

NOTES:

All tubes shall be ASTM A-500 Grade C.
 Base plates shall be ASTM A-572 Grade 50.
 All other steel shall be ASTM A-36 unless otherwise noted.
 Bolts shall conform to ASTM A307
 Anchor rods shall conform to ASTM F1554 GR 55

The above material and all anchor rods and miscellaneous bolts, nuts, and washers shall be galvanized after fabrication in accordance with Section 509 and stained in accordance with Section 522 Environmental Stain (Galvanized) of the project specifications. The color shall be Weathering Steel Brown, equivalent to Federal Standard 595C Color No 20059. Set screws shall be a ferrous material with ultimate strength that is at least 60 ksi and shall be either hot dipped galvanized steel or stainless steel and shall be painted after assembly.

Concrete, reinforcing steel, and structural steel elements shall conform to the requirements of sections 601, 602 and 509, respectively.

The tubes shall be shop bent or fabricated to fit horizontal curve when radius is less than 2400 feet. Tubes shall be continuous over not less than three posts, preferably 4. No welded butt splices will be allowed in the tube sections.

The centerline of the tube splice or tube expansion splice shall be 1'-8" minimum from the centerline of the posts.

All bolts that have lock washers shall be tightened to snug only.

Posts shall be perpendicular to the longitudinal roadway grade.

One or more 10'-0" post spacings may be reduced (6'-8" Min) in order to maintain dimensions from the rail posts to parapet expansion gaps or to the end of rail. The centerline of the posts shall be 2'-6" minimum from the end of the parapet at an expansion joint or gap.

Anchor rods shall be set in an adhesive anchoring system. The adhesive anchoring system shall consist of an epoxy grout on the approved products list with a bond shear strength of no less than 1,600 psi and shall exceed the ultimate shear strength of the concrete. The anchor rods shall be clean and shall have threads full length to fully develop the shear bond capacity with the epoxy grout. The holes for the anchor bolts shall be core drilled and capable of cutting through the existing reinforcing steel. The surface of the core holes shall be clean and rough textured in accordance with the epoxy manufacturer's specifications to ensure adequate bond to develop the shear strength of the concrete.

Use Loctite, Permatex, Vibra-tite or equal (ASTM D5363) threadlocker to secure set screw.

Parapet, deck, and reinforcing details shown are an approximation of existing conditions, which will vary.

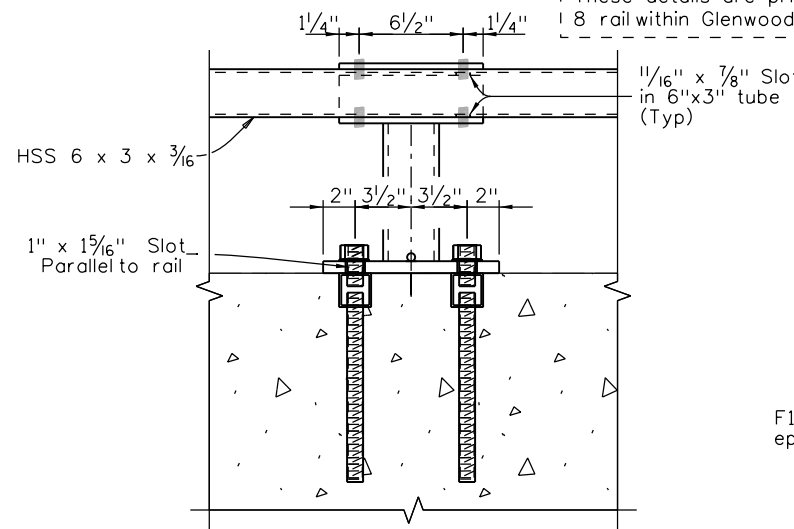
Payment will be made under Item 606, Bridge Rail Type 8R MASH for all posts, post anchors, base plates, anchors, miscellaneous bolts, nuts, washers, tubes, tube expansion devices, tube splices, reflector tabs, and joint cover systems. This shall also include concrete (Class D) and reinforcing steel as may be required for parapet repair or alteration to fit parapet expansion joint cover details.

Prior to fabrication of this item, three sets of working drawings which comply with the requirements of Section 105, shall be submitted to the Engineer for archiving and information only.

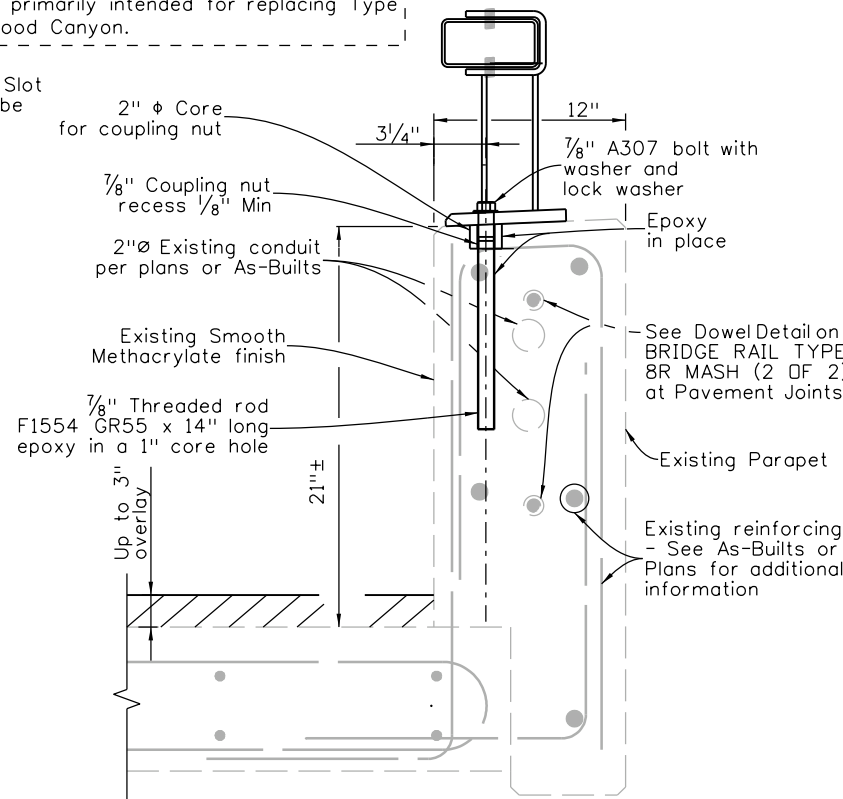
Structural Steel:	
AASHTO M-183 (ASTM A-36)	$f_y = 36$ ksi
Cold formed ASTM A500 Grade C	$f_y = 50$ ksi
AASHTO M223 (ASTM A572 Grade 50)	$f_y = 50$ ksi
Reinforced Concrete:	
Class D Concrete:	$f'_c = 4.5$ ksi
Reinforcing Steel:	$f_y = 60$ ksi

	"A"
Splices	0.375
Splices at Pavement Joints	0.625
Bridges	Per Exp Joint details but not less than 1" per 100' of bridge.

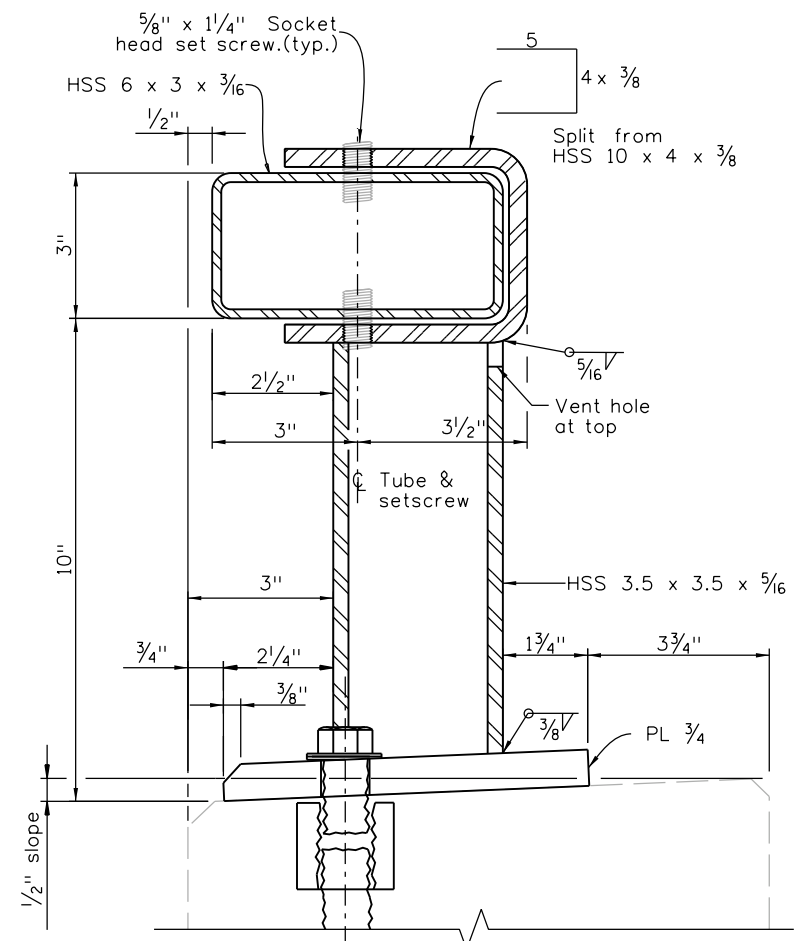
Designer:
 These barrier details have been MASH tested to TL-3 level only. No changes shall be made without approval.
 These details are primarily intended for replacing Type 8 rail within Glenwood Canyon.



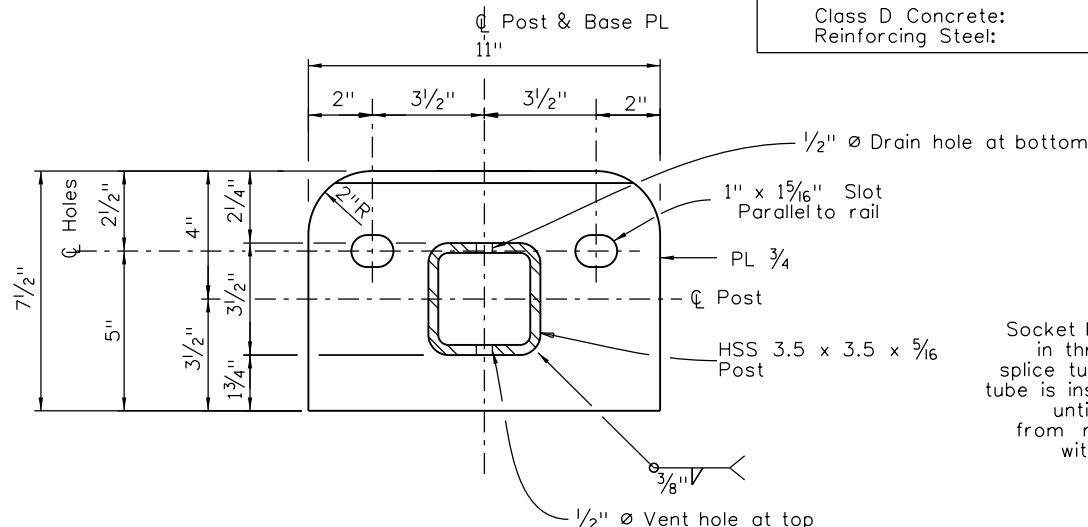
ELEVATION



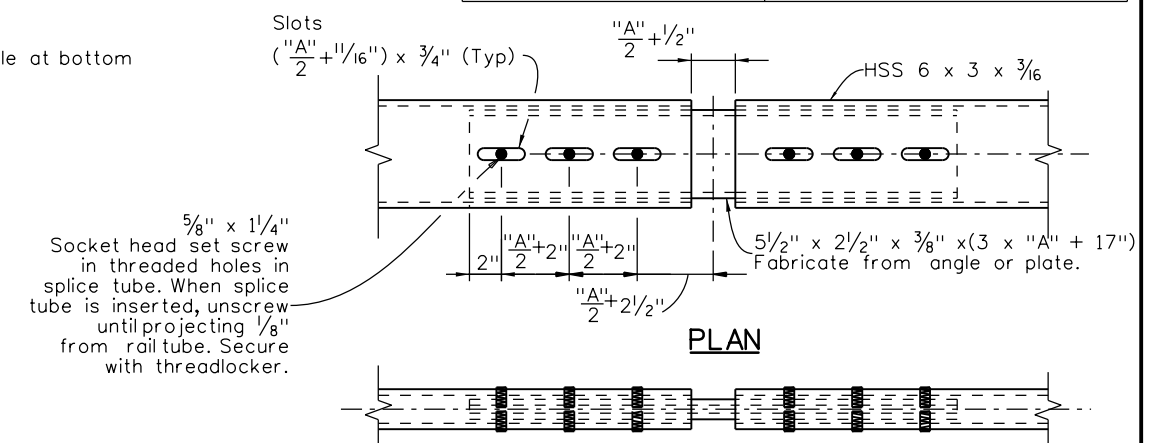
PARAPET SECTION



SECTION



BASE PLATE DETAILS



ELEVATION

Revision Dates	(Preliminary Stage Only)
6/19	

INITIALS	DESIGN	DATE	DETAIL	DATE	QUANTITY	DATE
By						
Checked By						

Print Date: \$DATE\$	Sheet Revisions			Colorado Department of Transportation		As Constructed		BRIDGE RAIL TYPE 8R MASH (1 OF 2)		Project No./Code			
File Name: Sheet B-606-8RMASHA.dgn	Date:	Comments	Init.	2829 West Howard Place, 3rd Floor Denver, CO 80204 Phone: 303-512-4079 FAX: 303-757-9197		No Revisions:		Designer: XXXXXXXX Detailer: XXXXXXXX Sheet Subset: BRIDGE Subset Sheets: XXX of XXX		Project Number			
Horiz. Scale: 1:1						Revised:				Structure Numbers		Code	
Unit Information						Void:				X-XX-XX		Sheet Number	
				Staff Bridge Branch		Initials							