

NOTES:

- All tubes shall be ASTM A1085. All posts, base plates, and splice tubes fabricated by welding shall be ASTM A572 Grade 50. Post anchor, encased in concrete, shall be Grade 36 steel and need not be galvanized. All other steel shall be Grade 36 unless otherwise noted.
- The above material and all anchor bolts and miscellaneous bolts, nuts, and washers shall be galvanized after fabrication in accordance with Section 509. Concrete, reinforcing steel, and structural steel elements shall conform to the requirements of Sections 601 & 606, 602, and 509, respectively unless otherwise noted. Concrete sealer shall conform to Section 515.
- The tubes shall be shop bent or fabricated to fit horizontal curve when radius is less than 1,800 feet.
- Tubes shall be continuous over not less than 2 posts, preferably 4 posts except at approach slab end joint. No welded butt splices will be allowed in the tube sections.
- The centerline of the tube splice shall be 1'-8" minimum and 2'-6" maximum from the centerline of the posts.
- All bolts that have lock washers shall be tightened to snug tight only.
- Posts, curbs, and stirrups shall be perpendicular to the longitudinal roadway grade and cross slopes. For Bridge rail at sidewalks, all posts, curb, & stirrups shall be plumb.
- One or more 10'-0" post spaces may be reduced (6'-8" Min) in order to maintain dimensions from the end of the rail and expansion joints or concrete buttresses.
- The top and inside face of the rail curb 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.
- Payment will be made under item 606, Bridge Rail Type 10 MASH, for all posts, post anchors, base plates, anchor bolts, miscellaneous bolts, nuts, washers, tubes, tube expansion devices, tube splices, end plates, Concrete Class DF, reinforcing steel, concrete sealer, and reflector tabs.
- Prior to fabrication of this item, an electronic PDF which complies with the requirements of section 105, shall be submitted to the Engineer for information only.
- #3 reinforcing may be substituted for #4 reinforcing with the spacing and additional bars shown.

DESIGN DATA

Design: AASHTO MASH 2016 TL-5 with 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 and Crash Testing).

Structural Steel:
 AASHTO M270 Gr 36 (ASTM A709 Gr 36) $f_y = 36$ KSI
 AASHTO M270 Gr 50 (ASTM A992/A572 Gr 50) $f_y = 50$ KSI
 ASTM A1085 $f_y = 50$ KSI

Concrete: Class DF $f'_c = 4.5$ KSI

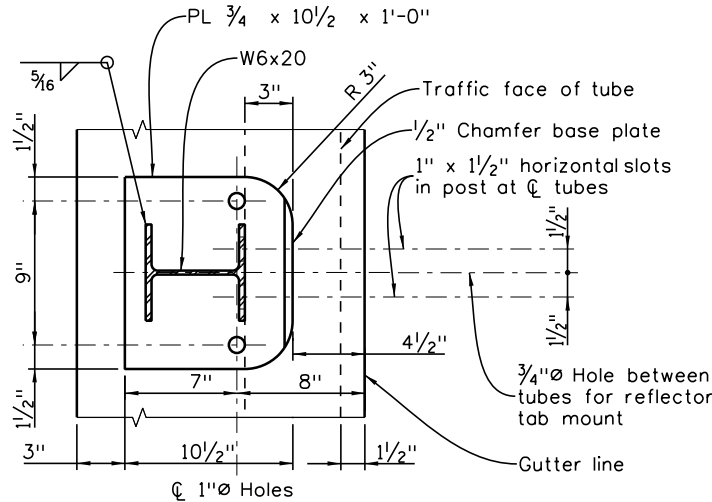
Reinforcing Steel: ****LONG LEAD ITEM****
 Splice Length = 2'-5" for #4, 1'-10" for #3
 All tie wire, chairs and supports shall be stainless steel or plastic coated.
 All reinforcing bends shown shall use a 4D pin diameter.

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

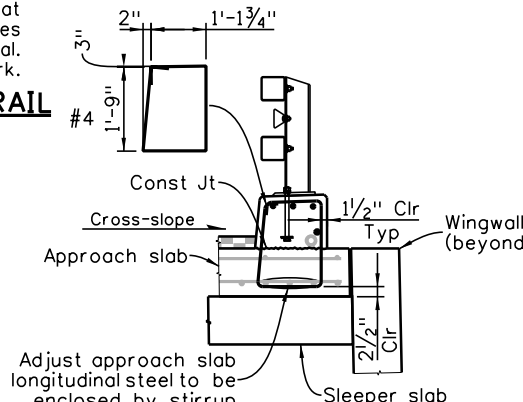
ASTM A1035CS, (Grade 100) $f_y = 100$ KSI Min
 Reinforcing steel shall be low-carbon, chromium, conforming to ASTM A1035/A1035M Alloy Type 1035 CS Grade 100 with a minimum chromium content of 9.2%. Stainless steel per ASTM A955 may be substituted.

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

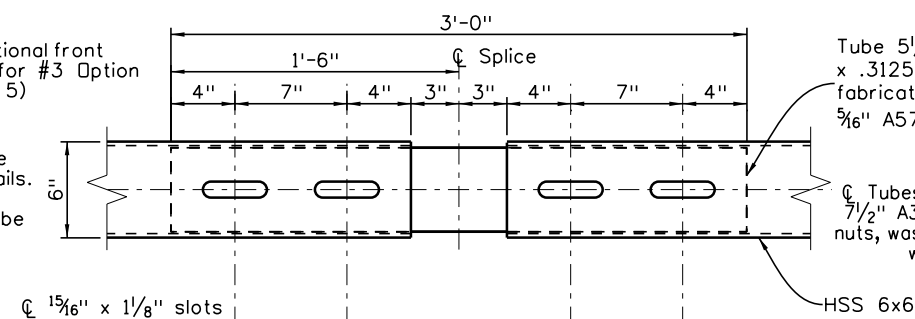
Reinforcing steel on structures and retaining walls carrying Interstate traffic (including ramps and crossing structures) and on any structures on the state highway system in Clear Creek, Grand, Gunnison, Hinsdale, Jackson, Lake, Mineral, Park, Pitkin, Rio Grande, Routt, San Juan, and Summit Counties shall be solid stainless steel (ASTM A955). Reinforcing steel in Bridge rails on structures in other locations shall ASTM A1035CS



PLAN - POST DETAIL



POST ELEVATION

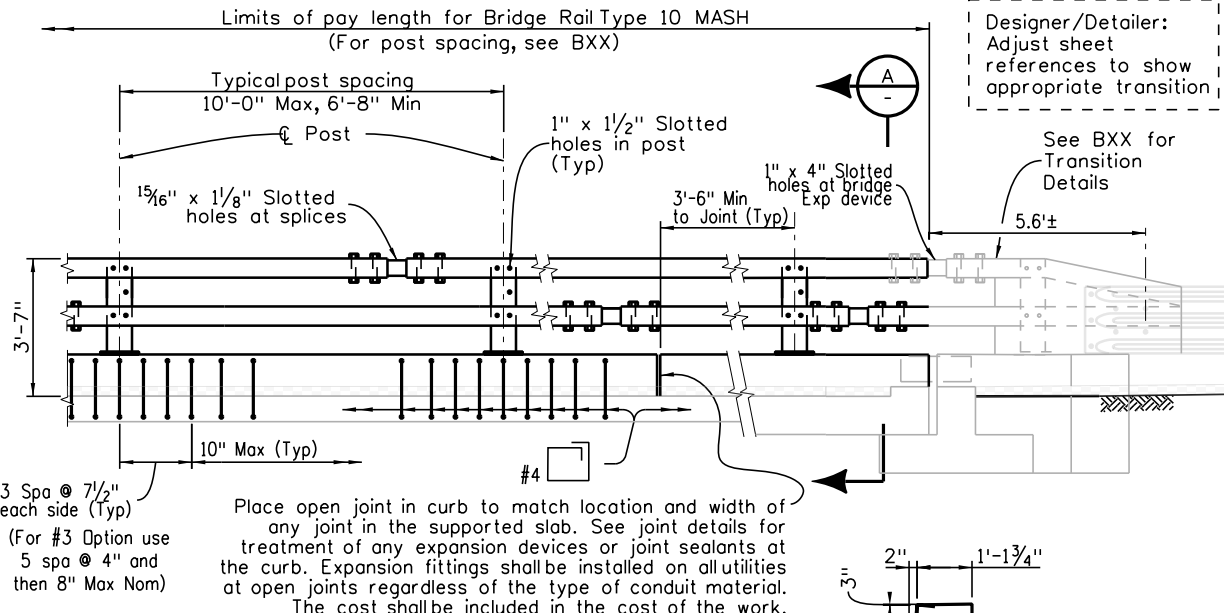


PLAN - TUBE SPLICE

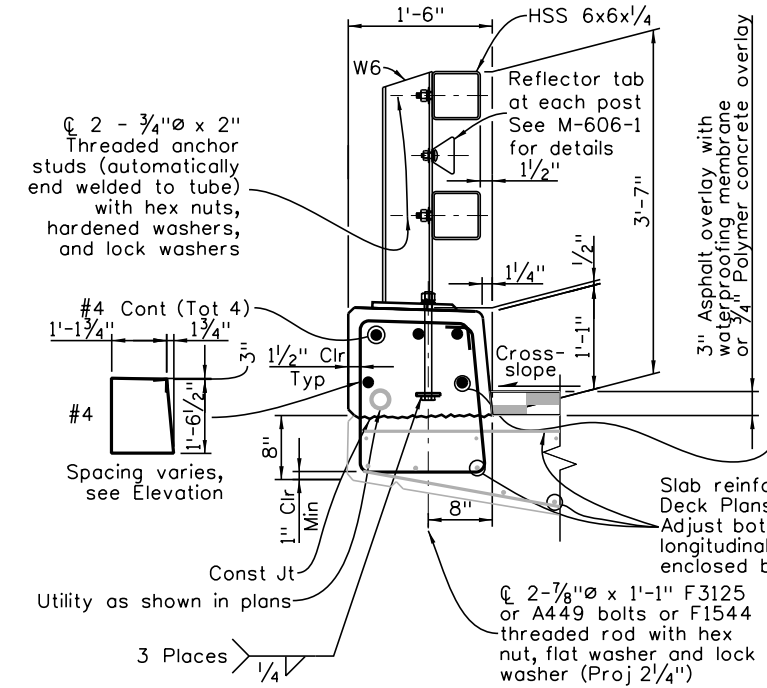
FOR INFORMATION ONLY

DESCRIPTION	UNIT	PER LF
Concrete Sealer	SY	0.28
Structural Steel (Galvanized)	LB	49.6
Concrete Class DF	CY	0.059
Reinforcing Steel (High Performance) ▲	LB	8.7

(6.6 for #3 Option)

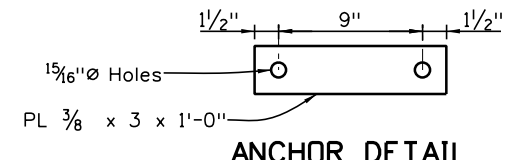


ELEVATION - BRIDGE RAIL



BRIDGE TYPICAL SECTION

Used when placed on concrete slab.
 Bottom of stirrup parallel to top of deck steel.



ANCHOR DETAIL

REVISION DATES	DATE	BY	DESCRIPTION
12/19	1/20		
6/20	6/20		
3/23	3/23		
9/24	9/24		
11/24	11/24		
11/25	11/25		

INITIALS	DESIGN	DATE	DETAIL	DATE	QUANTITY	DATE

Note to Designer: Any changes to reinforcing or shape requires Staff Bridge approval!

All seals for this set of drawings are applied to the cover page(s)	Print Date: \$DATE\$	Sheet Revisions		Colorado Department of Transportation		As Constructed		BRIDGE RAIL TYPE 10MASH		Project No./Code	
	File Name: Sheet_B-606-10MASH.dgn	Date:	Comments	Init.	2829 West Howard Place, 3rd Floor Denver, CO 80204 Phone: 303-512-4079 FAX: 303-757-9197		No Revisions:		Project Number		
	Horiz. Scale: None Vert. Scale: As Noted				Staff Bridge Branch		Revised:		Designer: XXXXXXXX	Structure Numbers: X-XX-XX	Code
	Unit Information Unit Leader Initials						Void:		Detailer: XXXXXXXX	Subset Sheets: BXX of XXX	Sheet Number