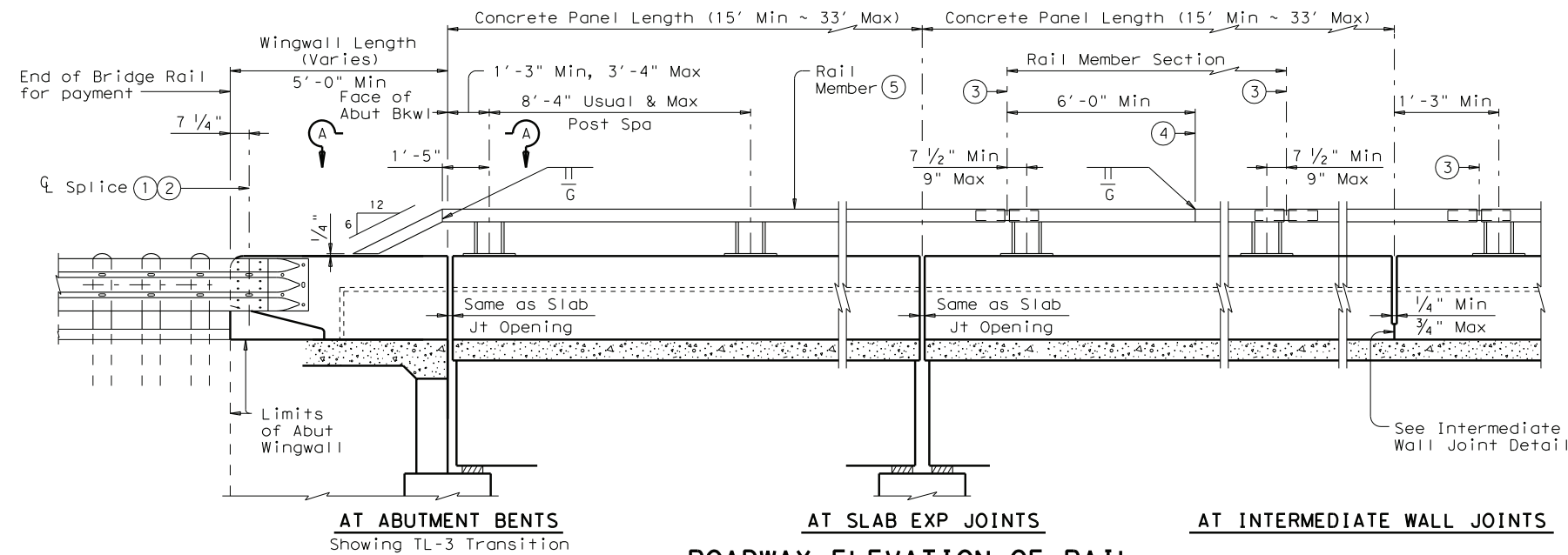
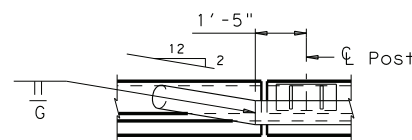


DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



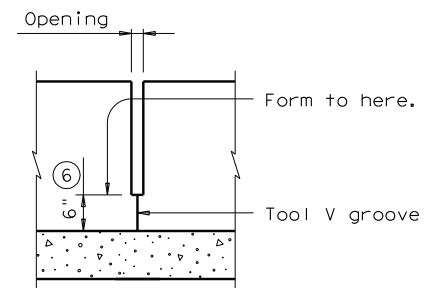
ROADWAY ELEVATION OF RAIL

(Rail Member showing Elliptical Tube Option, Rectangular Tube Option similar).



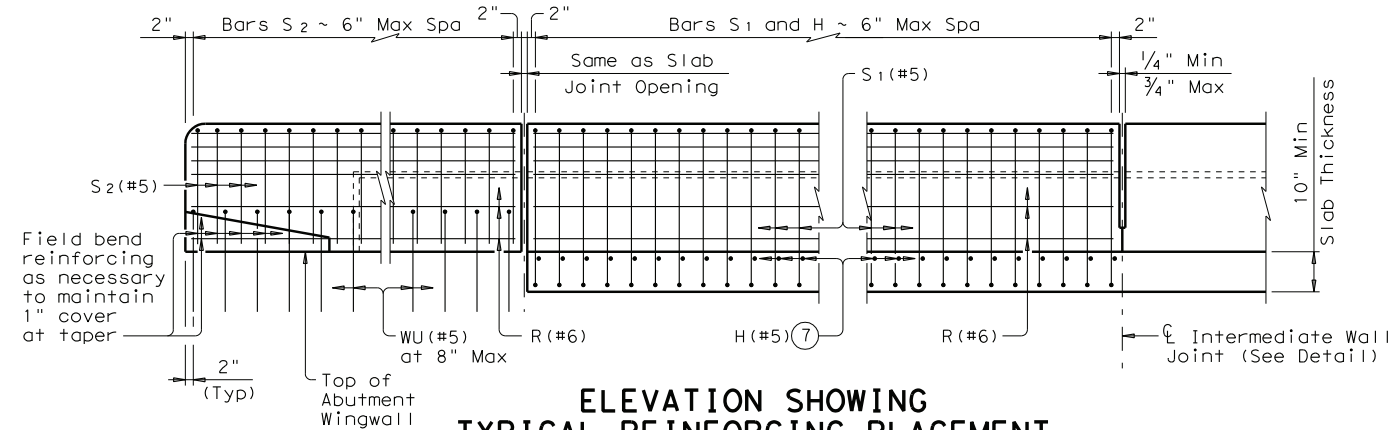
VIEW A-A

(Showing Rail Member turn-down)
 (Rail Member showing Elliptical Tube Option, Rectangular Tube Option similar).



INTERMEDIATE WALL JOINT DETAIL

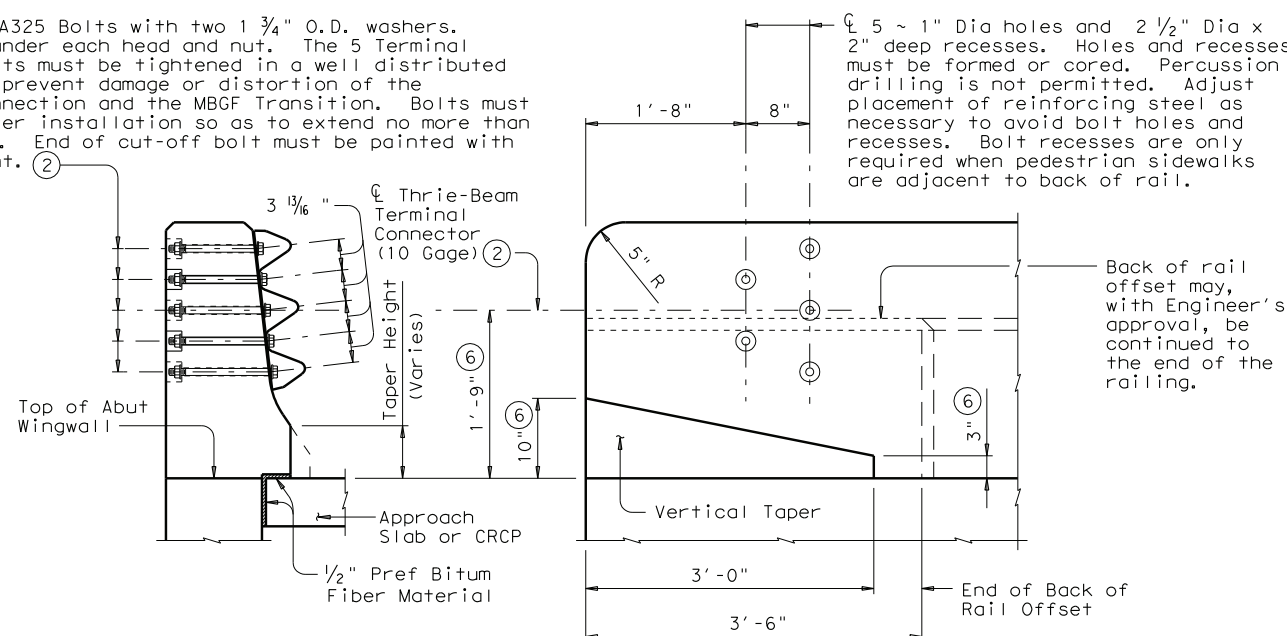
Provide at all interior bents without slab expansion joints. Space equally in between at 33' Max, 15' Min. Location independent of rail member splices.



ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

ϕ 5 ~ $\frac{7}{8}$ " Dia A325 Bolts with two $1\frac{3}{4}$ " O.D. washers. Place washer under each head and nut. The 5 Terminal Connection Bolts must be tightened in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the MBGF Transition. Bolts must be cut off after installation so as to extend no more than $\frac{3}{4}$ " beyond nut. End of cut-off bolt must be painted with Zinc-rich paint.

ϕ 5 ~ 1" Dia holes and 2 $\frac{1}{2}$ " Dia x 2" deep recesses. Holes and recesses must be formed or cored. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail.



SECTION ELEVATION TL-3 TERMINAL CONNECTION DETAILS

- ① Showing TL-3 Splice location. Metal Beam Guard Fence Transitions must be attached to the bridge rail and extended along the embankment unless otherwise shown in the plans.
- ② Terminal Connector and associated hardware are to be paid for under the Item "Metal Beam Guard Fence".
- ③ ϕ Exp Jt or Splice Jt as required.
- ④ One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove, double vee groove, or single groove. Grind smooth.
- ⑤ Unless directed otherwise by the Engineer, the fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.
- ⑥ Increase 2" for structures with Overlay.
- ⑦ Bars H(#5) are part of rail reinforcing and are included in unit price bid for railing. Extend Bars H 2'-0" Min past ϕ of beam/girder. Space with Bars S1. Bars H match slab bar cover. Bars H may be bundled with top slab reinforcing if spacing is equivalent. Omit Bars H when top slab reinforcement is spaced less than 4".

SHEET 1 OF 3



TRAFFIC RAIL

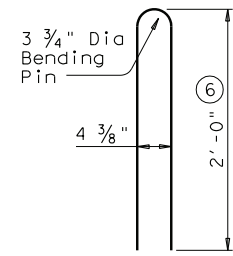
TYPE T80HT

FILE: r1std015.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
© TxDOT April 2009	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
05-11: Notes and Wall Joint Note.	COUNTY	CONTROL	SECT	JOB
				HIGHWAY

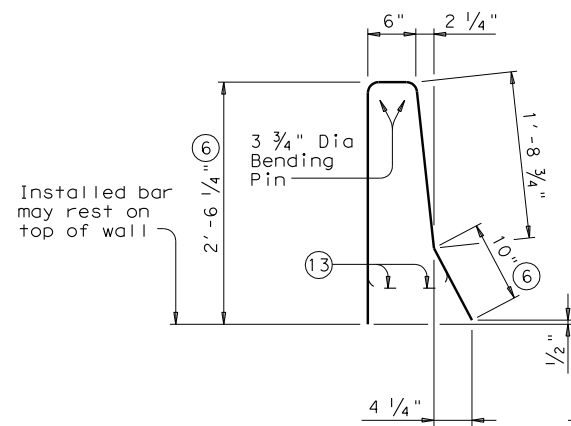
LEVELS DISPLAYED	
1	

RAIL DATA FOR HORIZONTAL CURVES

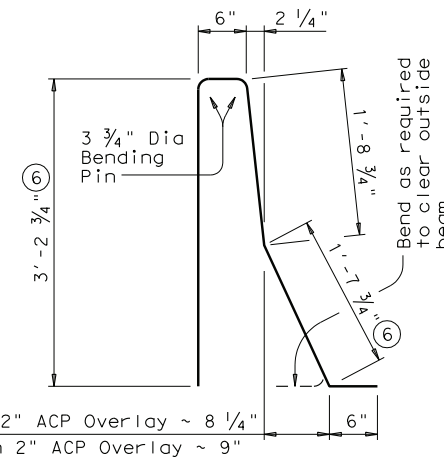
	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
Rail Members	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	To required radius (15)
	Over 700' thru 1400'	7'-3"	or to chords shown (15)
	Thru 700'	Zero	To required radius (15)



BARS WU (#5)



BARS S2 (#5)



BARS S1 (#5)

CONSTRUCTION NOTES:

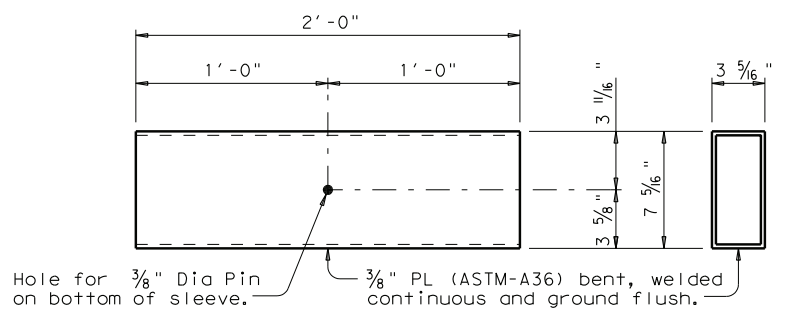
This rail may be slip-formed if approved by the Engineer when epoxy adhesive anchor bolts are used. Slip-forming parapet is not allowed if anchor bolts are cast with parapet wall. At the contractor's option anchor bolts may be cast with the parapet (See Cast-in-Place Anchor Bolt Options). Rail parapet must be plumb unless otherwise approved by the Engineer. Steel posts must be square to the top of parapet. Use epoxy mortar under post base plates if gaps larger than 1/16 inch exist. Panel lengths of tube members must be attached continuously to a minimum of three posts. Round or chamfer all exposed edges of steel components 1/16 inch by grinding prior to galvanizing.

MATERIAL NOTES:

Galvanize all steel components except reinforcing steel. Anchor bolts must be 7/8 inch diameter A193 Gr B7 fully threaded rods with heavy hex nuts, one hardened washer and one 2 1/4 inch O.D. washer each. Embed threaded rods 10 1/2 inch minimum into concrete parapet using a Type III, Class C epoxy adhesive anchorage system capable of obtaining an ultimate load, per threaded rod, of 34 kips in tension, considering spacing and edge distance. Submit evidence of the proposed epoxy adhesive anchorage system's ability to develop this load to the Engineer for approval prior to use (Hilti HIT RE 500 is known to achieve the necessary ultimate loads through physical testing and need not be submitted for approval if used). Anchor installation, including hole size, drilling, and clean-out, must be in accordance with the manufacturer's instructions. Optional cast-in-place anchor bolts must be 1/2 inch diameter ASTM A325 or A449 bolts (or A193 Gr B7 threaded rods with one tack welded heavy hex nut each) with one heavy hex nut and one hardened steel washer plus one 2 1/4 inch O.D. steel washer at each bolt. Nuts must conform to A563 requirements. Use Class "C" concrete. Use Class "C" (HPC) if required elsewhere. Chamfer all exposed corners. Reinforcing steel must be Grade 60. Welded Wire Reinforcing will not be permitted in this rail. Epoxy coat all rail reinforcement if slab bars are epoxy coated.

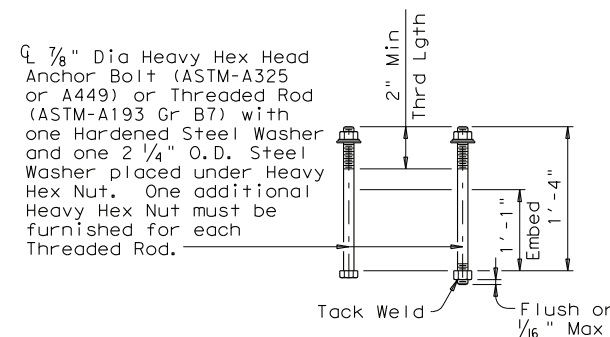
GENERAL NOTES:

This rail was evaluated based on the results of previous crash tests and approved for a NCHRP Report 350 TL-5 rating. This rail can be used for design speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. This railing cannot be used on bridges with expansion joints providing more than 5 inch movement. This rail requires a 10 inch minimum slab thickness. Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications. The T80HT Rail may terminate on the structure if safety considerations so allow. In this case, there must be a custom section, detailed elsewhere in the plans, transitioning between this and a normal traffic railing such as T551. See Bridge Layout for limits. Erection drawings showing panel lengths, rail post spacing, and anchor bolt setting must be submitted to the Engineer for approval. Average weight of railing with no overlay: 447 plf total (145 plf Conc) 32 plf (Steel).

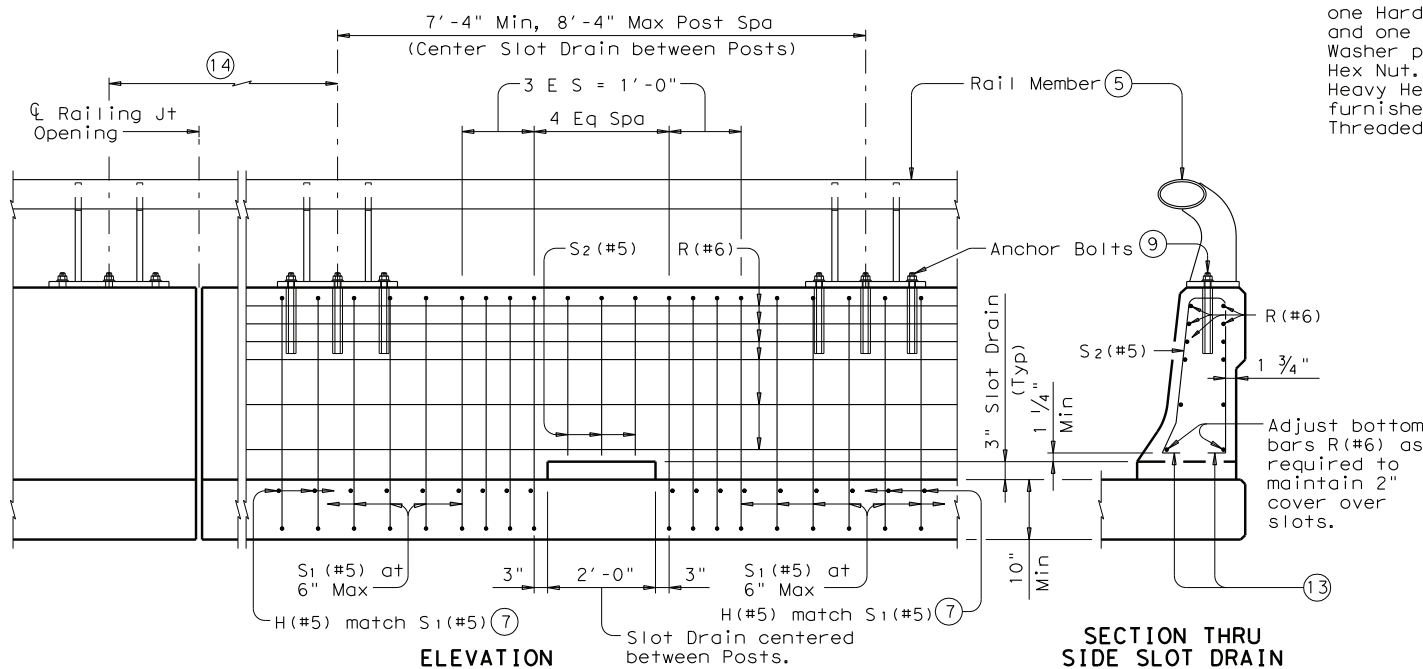


RECTANGULAR TUBE SLEEVE MEMBER DETAIL
(See Tube Splice Detail)

- (5) Unless directed otherwise by the Engineer, the fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.
- (6) Increase 2 inch for structures with Overlay.
- (7) Bars H(#5) are part of rail reinforcing and are included in unit price bid for railing. Extend Bars H 2'-0 inch minimum past centerline of beam/girder. Space with Bars S1. Bars H may be bundled with top slab reinforcing if spacing is equivalent. Omit Bars H when top slab reinforcement is spaced less than 4 inch.
- (9) See "Material Notes" for Anchor Bolt information.
- (13) Bend or cut bars as required to clear drain slots.
- (14) Slots are not allowed in areas where there is a joint in the concrete panel between rail posts.
- (15) Shop drawings for approval are required for tubular steel sections.



CAST-IN-PLACE ANCHOR BOLT OPTIONS (9)



OPTIONAL SIDE SLOT DRAIN DETAILS

Note: Side Slot Drains must be centered between rail posts within the limits shown. Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots are not permitted.

FILE: r1std015.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CR: TxDOT
© TxDOT April 2009	DISTRICT	FEDERAL AID PROJECT	SHEET	
REVISIONS				
05-11: Notes and Wall Joint Note.	COUNTY	CONTROL	SECT	JOB HIGHWAY

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

LEVELS DISPLAYED	PATH:
1	