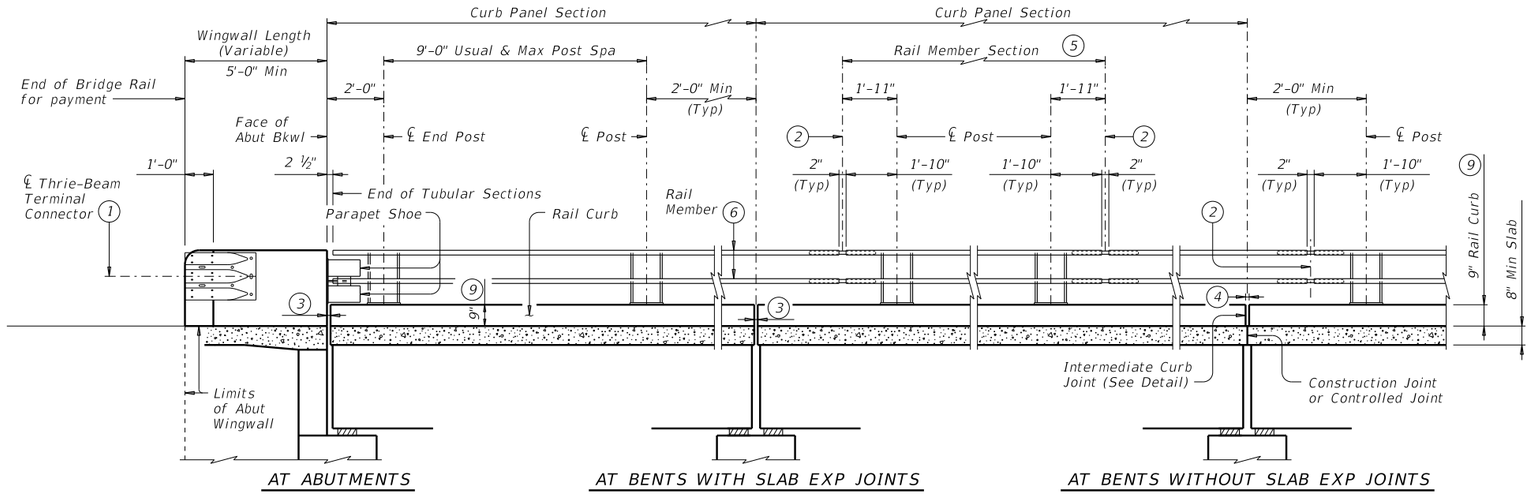


ROADWAY ELEVATION OF RAIL

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) ℄ Expansion Joint or Splice Joint as required.

(3) Same as slab joint opening. (5" Max Expansion Joint).

(4) ¼" Min, ¾" Max.

(5) Rail member sections must have at least two posts but not more than four.

(6) HSS 6 x 2 x ¼ (ASTM-A1085 or A500 Grade B).

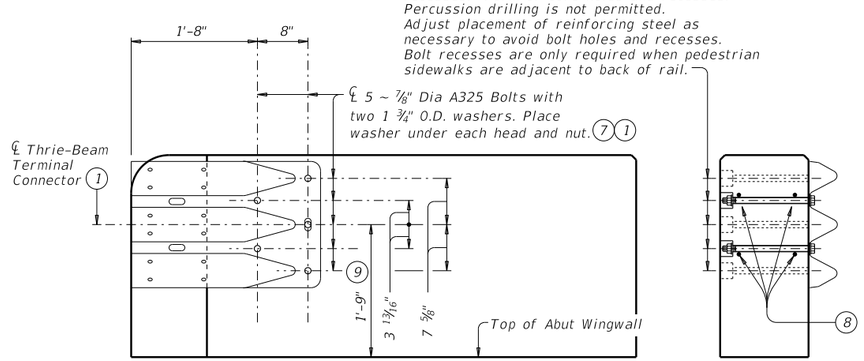
(7) Provide bolts of sufficient length to extend ½" to ¾" beyond nut.

(8) Place 4 additional Bars R(#5) 3'-8" in length inside Bars U(#5) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.

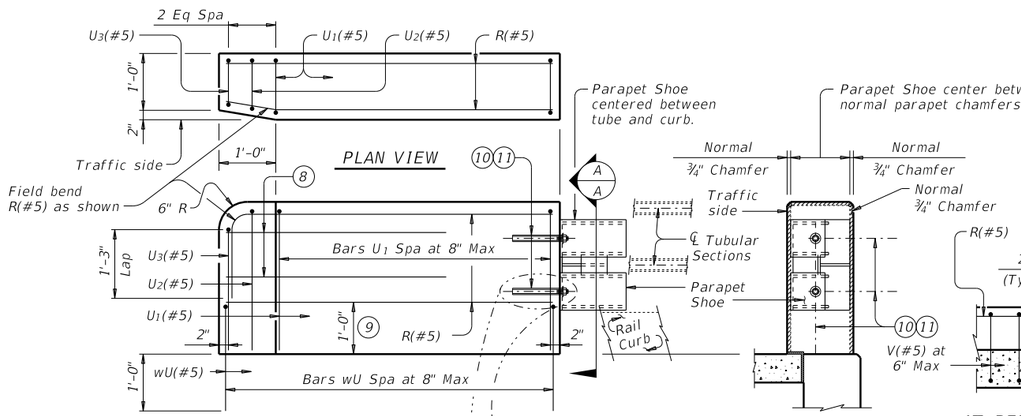
(9) Increase 2" for structures with overlay.

(10) Anchor bolts must be ⅞" Dia ASTM A193 Grade B7 or F1554 Gr 105 fully threaded rods with heavy hex nuts and one hardened washer (1 ¾" OD) each. Embed threaded rods 8" into parapet wall with a Type III, Class C, D, E, or F epoxy anchorage system.

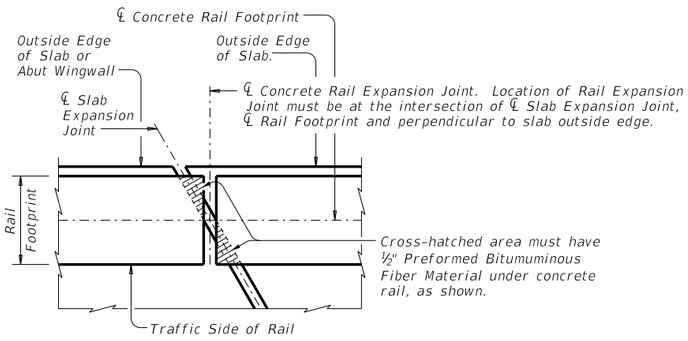
(11) Install Parapet Shoe after rail has been placed. To ease installation, temporarily brace parapet shoe until the anchorage system achieves manufacturer's recommended curing time. Anchorage system must be assembled with one (1 ¾" OD) hardened washer and one heavy hex nut each. Remove temporary bracing after anchorage systems has been firmly tightened.



TERMINAL CONNECTION DETAILS

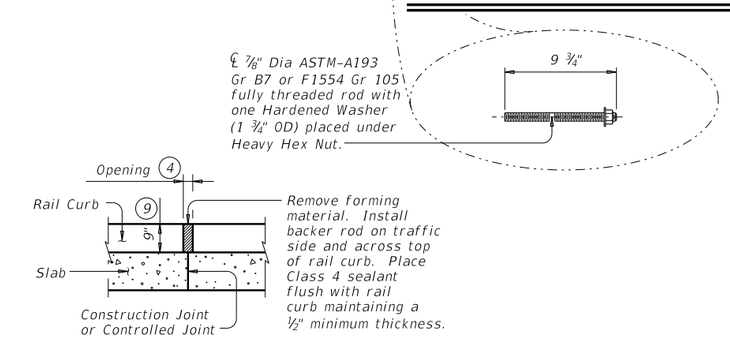


ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.



INTERMEDIATE CURB JOINT DETAIL

Provide at all interior bents without slab expansion joints. Location independent of rail member splices.

SHEET 1 OF 4

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T1W

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REVISIONS				
03-16: Moved chamfer note to Construction Notes. Added Class D, E or F epoxy to note 10.	DIST	COUNTY		SHEET NO.

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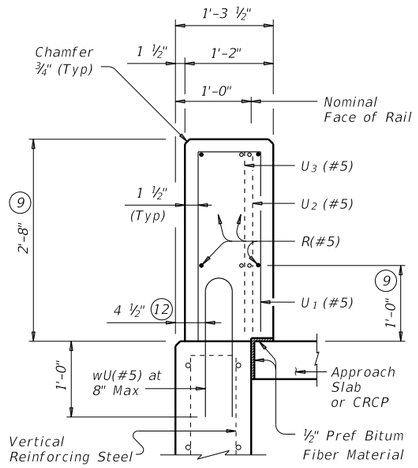
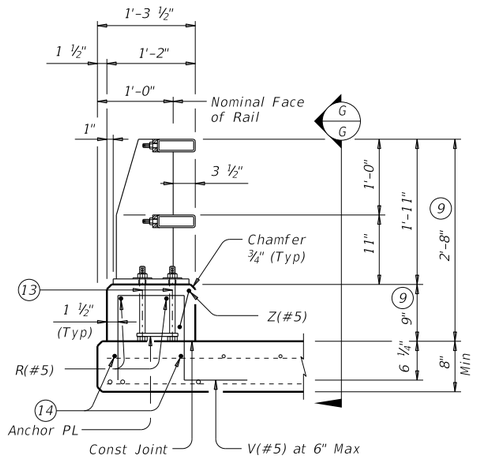
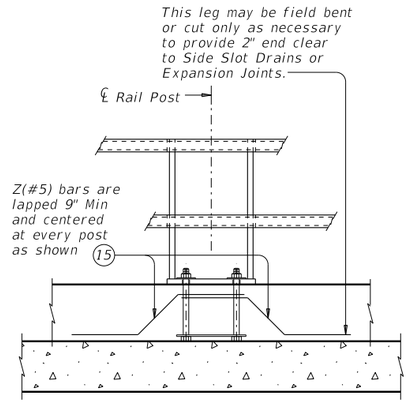


ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS

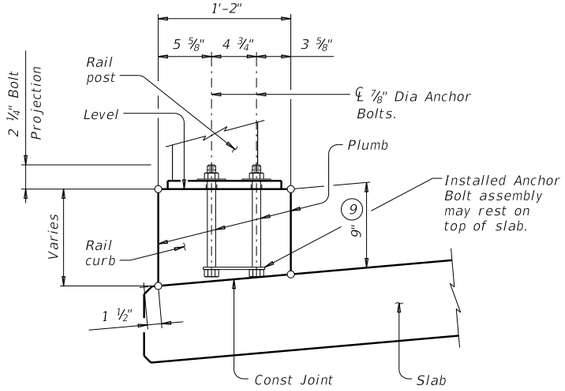


ON BRIDGE SLAB



VIEW G-G

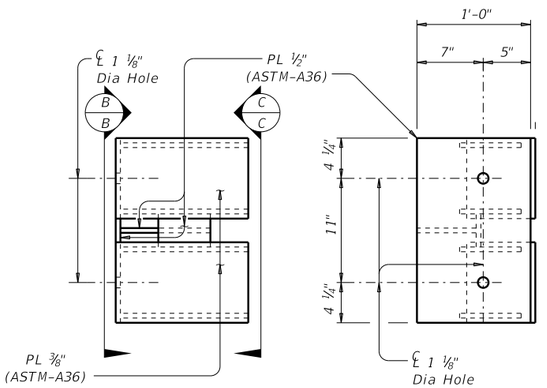
Bars V and R omitted for clarity.



RAIL CURB FORMING DETAIL

Reinforcing steel and rail curb chamfers not shown for clarity.

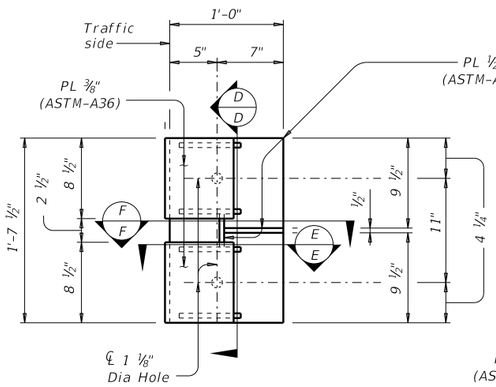
SECTIONS THRU RAIL



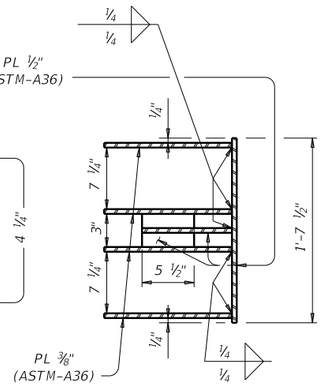
PARAPET SHOE

(Parapet Shoe weight = 92 lb each, for contractor's information only).

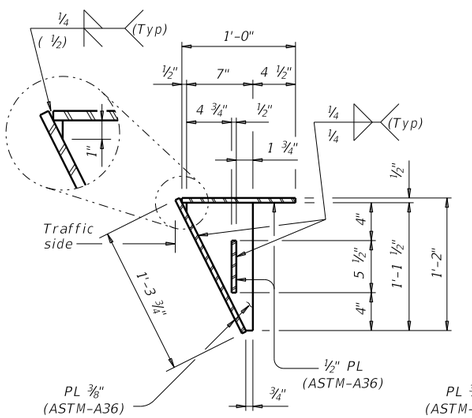
VIEW B-B



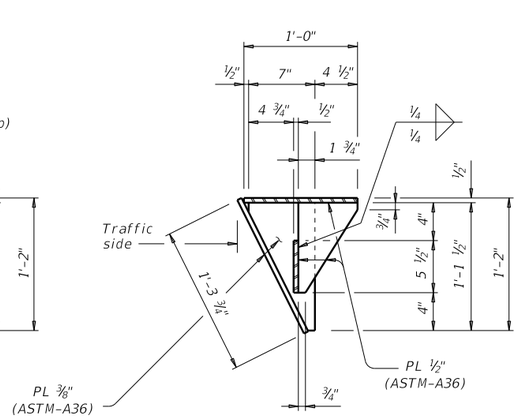
VIEW C-C



SECTION D-D



SECTION E-E



SECTION F-F

(9) Increase 2" for structures with overlay.

(12) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

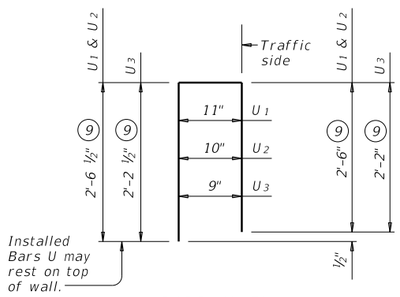
(13) ℄ ⅞" Dia Anchor Bolts. See "Anchor Bolt Assembly Details".

(14) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

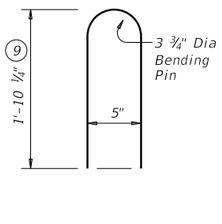
(15) Adjust Bars Z(#5) as necessary to avoid Bars V(#5).

(16) Length shown for 6 ¼" Min bar embedment with no overlay. Adjust as required.

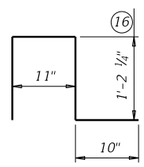
(17) Increase 2 ¾" for structures with overlay.



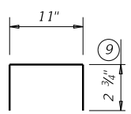
BARS U(#5)



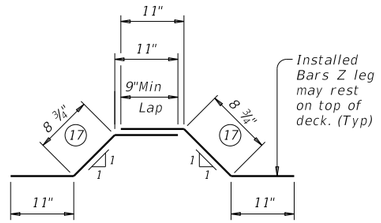
BARS wU(#5)



BARS V(#5)



BARS VS(#5)



BARS Z(#5)

SHEET 2 OF 4

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T1W

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REVISIONS				
03-16: Moved chamfer note to Construction Notes. Added Class D, E or F epoxy to note 10.	DIST	COUNTY		SHEET NO.

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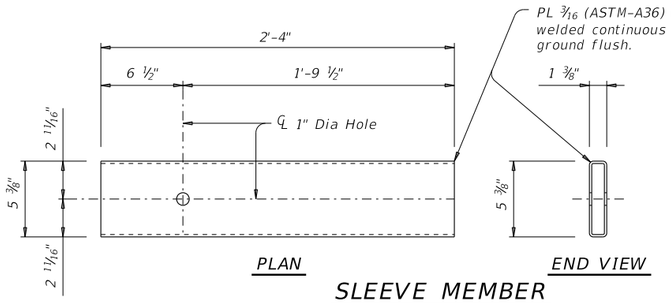
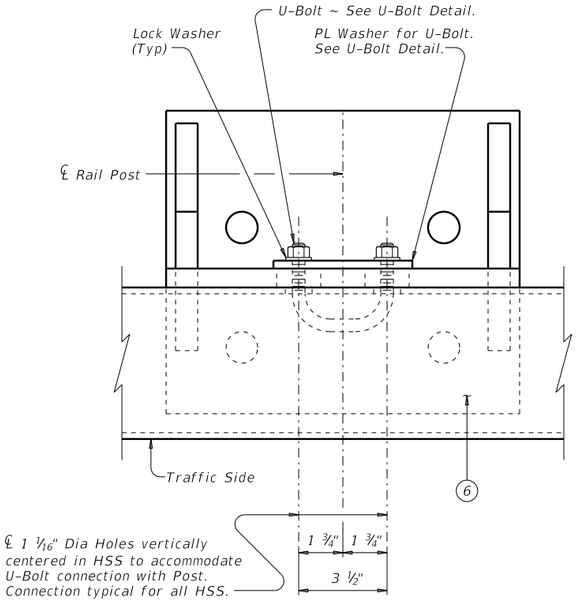
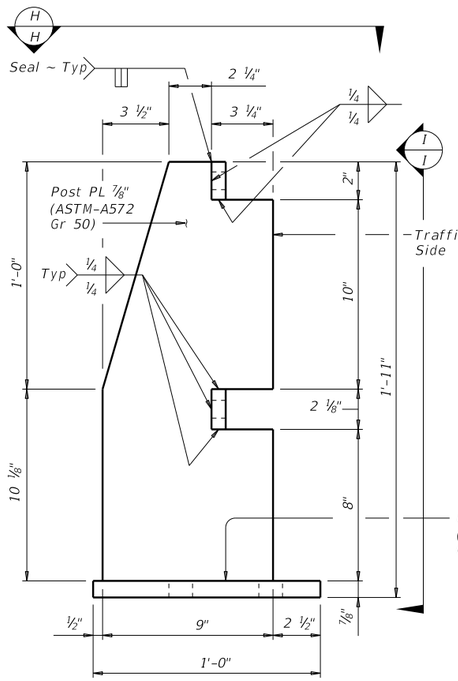


SLEEVE MEMBER

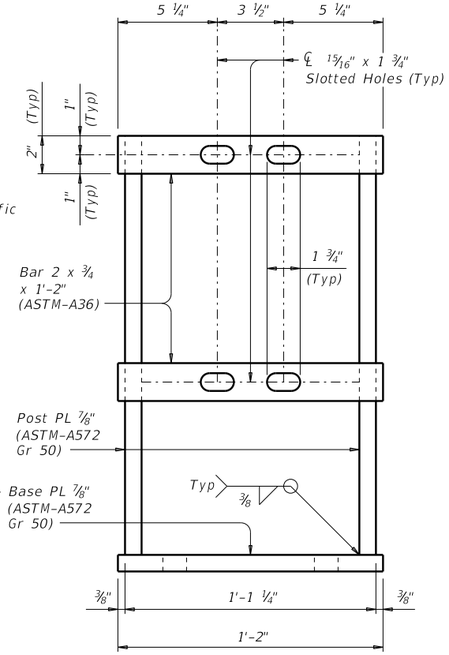


TOP VIEW OF RAIL POST

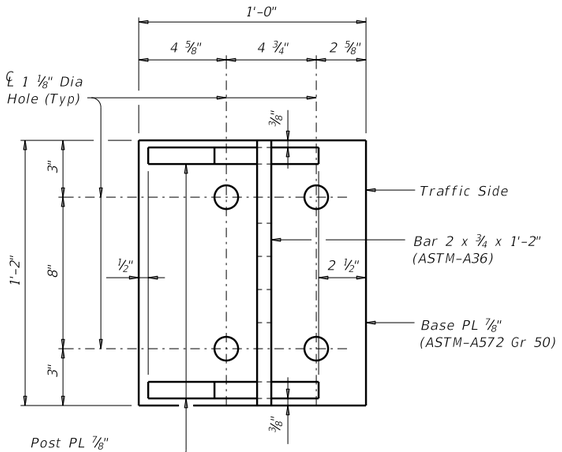
(Showing connection for rail post and HSS.)



POST DETAIL

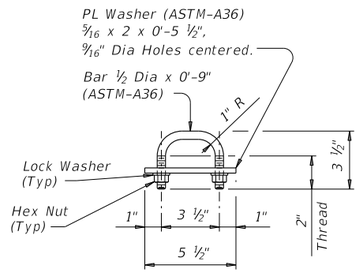


VIEW I-I



VIEW H-H

(Showing Hole location in Base PL)

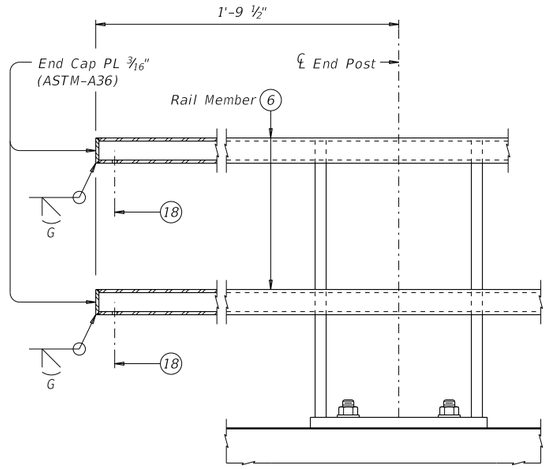


U-BOLT DETAIL

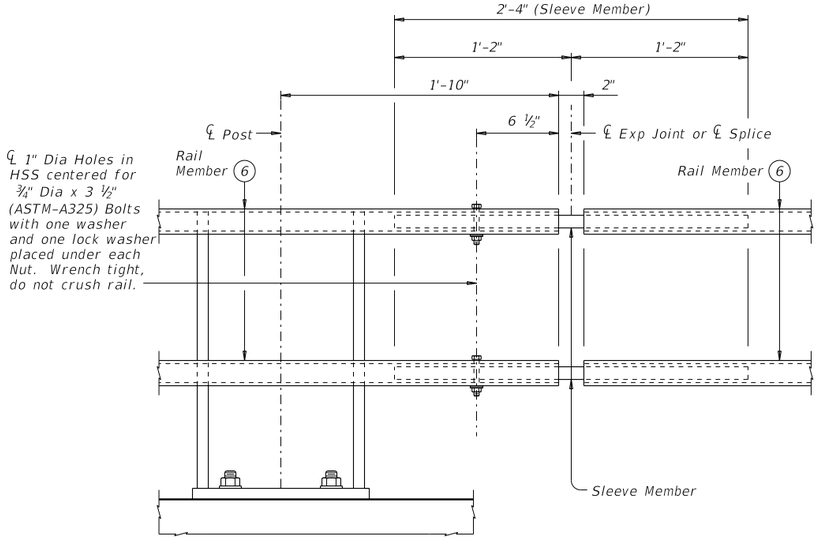
(Showing U-Bolt for rail post and HSS.)

⑥ HSS 6 x 2 x ¼ (ASTM-A1085 or A500 Grade B).

⑱ ℄ ⅜" Dia Drain Hole in bottom of HSS.



END CAPS ON HSS AT END POST



EXPANSION JOINT OR SPLICE

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TRAFFIC RAIL

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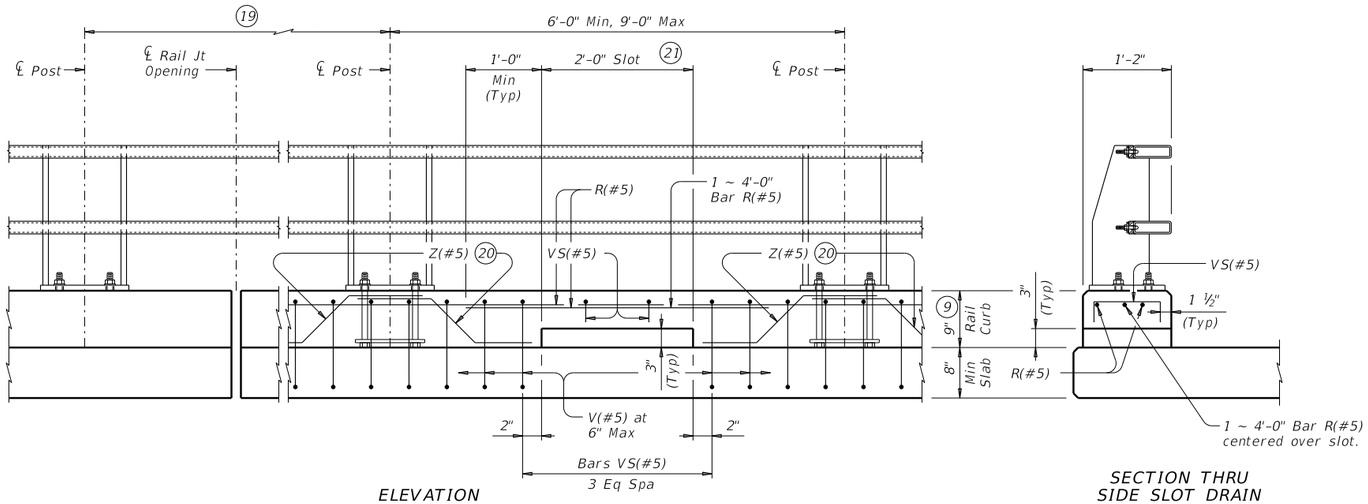
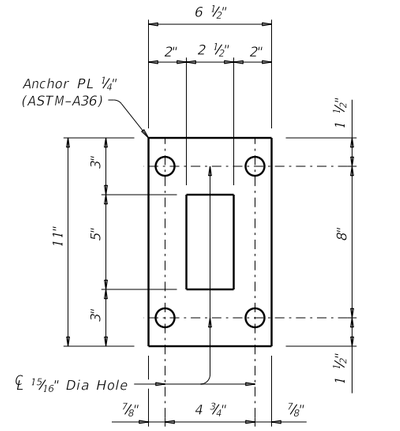
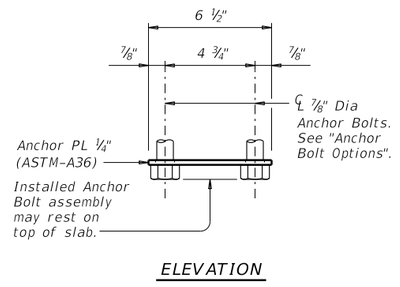
FILE:



OPTIONAL SIDE SLOT DRAIN DETAILS 22



PLAN OF ANCHOR PLATE 23



ELEVATION

ANCHOR BOLT ASSEMBLY DETAILS

(9) Increase 2" for structures with Overlay.

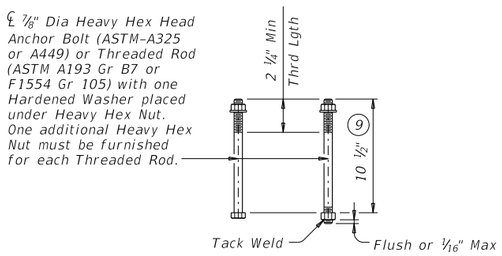
(19) Side slot drains are not allowed in areas where there is a joint in the concrete curb between rail posts.

(20) Bars Z(#5). See "Section Thru Rail" and "View G-G" for Bar Z placement and spacing.

(21) Center side slot drain between posts within the limits shown.

(22) Side slot drains may be used where shown elsewhere on the plans or as directed by the Engineer. Do not place drains over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway and a sidewalk, side slot drains are not permitted.

(23) Galvanizing Anchor Plate is not required.



ANCHOR BOLT OPTIONS

(Showing Anchor Bolts for Base Plate)

CONSTRUCTION NOTES:

The face of tubular sections and rail curb must be plumb unless otherwise approved. Steel posts must be square to the top of curb. Use Type VIII epoxy mortar under post base plates if gaps larger than 1⁄16" exist.

Bend tubes to required radius for curved rails. Shop drawings for approval are required for curved rails.

One shop splice per rail member section is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.

Round or chamfer exposed edges of rail members and rail posts to approximately 1⁄16" by grinding.

Chamfer all exposed concrete corners.

MATERIAL NOTES:

Galvanize all steel components except reinforcing steel and anchor plate unless noted otherwise.

When plans require painted steel, follow the requirements for painting galvanized steel in Item 446, "Field Cleaning and Painting Steel". Do not paint sleeve members until after they are installed.

Anchor bolts for base plate must be ⅞" Dia ASTM A325 or A449 bolts (or ASTM-A193 Gr B7 or F1554 Gr 105 threaded rods with one tack welded heavy hex nut each) with one hardened washer placed under each heavy hex nut. Nuts must conform to A563 requirements.

Provide Class "S" concrete. When Class "S" concrete for slab is HPC, include a minimum of 3 gallons of calcium nitrite inorganic corrosion inhibitor per cubic yard of Class "S" concrete.

Provide Grade 60 reinforcing steel.

Provide bar laps, where required, as follows:

Uncoated ~ #5 = 1'-9"
Epoxy coated ~ #5 = 2'-7"

Epoxy coat all rail reinforcement if slab bars are epoxy coated.

GENERAL NOTES:

This rail has been evaluated and accepted to be of equal strength to railings with like geometry, which have been crash tested to meet NCHRP Report 350 TL-3 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use his railing on bridges with expansion joints providing more than 5" movement or on cast-in-place retaining walls, unless otherwise noted.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Submit erection drawings showing panel lengths, rail post spacing, and anchor bolt setting, to the Engineer for approval.

Average weight of railing with no overlay:

173 plf total
131 plf (Conc)
42 plf (Steel).

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

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TRAFFIC RAIL

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