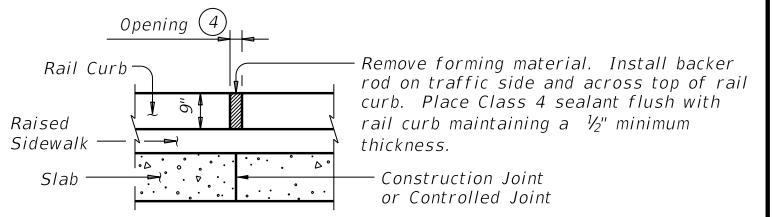


INTERMEDIATE CURB JOINT DETAIL

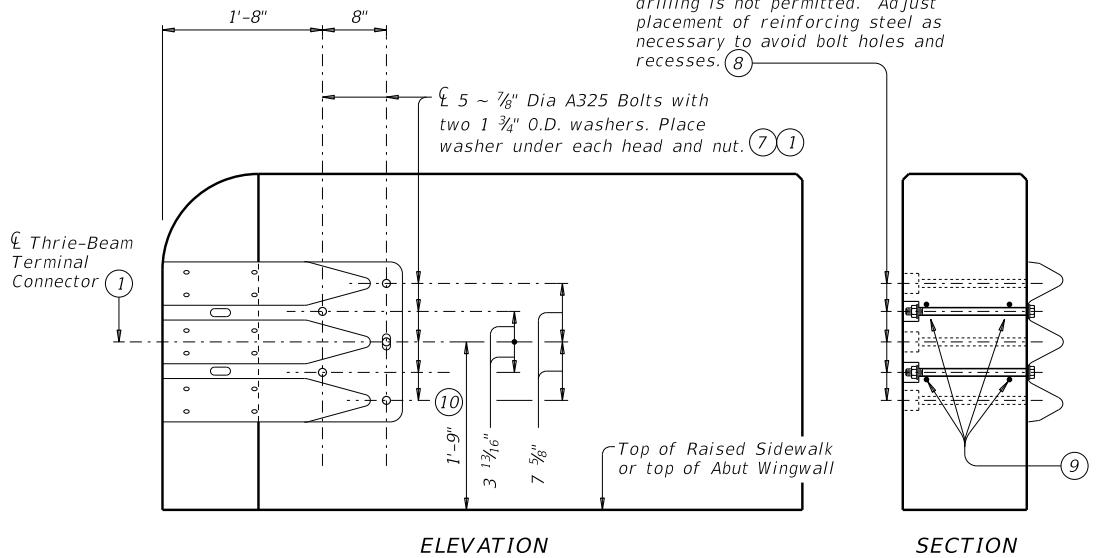
Provide at all interior bents without slab expansion joints. Location independent of rail member splices.



ROADWAY ELEVATION OF RAIL

Showing combination rail on a raised sidewalk.

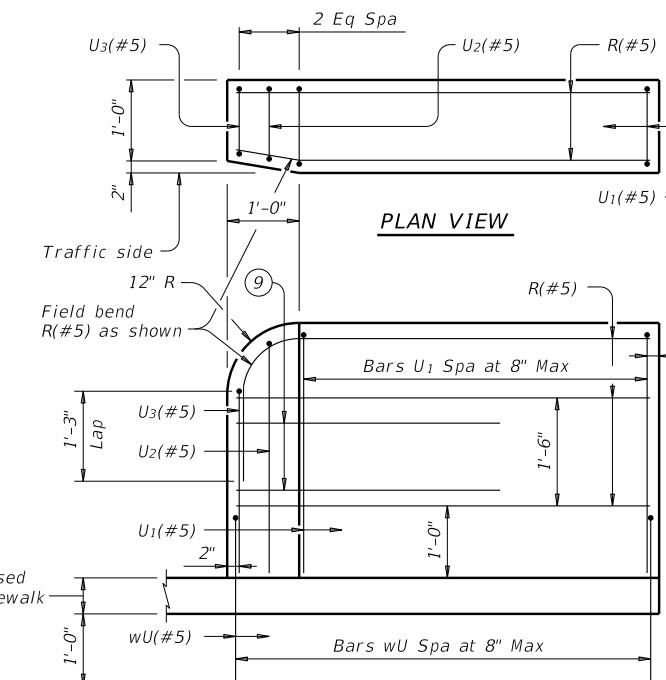
5 ~ 1" Dia holes and 2 1/2" Dia x 2" deep recesses. Form or core holes and recesses. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. 8



TERMINAL CONNECTION DETAILS

- (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) 1/4 Expansion Joint or Splice Joint as required.
- (3) Same as slab joint opening. (5" Max Expansion Joint).
- (4) 1/4 Min, 3/4 Max.
- (5) Rail member sections must have at least two posts but not more than four.
- (6) HSS 6 x 2 x 1/4 (ASTM-A1085 or A500 Grade B).

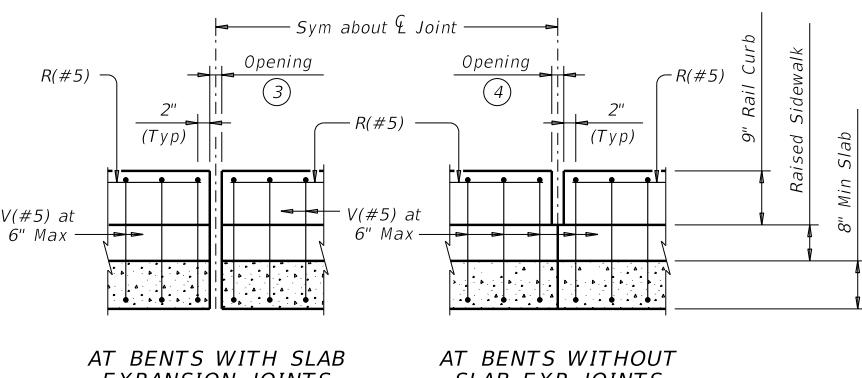
- (7) Provide bolts of sufficient length to extend 1/2" to 3/4" beyond nut.
- (8) Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail.
- (9) Place 4 additional Bars R(#5) 3'-8" in length inside Bars U(#5) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.
- (10) Increase 2" for structures with Overlay.



AT ABUTMENT WINGWALL

ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

Showing with raised sidewalk

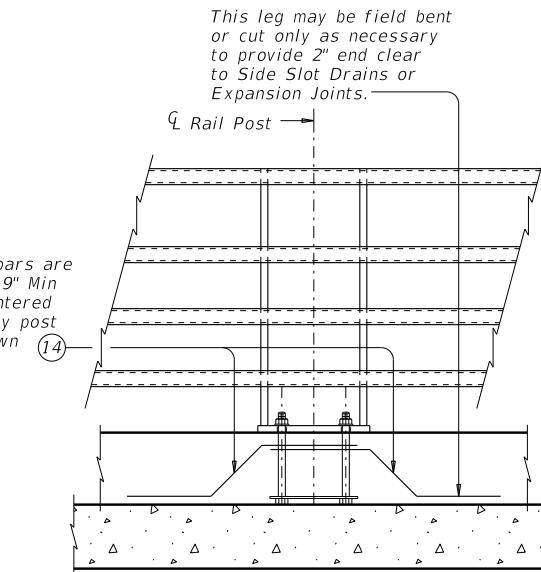
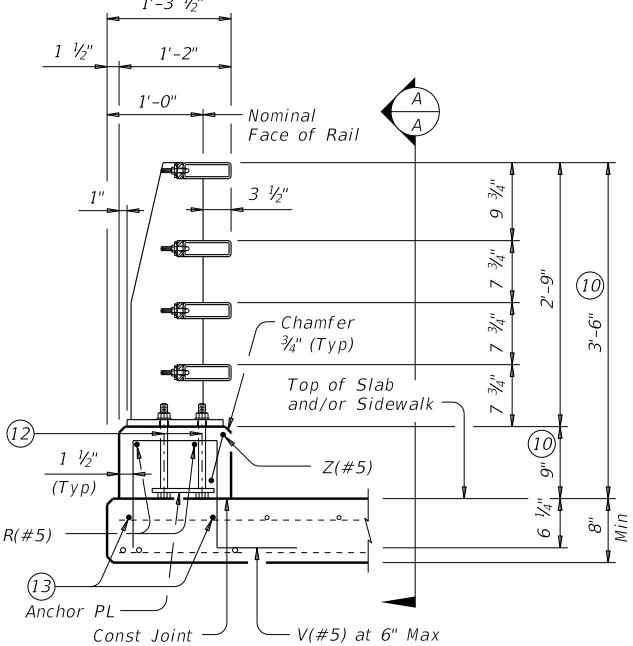
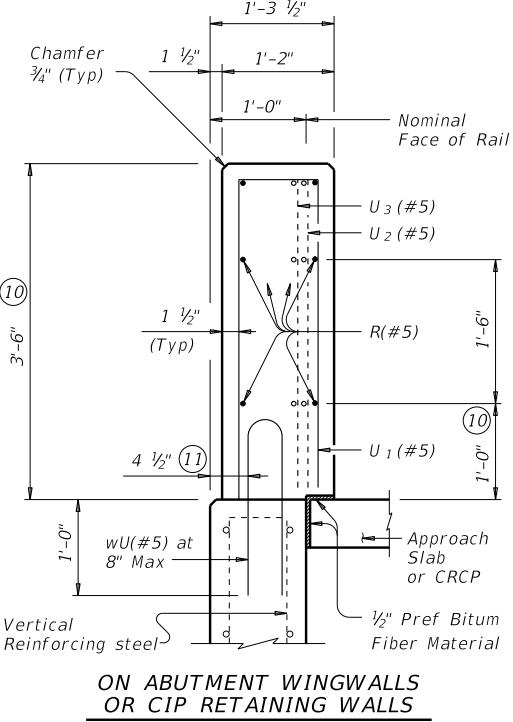


SHEET 1 OF 4

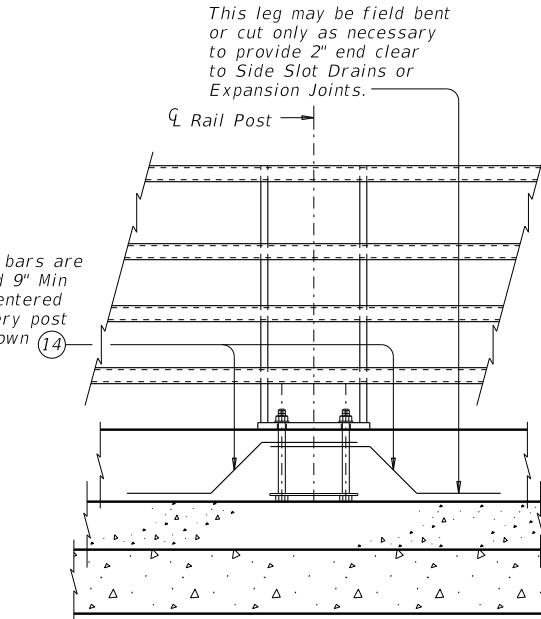
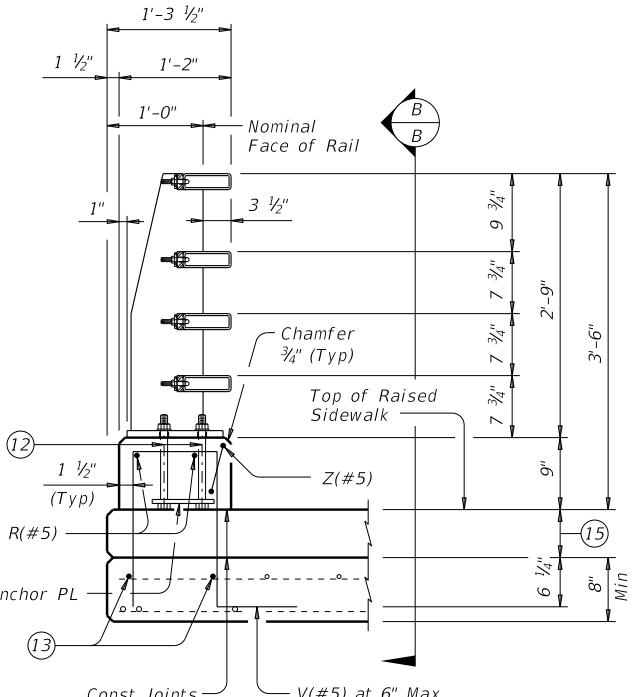
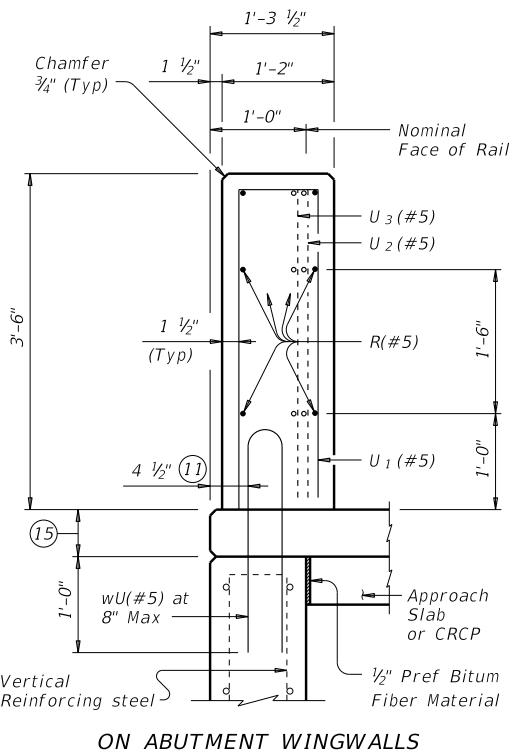
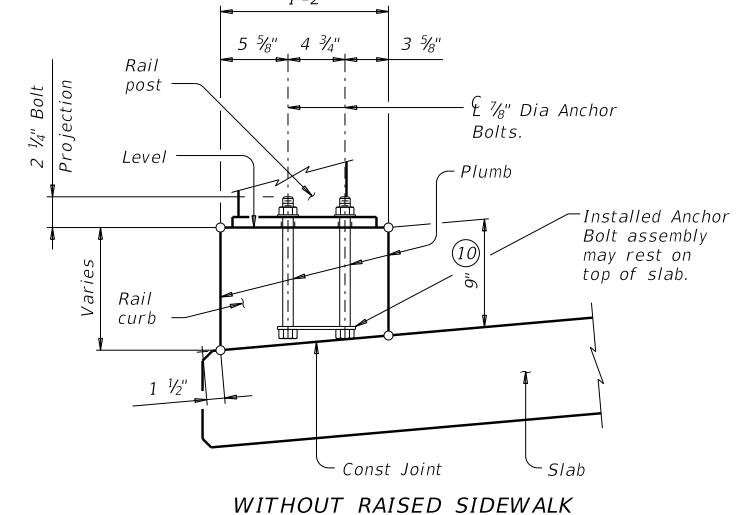
 Texas Department of Transportation		Bridge Division Standard				
		FILE: r1std017.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
© TxDOT	July 2014	REVISIONS	CONT	SECT	JOB	HIGHWAY
			DIST	COUNTY		SHEET NO.

COMBINATION RAIL

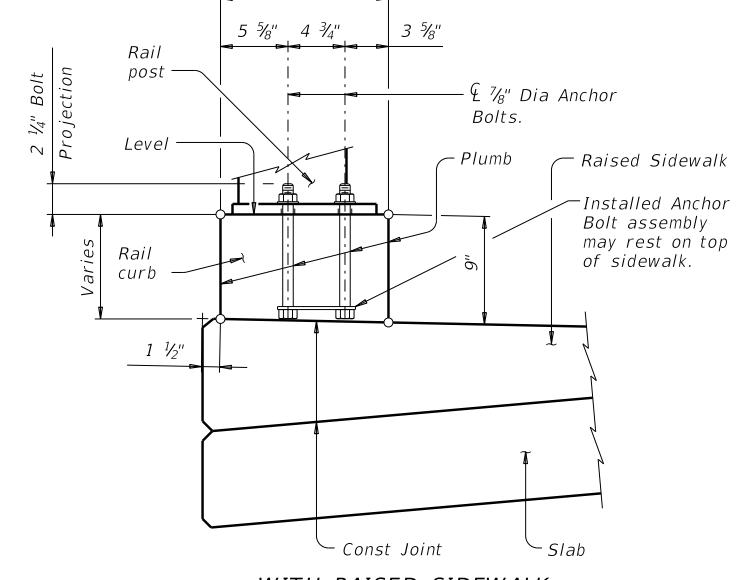
TYPE C1W



Bars V and R omitted for clarity.
Showing without raised sidewalk.



Bars V and R omitted for clarity.
Showing with raised sidewalk.



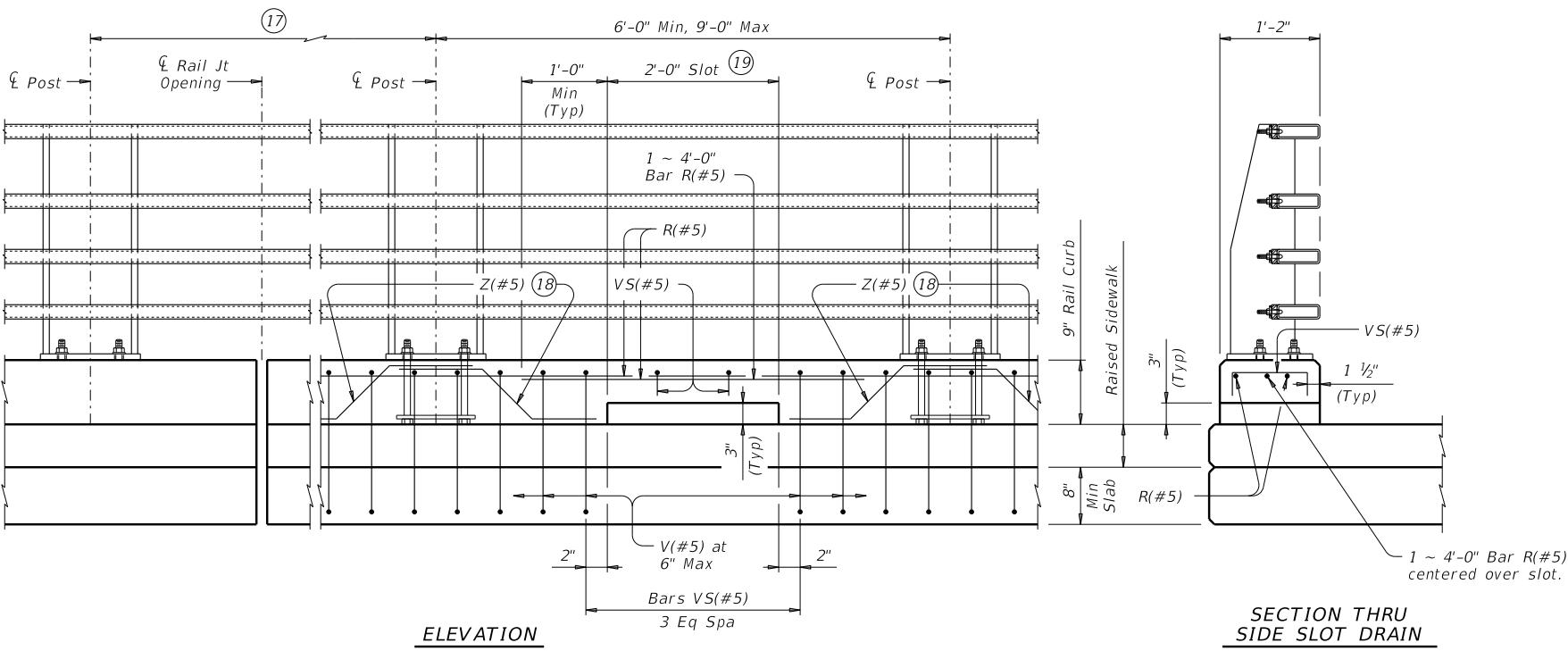
RAIL CURB FORMING DETAIL

Reinforcing steel and rail curb chamfers not shown for clarity.

SHEET 2 OF 4

	Bridge Division Standard
COMBINATION RAIL	
TYPE C1W	
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	CK: JMH
	CONT SECT JOB HIGHWAY
DIST	COUNTY
	SHEET NO.

- ⑩ Increase 2" for structures with Overlay.
- ⑪ 5 1/4" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.
- ⑫ 4 1/8" Dia Anchor Bolts. See "Anchor Bolt Assembly Details".
- ⑬ Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.
- ⑭ Adjust Bars Z(#5) as necessary to avoid Bars V(#5).
- ⑮ Raised Sidewalk.

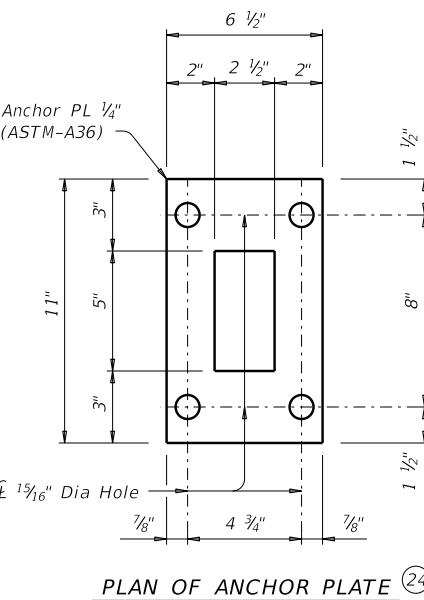


ELEVATION

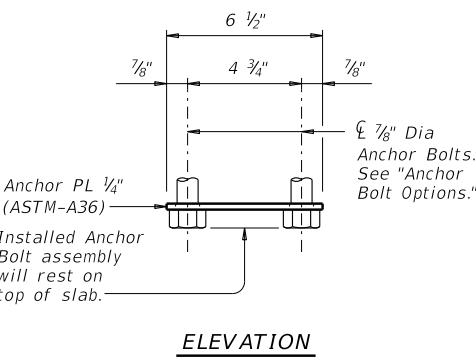
SECTION THRU
SIDE SLOT DRAIN

OPTIONAL SIDE SLOT DRAIN DETAILS ⑳

Showing side slot drain on raised sidewalk, without raised sidewalk similar.

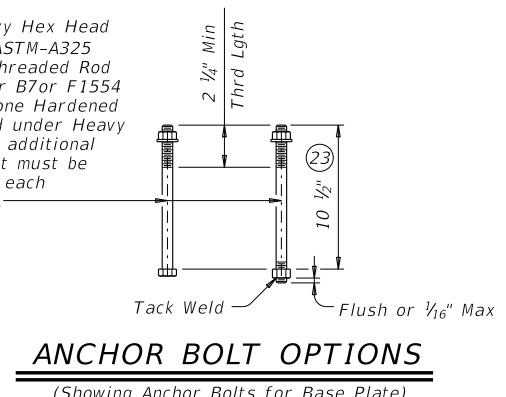


PLAN OF ANCHOR PLATE ⑳



ELEVATION

ANCHOR BOLT ASSEMBLY DETAILS

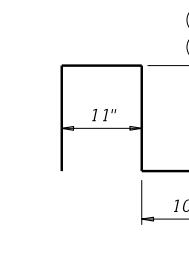


ANCHOR BOLT OPTIONS

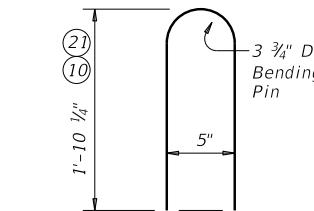
(Showing Anchor Bolts for Base Plate)

- ⑩ Increase 2" for structures with Overlay.
- ⑪ Side slot drains are not allowed in areas where there is a joint in the concrete curb between rail posts.
- ⑫ Bars Z(#5). See "Section Thru Rail" and "View A-A or B-B" for Bar Z placement and spacing.
- ⑬ Center side slot drain between posts within the limits shown.
- ⑭ 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.
- ⑮ For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.
- ⑯ Increase 2 3/4" for structures with Overlay.
- ⑰ When rail is used as a traffic barrier protecting the pedestrian walkway with no raised sidewalk, increase 2" for structures with overlay.
- ⑱ Galvanizing Anchor Plate is not required.

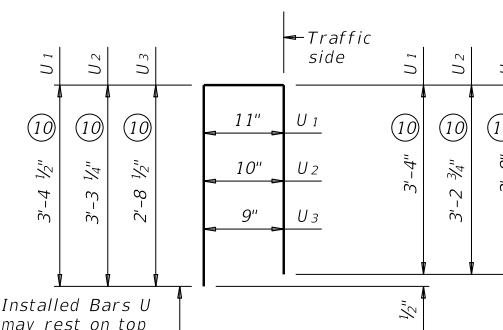
BARS VS(#5)



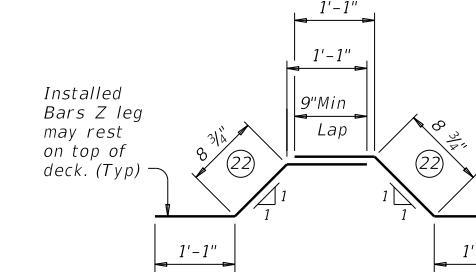
BARS V(#5)



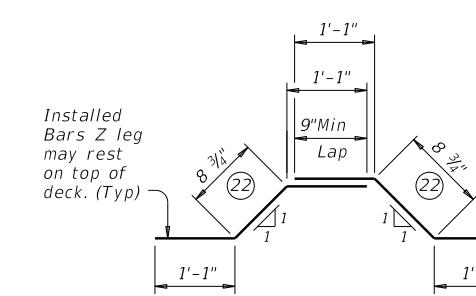
BARS wU(#5)



BARS U(#5)



BARS Z(#5)



CONSTRUCTION NOTES:

The face of tubular sections and rail curb must be plumb unless otherwise approved by the Engineer. 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 must be rounded or chamfered to approximately 1/16" by grinding.

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, "Cleaning and Painting Steel". Do not paint sleeve members until after they are installed.

Anchor bolts for base plate must be 7/8" 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. Chamfer all exposed corners.

Provide Grade 60 reinforcing steel.

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

Provide bar laps, where required, as follows:

Uncoated ~ #5 = 1'-9"

Epoxy coated ~ #5 = 2'-7"

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 this railing on bridges with expansion joints providing more than 5" movement.

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:

205 plf total

131 plf (Conc)

74 plf (Steel).

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

SHEET 4 OF 4

Texas Department of Transportation		Bridge Division Standard
COMBINATION RAIL		
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DIST	COUNTY	SHEET NO.

TYPE C1W