

	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 (18)
	Over 700' thru 1400'	7'-3"	or to chords shown (18)
	Thru 700'	Zero	To required radius (18)

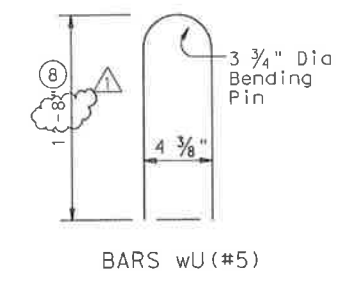
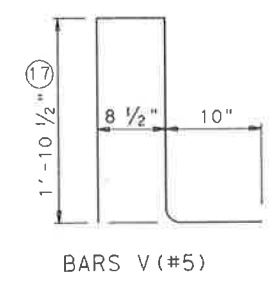
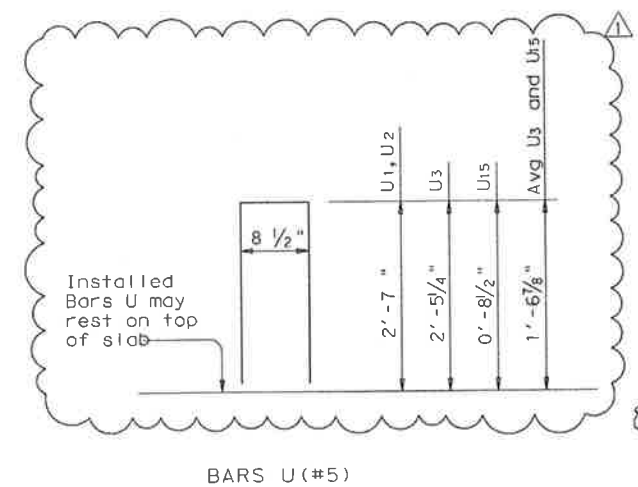
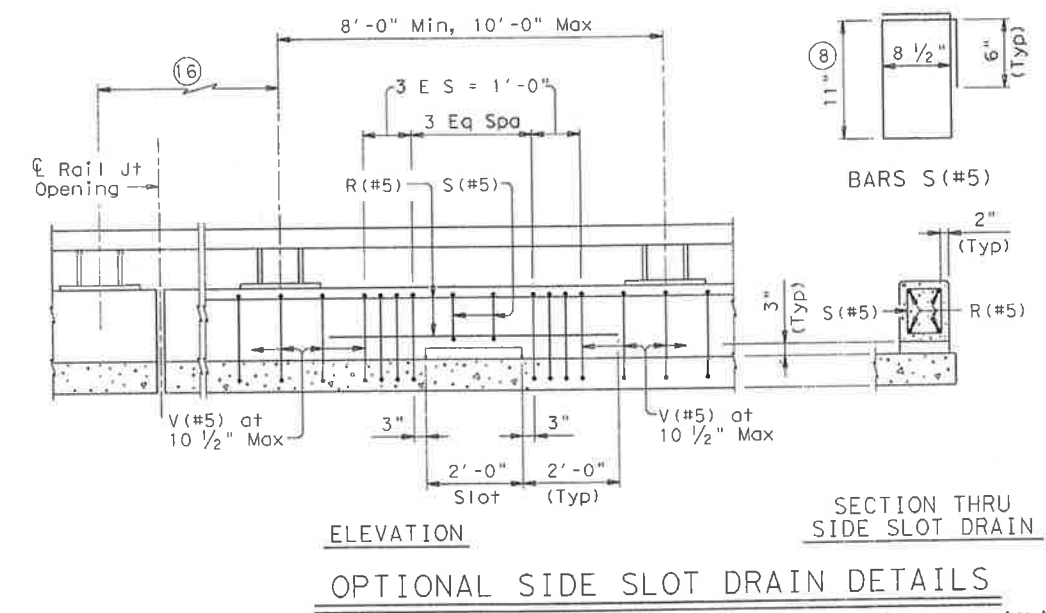
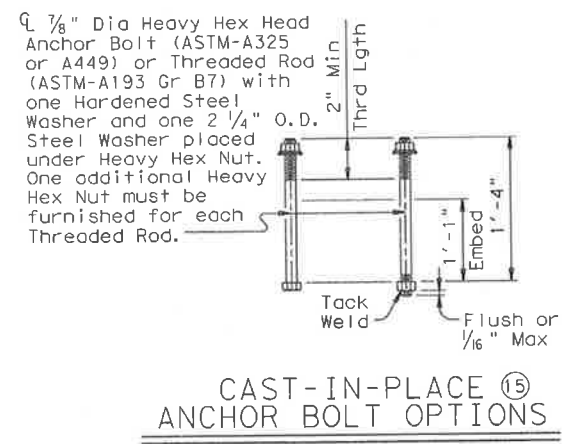
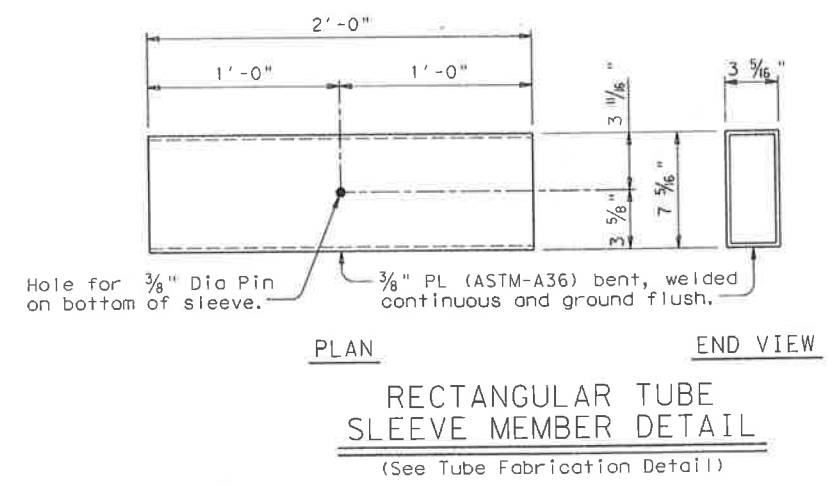
- (8) Increase 2" for structures with overlay.
- (15) See "General Notes" for anchor bolt information.
- (16) Slots are not allowed in areas where there is a joint in the concrete parapet between rail post.
- (17) Length shown for 6 1/2" Min bar embedment with no overlay. Adjust as required.
- (18) Shop drawings for approval required for tubular steel sections.

CONSTRUCTION NOTES:
 This rail may be slip-formed if approved by the Engineer when epoxy adhesive anchor bolts are used.
 Cap all open ends of tubular steel sections.
 At the contractor's option anchor bolts may be cast with the parapet (See Cast-in-Place Anchor Bolt Options).
 Slip-forming parapet is not allowed if anchor bolts are cast with parapet wall.
 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" exist.
 Rail member sections must have at least two posts but not more than four.
 Round or chamfer all exposed edges of steel components 1/16" by grinding prior to galvanizing.

MATERIAL NOTES:
 Galvanize all steel components except reinforcing steel.
 Anchor bolts must be 7/8" Dia ASTM A193 Grade B7 fully threaded rods with heavy hex nuts, one hardened washer and one (2 1/4" OD) washer each. Embed threaded rods into parapet wall with a Type III Class C epoxy anchorage system. Minimum embedment depth is 8". Anchorage system chosen must be able to achieve an ultimate tensile resistance of 34 kips per bolt. The Contractor must provide evidence to the Engineer that this can be achieved. Evidence of adequate tensile resistance can be based on the manufacturer's published values of ultimate tensile strength (anchor spacing and edge distance must be accounted for). 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 7/8" Dia 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" O.D. steel washer at each bolt. Nuts must conform to A563 requirements.
 Use Class "C" concrete. Use Class "C" (HRC) if required elsewhere. Chamfer all exposed corners. Concrete color shall be Elephant Gray.
 Reinforcing steel must be Grade 60.
 Epoxy coat all rail reinforcement if slab bars are epoxy coated.

GENERAL NOTES:
 This rail has been evaluated to be of equal strength to the T4 (A) railing, which has been crash tested to meet NCHRP Report 350 TL-3 criteria. This rail can be used for design 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 design speeds of 45 mph and less.
 This railing cannot be used 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.
 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: 263 plf total
 234 plf (Conc)
 29 plf (Steel).

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.



Modifications ESC 04/29/10
 Revised End Rail, Eliminate Connections, and modified material notes

SHEET 3 OF 3

Texas Department of Transportation
 Bridge Division

TRAFFIC RAIL

TYPE T401 (MOD)

FILE: r1st006.dgn	DN: TxDOT	CK: TxDOT	DM: JTR	CK: JMH
©TxDOT April 2009	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	COUNTY	CONTROL	SECT	JOB
				HIGHWAY

LEVELS DISPLAYED

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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 will not be permitted.