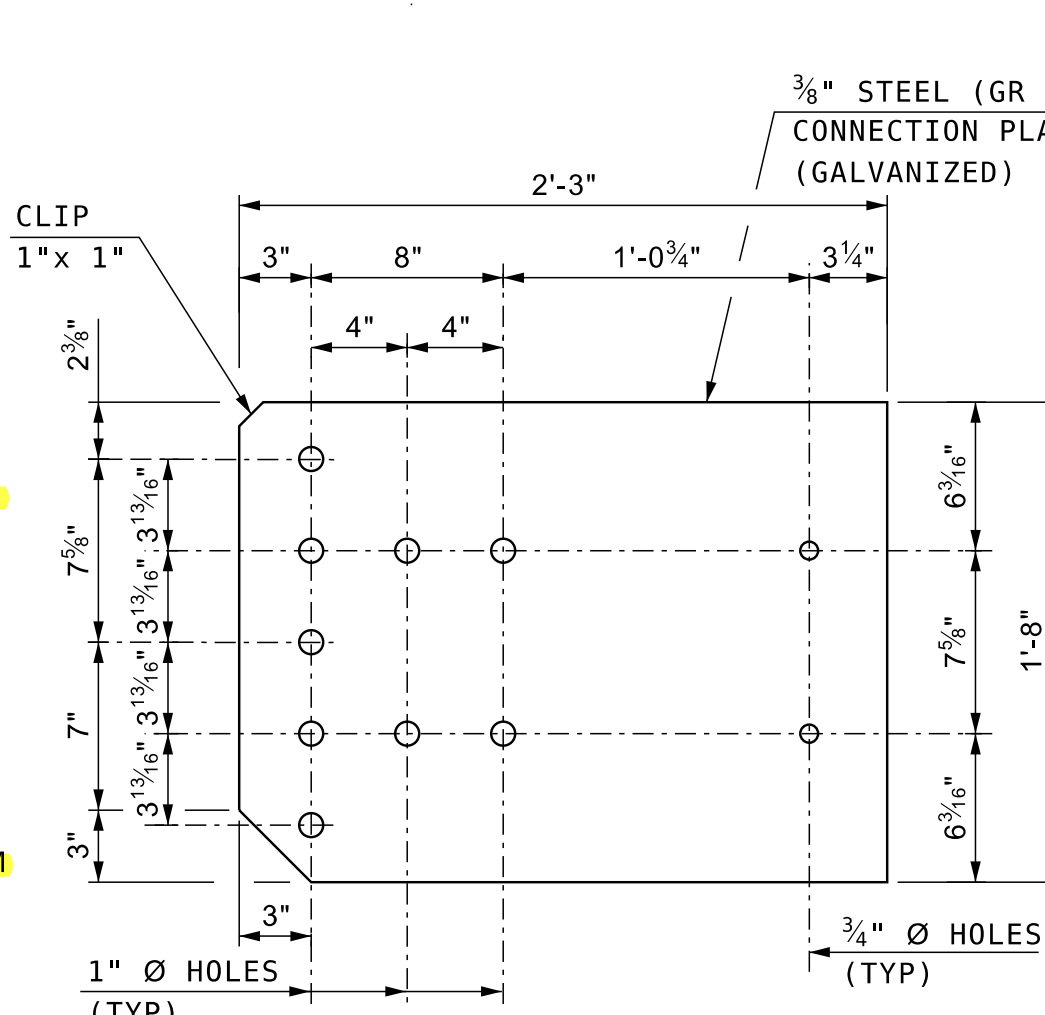
ELEVATION - APPROACH RAIL

SCALE: 3/4" = 1'-0"



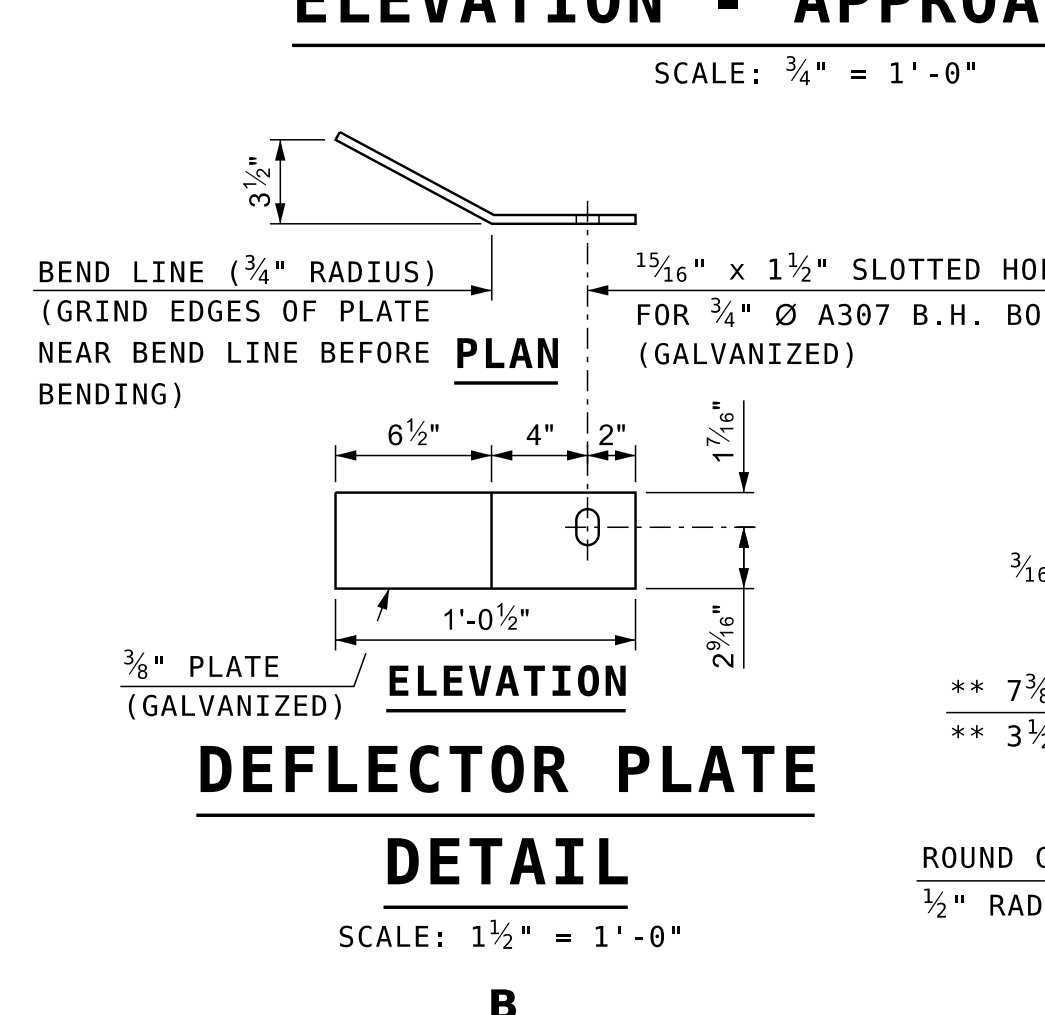
SECTION A-A (POST RAIL ASSEMBLY)

SCALE: 3/4" = 1'-0"



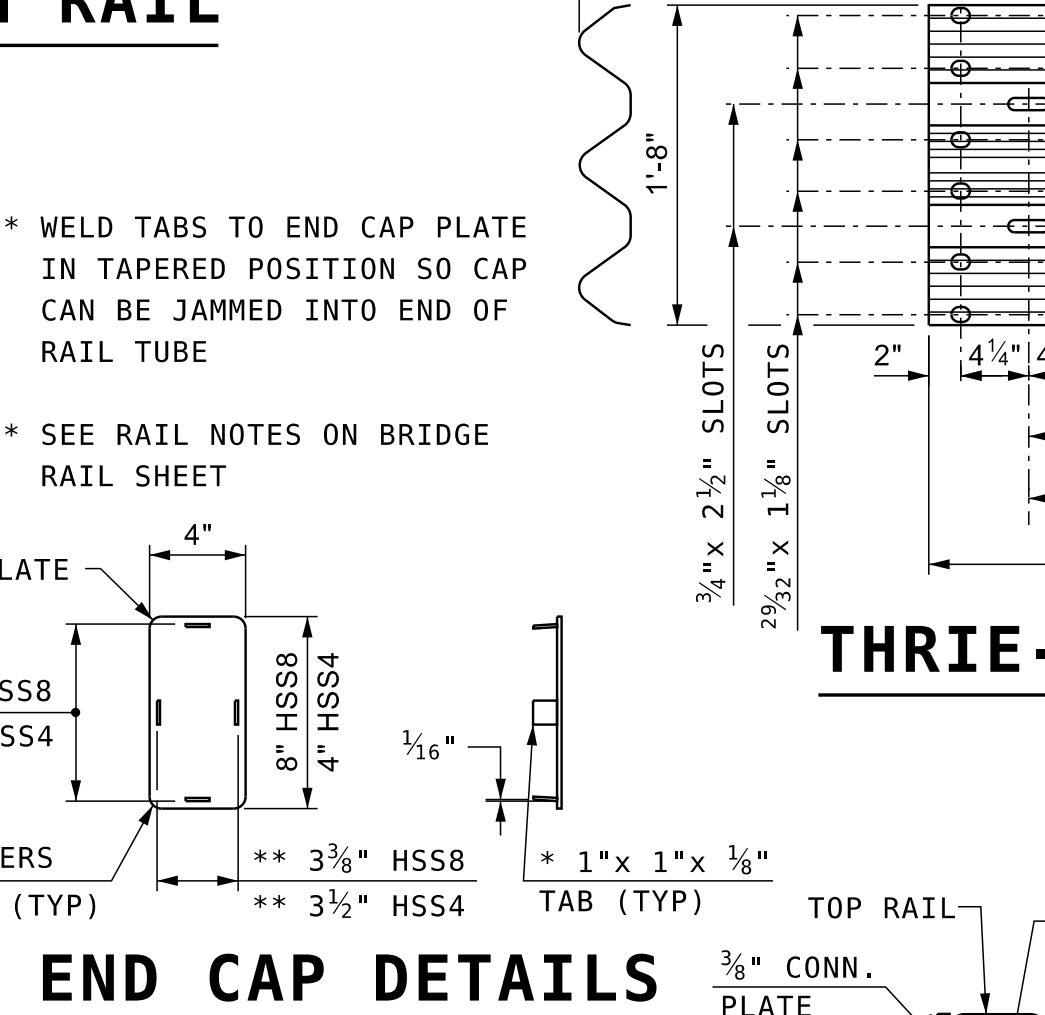
CONNECTION PLATE

SCALE: 1 1/2" = 1'-0"



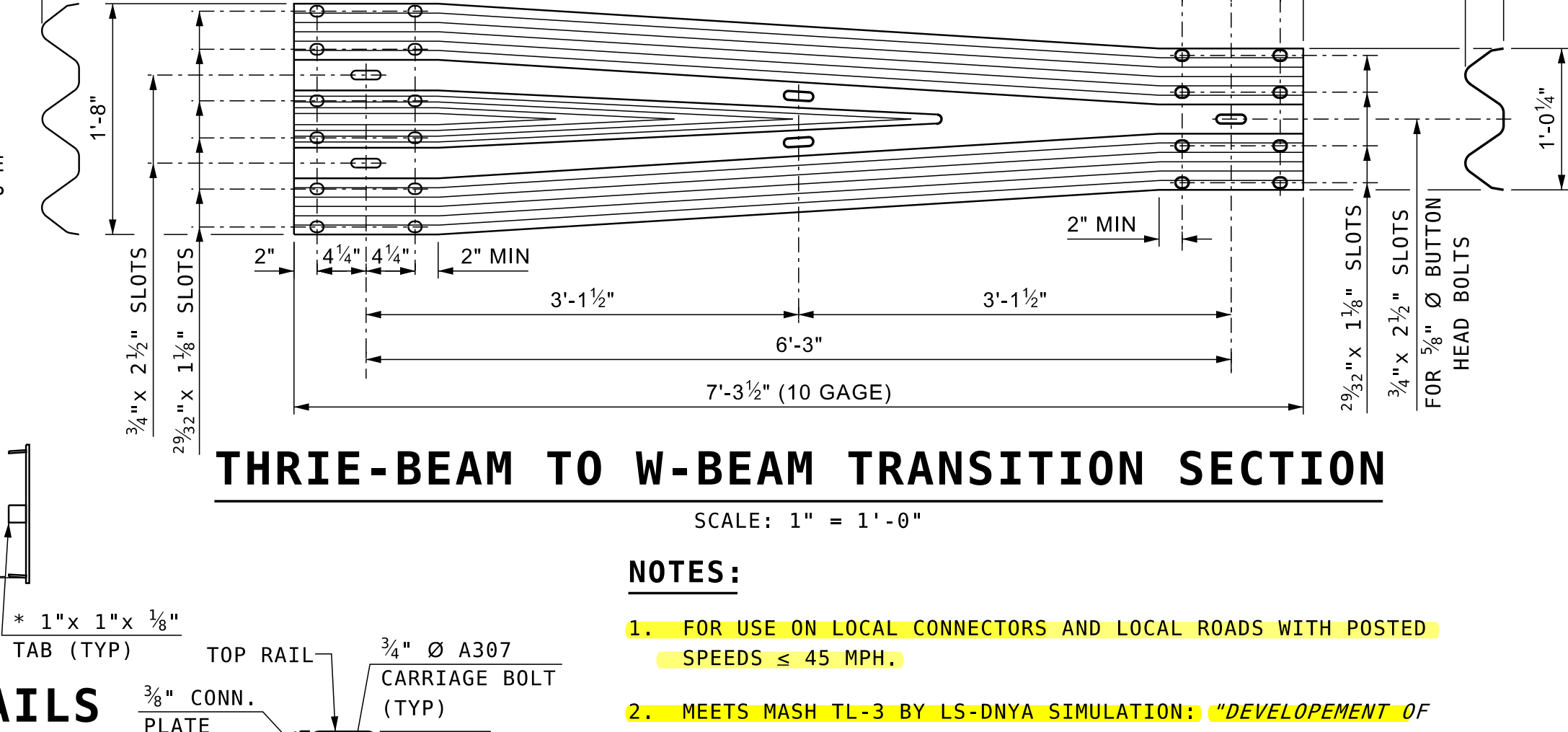
DEFLECTOR PLATE DETAIL

SCALE: 1 1/2" = 1'-0"



END CAP DETAILS

SCALE: 1 1/2" = 1'-0"

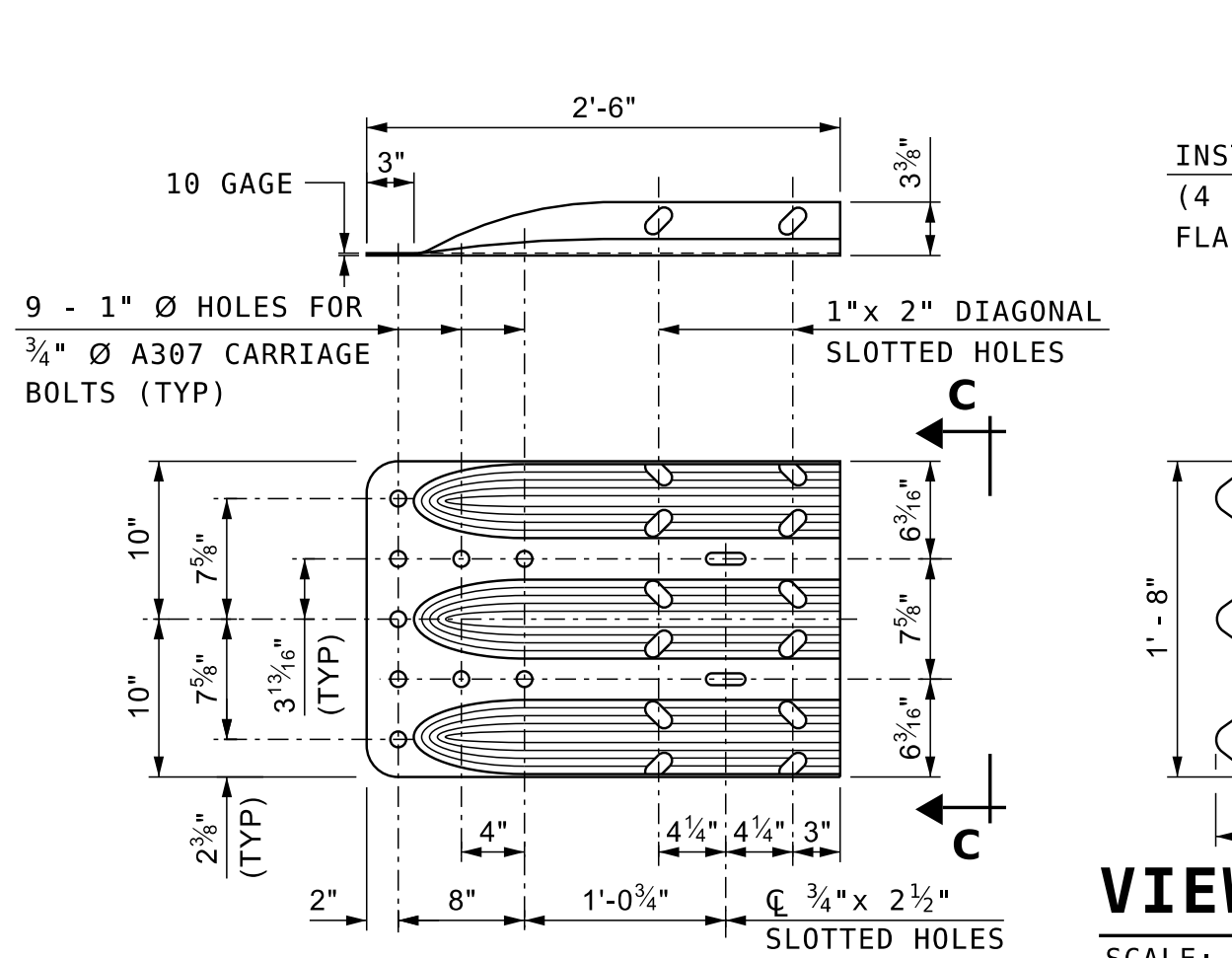


THRIE-BEAM TO W-BEAM TRANSITION SECTION

SCALE: 1" = 1'-0"

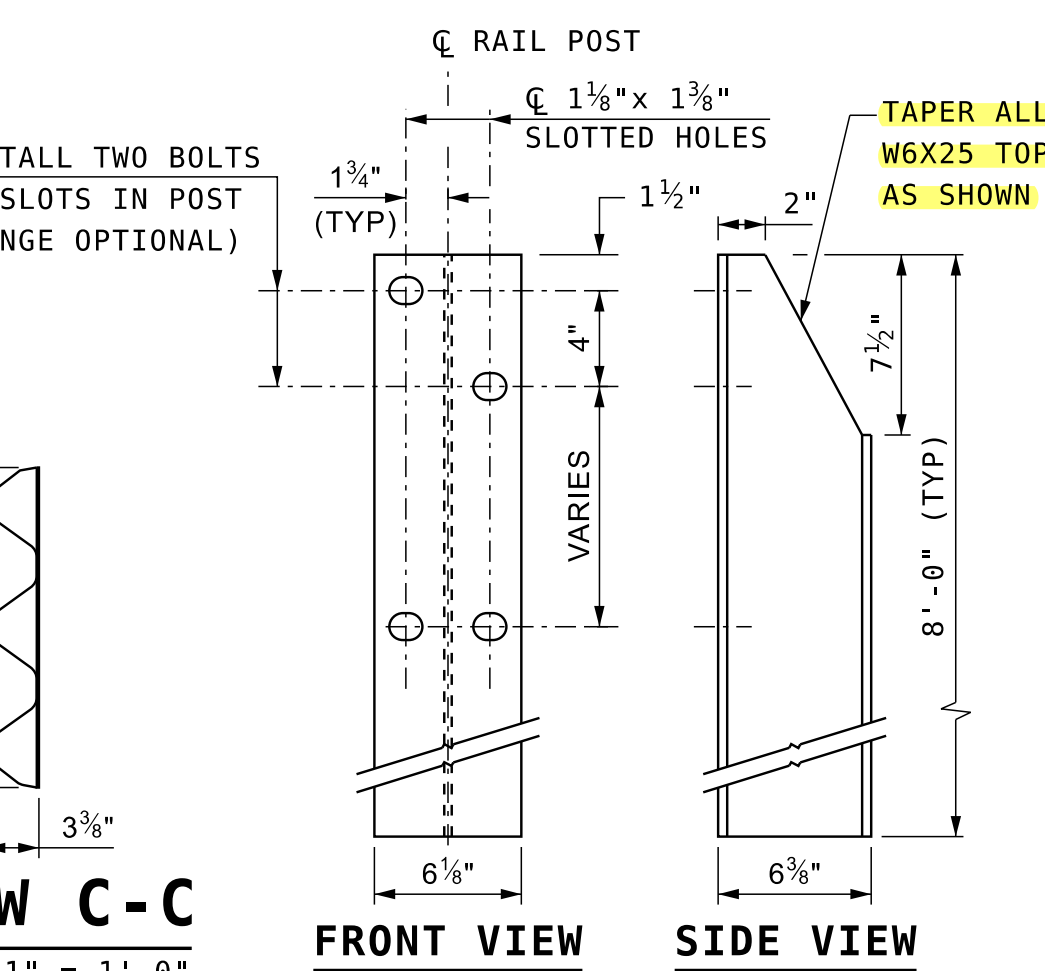
NOTES:

- FOR USE ON LOCAL CONNECTORS AND LOCAL ROADS WITH POSTED SPEEDS ≤ 45 MPH.
- MEETS MASH TL-3 BY LS-DNVA SIMULATION: "DEVELOPEMENT OF MASH COMPUTER SIMULATED STEEL BRIDGE RAIL AND TRANSITION DETAILS" (NETC), APRIL 2020. FIELD PERFORMANCE CRASHWORTHINESS (29 YEARS): "IN-SERVICE PERFORMANCE EVALUATION OF NETC BRIDGE RAILING", JUNE 2022. CRASH TESTED (NETC 2005) AND ACCEPTED AS NCHRP 350 TL-4 (FHWA LETTER: HSSD/B-146, JULY 2008).
- ALL BRIDGE APPROACH RAIL MATERIALS, DIMENSIONS, SIZES, AND NOTES SHALL BE THE SAME AS THOSE OF THE BRIDGE RAIL, UNLESS OTHERWISE NOTED. SEE BRIDGE RAIL SHEET FOR NOTES AND ADDITIONAL INFORMATION.
- W6 x 25 POSTS SHALL BE THE SAME MATERIAL AS THE BRIDGE RAIL POSTS. W6 x 8.5 POSTS SHALL BE THE SAME AS W-BEAM GUARDRAIL POSTS.
- CARRIAGE BOLTS SHALL BE ASTM A307, AND NUTS SHALL BE ASTM A563 GRADE A OR BETTER (GALVANIZED).
- WELD BARS ADJUSTED FOR SLOPE & BEND. USE COMPLETE JOINT PENETRATION BUTT WELD (B-U2).
- ALL COMPONENTS, EXCEPT TUBULAR RAIL, SHALL CONFORM TO SECTION 606 OF NHDOT SPECIFICATIONS.



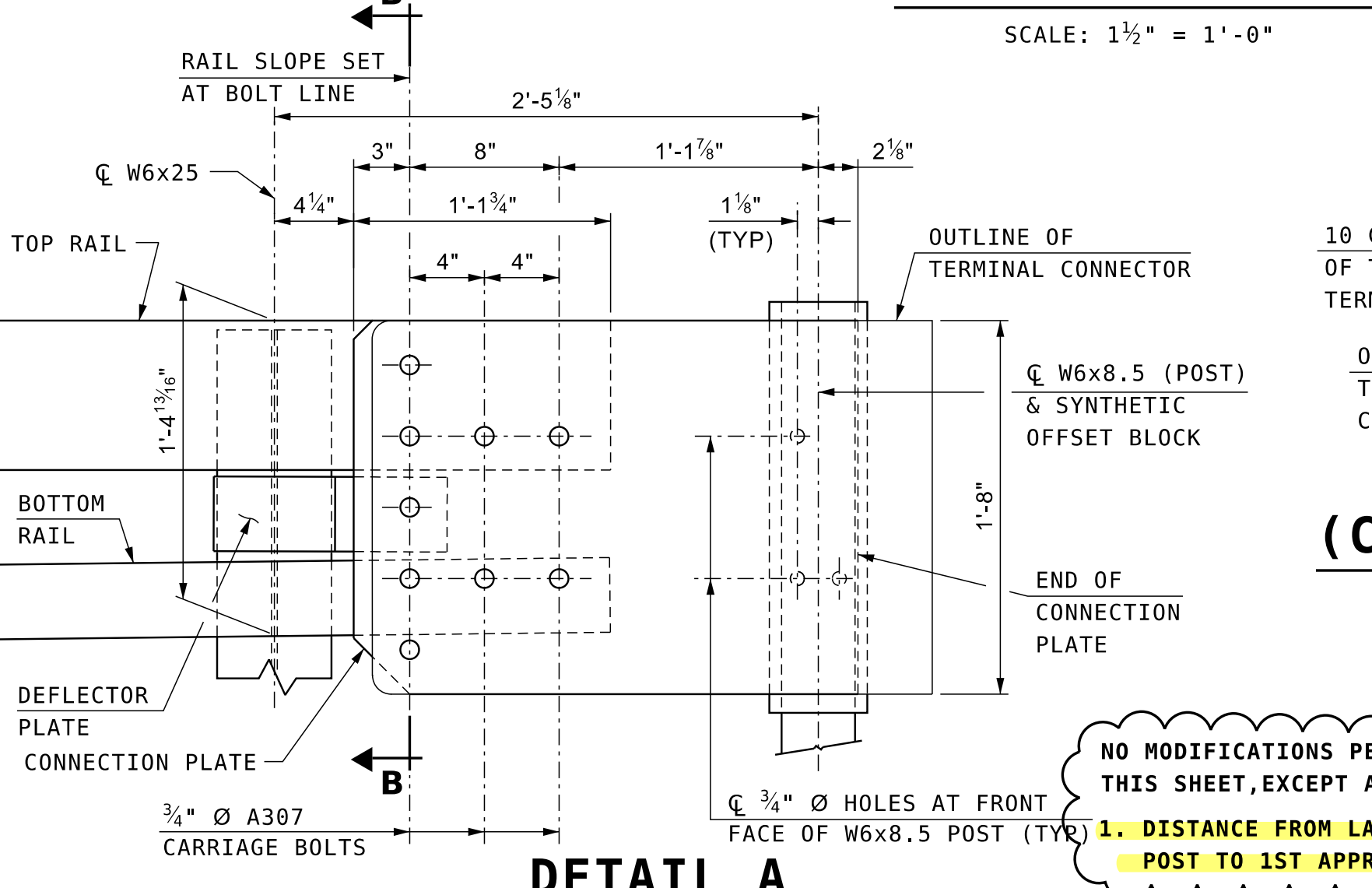
THRIE-BEAM TERMINAL CONNECTOR

SCALE: 1" = 1'-0"



RAIL POST (W6x25)

SCALE: 1 1/2" = 1'-0"



DETAIL A

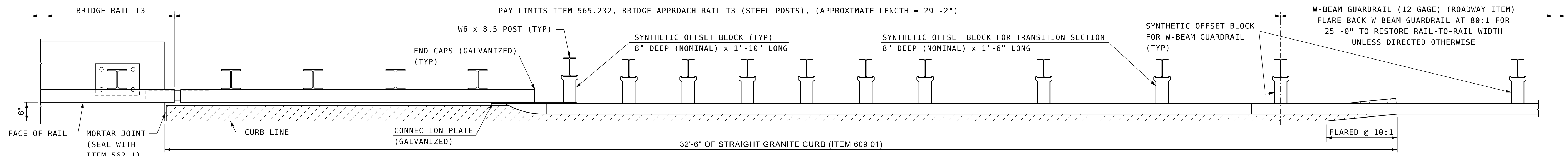
OVERLAPPING OF DOUBLE NESTED THRIE-BEAM NOT SHOWN FOR CLARITY

SCALE: 1 1/2" = 1'-0"

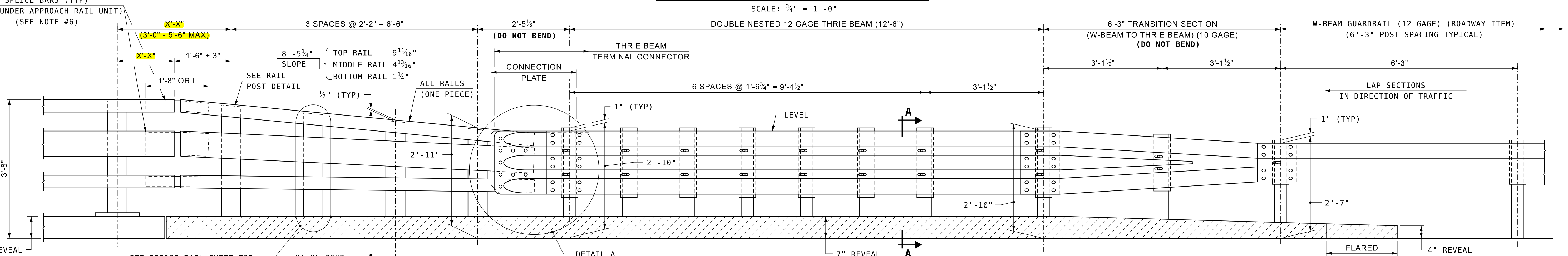
NO MODIFICATIONS PERMITTED TO THIS SHEET, EXCEPT AS NOTED BELOW:

1. DISTANCE FROM LAST BRIDGE POST TO 1ST APPROACH POST.

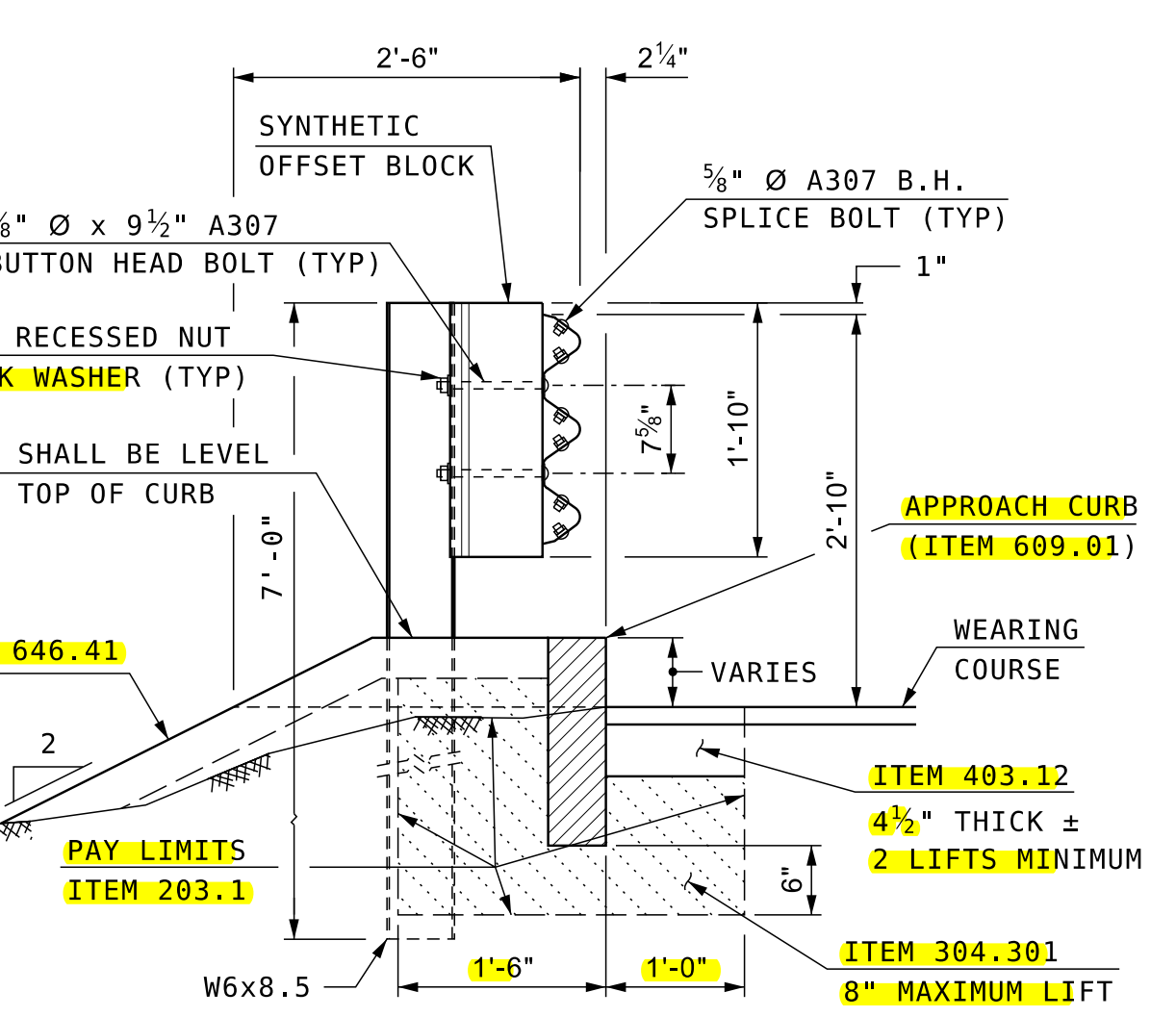
STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN		BRIDGE NO.		STATE PROJECT					
T2 STEEL BR APP RAIL (STEEL POSTS)									
REVISIONS AFTER PROPOSAL	DESIGNED	NETC/JSZ	3/02	CHECKED	NHDOT	DATE	BY	DATE	BRIDGE SHEET
	DRAWN	PJP	5/08	CHECKED	JSZ	10/05			XX OF
	QUANTITIES	xxx	xx/xx	CHECKED	xxx	xx/xx			FILE NUMBER
	ISSUE DATE	11/15/05	FEDERAL PROJECT NO.						
	REV. DATE	7/31/23							TOTAL SHEETS
SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE							
BR-RAIL-ST	T2 BR-APP-RAIL	AS NOTED							



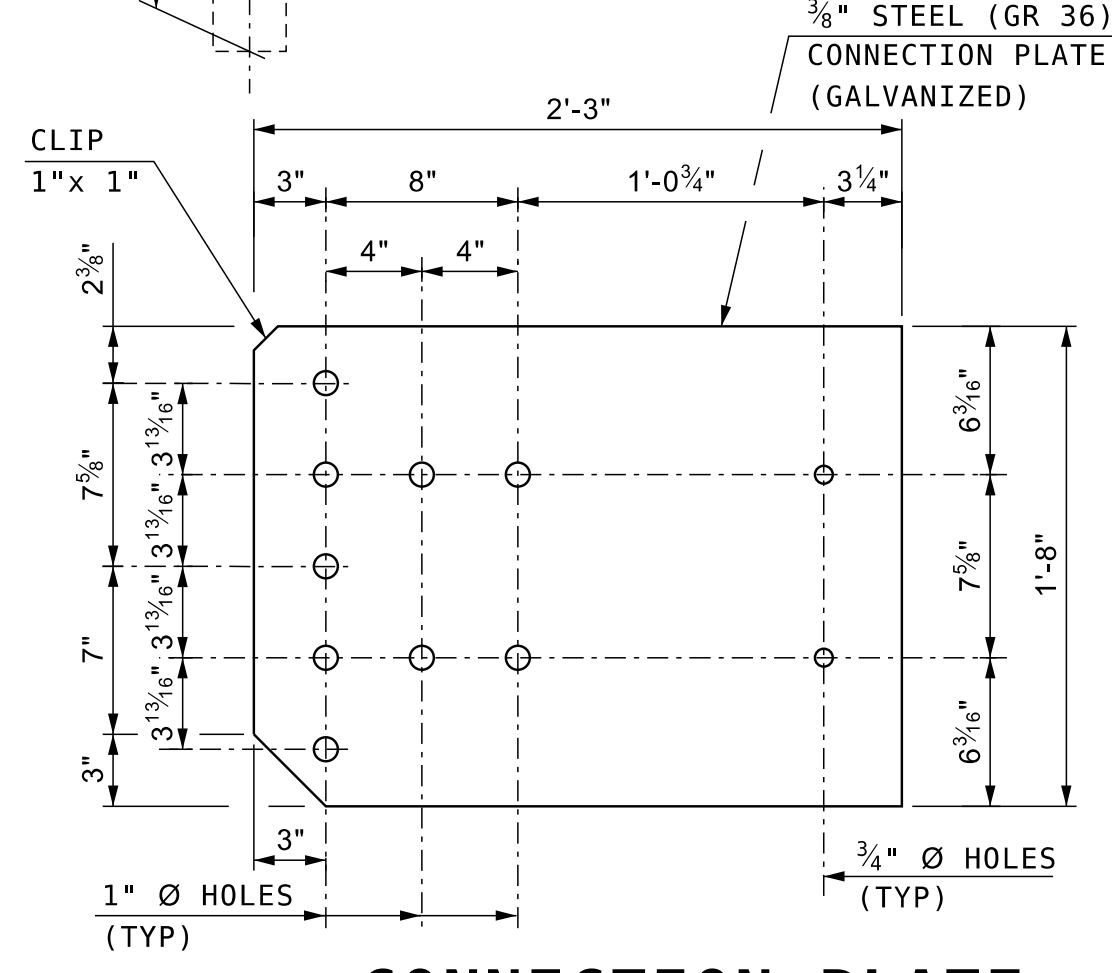
PLAN VIEW - APPROACH RAIL



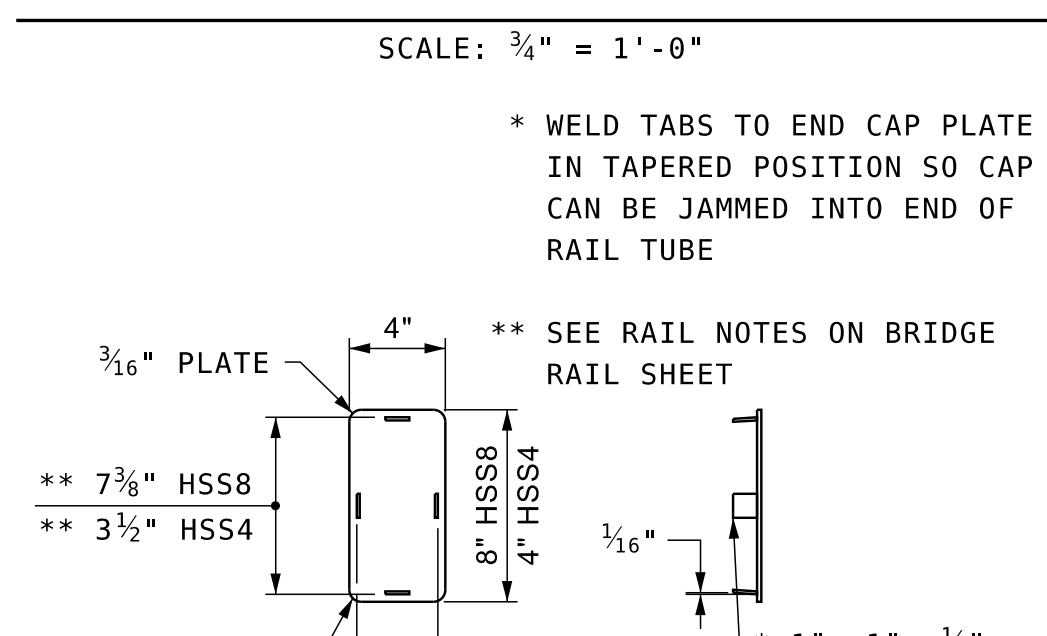
ELEVATION - APPROACH RAIL



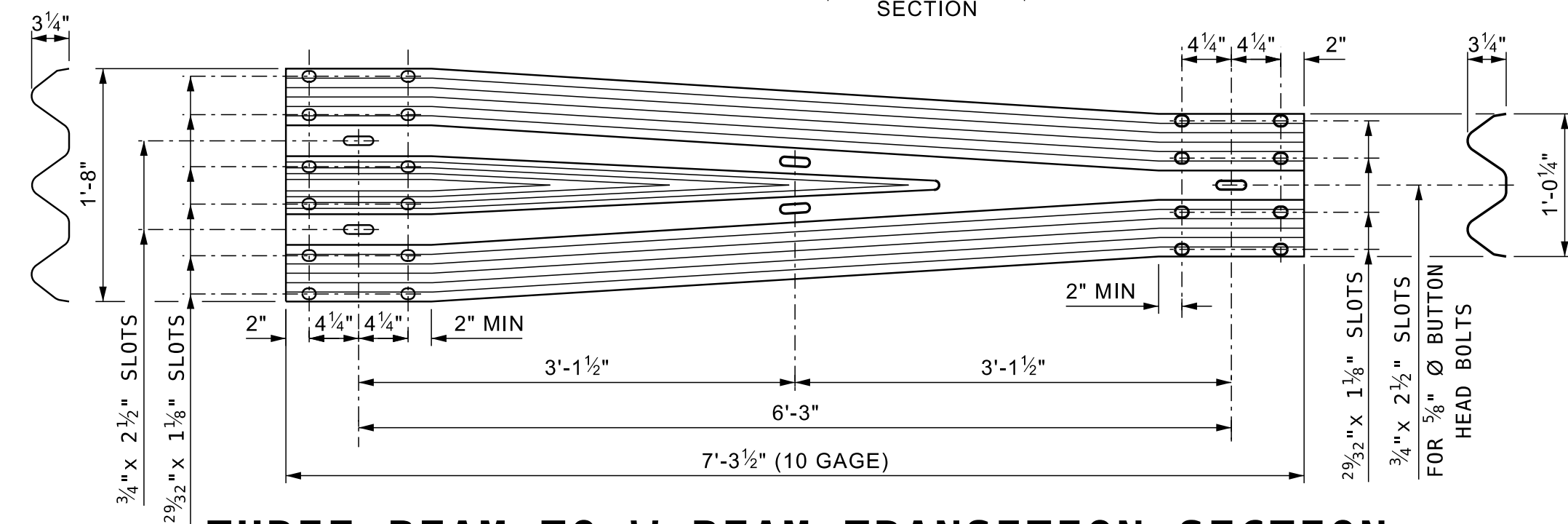
SECTION A-A (POST RAIL ASSEMBLY)



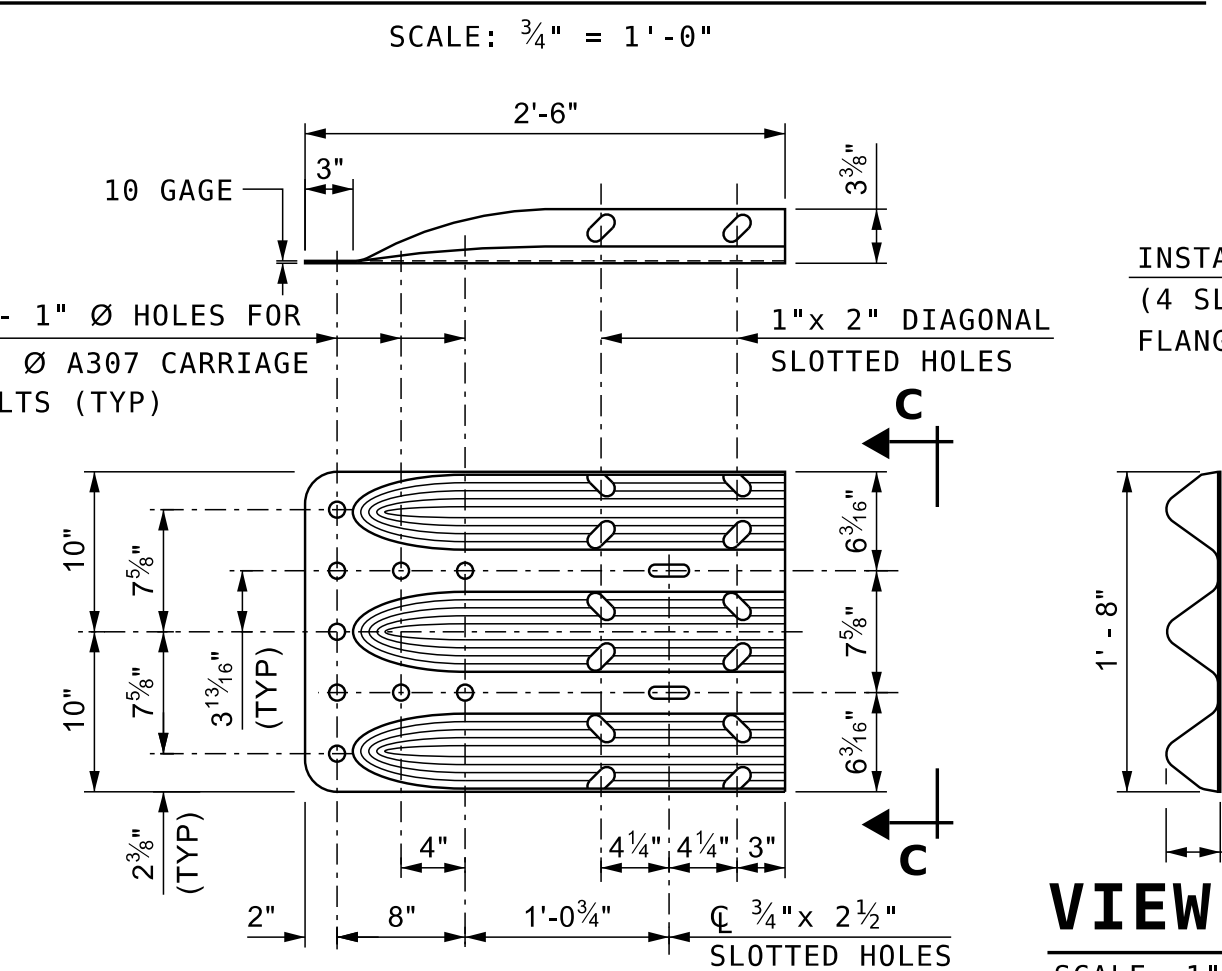
CONNECTION PLATE



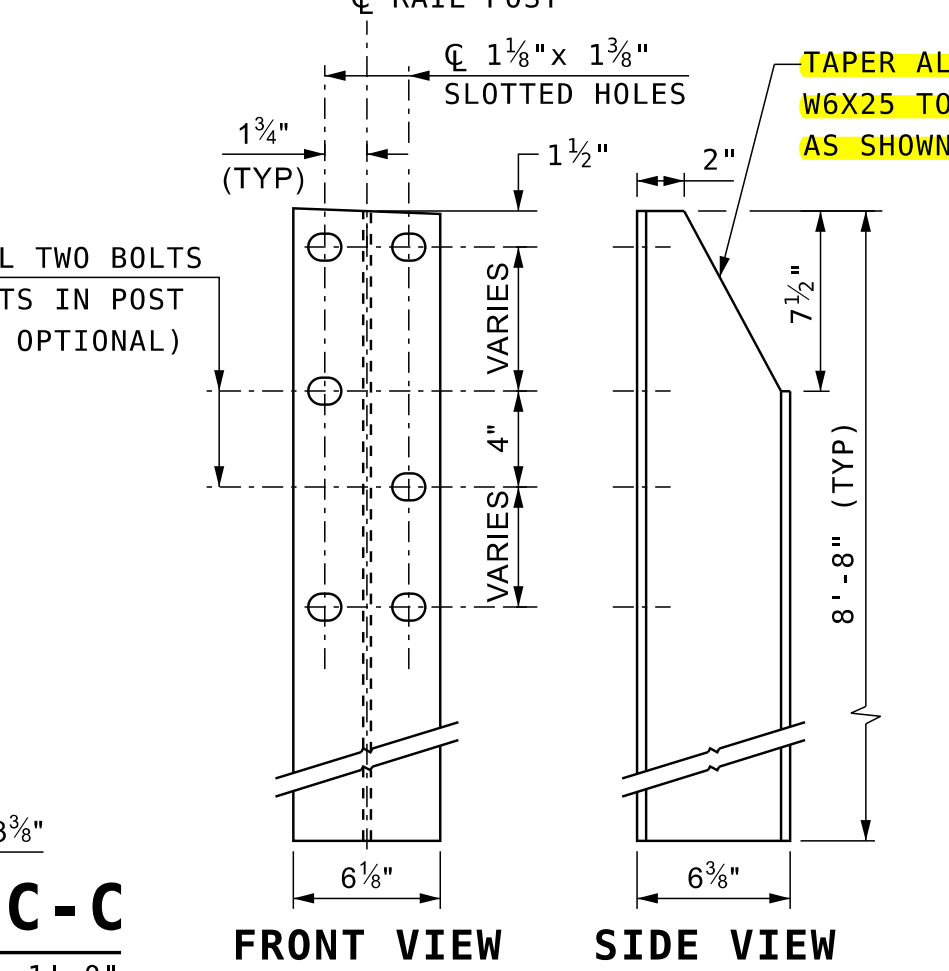
END CAP DETAILS



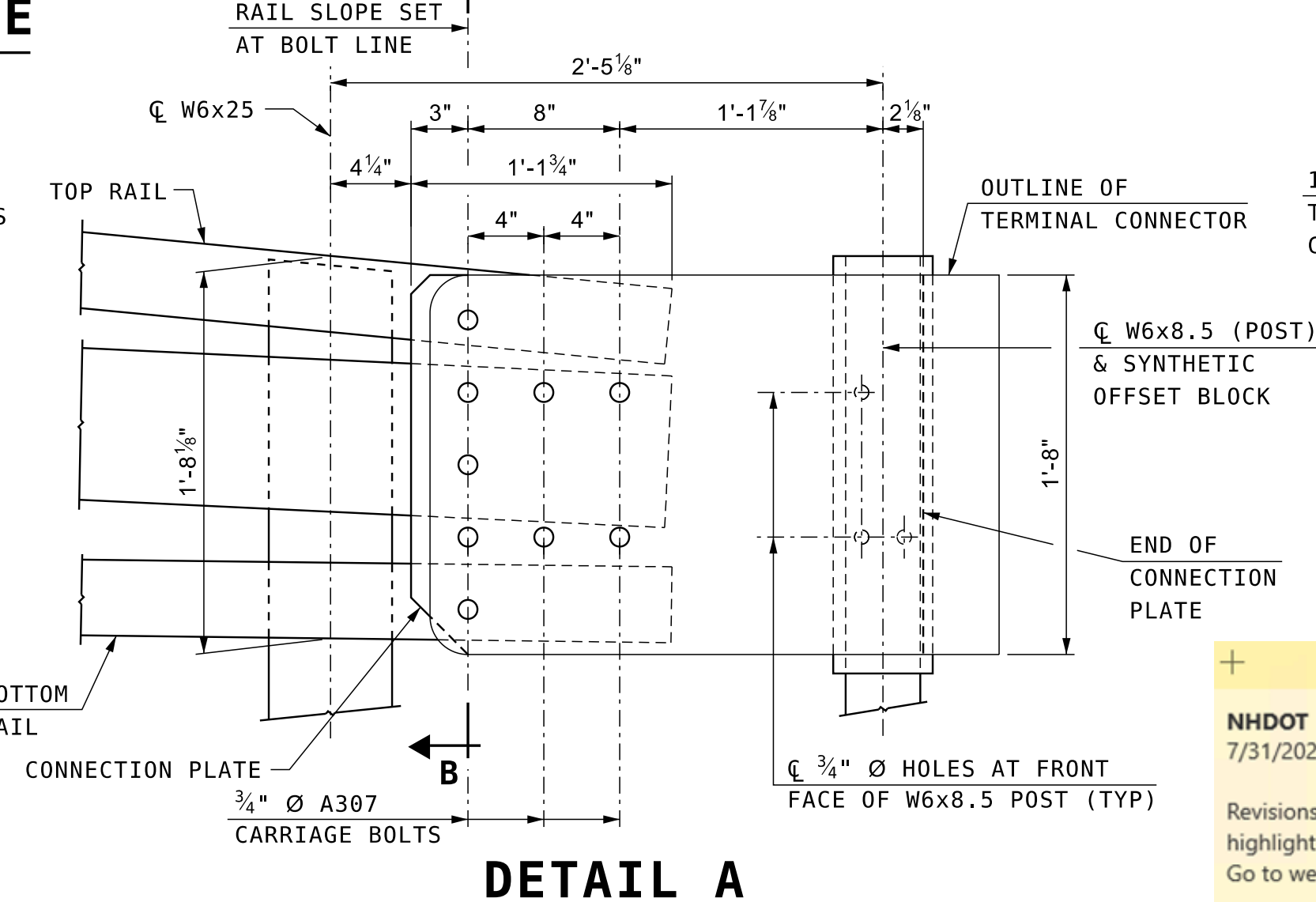
THRIE-BEAM TO W-BEAM TRANSITION SECTION



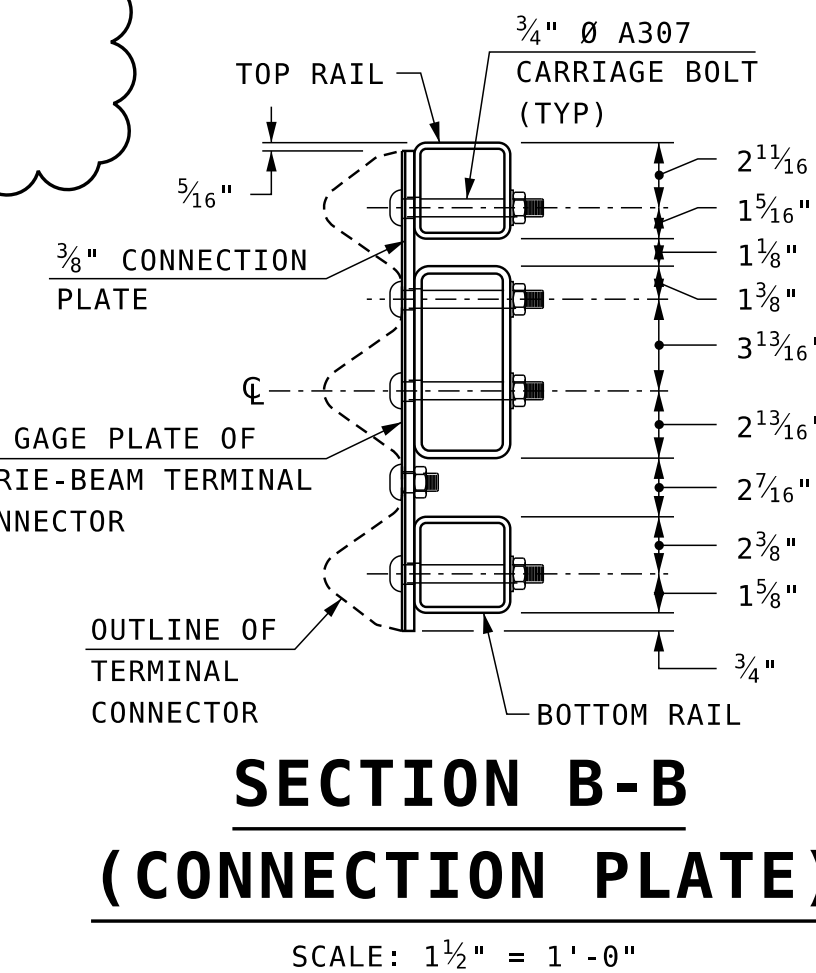
THRIE-BEAM TERMINAL CONNECTOR



RAIL POST (W6x25)



DETAIL A



SECTION B-B (CONNECTION PLATE)

- NOTES:**
- FOR USE ON ALL INTERSTATE, STATE, AND LOCAL ROADS.
 - MEETS MASH TL-4 BY LS-DNVA SIMULATION: "DEVELOPEMENT OF MASH COMPUTER SIMULATED STEEL BRIDGE RAIL AND TRANSITION DETAILS" (NETC, APRIL 2020). FIELD PERFORMANCE CRASHWORTHINESS (29 YEARS): "IN-SERVICE PERFORMANCE EVALUATION OF NETC BRIDGE RAILING", JUNE 2022. CRASH TESTED (NETC 2005) AND ACCEPTED AS NCHRP 350 TL-4 (FHWA LETTER: HSSD/B-146, JULY 2008).
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 - ALL COMPONENTS, EXCEPT TUBULAR RAIL, SHALL CONFORM TO SECTION 606 OF NHDOT SPECIFICATIONS.

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN	BRIDGE NO.			STATE PROJECT					
LOCATION									
T3 STEEL BR APP RAIL (STEEL POSTS)									
REVISIONS AFTER PROPOSAL	BY	DATE	CHECKED	BY	DATE	BRIDGE SHEET			
DESIGNED	NETC/JSZ	3/02	CHECKED	NHDOT		XX OF			
DRAWN	PJP	10/05	CHECKED	JSZ	10/05	FILE NUMBER			
QUANTITIES	XXX	XX/XX	CHECKED	XXX	XX/XX				
ISSUE DATE	11/15/05	FEDERAL PROJECT NO.		SHEET NO.		TOTAL SHEETS			
REV. DATE	7/31/23								

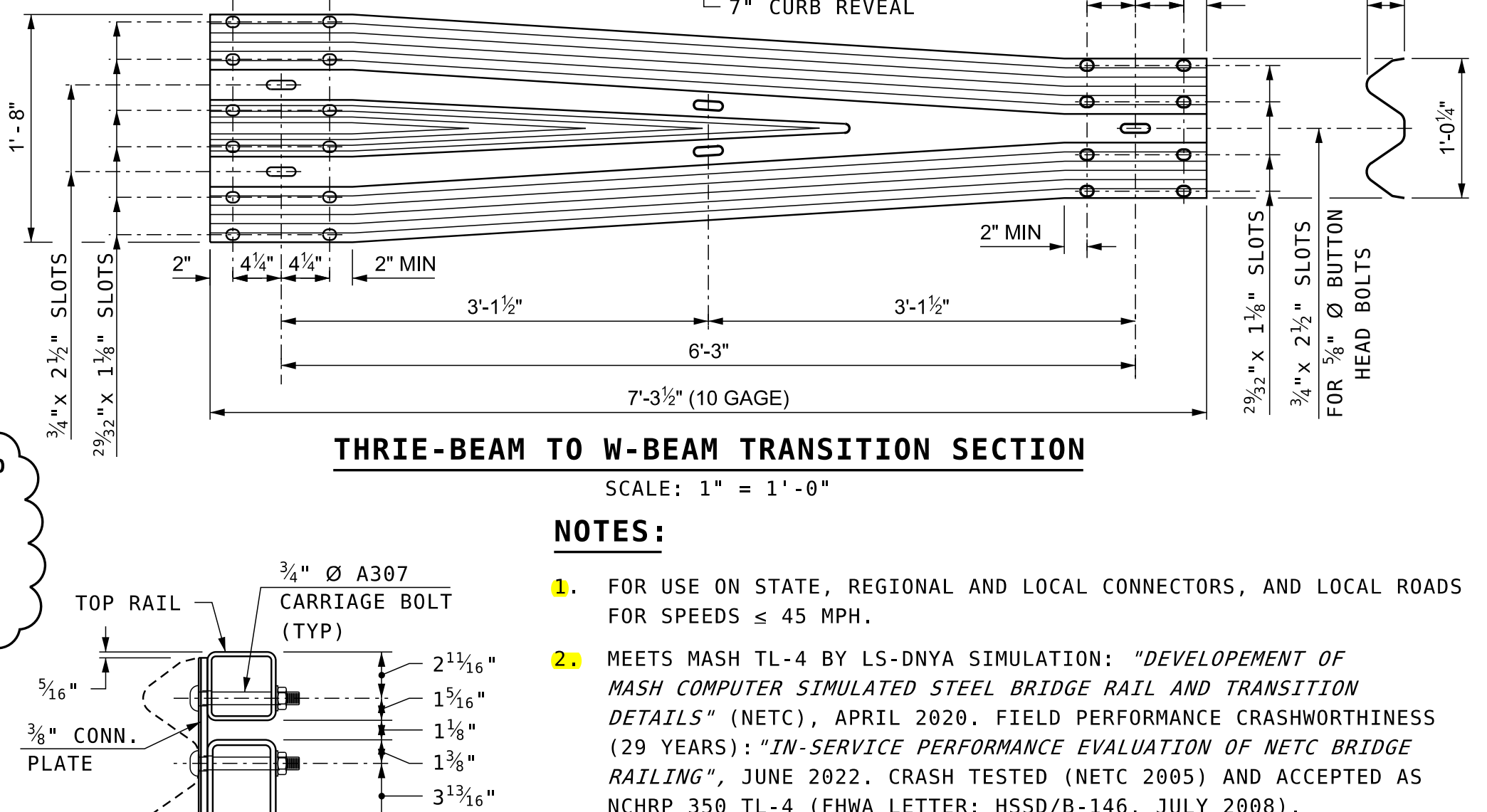
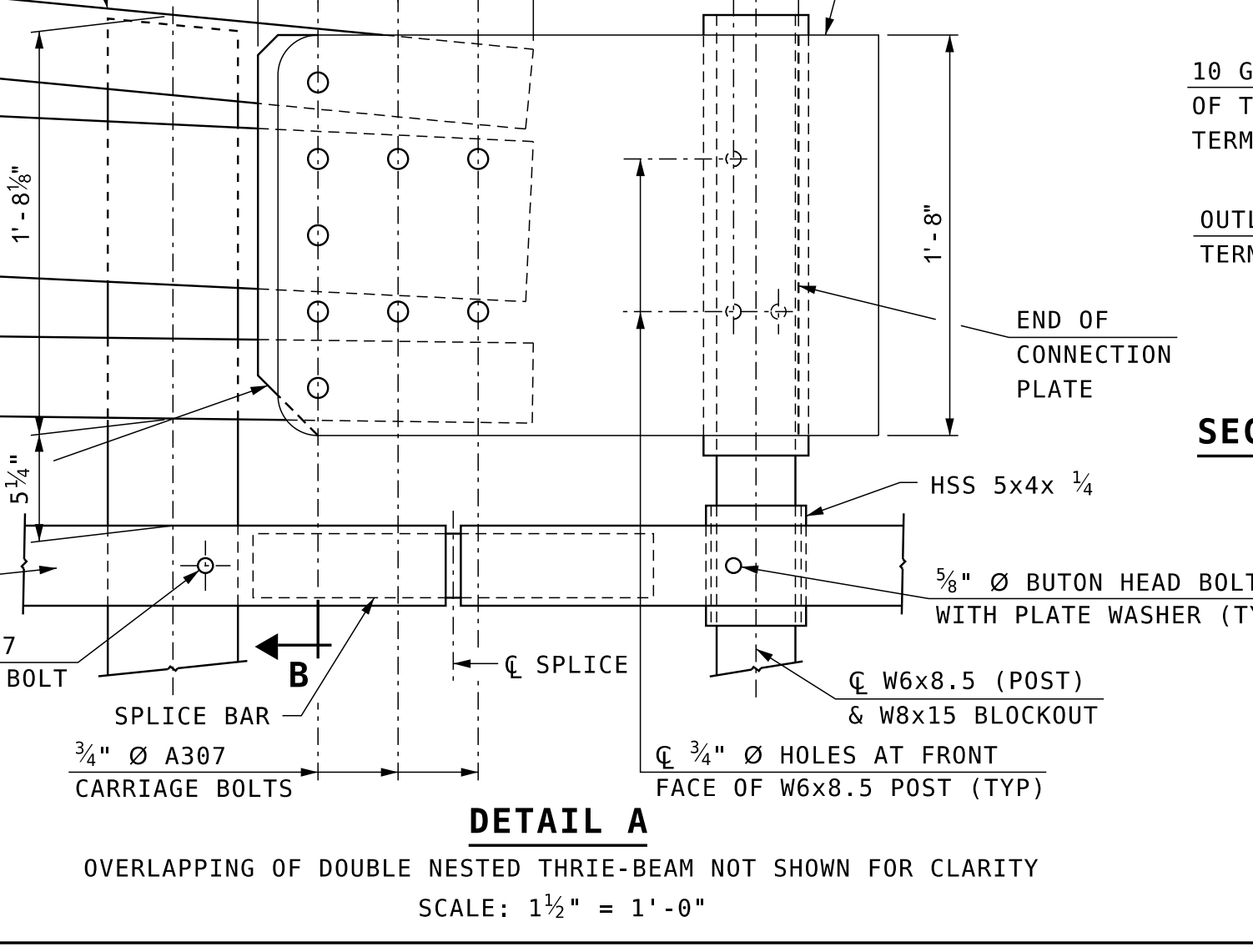
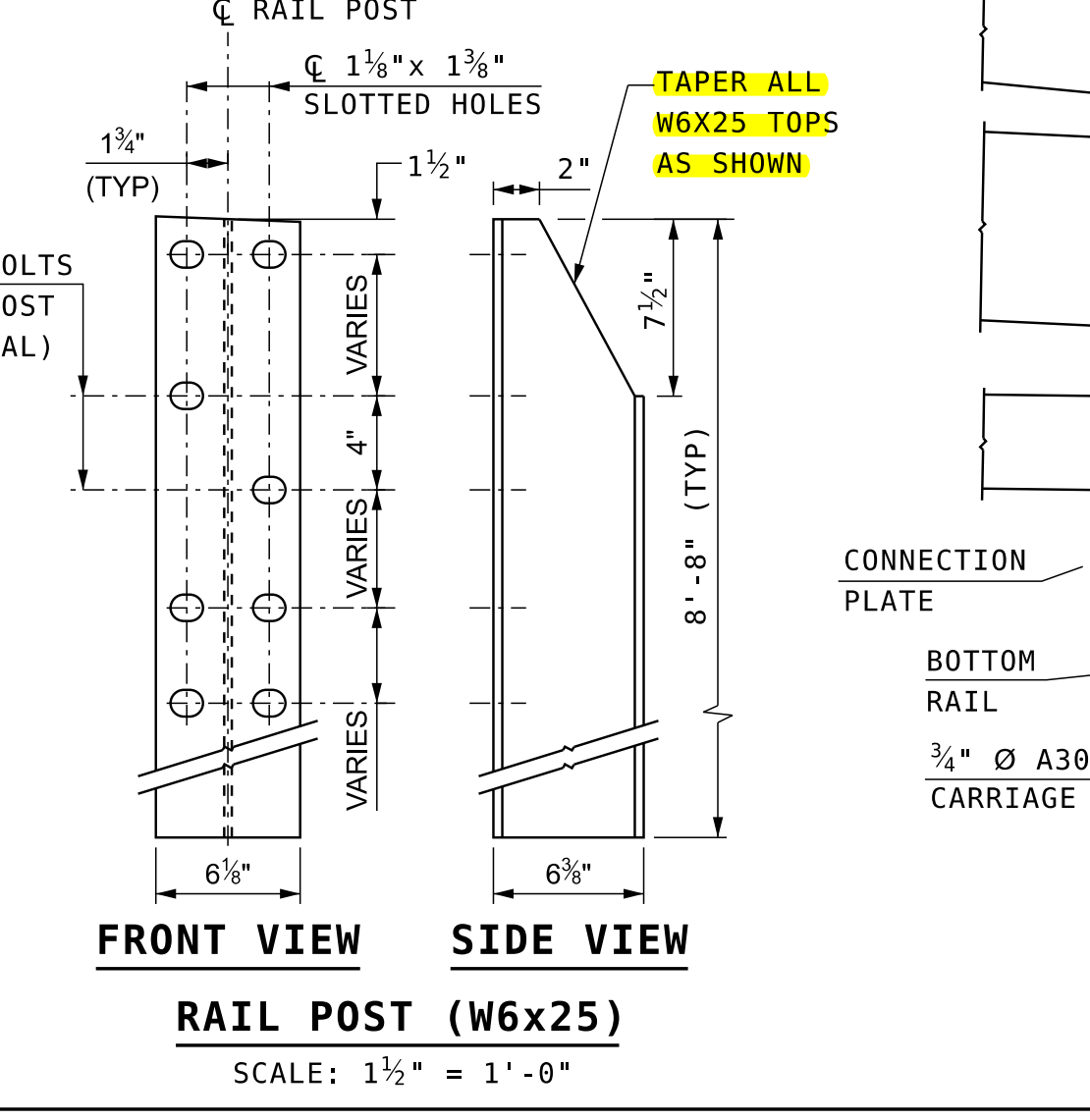
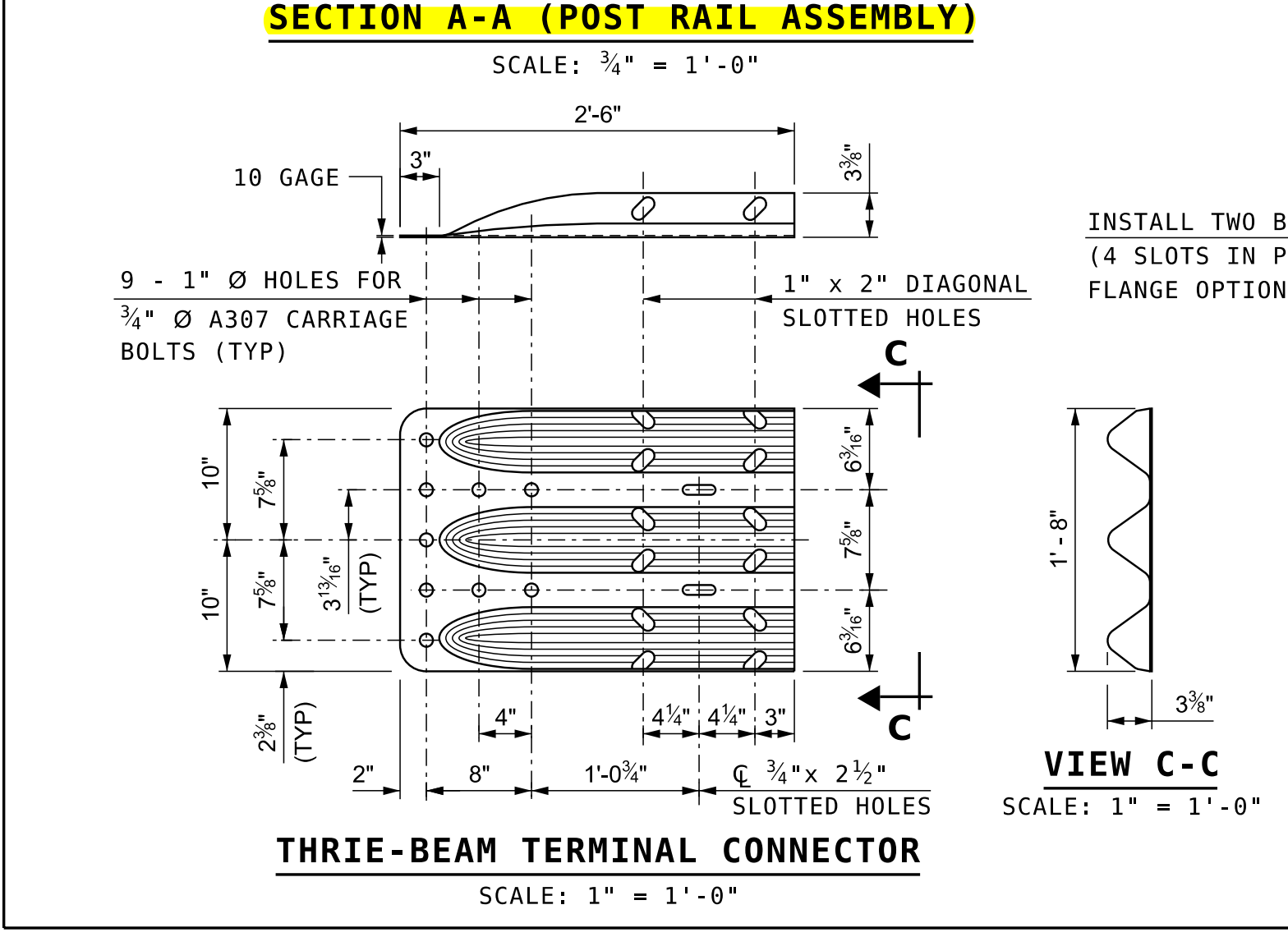
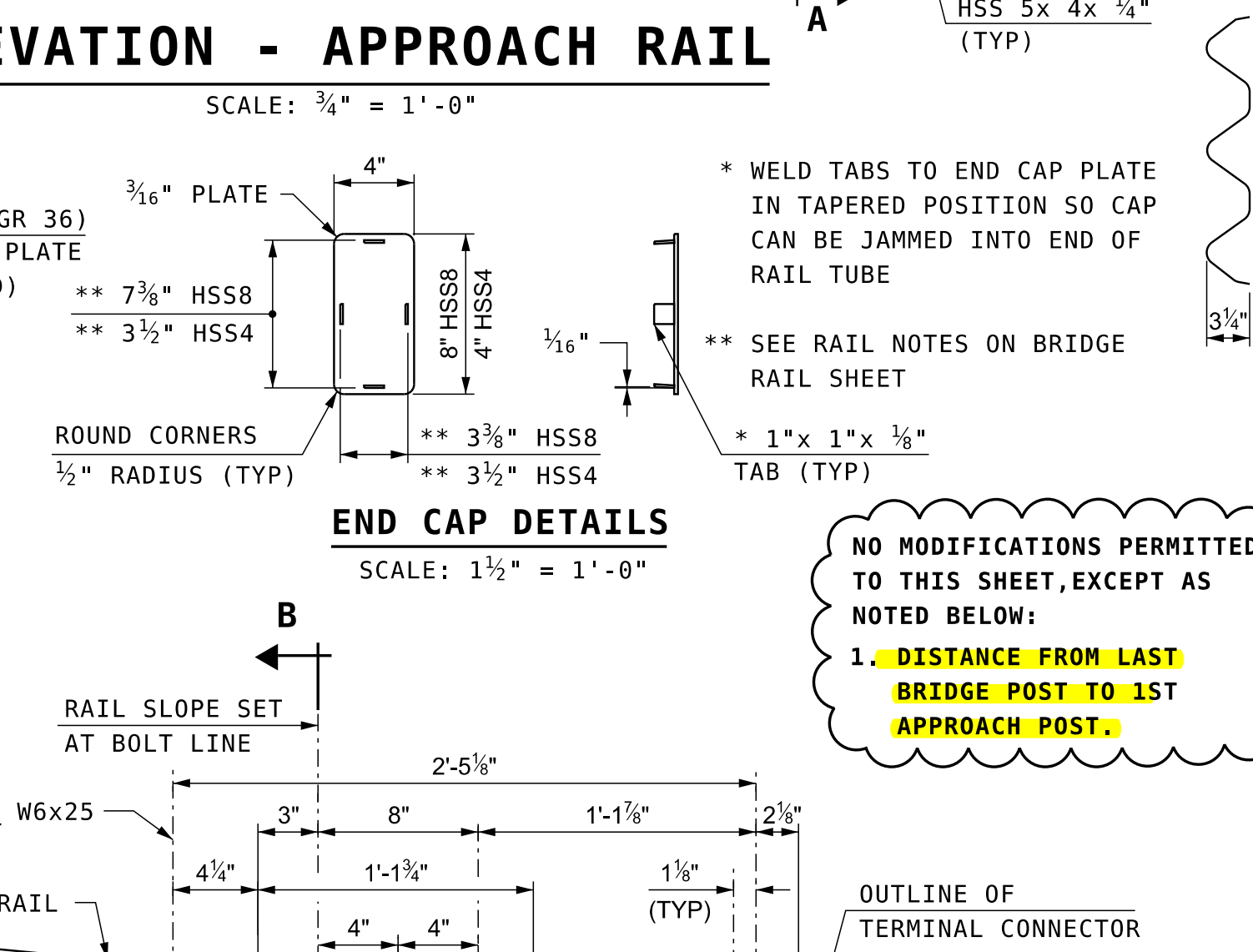
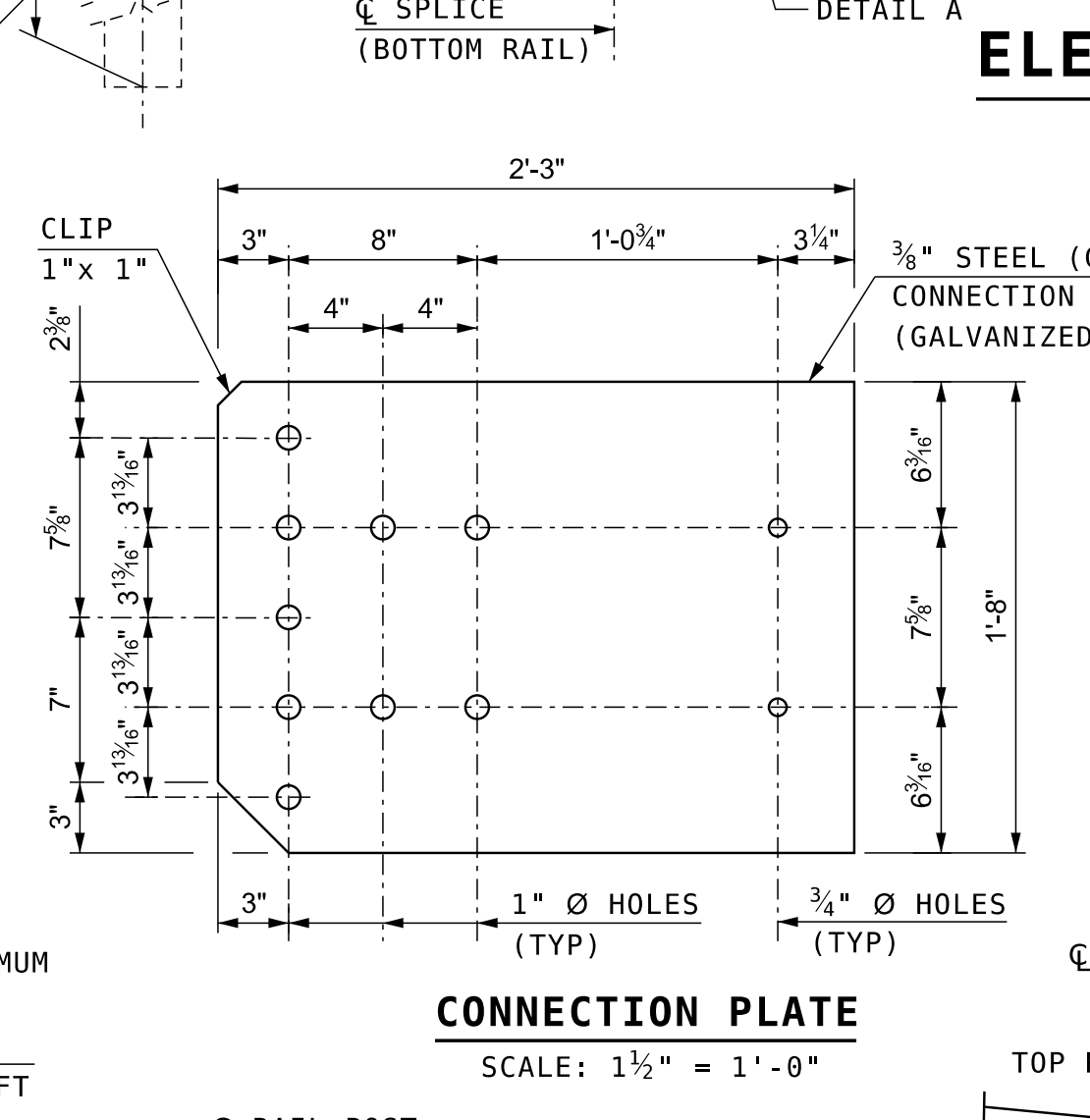
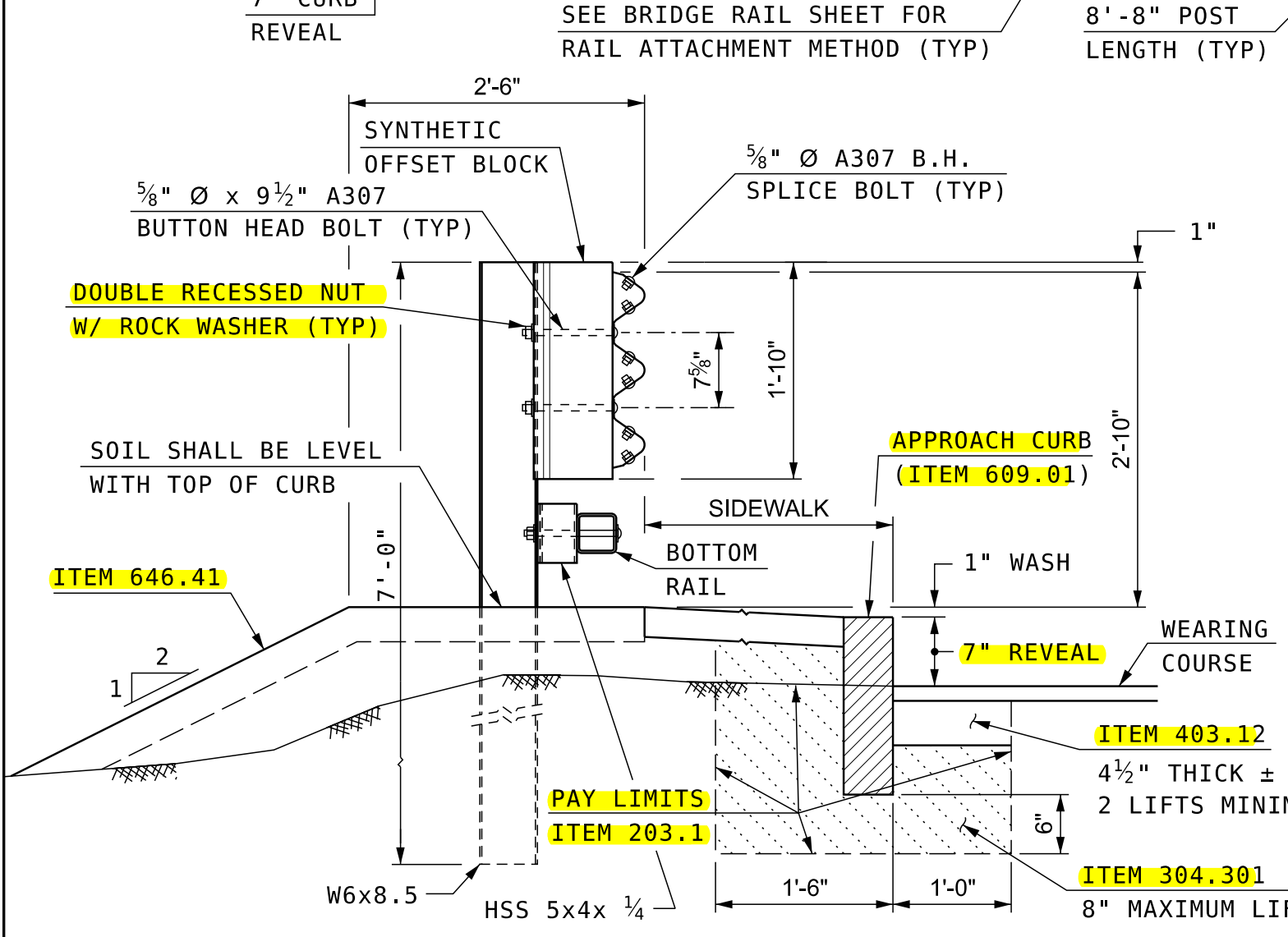
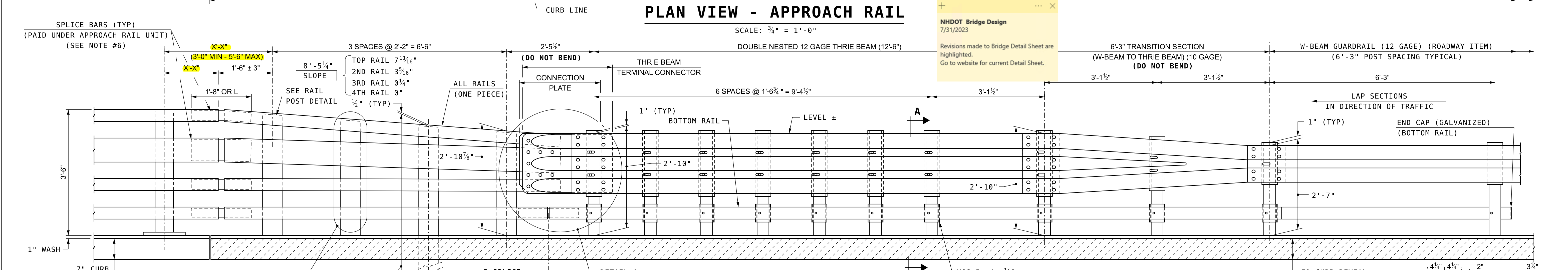
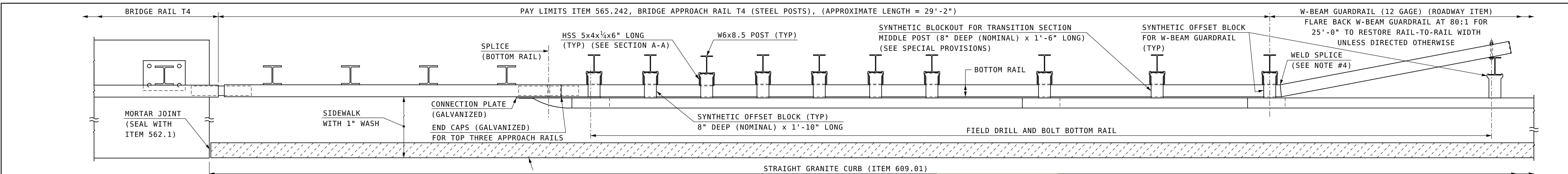
NO MODIFICATIONS PERMITTED TO THIS SHEET, EXCEPT AS NOTED BELOW:

- DISTANCE FROM LAST BRIDGE POST TO 1ST APPROACH POST.

NHDOT Bridge Design
7/31/2023

Revisions made to Bridge Detail Sheet are highlighted.
Go to website for current Detail Sheet.

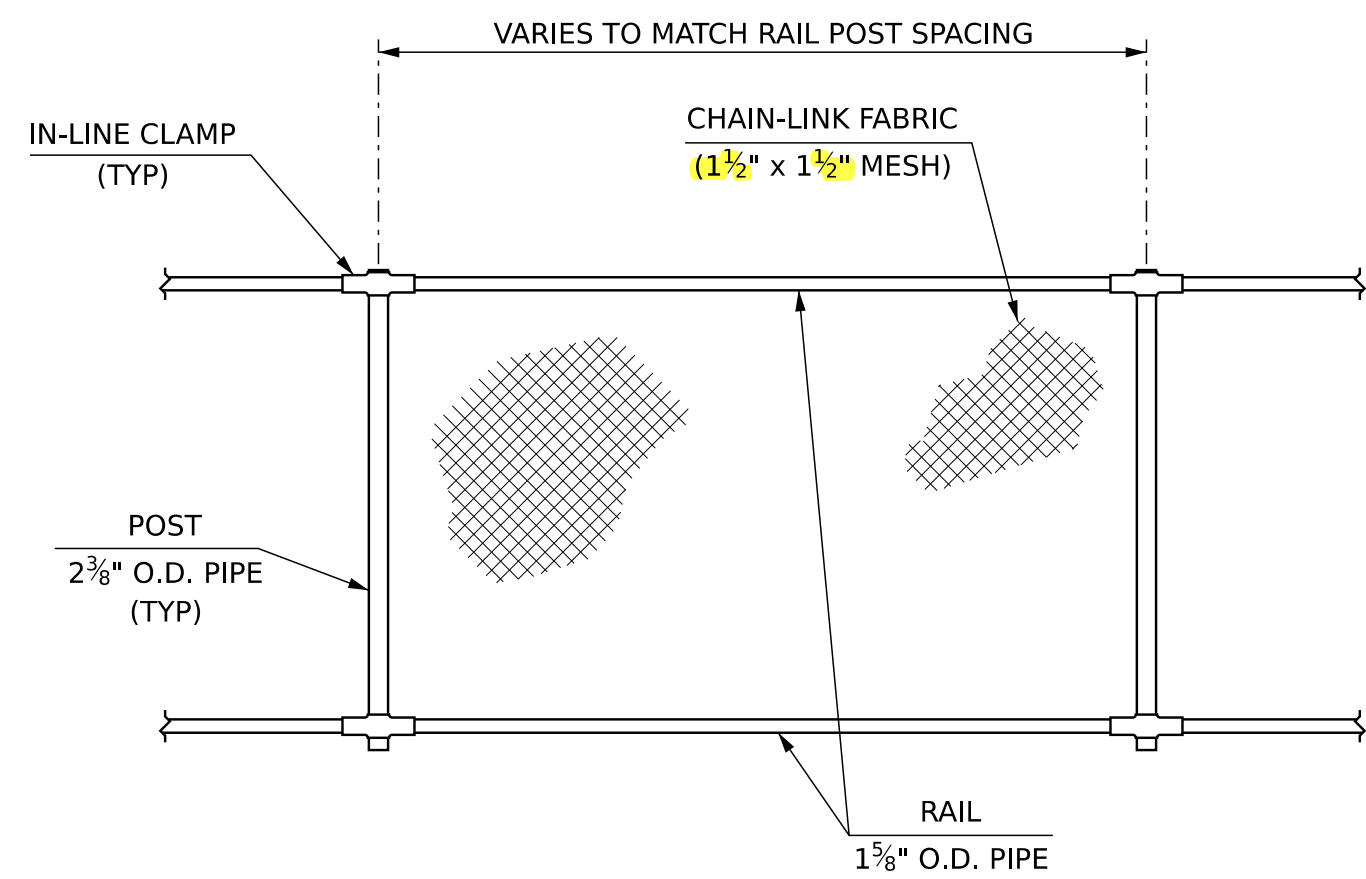
SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
BR-RAIL-ST	T3 BR-APP-RAIL	AS NOTED



NO MODIFICATIONS PERMITTED TO THIS SHEET, EXCEPT AS NOTED BELOW:
1. DISTANCE FROM LAST BRIDGE POST TO 1ST APPROACH POST.

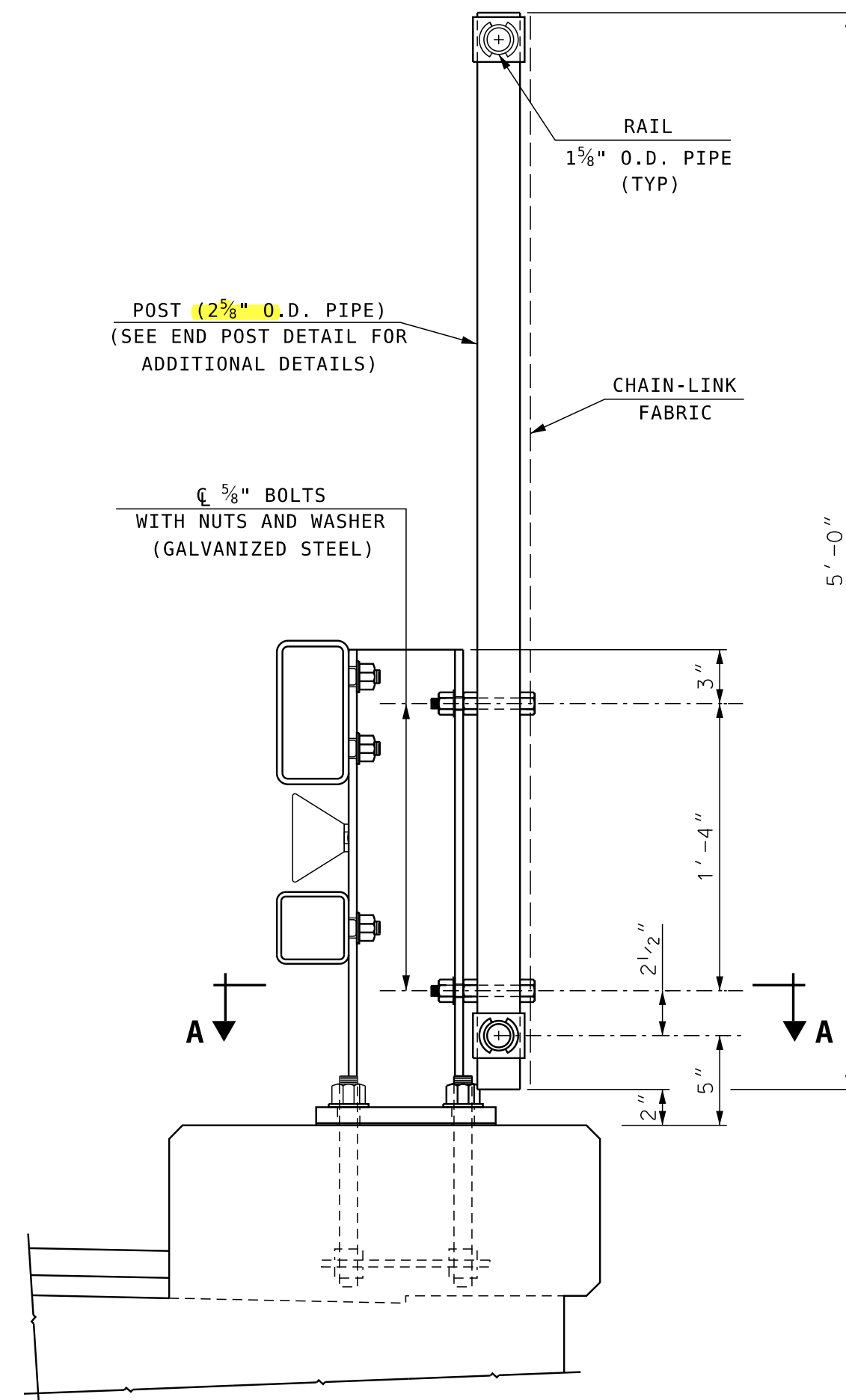
- NOTES:**
- FOR USE ON STATE, REGIONAL AND LOCAL CONNECTORS, AND LOCAL ROADS FOR SPEEDS ≤ 45 MPH.
 - MEETS MASH TL-4 BY LS-DNYA SIMULATION: "DEVELOPMENT OF MASH COMPUTER SIMULATED STEEL BRIDGE RAIL AND TRANSITION DETAILS" (NETC), APRIL 2020. FIELD PERFORMANCE CRASHWORTHINESS (29 YEARS): "IN-SERVICE PERFORMANCE EVALUATION OF NETC BRIDGE RAILING", JUNE 2022. CRASH TESTED (NETC 2005) AND ACCEPTED AS NCHRP 350 TL-4 (FHWA LETTER: HSSD/B-146, JULY 2008).
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 - WELD BARS ADJUSTED FOR SLOPE & BEND. USE COMPLETE JOINT PENETRATION BUTT WELD (B-U2).
 - ALL COMPONENTS, EXCEPT TUBULAR RAIL, SHALL CONFORM TO SECTION 606 OF NHDOT SPECIFICATIONS.

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN		BRIDGE NO.		STATE PROJECT					
LOCATION									
T4 STEEL BR APP RAIL (STEEL POSTS)									
BRIDGE SHEET									
XX OF									
FILE NUMBER									
DESIGNED NETC/JSZ 3/02 CHECKED NHDOT									
DRAWN PJP 10/05 CHECKED JSZ 10/05									
QUANTITIES xxx xx/xx CHECKED xxx xx/xx									
ISSUE DATE 11/15/05 FEDERAL PROJECT NO. SHEET NO. TOTAL SHEETS									
REV. DATE 7/31/23									



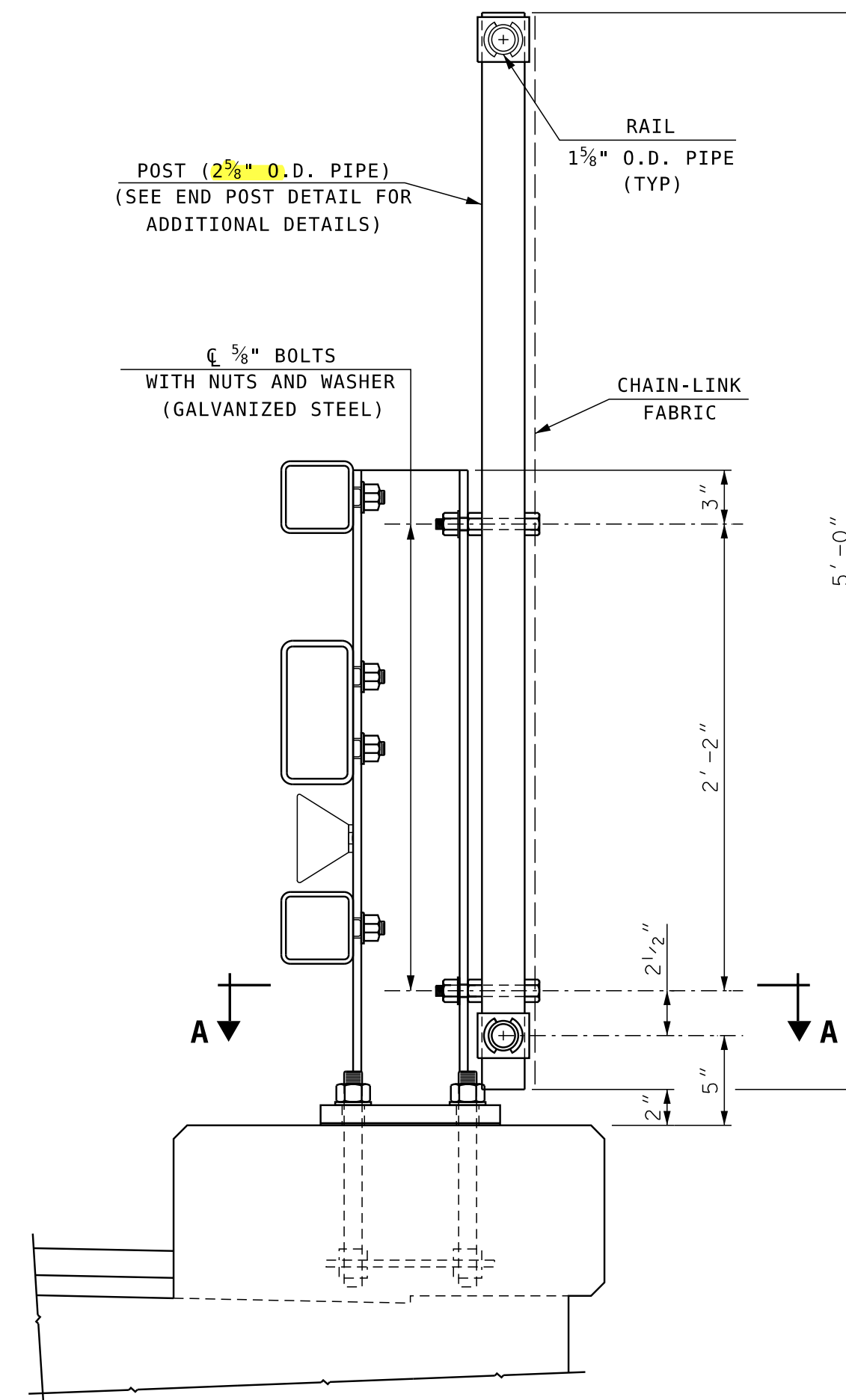
ELEVATION - SNOW SCREENING

SCALE: 1/2" = 1'-0"



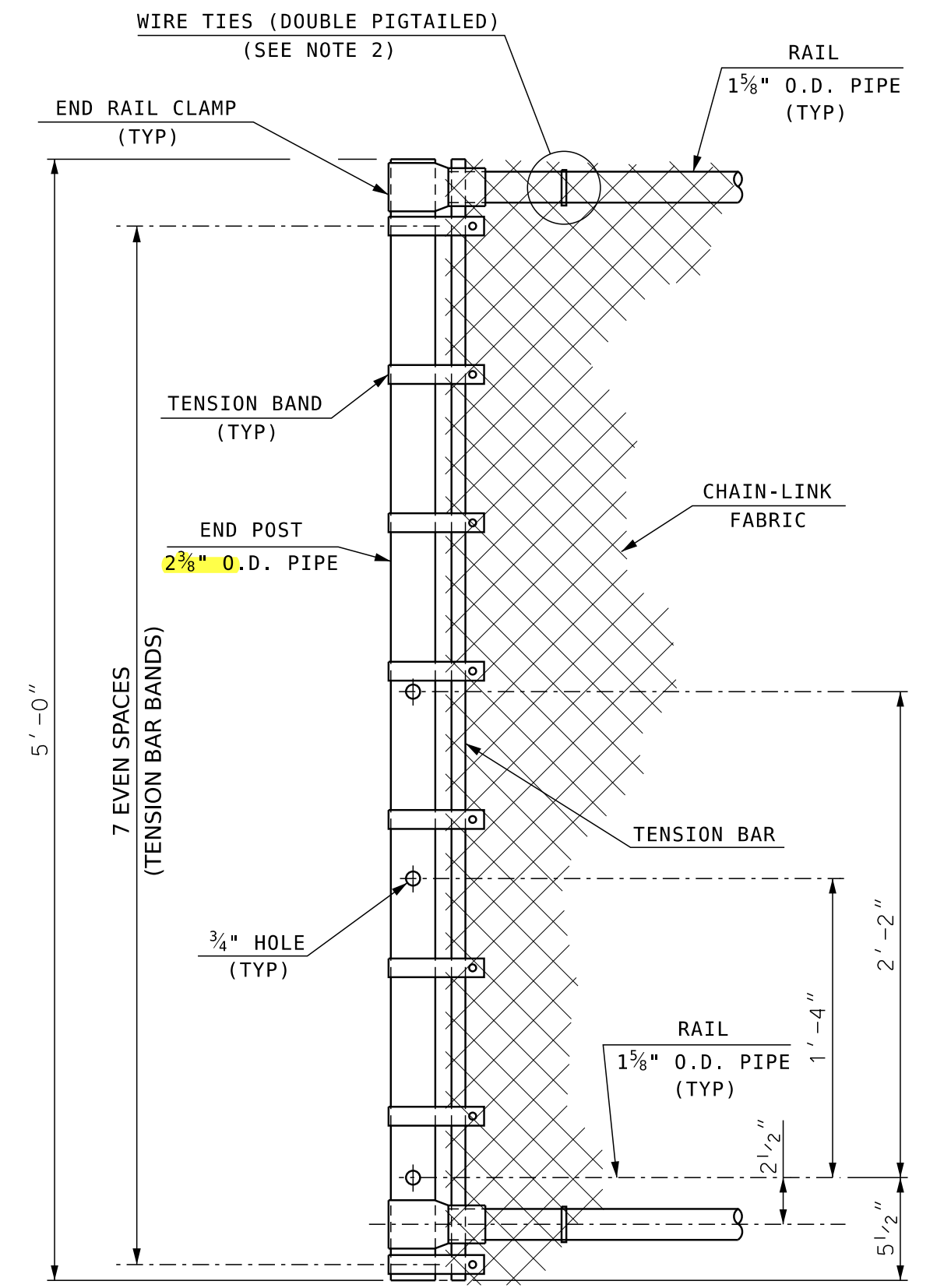
TYPICAL SECTION

(T2 BRIDGE RAIL)
SCALE: 1 1/2" = 1'-0"



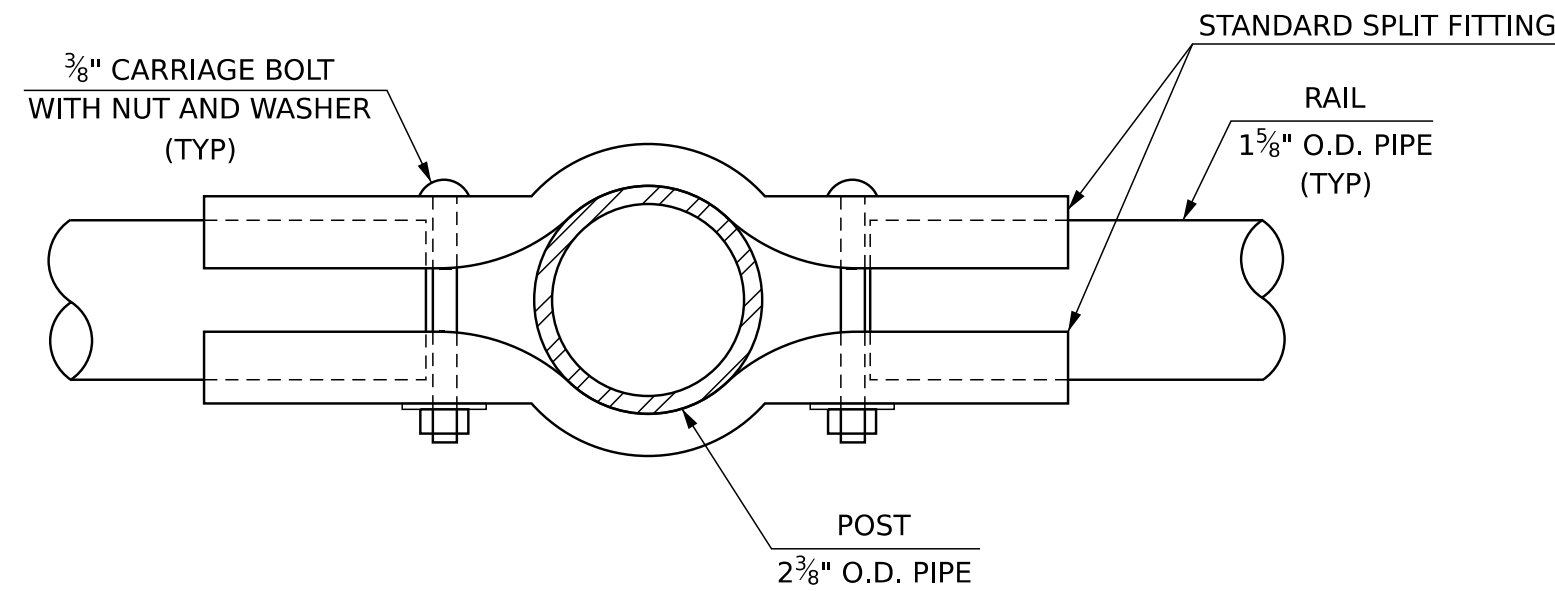
TYPICAL SECTION

(T3 BRIDGE RAIL)
SCALE: 1 1/2" = 1'-0"



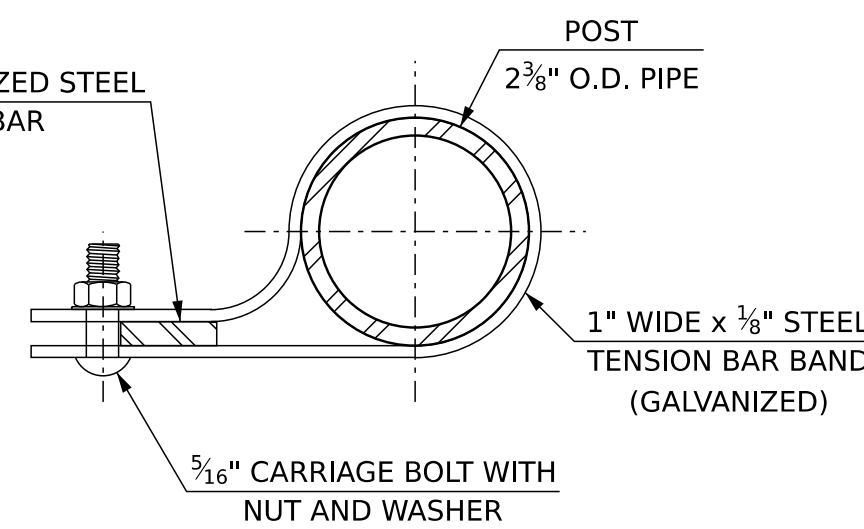
END POST DETAIL

SCALE: 1 1/2" = 1'-0"



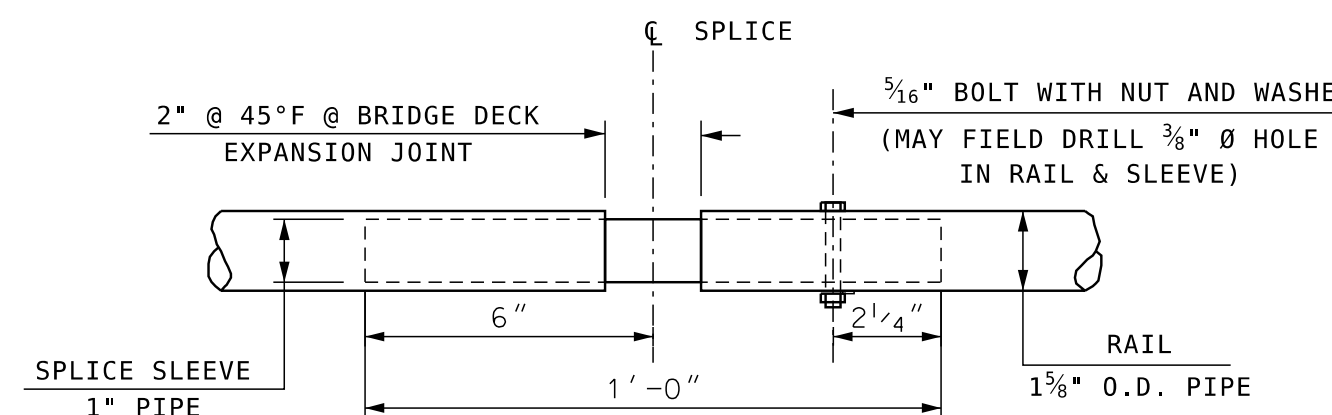
IN-LINE CLAMP DETAIL

SCALE: 6" = 1'-0"



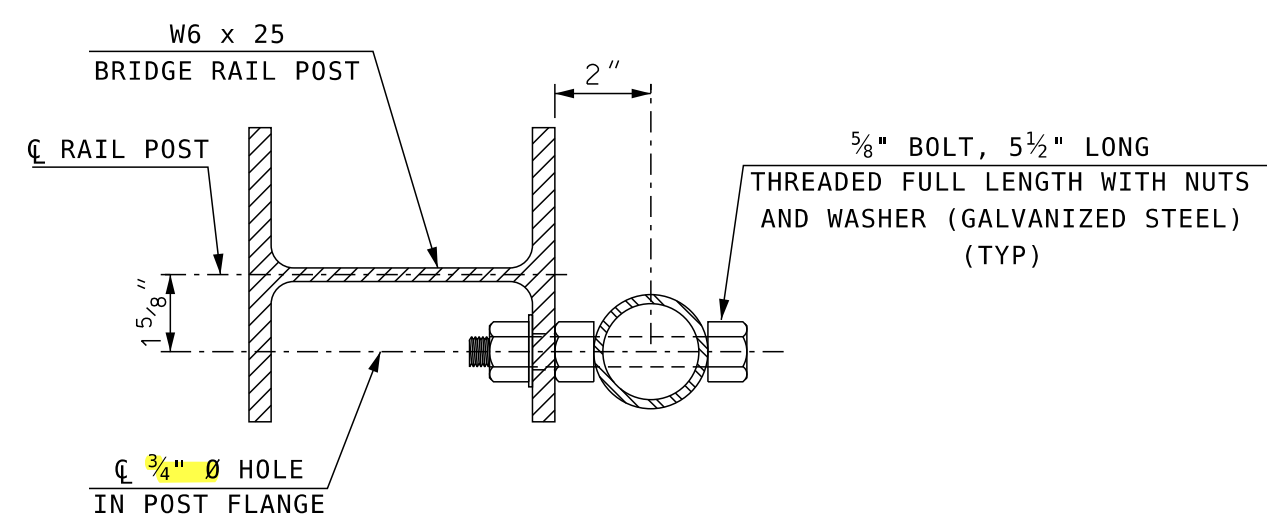
TENSION BAND DETAIL

SCALE: 6" = 1'-0"



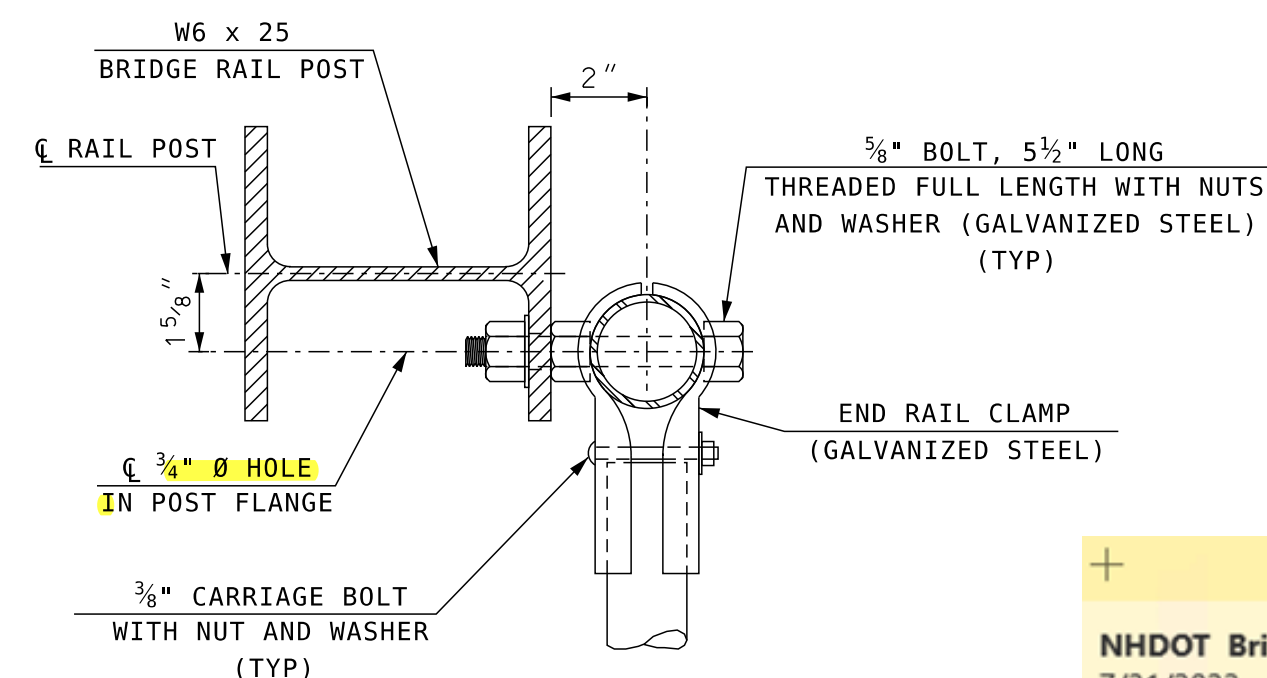
RAIL SPLICE DETAIL

SCALE: 3" = 1'-0"



SECTION A-A

(AT INTERIOR POST)
SCALE: 3" = 1'-0"

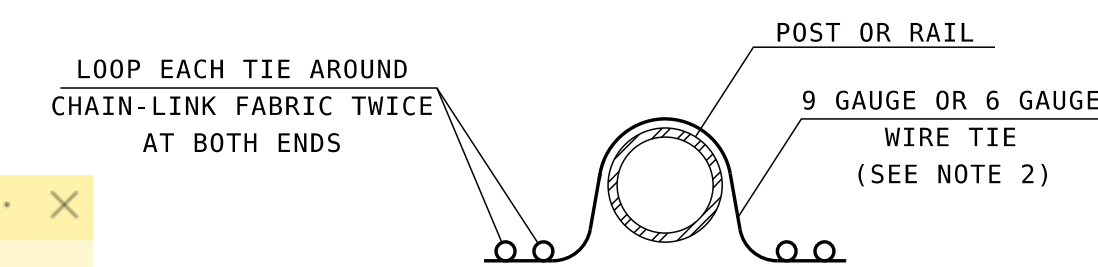


SECTION A-A

(AT END POST)
SCALE: 3" = 1'-0"

NHDOT Bridge Design
7/31/2023

Revisions made to Bridge Detail Sheet are highlighted.
Go to website for current Detail Sheet.



DOUBLE PIGTAILED TIE

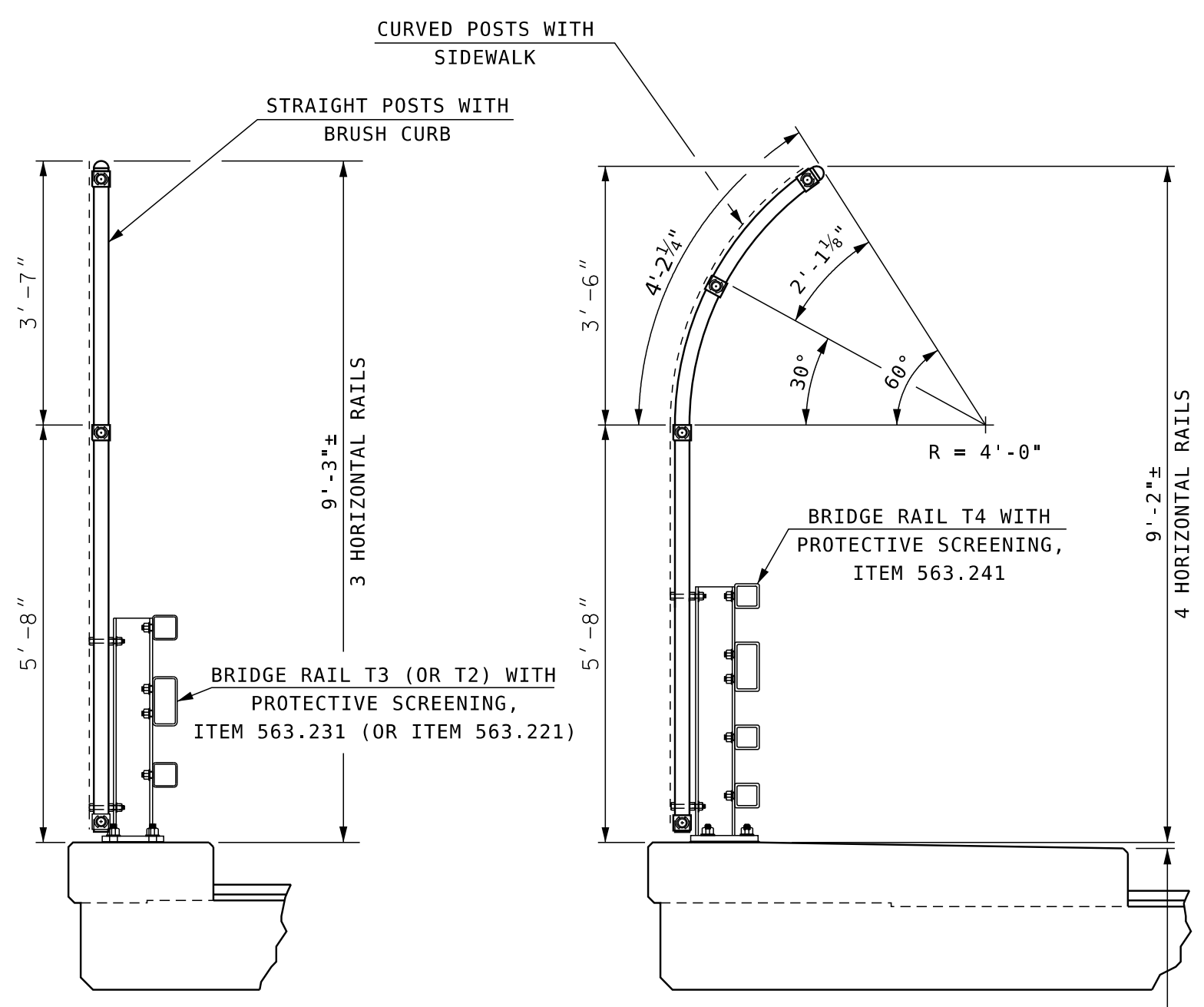
NOT TO SCALE

NO MODIFICATIONS SHALL BE MADE TO THIS SHEET

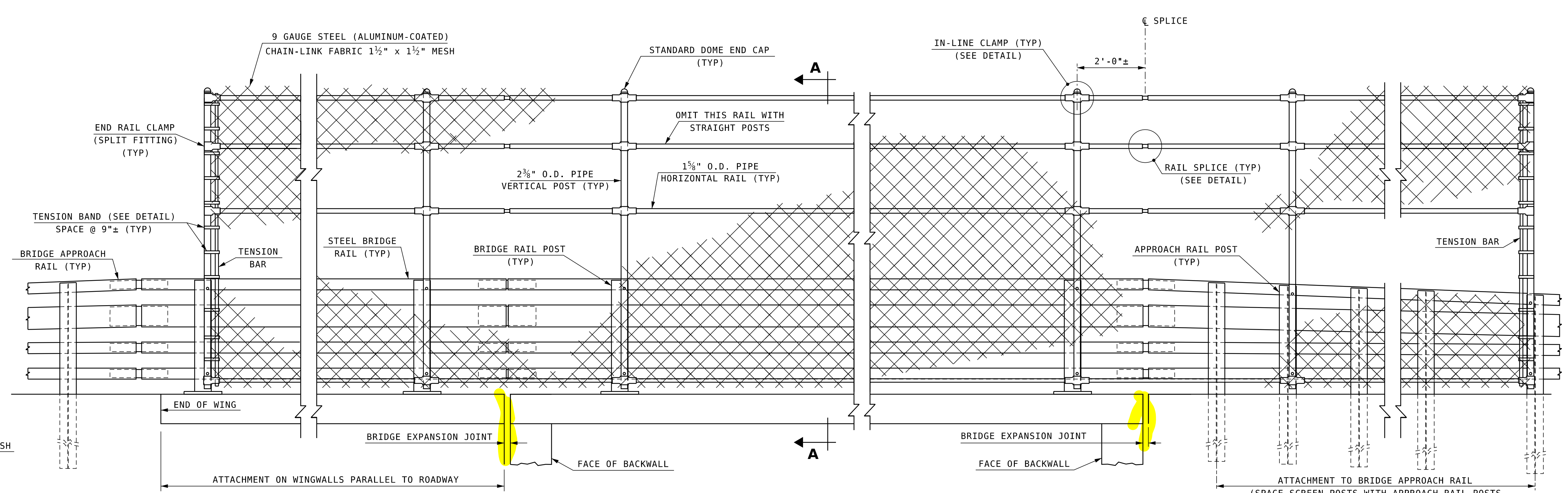
GENERAL NOTES

- CHAIN-LINK FABRIC SHALL BE 9 GAUGE STEEL, ALUMINUM-COATED CONFORMING TO ASHTO M 181, TYPE II (ASTM A 491). CHAIN-LINK FABRIC SHALL BE KNUCKLED ON TOP AND BOTTOM. THE SIZE OF WIRE MESH (FABRIC) SHALL BE 1 1/2".
- WIRE TIES SHALL BE STANDARD ROUND 9 GAUGE ALUMINUM-COATED STEEL OR 6 GAUGE ALUMINUM ALLOY CONFORMING TO ASTM F 626. ALL TIES SHALL BE WRAPPED AROUND CHAIN-LINK FABRIC TWICE (DOUBLE PIGTAILED) AT BOTH ENDS. SPACE TIES @ 6" O.C. TO BOTTOM RAIL AND @ 12" O.C. TO ALL POSTS AND OTHER RAILS.
- POSTS AND RAIL PIPES SHALL BE HOT-DIP GALVANIZED STEEL CONFORMING TO AASHTO M 181, GRADE 1 (ASTM F 1083). ALL PIPES SHALL BE SCHEDULE 40, STANDARD WEIGHT.
- TENSION BARS, BAR BANDS, IN-LINE CLAMPS AND END RAIL CLAMPS SHALL BE STEEL. STEEL COMPONENTS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111 (ASTM A 123) OR AASHTO M 232 (ASTM A 153) AS APPLICABLE. ALL BAR BANDS SHALL HAVE A BEVELED EDGE.
- ALL BOLTS AND NUTS SHALL BE STEEL CONFORMING TO ASTM A 307 AND ASTM A 563 GRADE A RESPECTIVELY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF ANSI B18.22. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111 (ASTM A 123) OR AASHTO M 232 (ASTM A 153) AS APPLICABLE.
- RAIL SPLICES SHALL BE PROVIDED AT BRIDGE DECK EXPANSION JOINT(S) AND BRIDGE RAIL SPLICES AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
- RAIL MAY BE FIELD CUT (SAWN) TO FIT POST SPACING. GALVANIZED RAIL, CUT OR DRILLED AS ALLOWED, SHALL BE TOUCHED-UP IN ACCORDANCE WITH 563.3.2.2.3.
- ALL COSTS FOR CHAIN-LINK FABRIC, POSTS, RAILS AND APPURTENANCES SHALL BE INCLUDED IN ITEM 563.223. BRIDGE RAIL T2 WITH SNOW SCREENING, OR ITEM 563.233, BRIDGE RAIL T3 WITH SNOW SCREENING, OR ITEM 563.95, SNOW SCREENING FOR OVERPASS STRUCTURES, AS APPLICABLE.
- SEE BRIDGE RAIL SHEET FOR ADDITIONAL DETAILS.

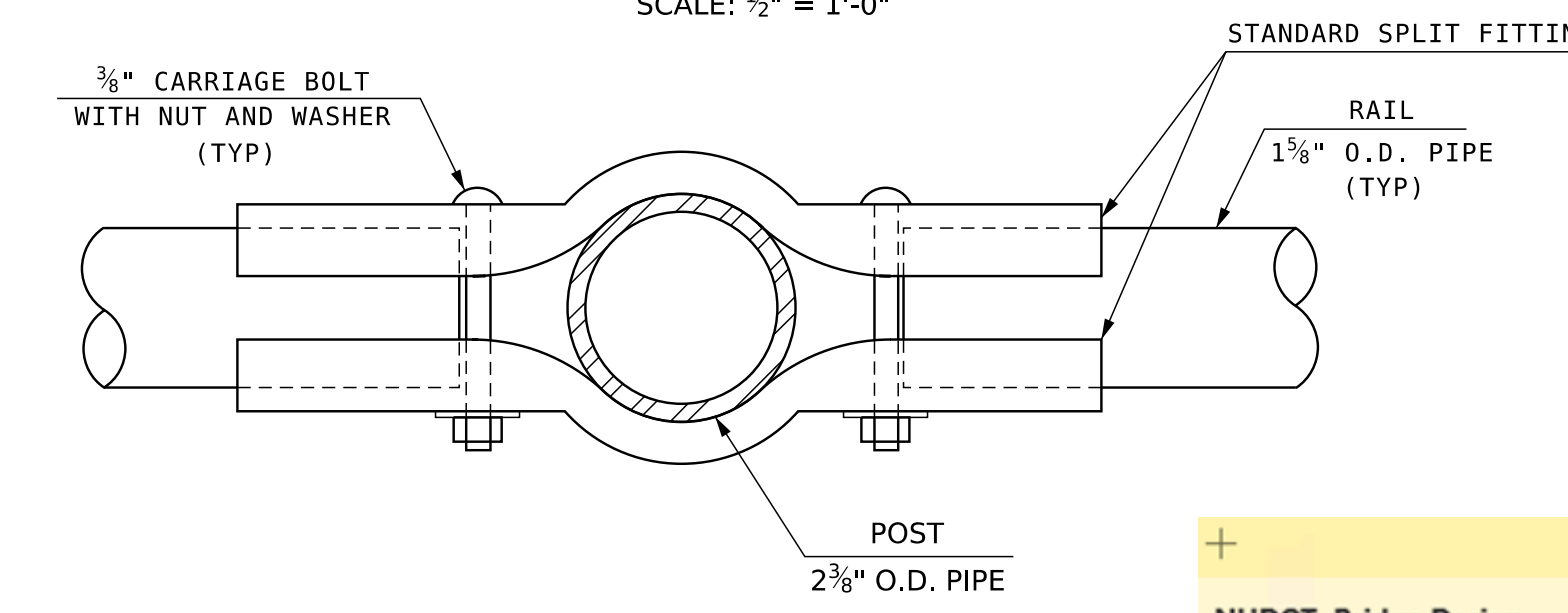
STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN		BRIDGE NO.			STATE PROJECT				
LOCATION									
SNOW SCREEN WITH STEEL BRIDGE RAIL									
REVISIONS AFTER PROPOSAL		BY		DATE		BY		DATE	
		DESIGNED		NHDOT		8/10		CHECKED	
		DRAWN		PJP		8/10		CHECKED	
		QUANTITIES						CHECKED	
		ISSUE DATE		2/98		FEDERAL PROJECT NO.		SHEET NO.	
		REV. DATE		7/31/23					
SUBDIRECTORY		.DGN LOCATOR			SHEET SCALE				
BR-RAIL-ST		BR-SNOWSCREEN			AS NOTED				
		BRIDGE SHEET		XX OF					
		FILE NUMBER							
		TOTAL SHEETS							



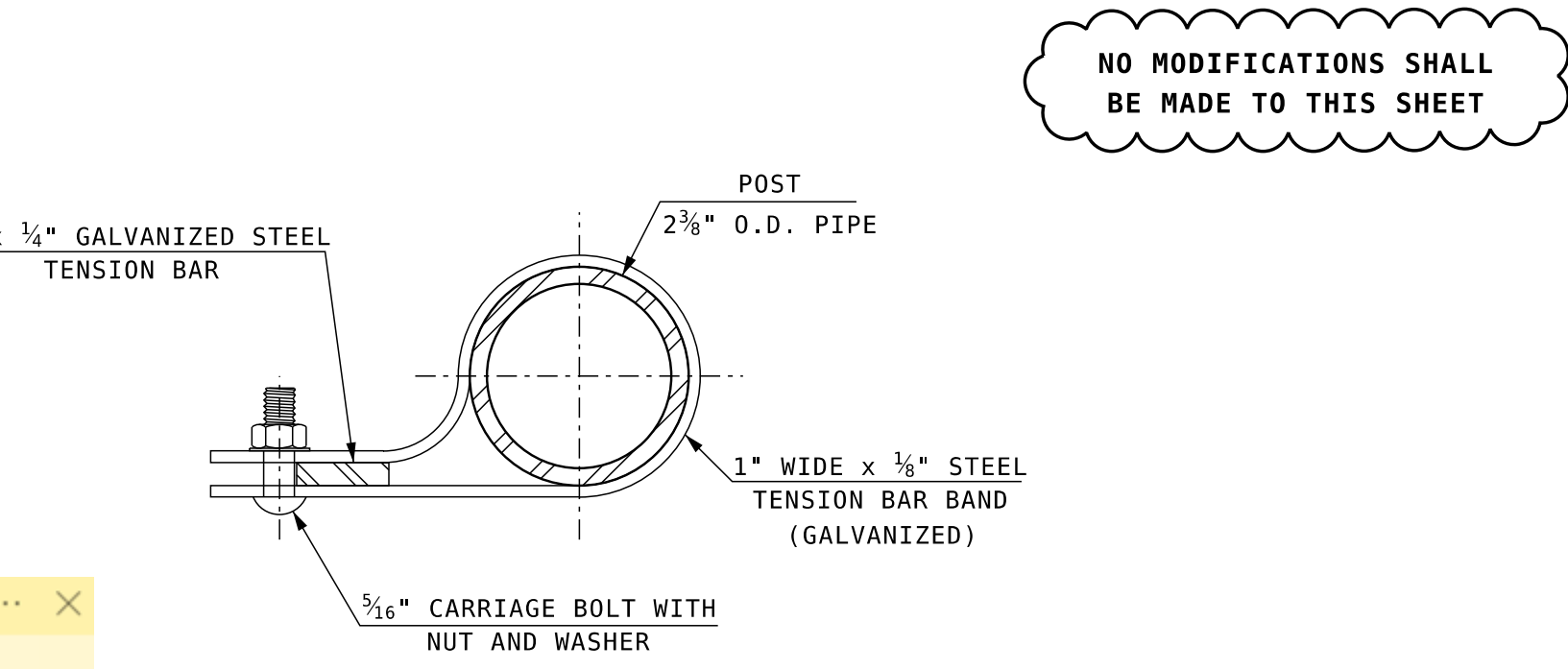
SECTION A-A
SCALE: 1/2" = 1'-0"



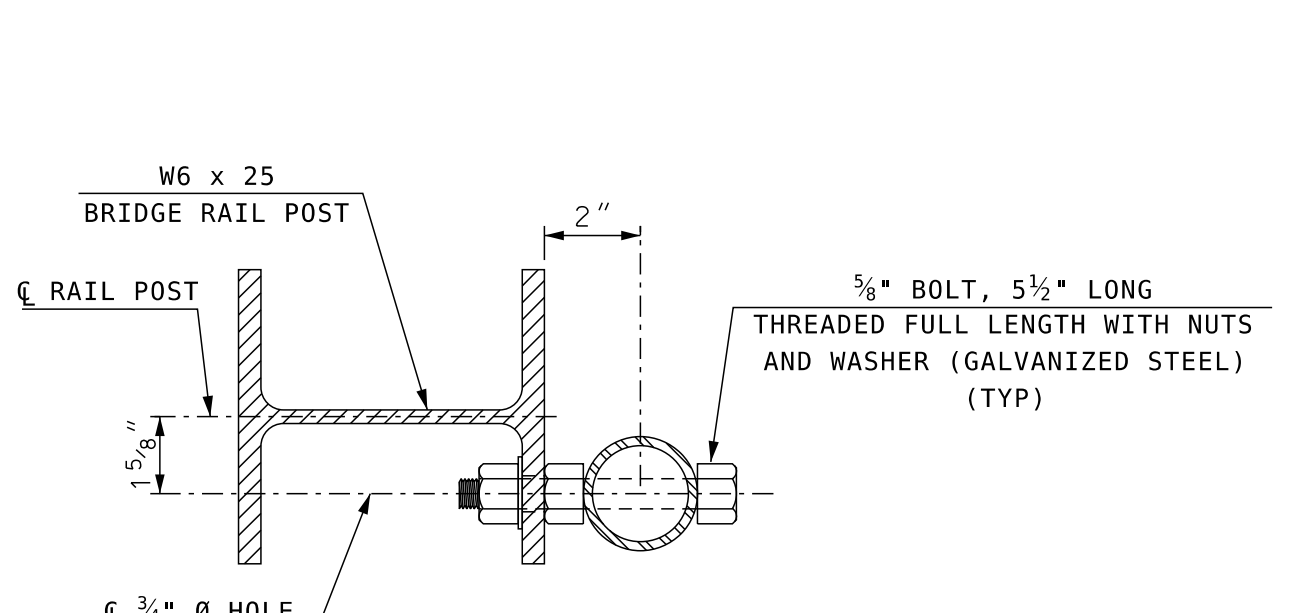
BACK SIDE ELEVATION VIEW
SCALE: 1/2" = 1'-0"



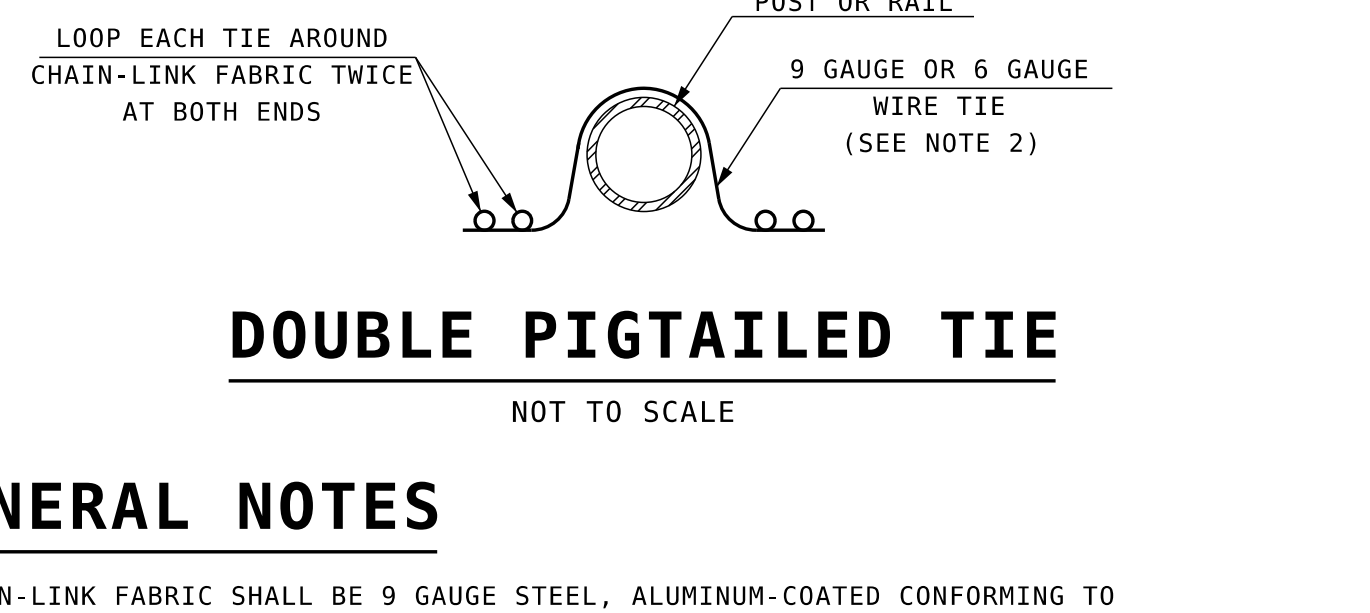
IN-LINE CLAMP DETAIL
SCALE: 6" = 1'-0"



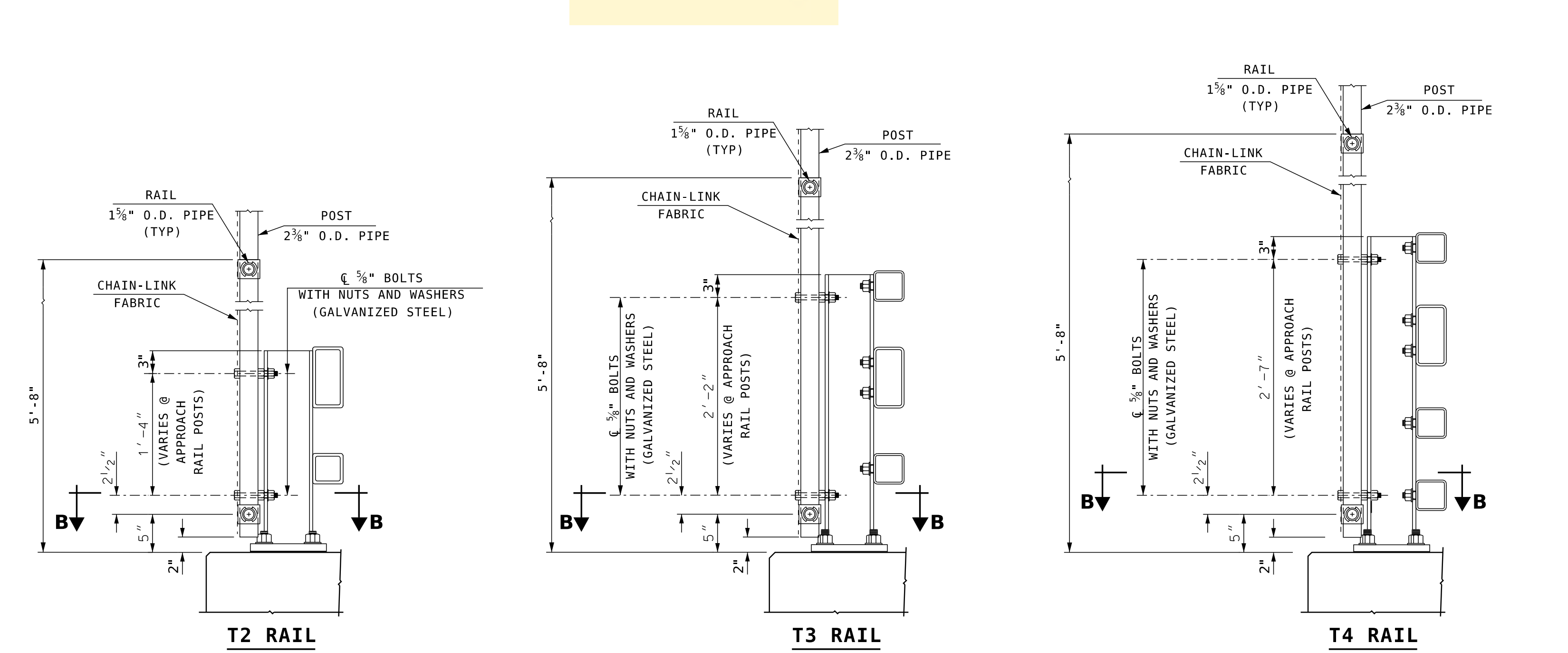
TENSION BAND DETAIL
SCALE: 6" = 1'-0"



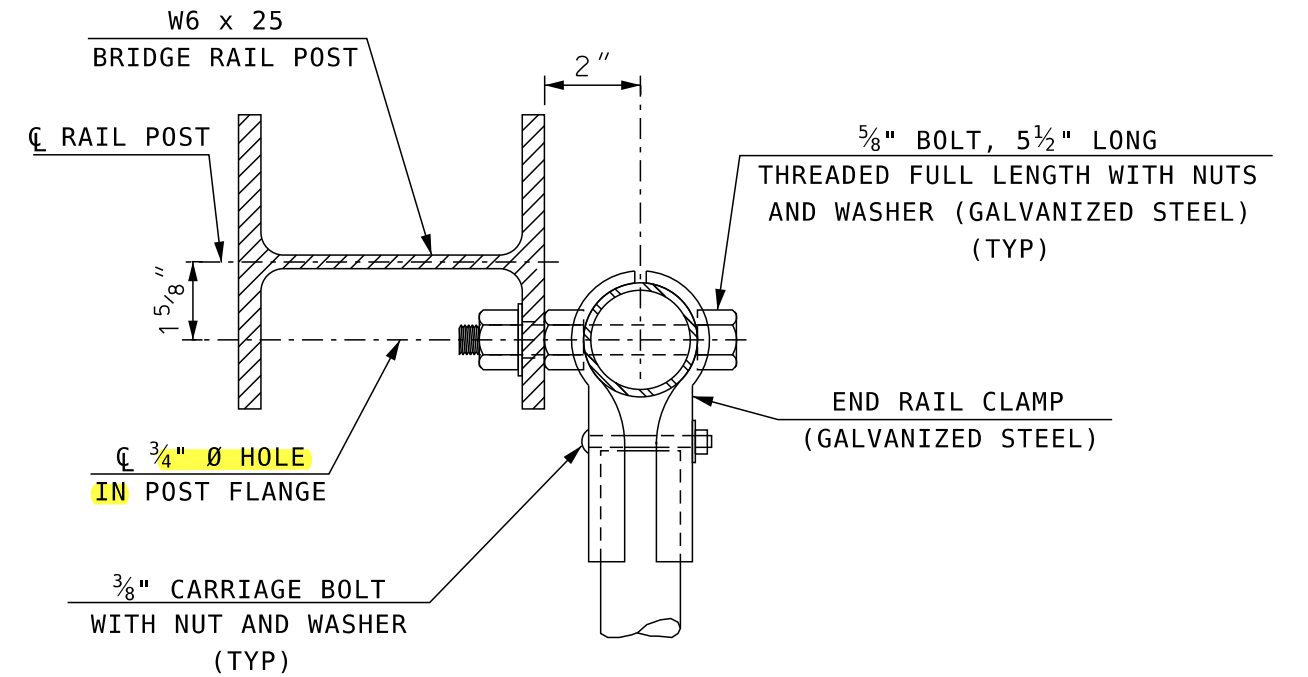
SECTION A-A
(AT INTERIOR POST)
SCALE: 3" = 1'-0"



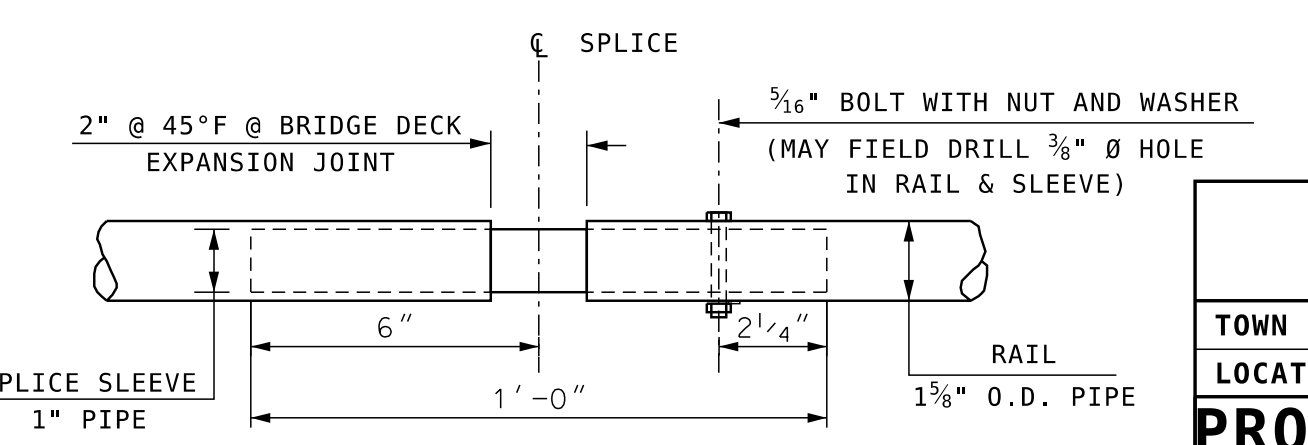
DOUBLE PIGTAILED TIE
NOT TO SCALE



POST CONNECTION DETAILS
SCALE: 1" = 1'-0"



SECTION A-A
(AT END POST)
SCALE: 3" = 1'-0"



RAIL SPLICE DETAIL
SCALE: 3" = 1'-0"

GENERAL NOTES

- CHAIN-LINK FABRIC SHALL BE 9 GAUGE STEEL, ALUMINUM-COATED CONFORMING TO ASHTO M 181, TYPE II (ASTM A 491). CHAIN-LINK FABRIC SHALL BE KNUCKLED ON TOP AND BOTTOM. THE SIZE OF WIRE MESH (FABRIC) SHALL BE 1 1/2".
- WIRE TIES SHALL BE STANDARD ROUND 9 GAUGE ALUMINUM-COATED STEEL OR 6 GAUGE ALUMINUM ALLOY CONFORMING TO ASTM F 626. ALL TIES SHALL BE WRAPPED AROUND CHAIN-LINK FABRIC TWICE (DOUBLE PIGTAILED) AT BOTH ENDS. SPACE TIES @ 6" O.C. TO BOTTOM RAIL AND @ 12" O.C. TO ALL POSTS AND OTHER RAILS.
- POSTS AND RAIL PIPES SHALL BE HOT-DIP GALVANIZED STEEL CONFORMING TO AASHTO M 181, GRADE 1 (ASTM F 1083). ALL PIPES SHALL BE SCHEDULE 40, STANDARD WEIGHT.
- TENSION BARS, BAR BANDS, IN-LINE CLAMPS AND END RAIL CLAMPS SHALL BE STEEL. STEEL COMPONENTS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111 (ASTM A 123) OR AASHTO M 232 (ASTM A 153) AS APPLICABLE. ALL BAR BANDS SHALL HAVE A BEVELED EDGE.
- ALL BOLTS AND NUTS SHALL BE STEEL CONFORMING TO ASTM A 307 AND ASTM A 563 GRADE A RESPECTIVELY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF ANSI B18.22. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111 (ASTM A 123) OR AASHTO M 232 (ASTM A 153) AS APPLICABLE.
- RAIL SPLICES SHALL BE PROVIDED AT BRIDGE DECK EXPANSION JOINT(S) AND BRIDGE RAIL SPLICES AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
- RAIL MAY BE FIELD CUT (SAWN) TO FIT POST SPACING. GALVANIZED RAIL, CUT OR DRILLED AS ALLOWED, SHALL BE TOUCHED-UP IN ACCORDANCE WITH 563.3.2.2.3.
- ALL COSTS FOR CHAIN-LINK FABRIC, POSTS, RAILS AND APPURTENANCES SHALL BE INCLUDED IN ITEM 563.221 (OR ITEM 563.231, OR ITEM 563.241), BRIDGE RAIL T2 (OR T3, OR T4) WITH PROTECTIVE SCREENING, OR ITEM 563.94, PROTECTIVE SCREENING FOR OVERPASS STRUCTURES, AS APPLICABLE.
- SEE BRIDGE RAIL SHEET FOR ADDITIONAL DETAILS.

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN	BRIDGE NO.				STATE PROJECT				
LOCATION									
PROTECTIVE SCREEN W/ STEEL BRIDGE RAIL									
REVISIONS AFTER PROPOSAL	BY	DATE	CHECKED	BY	DATE	BRIDGE SHEET			
	NHDOT	8/10		NHDOT	8/10	XX OF			
	PJP	8/10		MGL	8/10	FILE NUMBER			
QUANTITIES	CHECKED								
ISSUE DATE	11/98	FEDERAL PROJECT NO.	SHEET NO.		TOTAL SHEETS				
REV. DATE	7/31/23								

NO MODIFICATIONS SHALL BE MADE TO THIS SHEET

NHDOT Bridge Design
7/31/2023
Revisions made to Bridge Detail Sheet are highlighted.
Go to website for current Detail Sheet.