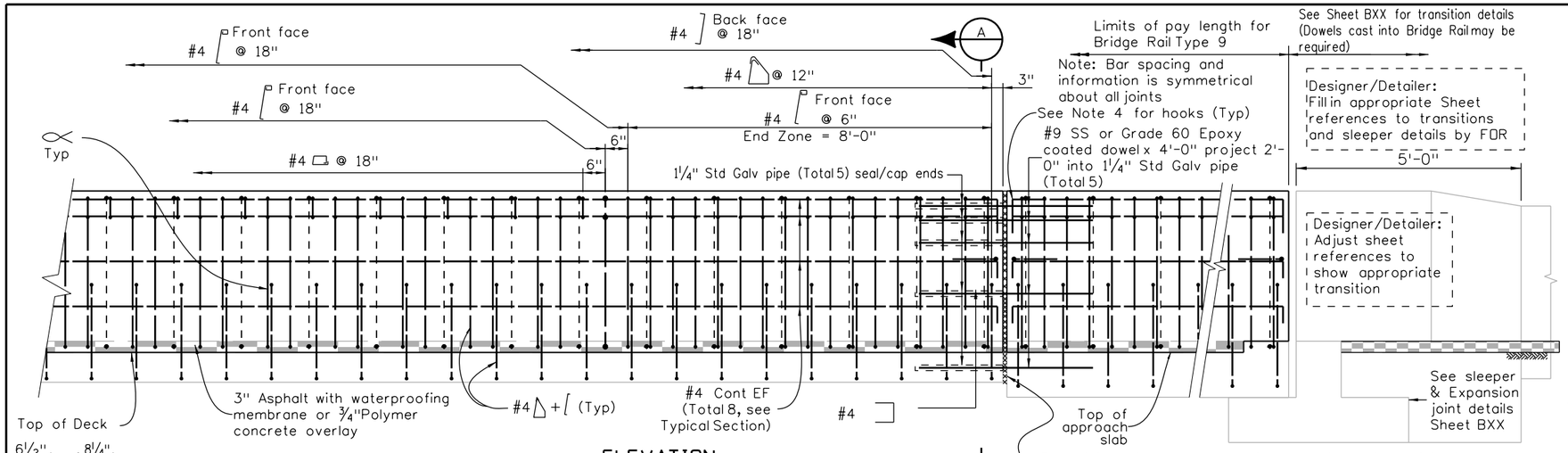
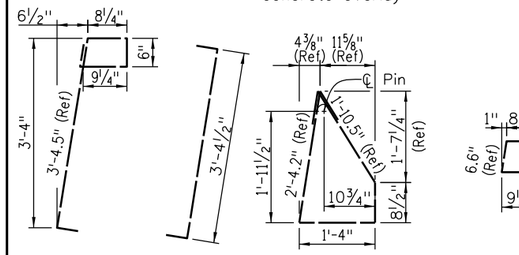
Revision Dates	
12/19	
12/19	
1/20	
11/21	
3/23	
9/ 24	
11/24	

B-606-9-4

(Use with B-606-9-3 and A, B, C or D)



ELEVATION



(Based on 8" Deck)

Note: All 90° hooks are 4½" length

Designer/Detailer: Back Section of Bridge Rail may not be straightened without approval from Staff Bridge. This change will require increased deck steel.

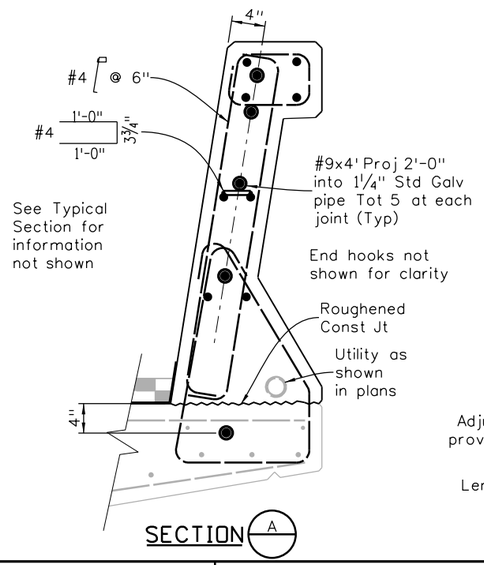
Designer: Check barrier strength when total conduit area > 10 in².

INFORMATION ONLY (8" Deck)

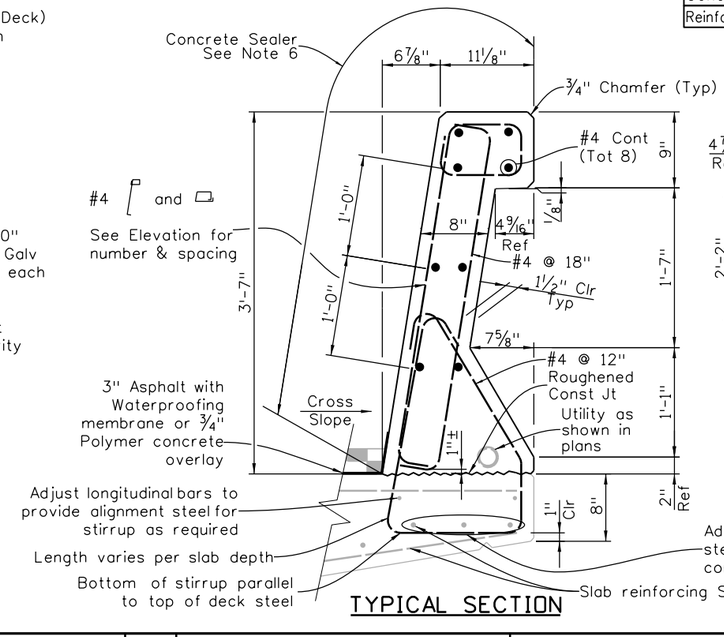
Description	Unit	Per Lin. Ft
Concrete Sealer	SY	0.51
Concrete Class DF	CY	0.12
Reinforcing Steel (High Performance) ▲	Lb	19.0 ✱

✱ For each joint with dowels add 68 Lb (Total)
For each joint add 26 Lb (Total U Bars, hooks and End Zone Reinforcing)
23 Lb of Structural Steel (Galvanized) is included in the cost of the work.

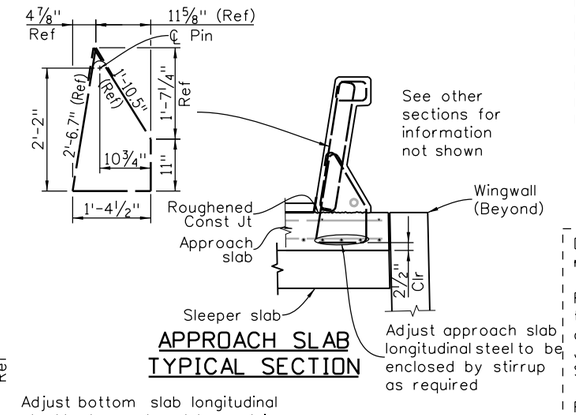
BENDING DIAGRAMS



SECTION A



TYPICAL SECTION



APPROACH SLAB TYPICAL SECTION

NOTES:

1. Payment will be made under Item 606 - Bridge Rail Type 9. Concrete Class DF, reinforcing steel, concrete sealer, and any other work necessary to complete this item as shown will not be measured and paid for separately, but shall be included in the cost of Bridge Rail Type 9.
2. Concrete, reinforcing steel, and structural steel elements shall conform to the requirements of sections 601 & 606, 602, and 509, respectively unless otherwise noted.
3. Rails shall be constructed perpendicular to bridge cross slope.
4. Longitudinal reinforcement shall terminate with a standard hook and 1½" clear on either side of all expansion joints.
5. The surface of the rail shall be tested with a 10 foot straightedge placed along the surface in the longitudinal direction. Deviation of the straightedge shall be less than ¼" plus allowance for roadway concrete surface from the horizontal and vertical curvature, if any.
6. The top and inside face of the rail shall receive a coating of Item 515, Concrete Sealer, either a silane/siloxane or a type compatible with the concrete coating or sealer/stain shown in the plans.

DESIGN DATA

Design: AASHTO MASH 2016 TL-5 with the rail height of 42" (by calculation), AASHTO MASH 2016 TL-4 for overlay thickness over 1" and resulting in a height of the top of rail over pavement of 36" Min (by Professional Evaluation)

Concrete: Class DF, f'c = 4.5 KSI

▲ Reinforcing Steel: **LONG LEAD ITEM**
Splice Length = 2'-5"
All reinforcing bends shown shall use a 4D pin diameter.
All tie wire, chairs and supports shall be stainless steel or plastic coated.

ASTM A955 fy = 75 KSI Min
Stainless steel reinforcing bars shall conform to ASTM 955, UNS Designations S24000, S31653, S31803, S32101 and S32304

ASTM A1035CS, (Grade 100), fy = 100 KSI Min
Reinforcing steel shall be low-carbon, chromium, conforming to ASTM A1035/A1035M Alloy Type 1035 CS Grade 100 with a minimum chromium content of 9.2%. Stainless steel per ASTM A955 may be substituted.

Bundled Reinforcing

Designer/Detailer: Select reinforcing steel to specify which reinforcing is required on the project per the following requirements:

Reinforcing steel on structures and retaining walls carrying Interstate traffic (including ramps and crossing structures) and on any structures on the state highway system in Clear Creek, Grand, Gunnison, Hinsdale, Jackson, Lake, Mineral, Park, Pitkin, Rio Grande, Routt, San Juan, and Summit Counties shall be solid stainless steel.

Reinforcing steel in Bridge rails on structures in other locations shall be ASTM A1035CS.

Any changes to reinforcing or shape must be approved by Staff Bridge.

INITIALS		DESIGN	DATE	DETAIL	DATE	QUANTITY	DATE
By							
Checked By							

All seals for this set of drawings are applied to the cover page(s)

Print Date: $DATE$
File Name: Sheet_B-606-9-4.dgn
Horiz. Scale: None Vert. Scale: As Noted
Unit Information Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
2829 West Howard Place, 3rd Floor
Denver, CO 80204
Phone: 303-512-4079
FAX: 303-757-9197
Staff Bridge Branch

Initials

As Constructed
No Revisions:
Revised:
Void:

BRIDGE RAIL TYPE 9
#4 OPTION

Designer:	XXXXXXXX	Structure Numbers	X-XX-XX
Detailer:	XXXXXXXX		X-XX-XX
Sheet Subset:	BRIDGE	Subset Sheets:	BXX of XXX

Project No./Code
Project Number
Code
Sheet Number

$PLOT_INFO$