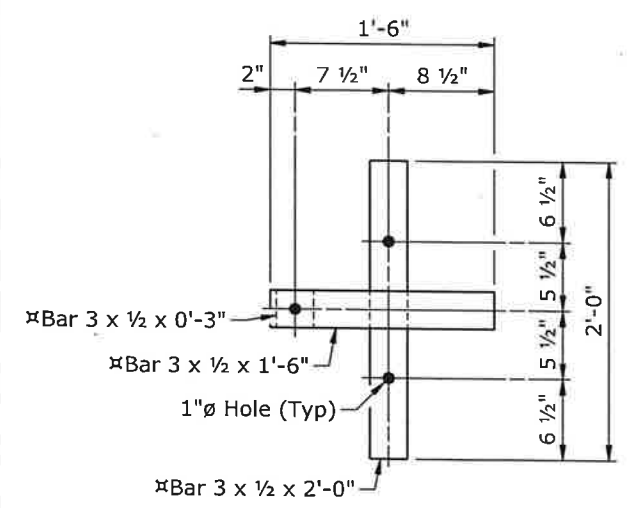
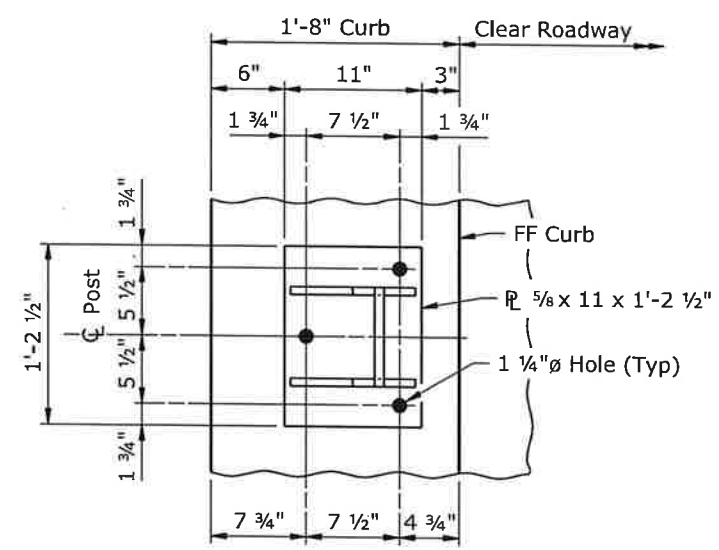


RAIL BOLT DETAIL

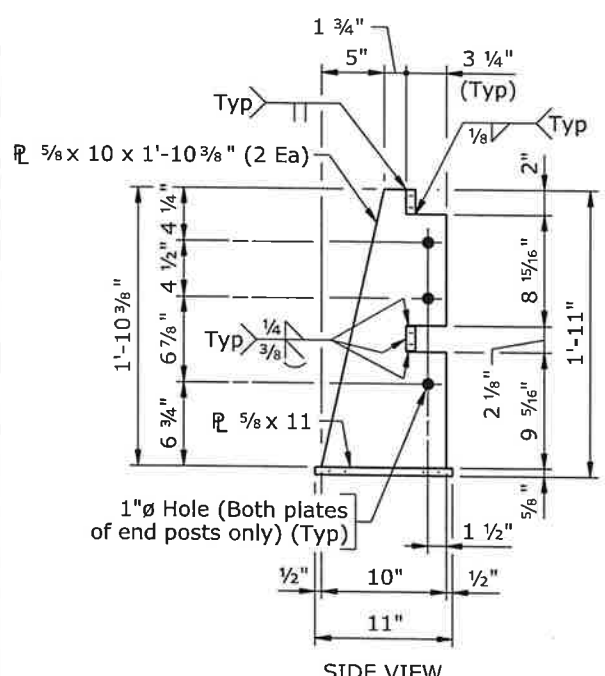


SECTION B-B
 (Not galvanized)
 (Anchor bolts and slab not shown)

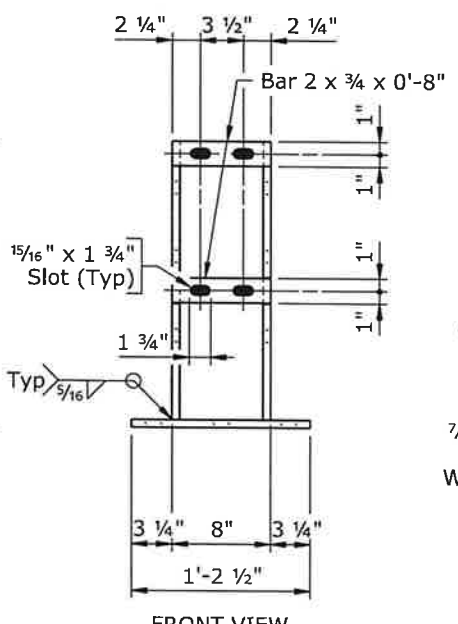


VIEW A-A
 (Anchor bolts, rails, and rail bolts not shown)

PLAN
 (X posts req'd on bridge)
 (X posts req'd on approach slabs)

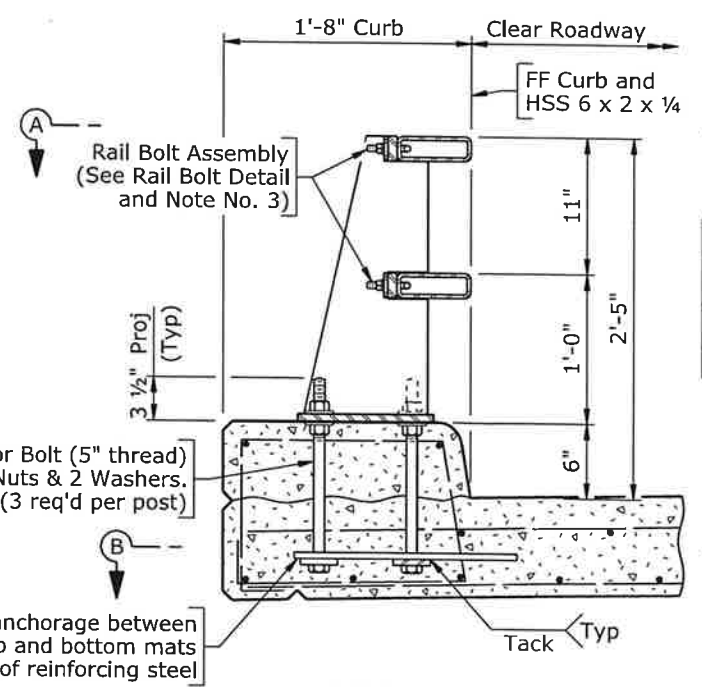


SIDE VIEW



FRONT VIEW

POST DETAILS
 (See View A-A for anchor bolt hole spacing)

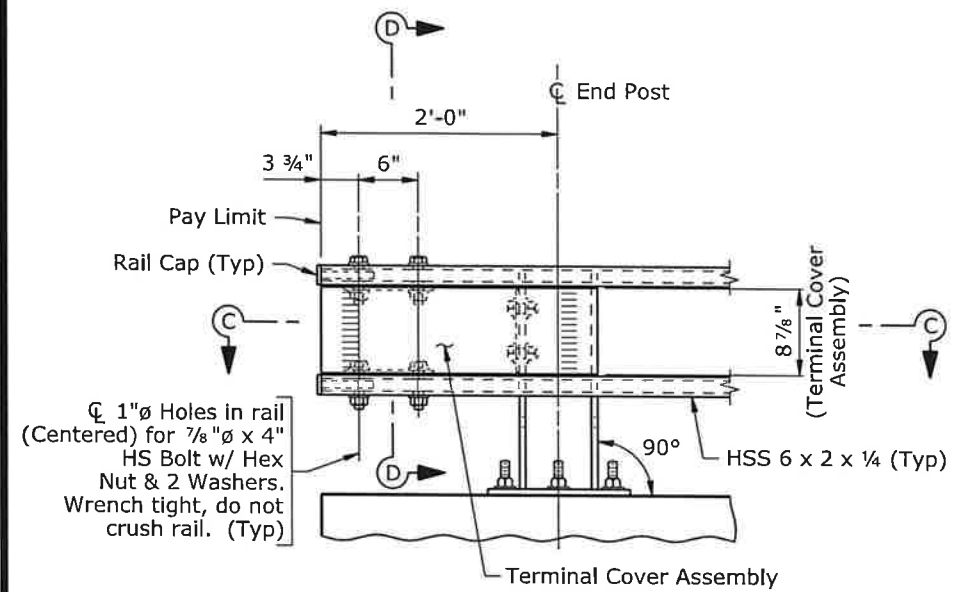


ASSEMBLY DETAIL
 (Shown near Center Post)
 (Bridge slab shown, approach slab similar)

ANCHOR BOLT TABLE	
Location	Anchor Bolt
Bridge Slab	7/8" ϕ x 1'-3"
Approach Slab	7/8" ϕ x 1'-5"

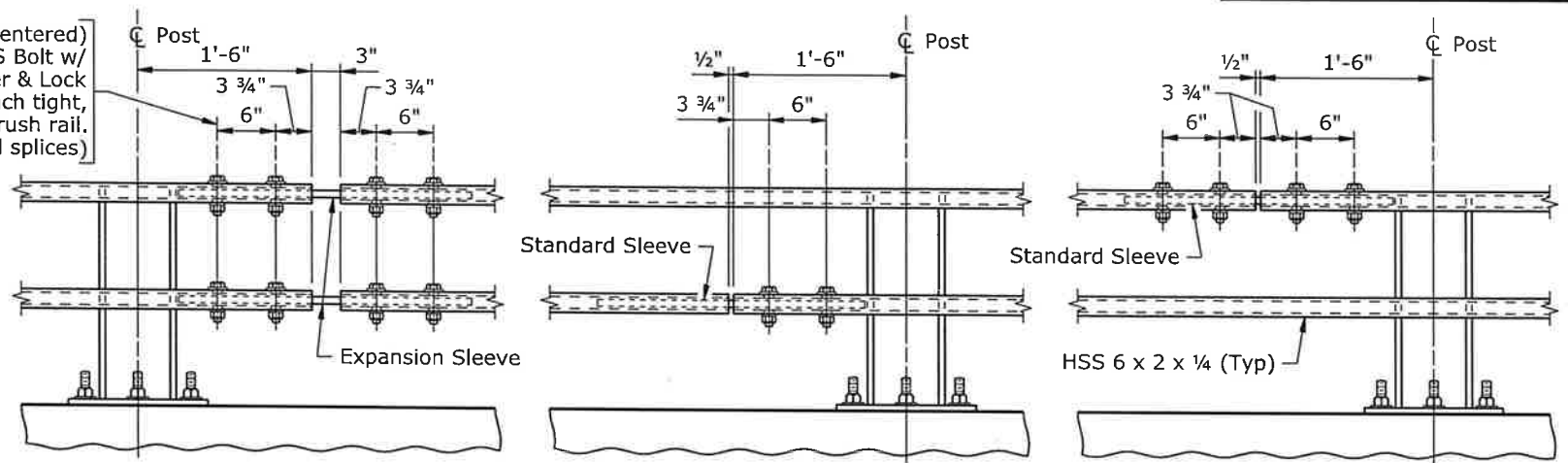
- Note:
- 1) Ensure the expansion splice is located in the railing panel which passes over the bridge expansion joint as indicated on the plan.
 - 2) Anchor bolts may be tack welded to anchorage (Shop or field).
 - 3) At post locations, drill two 1 1/4" ϕ holes in each rail to receive rail bolts (Shop or field). See Post Details for hole spacing.
 - 4) Paint surfaces of the railing components that have been cut, drilled, or otherwise damaged with two coats of zinc-rich paint conforming to ASTM A 780.
 - 5) After installing rails, paint exposed bolt threads with two coats of zinc-rich paint conforming to ASTM A 780.

WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
BRIDGE RAILING DETAILS			
TL3BRGRAIL_NCHRP350_br1.dgn			
REVISIONS		DESIGN	_____
		DETAIL	X ✓ X
		QTY'S	X ✓ X
REVIEW		DESIGN SECTION	X
APPROVAL		DRWG NO.	X
		SHEET	X of X



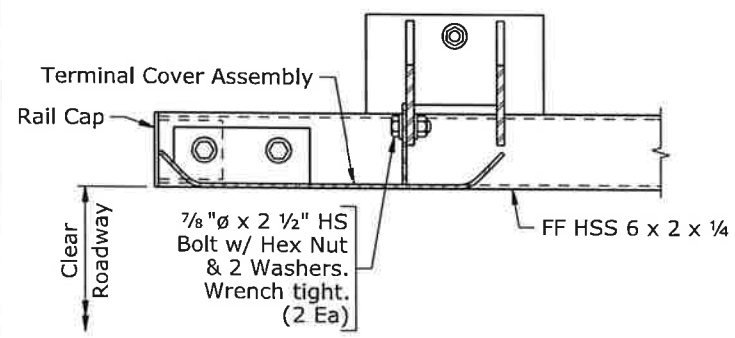
ELEVATION AT TERMINAL

1"Ø Holes in rail (Centered) for 3/4"Ø x 3 1/2" HS Bolt w/ Hex Nut, Washer & Lock Washer. Wrench tight, do not crush rail. (Typ) (All splices)

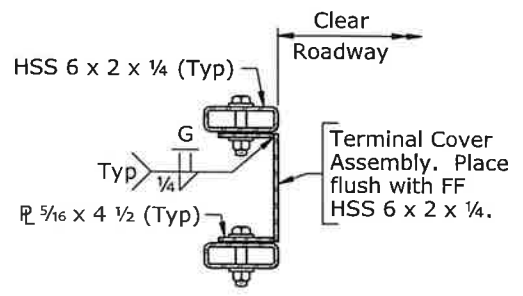


SPLICE DETAILS

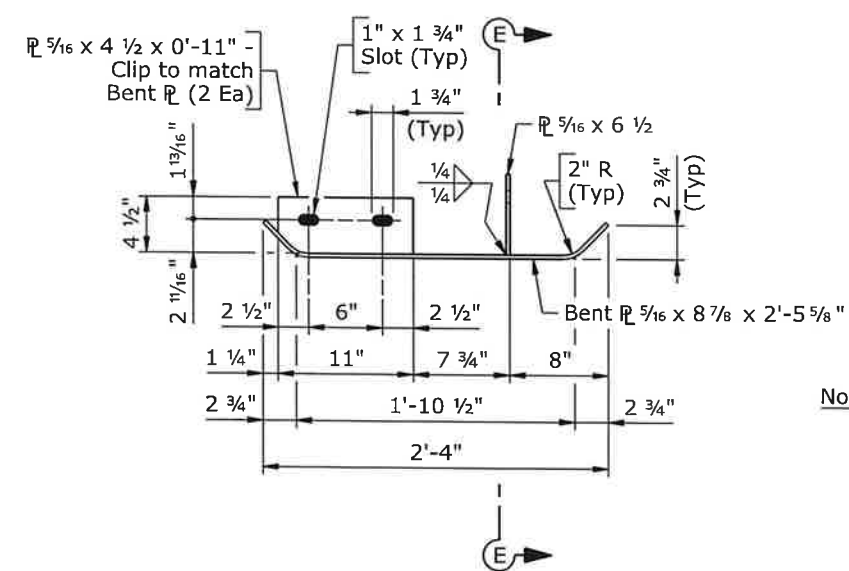
TERMINAL COMPONENT REQUIREMENTS		
Approach Guardrail Connection	Rail Caps Required	Terminal Cover Assembly Required
MGS Approach Guardrail	Yes (Without bolts)	≠No
Box Beam w/ Rubrail Approach Guardrail	No	No
No Approach Guardrail	Yes (With bolts)	Yes



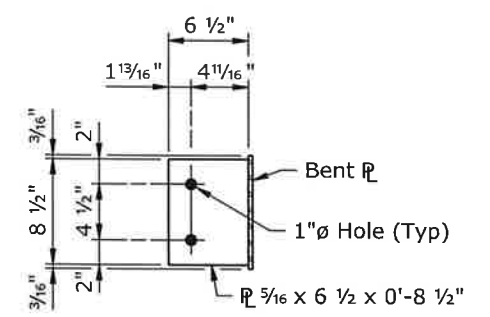
SECTION C-C



SECTION D-D

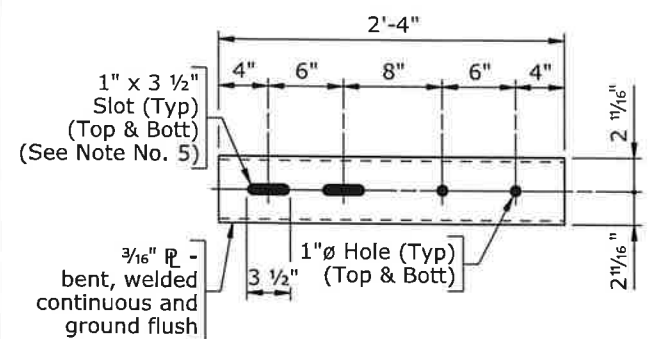


TERMINAL COVER ASSEMBLY DETAIL

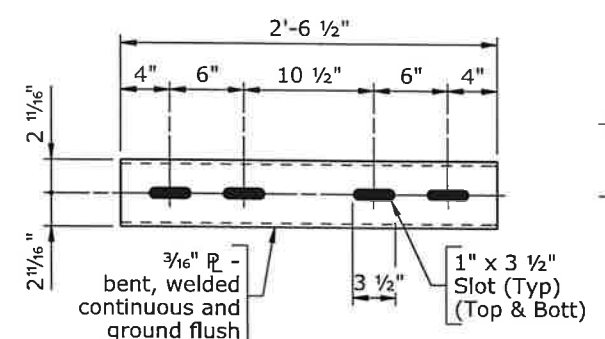


SECTION E-E

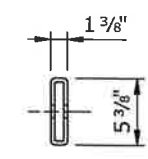
- Note:
- 1) Ensure each rail length is continuous over a minimum of two posts.
 - 2) In rehabilitation work, ensure railing that cannot feasibly be made continuous over a minimum of two posts has a double-bolted splice.
 - 3) Splices may be located on either side of post.
 - 4) Not more than one splice is permitted per side of post, except at expansion splices.
 - 5) Slots may be omitted in standard sleeves where bolts are required on one side of splice only.
 - 6) Do not shop splice rails.
 - 7) Terminal components removed during rehabilitation work will remain the property of the department.
 - 8) Installation of MGS approach guardrail will require other fabricated assemblies to be connected to end post. See road plans for details and pay item.



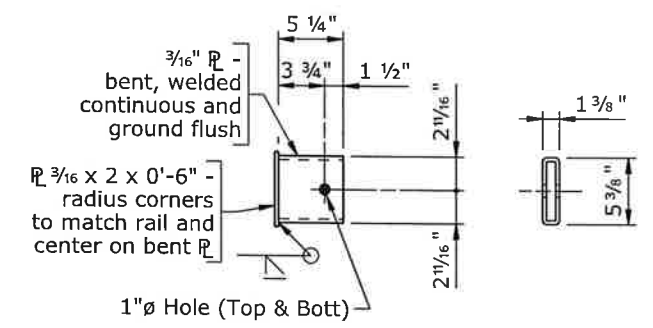
STANDARD SLEEVE



EXPANSION SLEEVE

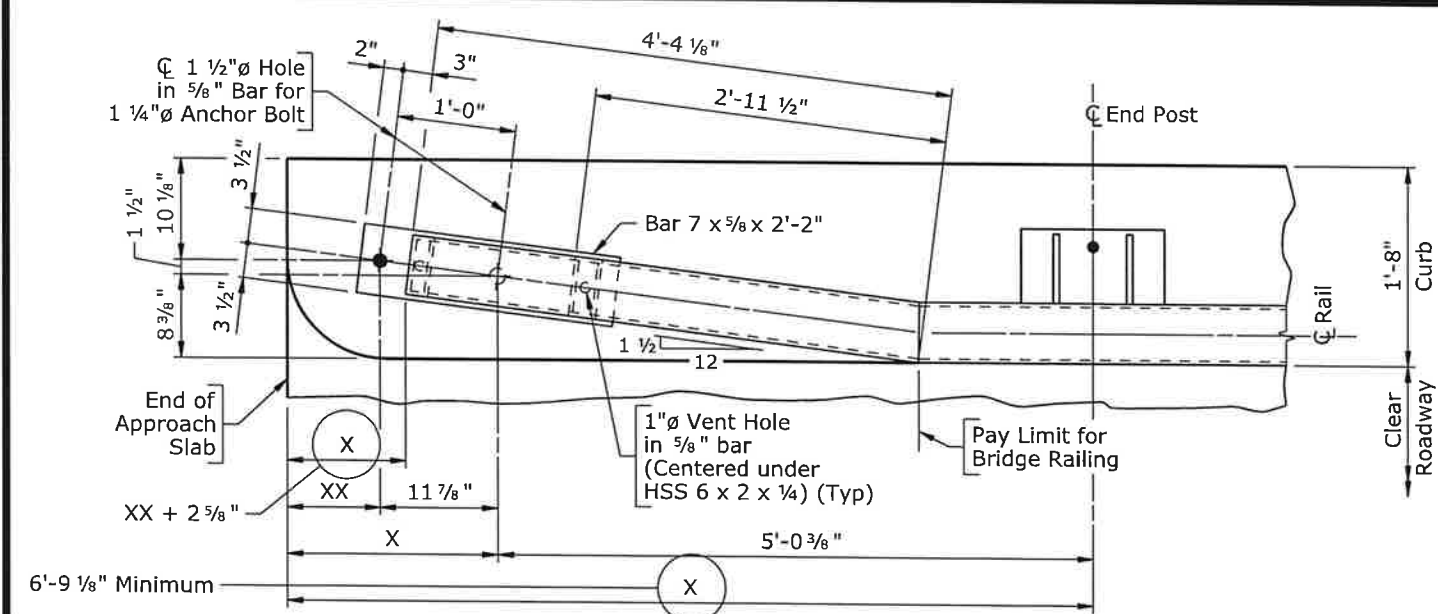


END VIEW

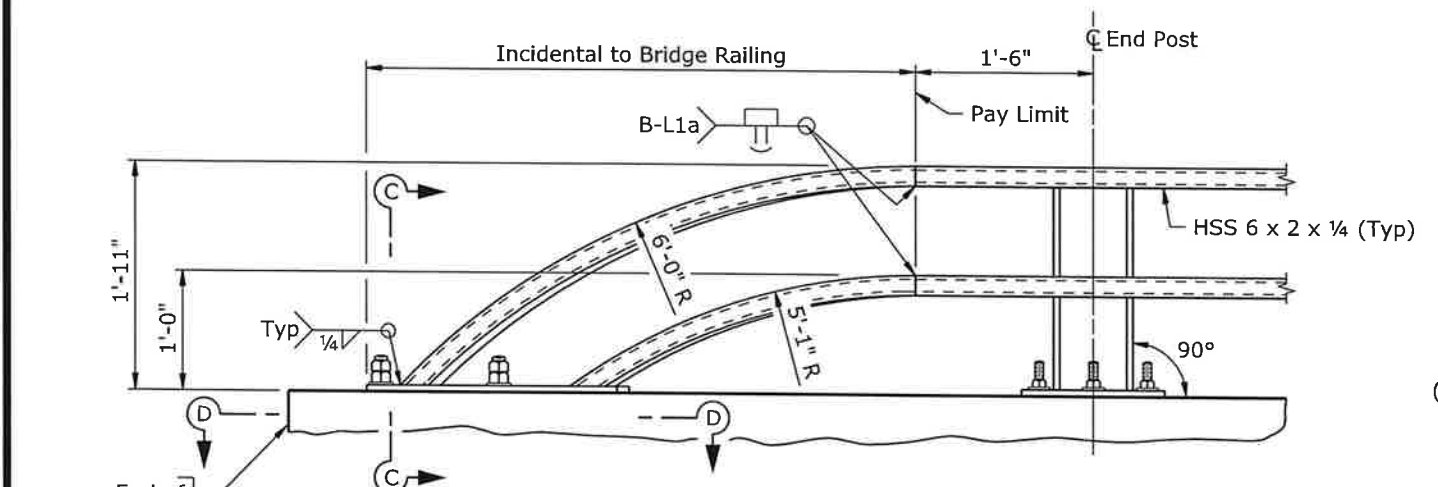


RAIL CAP DETAILS

WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
BRIDGE RAILING DETAILS			
TL3BRGRail_NCHRP350_br2.dgn			
REVISIONS	DESIGN	Design Section	X
	DETAIL	Drwg No.	X
	QTY'S	Sheet	X of X

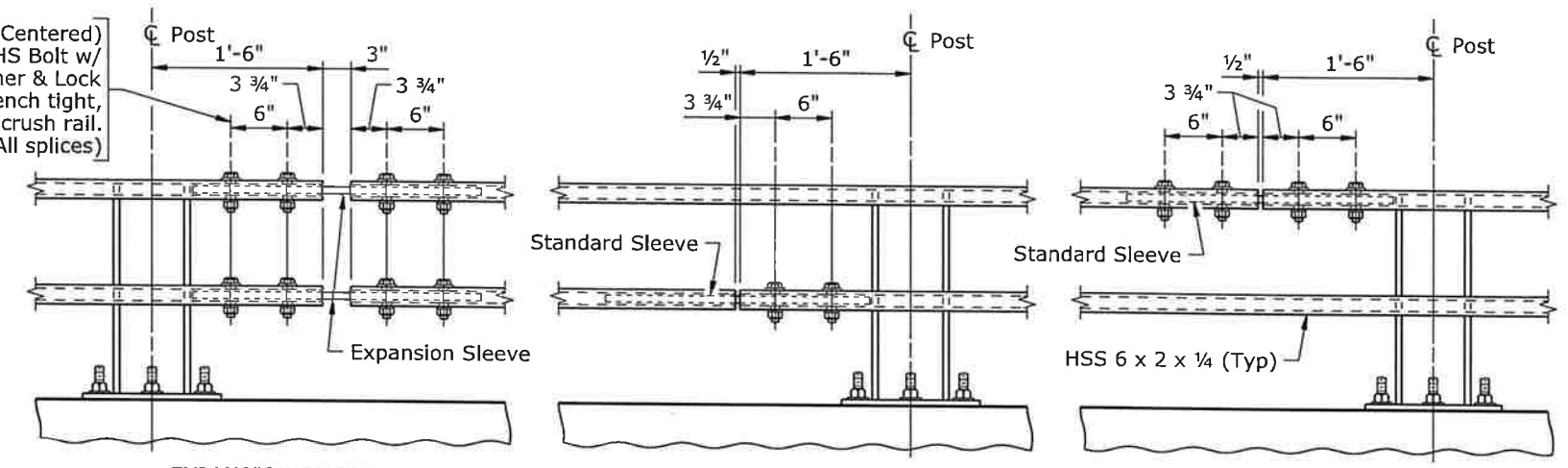


PLAN AT TURNDOWN TERMINAL
 (Bolts not shown)

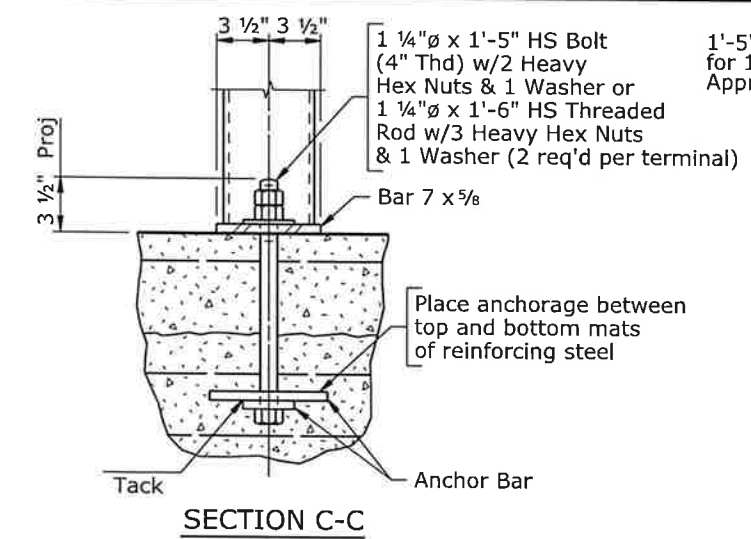


ELEVATION AT TURNDOWN TERMINAL

1" Ø Holes in rail (Centered) for 3/4" Ø x 3 1/2" HS Bolt w/ Hex Nut, Washer & Lock Washer. Wrench tight, do not crush rail. (Typ) (All splices)

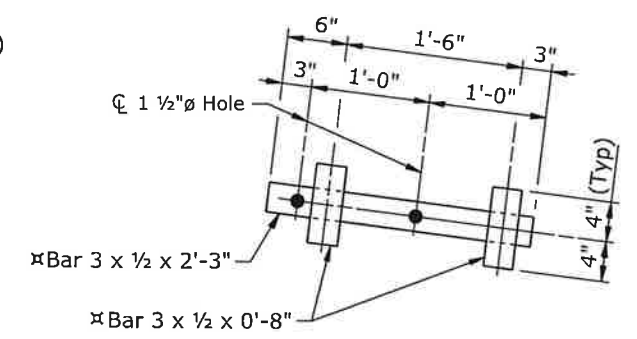


SPICE DETAILS
 EXPANSION SPLICE (Top and bottom rail)
 STANDARD SPLICE (Top or bottom rail)
 DOUBLE-BOLTED SPLICE (Top or bottom rail)

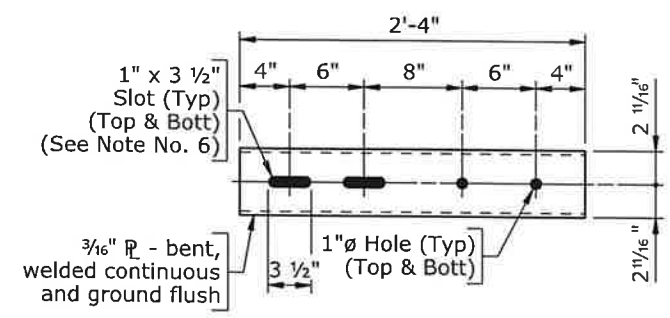


SECTION C-C

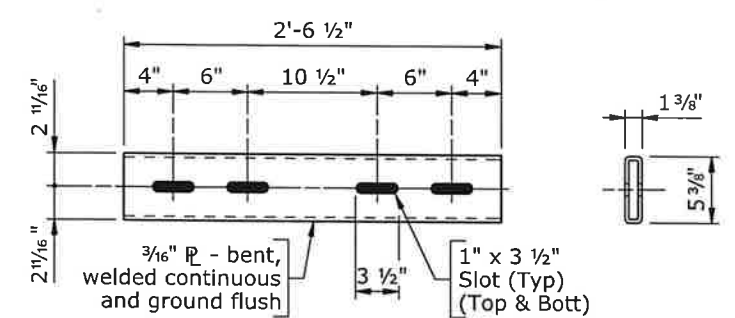
1'-5" Bolt for 1'-0" thick Approach Slabs



SECTION D-D
 (Showing anchor bars) (Not galvanized)



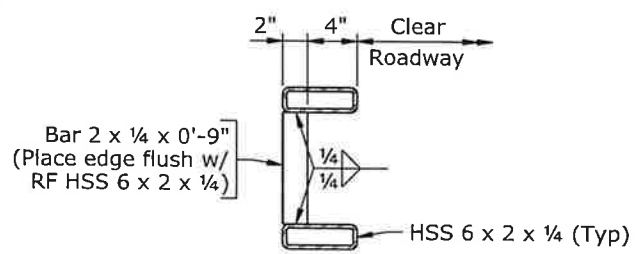
STANDARD SLEEVE



EXPANSION SLEEVE

END VIEW

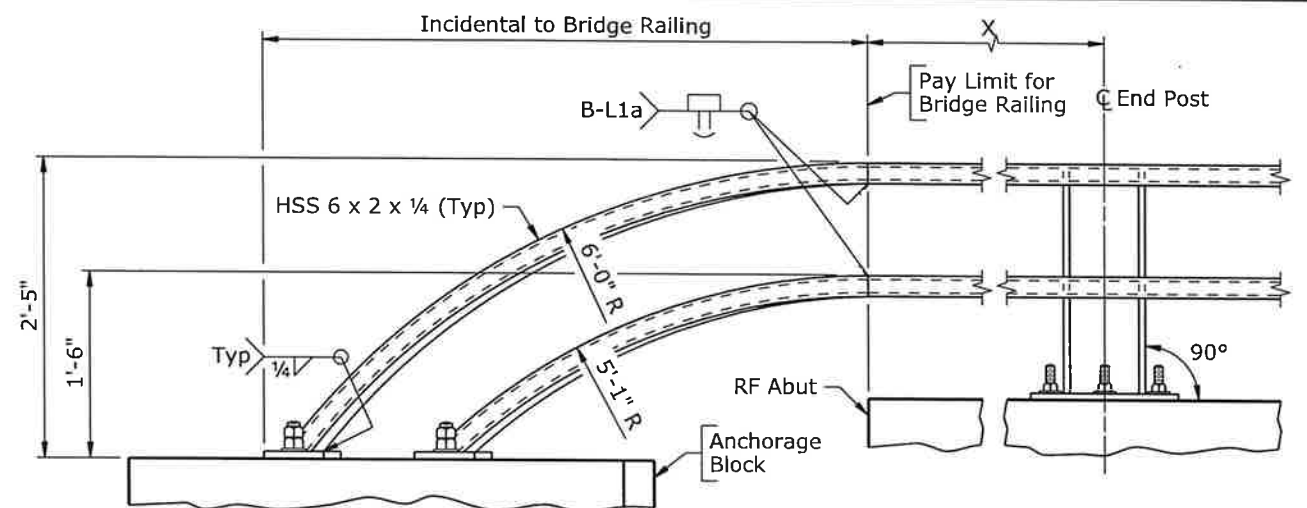
SLEEVE DETAILS



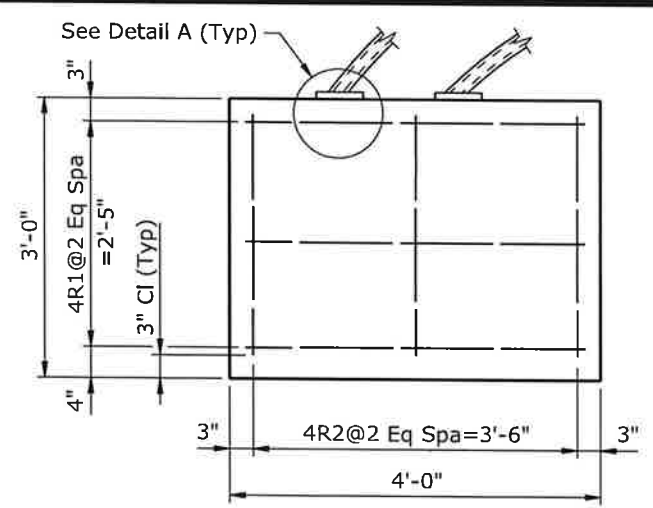
BRACE BAR DETAIL
 (See Note No. 8)

- Note:**
- 1) Either top or bottom rail in terminal section may be the longer rail.
 - 2) Ensure each rail length is continuous over a minimum of two posts. Railing that is part of a turndown terminal is continuous if either the top or bottom rail in the terminal is continuous over a minimum of two posts.
 - 3) In rehabilitation work, ensure railing that cannot feasibly be made continuous over a minimum of two posts has a double-bolted splice.
 - 4) Splices may be located on either side of post.
 - 5) Not more than one splice is permitted per side of post, except at expansion splices.
 - 6) Slots may be omitted in standard sleeves where bolts are required on one side of splice only.
 - 7) Do not shop splice rails.
 - 8) Ensure a brace bar is placed 2'-0" from the splice end of the shorter tube at turndown terminals.

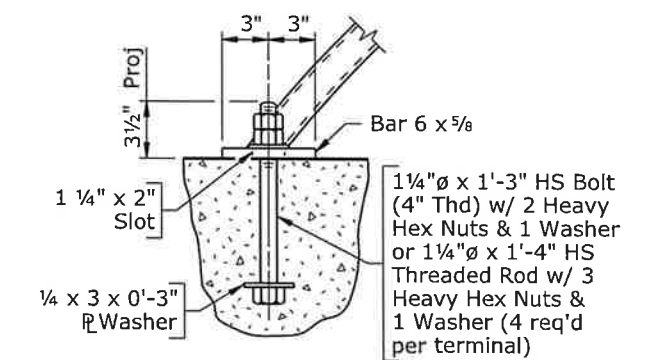
WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
BRIDGE RAILING DETAILS			
TL3BRGRAIL_NCHRP350_br3.dgn			
REVISIONS		DESIGN	✓
		DETAIL	X ✓ X
		QTY'S	X ✓ X
APPROVAL		DESIGN SECTION	X
		DRWG NO.	X
		SHEET	X of X



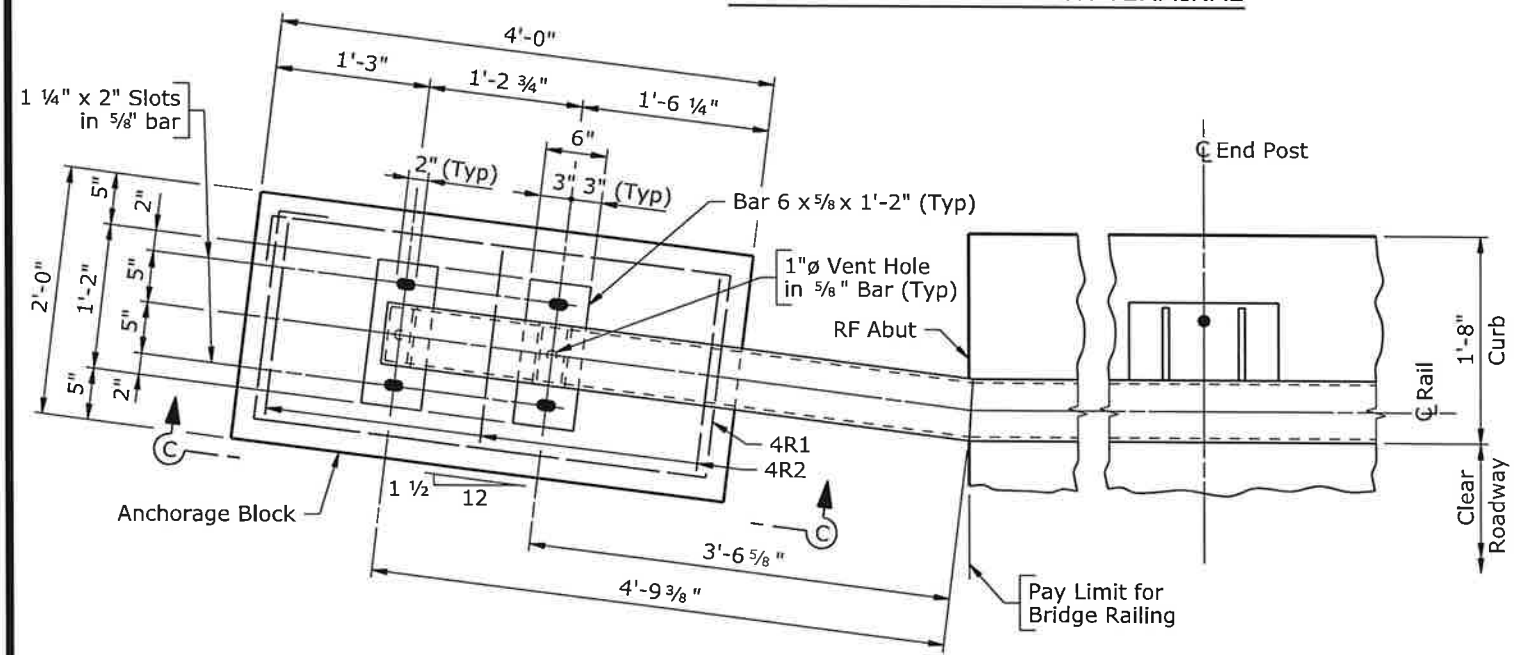
ELEVATION AT TURNDOWN TERMINAL



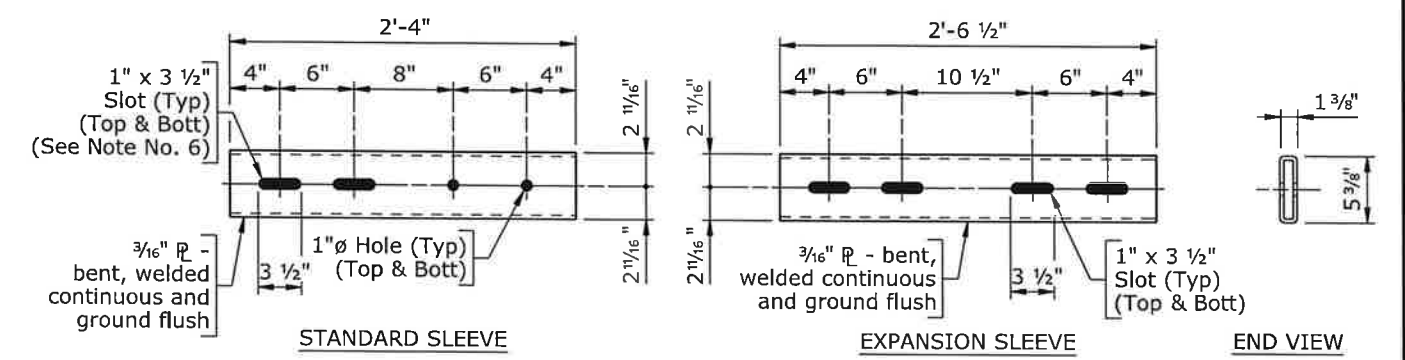
VIEW C-C



DETAIL A



PLAN AT TURNDOWN TERMINAL
(Bolts not shown)

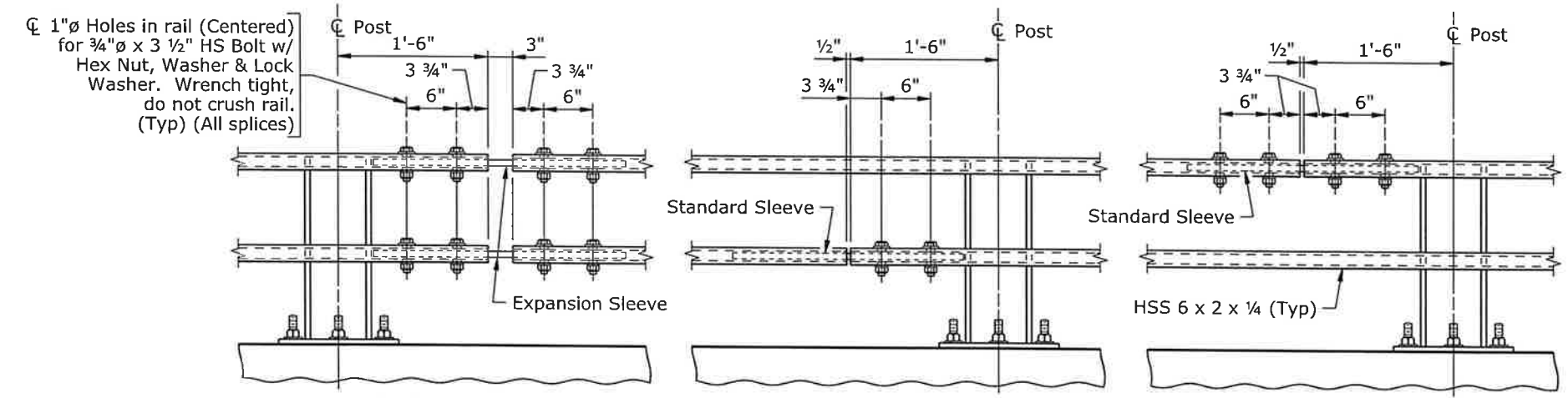


SLEEVE DETAILS

BILL OF REINFORCEMENT		
Location	Mark	Number Req'd Per Anchorage Block
Anchorage Block	4R1	3
	4R2	3
	Weight	41 LB

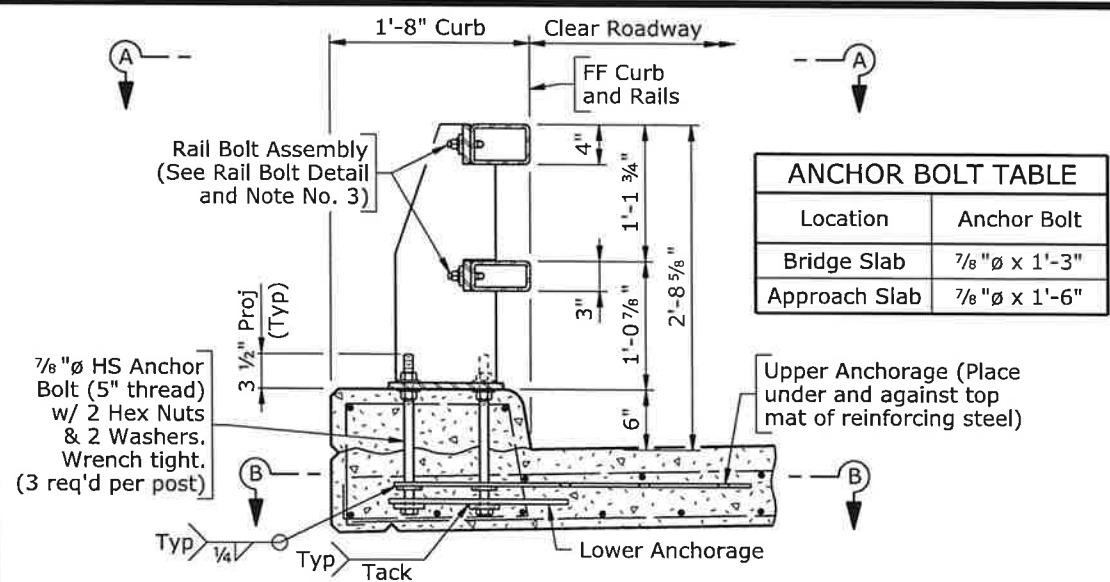
Bending Diagrams	
4R1 (Tie) (11'-5")	4R2 (Tie) (9'-1")

- Note:
- 1) Either top or bottom rail in terminal section may be the longer rail.
 - 2) Ensure each rail length is continuous over a minimum of two posts.
 - 3) In rehabilitation work, ensure railing that cannot feasibly be made continuous over a minimum of two posts has a double-bolted splice.
 - 4) Splices may be located on either side of post.
 - 5) Not more than one splice is permitted per side of post, except at expansion splices.
 - 6) Slots may be omitted in standard sleeves where bolts are required on one side of splice only.
 - 7) Do not shop splice rails.
 - 8) Ensure rail terminal section is in place and in proper alignment prior to placement of concrete in end anchorage block.



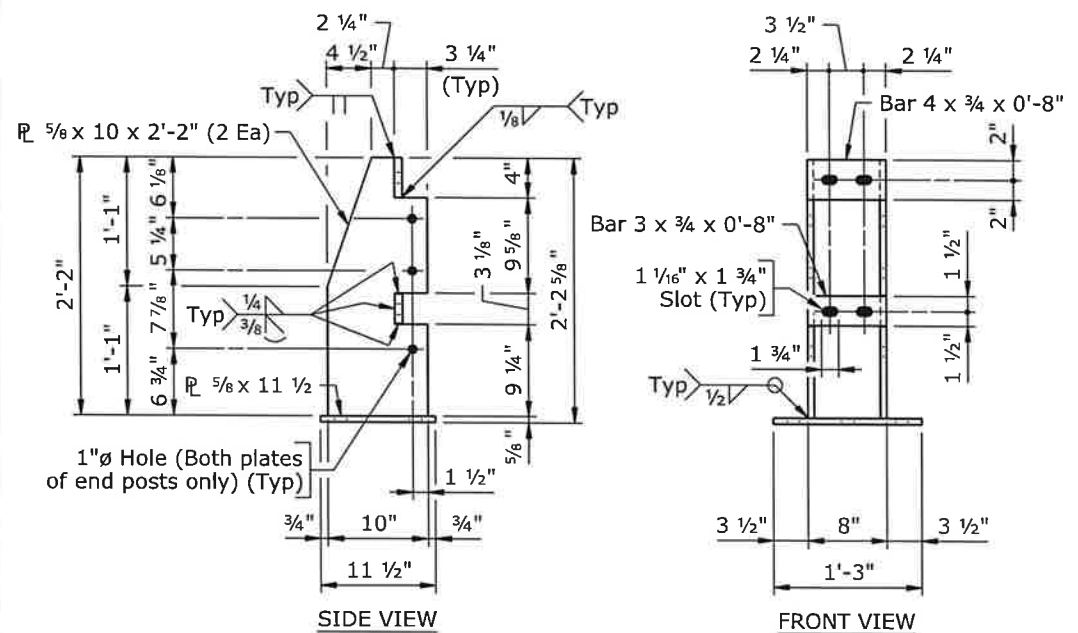
EXPANSION SPLICE (Top and bottom rail)
 STANDARD SPLICE (Top or bottom rail)
 DOUBLE-BOLTED SPLICE (Top or bottom rail)
 SPLICE DETAILS

WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
REVISIONS		BRIDGE RAILING DETAILS	
		TL3BRGRAIL_NCHRP350_br4.dgn	
REVIEW	DESIGN	Design Section	X
APPROVAL	DETAIL	Drwg No. X	Sheet X of X
	QTY'S		

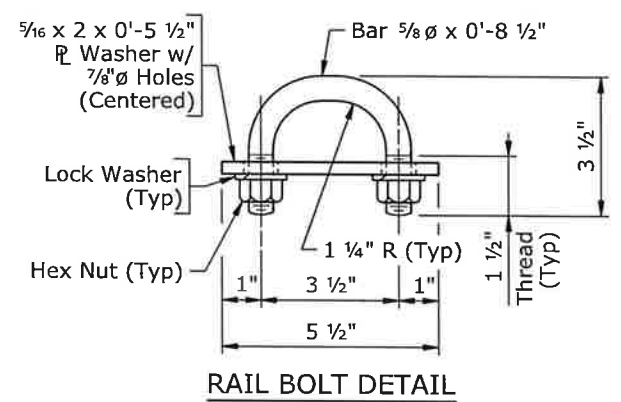


ANCHOR BOLT TABLE	
Location	Anchor Bolt
Bridge Slab	7/8" ϕ x 1'-3"
Approach Slab	7/8" ϕ x 1'-6"

ASSEMBLY DETAIL
 (Shown near \bar{C} Post)
 (Bridge slab shown, approach slab similar)

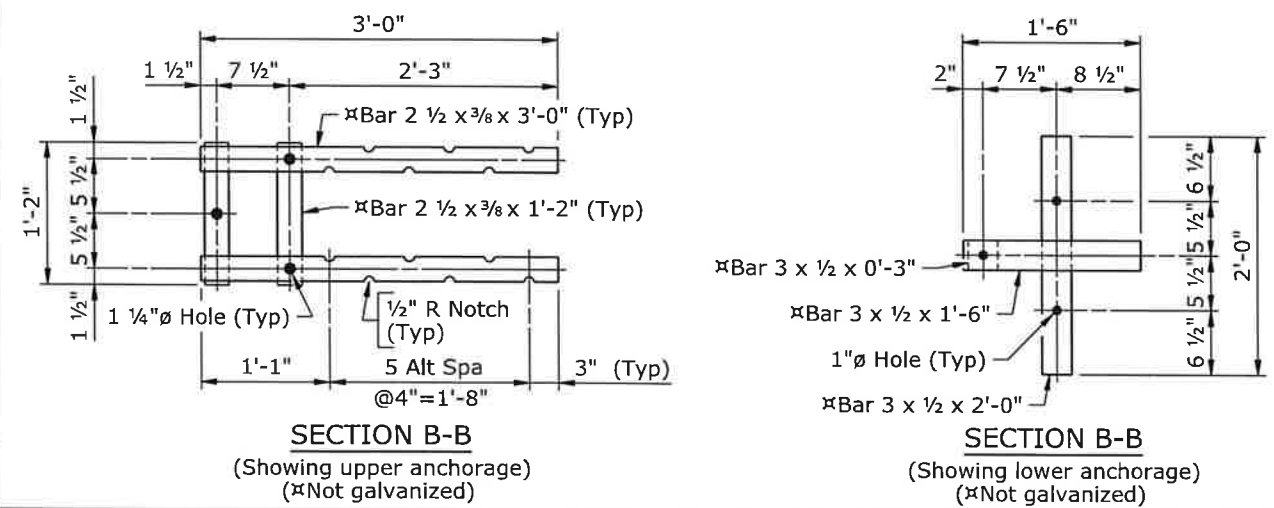


POST DETAILS
 (See View A-A for anchor bolt hole spacing)



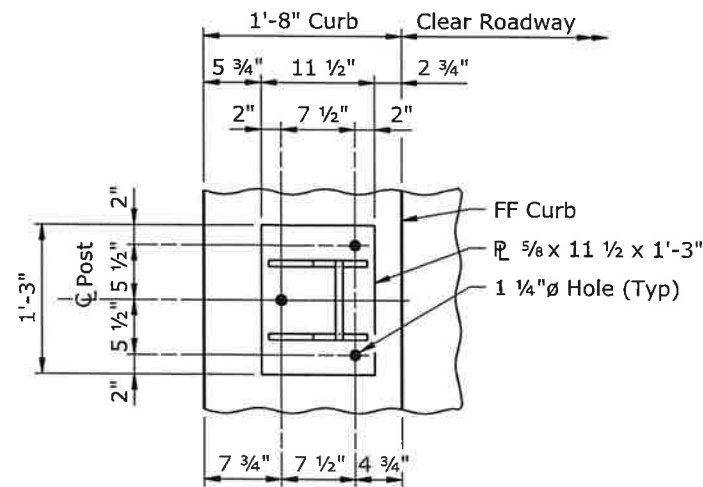
PLAN
 (X posts req'd on bridge)
 (X posts req'd on approach slabs)

- Note:**
- 1) Ensure the expansion splice is located in the railing panel which passes over the bridge expansion joint as indicated on the plan.
 - 2) Anchor bolts may be tack welded to lower anchorage (Shop or field).
 - 3) At post locations, drill two 1 1/16" ϕ holes in each rail to receive rail bolts (Shop or field). See Post Details for hole spacing.
 - 4) Paint surfaces of the railing components that have been cut, drilled, or otherwise damaged with two coats of zinc-rich paint conforming to ASTM A 780.
 - 5) After installing rails, paint all exposed bolt threads with two coats of zinc-rich paint conforming to ASTM A 780.



SECTION B-B
 (Showing upper anchorage)
 (Not galvanized)

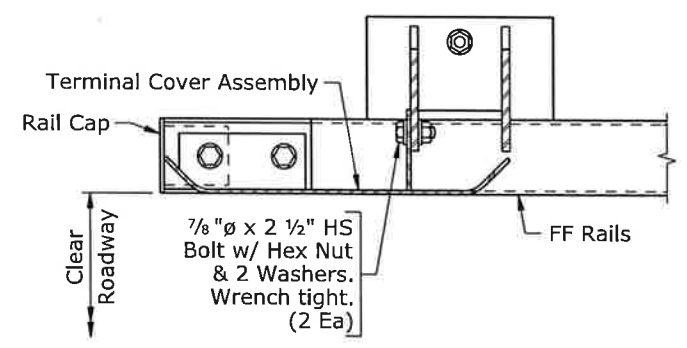
SECTION B-B
 (Showing lower anchorage)
 (Not galvanized)



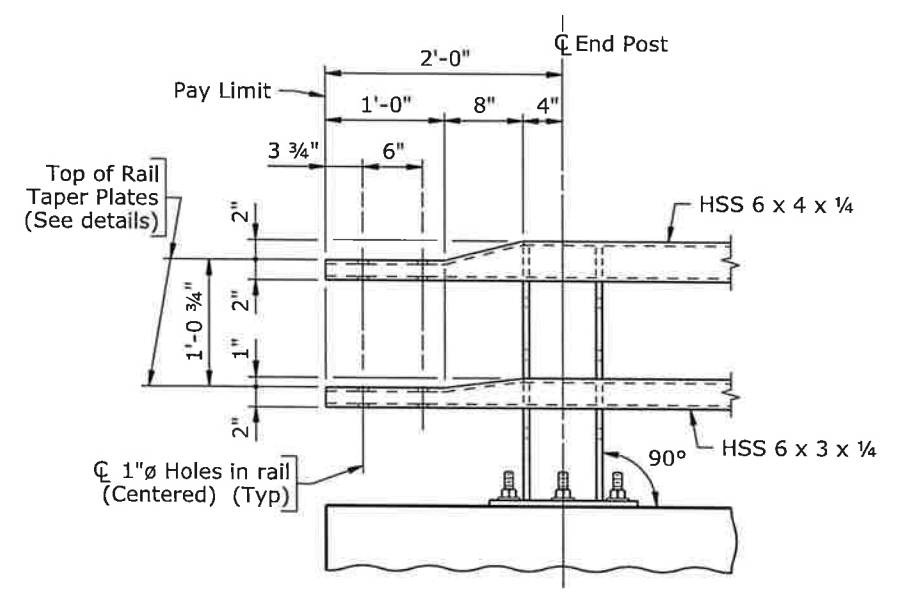
VIEW A-A
 (Anchor bolts, rails, and rail bolts not shown)

WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
BRIDGE RAILING DETAILS			
TL4BRGRail_NCHRP350_br1.dgn			
REVISIONS		Design Section	X
REVIEW	DESIGN	DETAIL	QTY'S
	X	X	X
APPROVAL		Drwg No. X	Sheet X of X

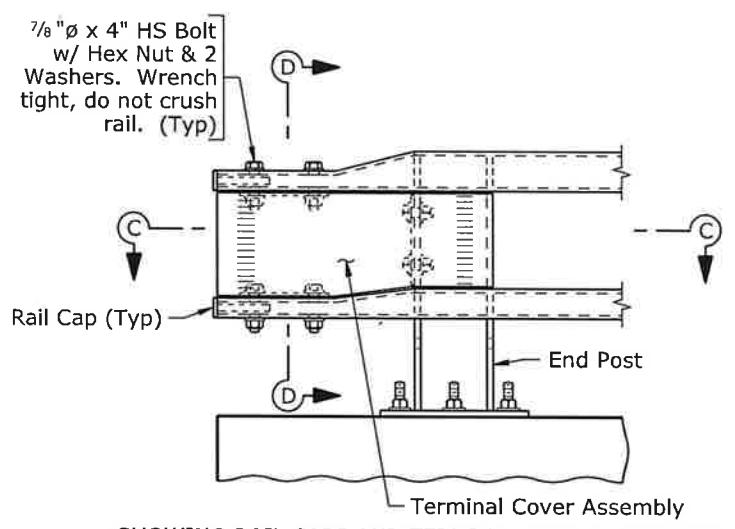
TERMINAL COMPONENT REQUIREMENTS		
Approach Guardrail Connection	Rail Caps Required	Terminal Cover Assembly Required
MGS Approach Guardrail	Yes (Without bolts)	≠No
Box Beam w/ Rubrail Approach Guardrail	No	No
No Approach Guardrail	Yes (With bolts)	Yes



SECTION C-C

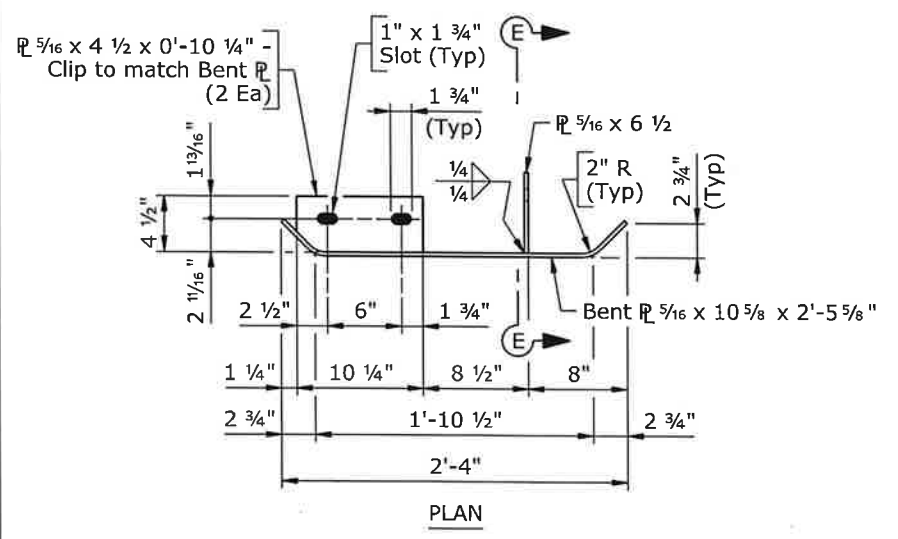


SHOWING RAILS

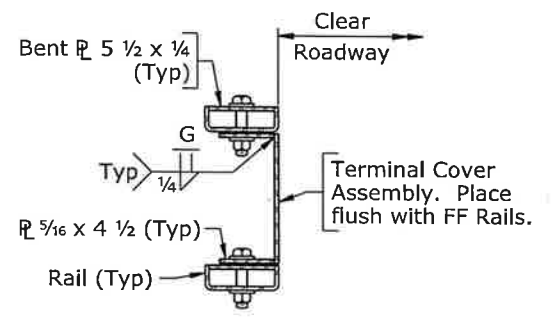


SHOWING RAIL CAPS AND TERMINAL COVER ASSEMBLY

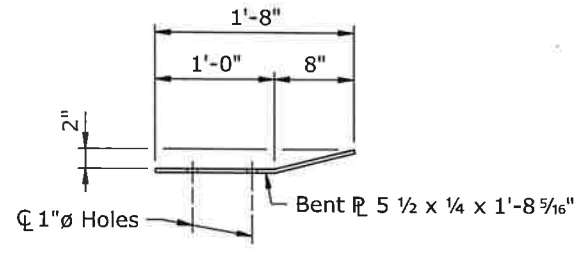
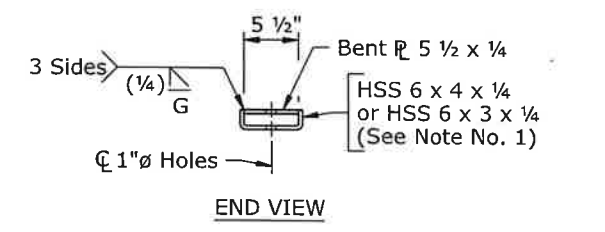
ELEVATIONS AT TERMINAL



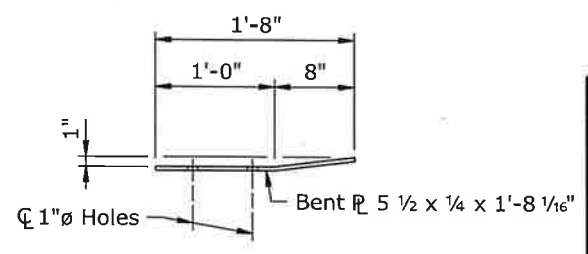
PLAN



SECTION D-D

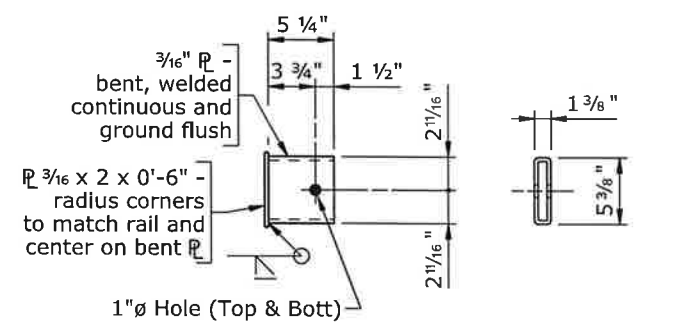


ELEVATION OF BENT PLATE FOR TOP RAIL (HSS 6 x 4 x 1/4 not shown)



ELEVATION OF BENT PLATE FOR BOTTOM RAIL (HSS 6 x 3 x 1/4 not shown)

RAIL TAPER PLATE DETAILS

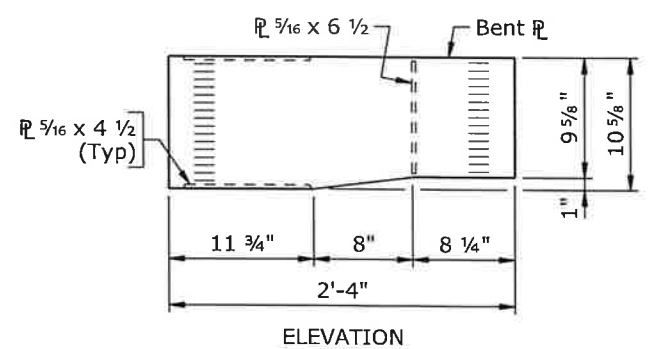


PLAN

END VIEW (R 3/16" x 2 not shown)

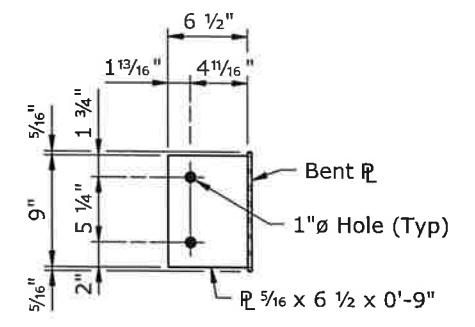
RAIL CAP DETAILS

- Note: 1) Cut top and bottom rails as required for fabrication of tapered end sections.
 2) Installation of MGS approach guardrail will require other fabricated assemblies to be connected to end post. See road plans for details and pay item.



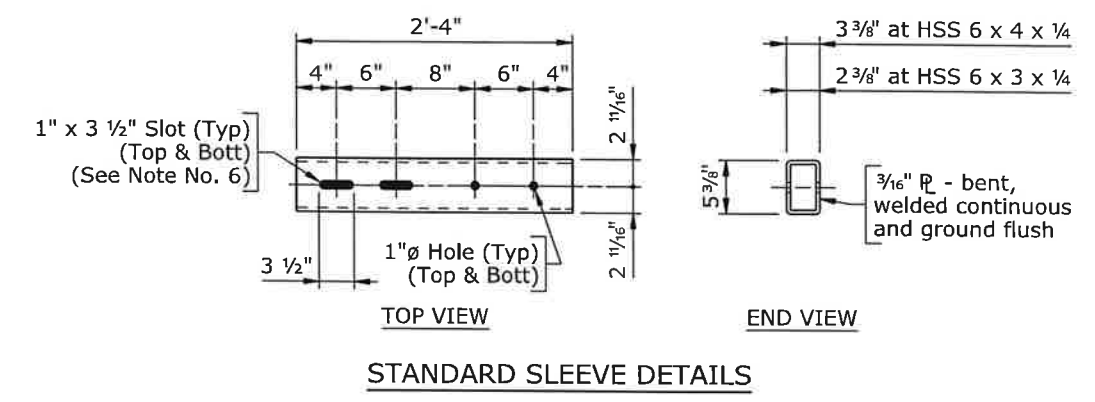
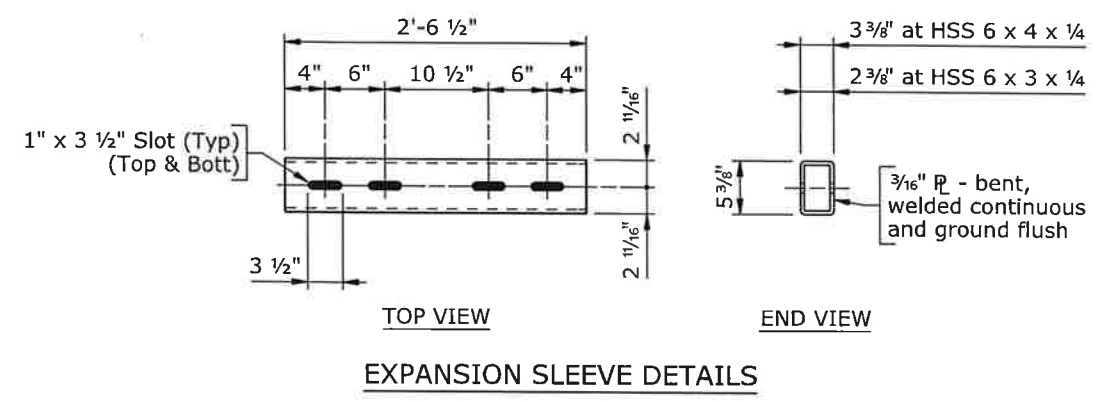
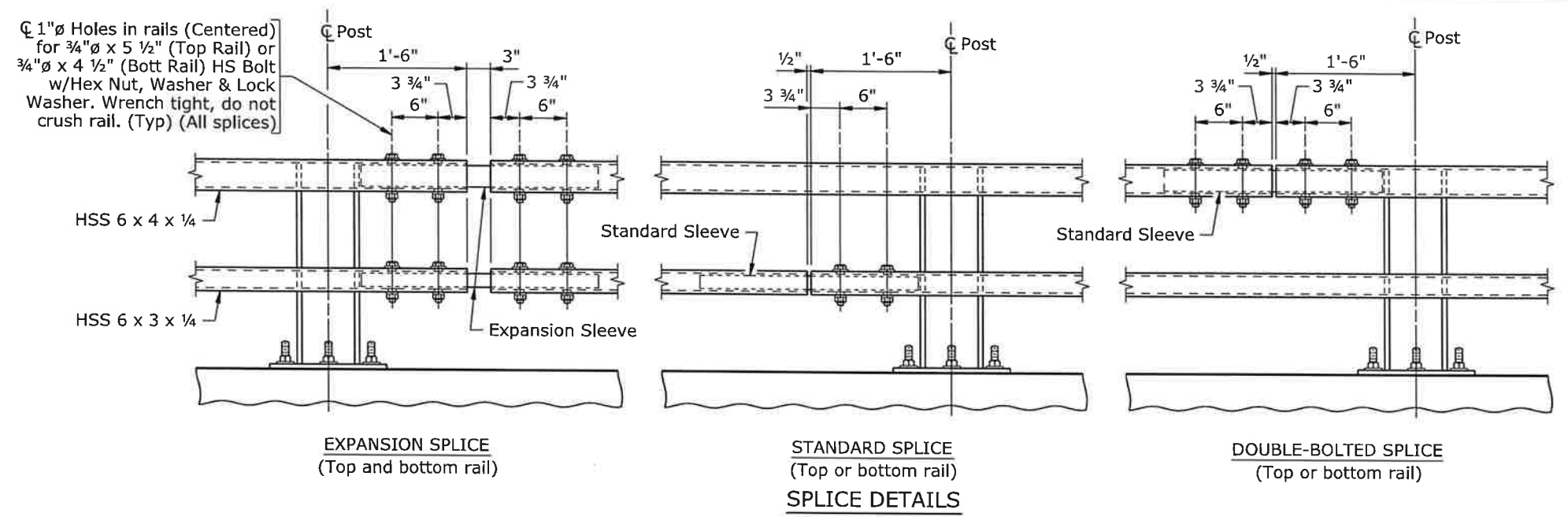
ELEVATION

TERMINAL COVER ASSEMBLY DETAILS



SECTION E-E

WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
BRIDGE RAILING DETAILS			
TL4BRGRAIL_NCHRP350_br2.dgn			
REVISIONS	DESIGN	Design Section	X
	DETAIL	Drwg No. X	Sheet X of X
	QTY'S		



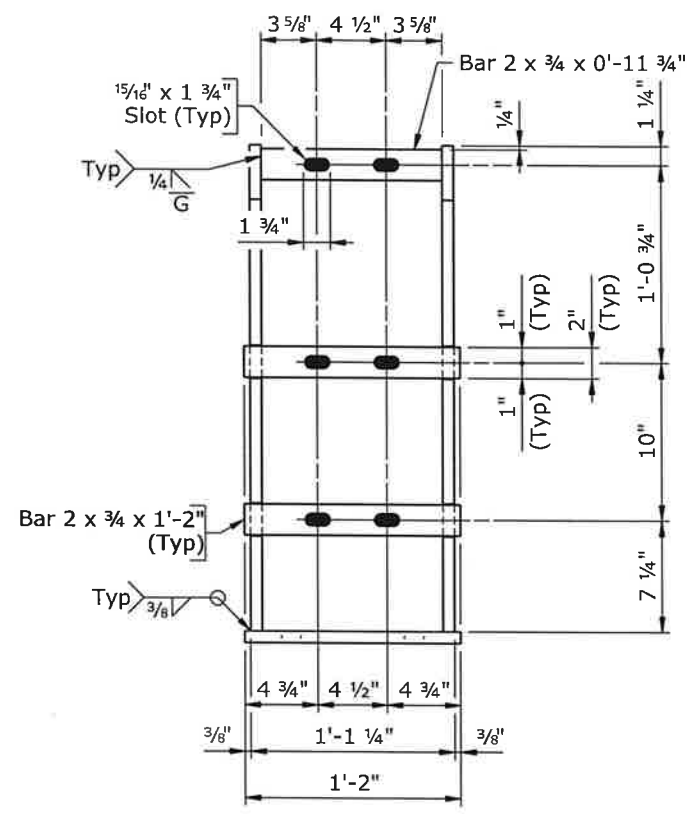
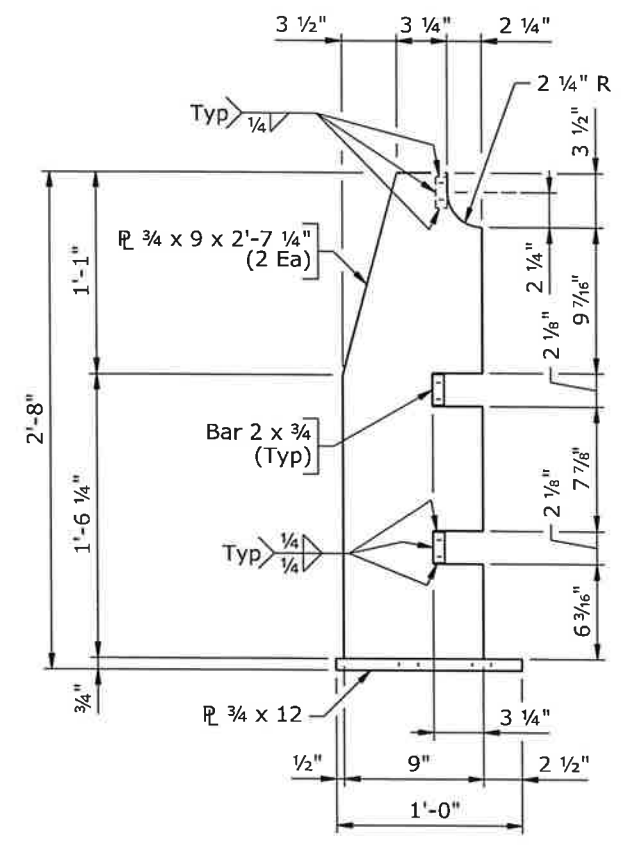
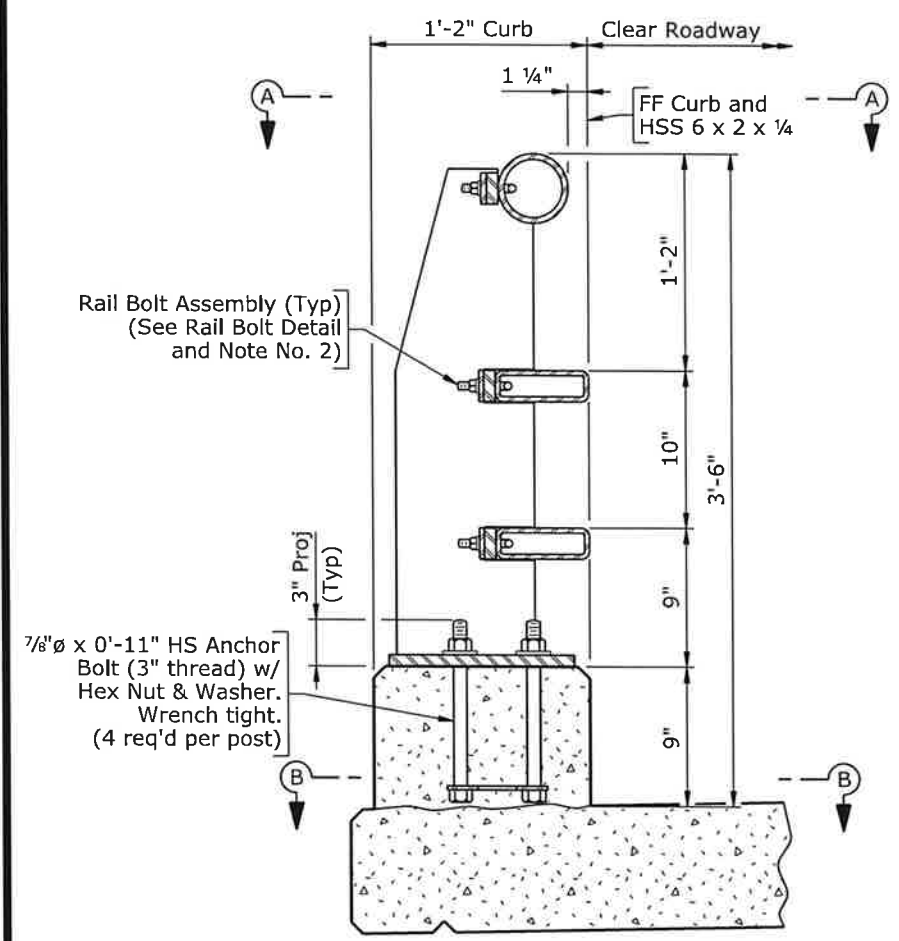
- Note:**
- 1) Ensure each rail length is continuous over a minimum of two posts.
 - 2) In rehabilitation work, ensure railing that cannot feasibly be made continuous over a minimum of two posts has a double-bolted splice.
 - 3) Splices may be located on either side of post.
 - 4) Not more than one splice is permitted per side of post, except at expansion splices.
 - 5) Do not shop splice rails.
 - 6) Slots may be omitted in standard sleeves where bolts are required on one side of splice only.

WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
REVISIONS		BRIDGE RAILING DETAILS	
TL4BRGRAIL_NCHRP350_br3.dgn			
REVIEW _____	DESIGN _____	Design Section X	
APPROVAL _____	DETAIL X ✓ X	Drwg No. X	Sheet X of X
	QTY'S X ✓ X		

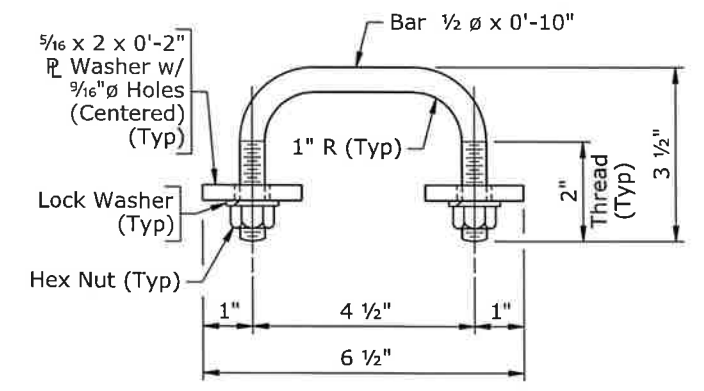
PLAN
 (X posts req'd on bridge)
 (X posts req'd on approach slabs)

Note: Ensure a splice is located in the railing panel which passes over rear face abutment as indicated on the plan.

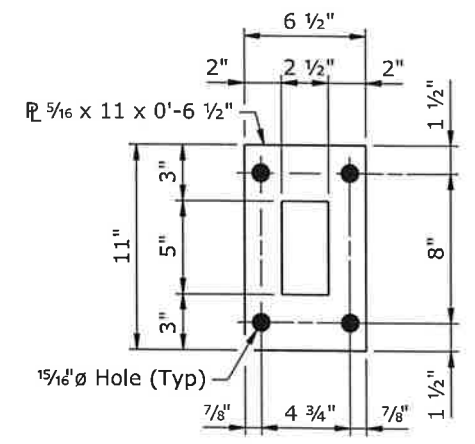
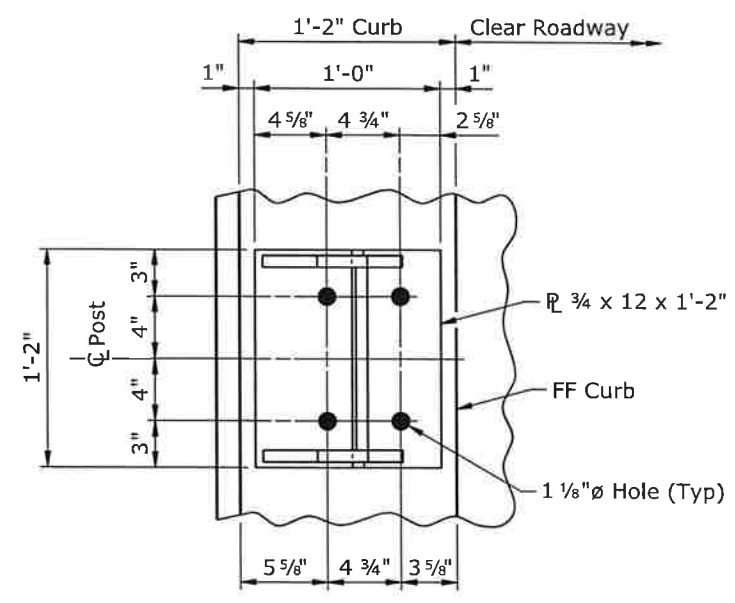
WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM	
REVISIONS	BRIDGE RAILING DETAILS
	TL4BRGRAIL_MASH_br1.dgn
REVIEW _____	DESIGN _____ ✓ _____
APPROVAL _____	DETAIL X ✓ X
	QTY'S X ✓ X
	Design Section X
	Drwg No. X Sheet X of X



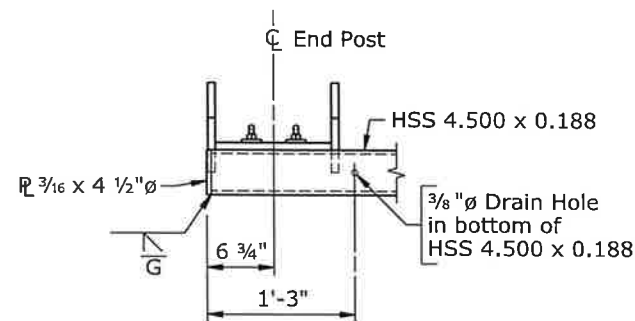
POST DETAILS
 (See View A-A for anchor bolt hole spacing)



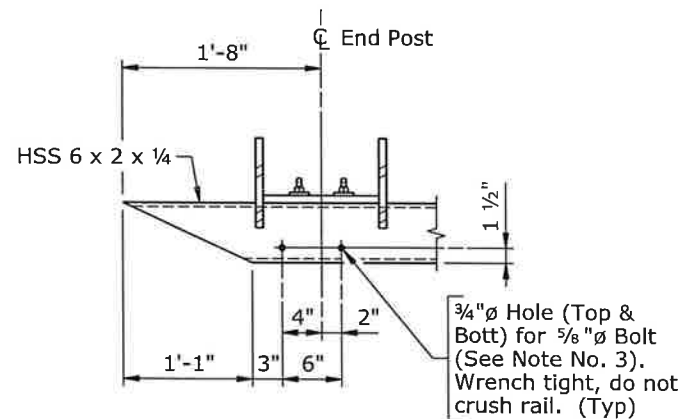
- Note:
- 1) Anchor bolts may be tack welded to lower anchorage (Shop or field).
 - 2) At post locations, drill two 1 1/16"Ø holes in each rail to receive rail bolts (Shop or field). See Post Details for hole spacing.
 - 3) Paint surfaces of the railing components that have been cut, drilled, or otherwise damaged with two coats of zinc-rich paint conforming to ASTM A 780.
 - 4) After installing rails, paint all exposed bolt threads with two coats of zinc-rich paint conforming to ASTM A 780.



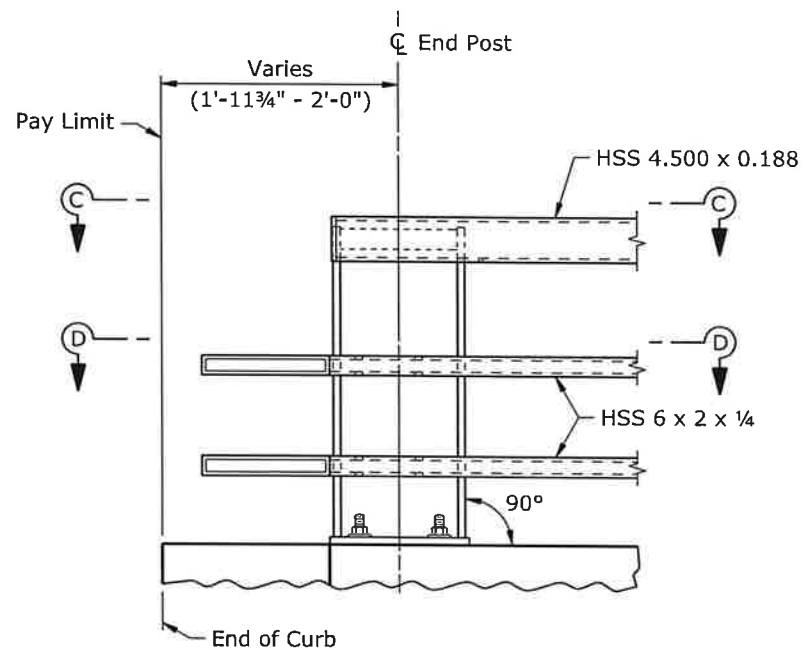
WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
BRIDGE RAILING DETAILS			
TL4BRGRAIL_MASH_br2.dgn			
REVISIONS		DESIGN	Design Section X
		DETAIL	Drwg No. X
		QTY'S	Sheet X of X
REVIEW			
APPROVAL			



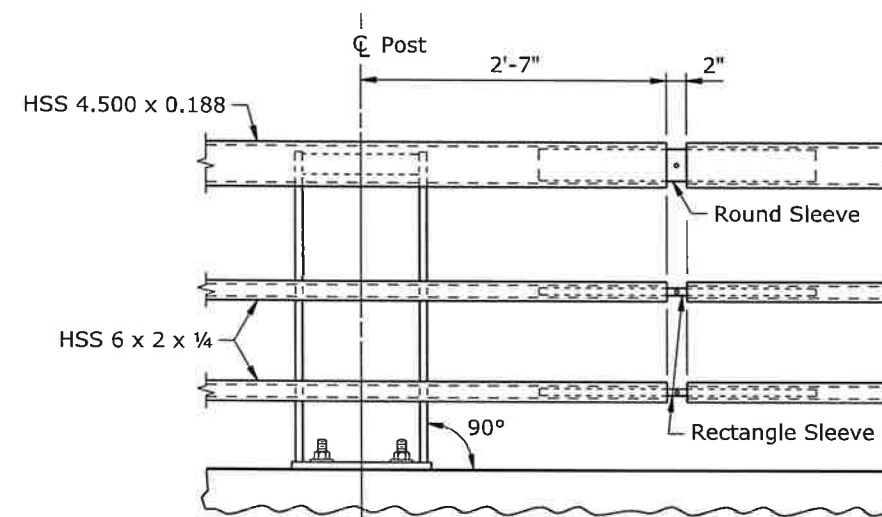
VIEW C-C
 (Curb and post base plate not shown)



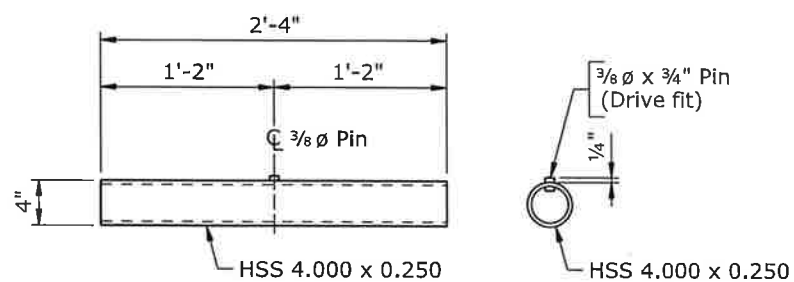
SECTION D-D
 (Typical at each HSS 6 x 2 x 1/4)
 (Curb and post base plate not shown)



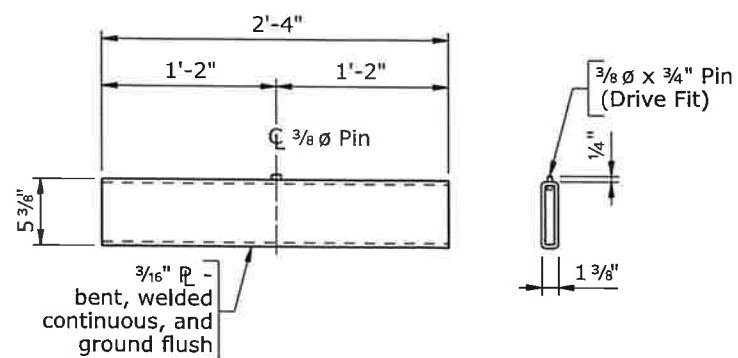
ELEVATION AT TERMINAL



SPLICE DETAIL



SLEEVE
ROUND SLEEVE DETAILS



SLEEVE
RECTANGLE SLEEVE DETAILS

- Note:**
- 1) Ensure each rail length is continuous over a minimum of two posts, but no more than four posts.
 - 2) Splices may be located on either side of post.
 - 3) Installation of box beam guardrail will require other fabricated assemblies to be connected to the end post. See road plans for details and pay item.

WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
BRIDGE RAILING DETAILS			
TL4BRGRAIL_MASH_br3.dgn			
REVISIONS		DESIGN	Design Section X
		DETAIL	Drwg No. X
		QTY'S	Sheet X of X