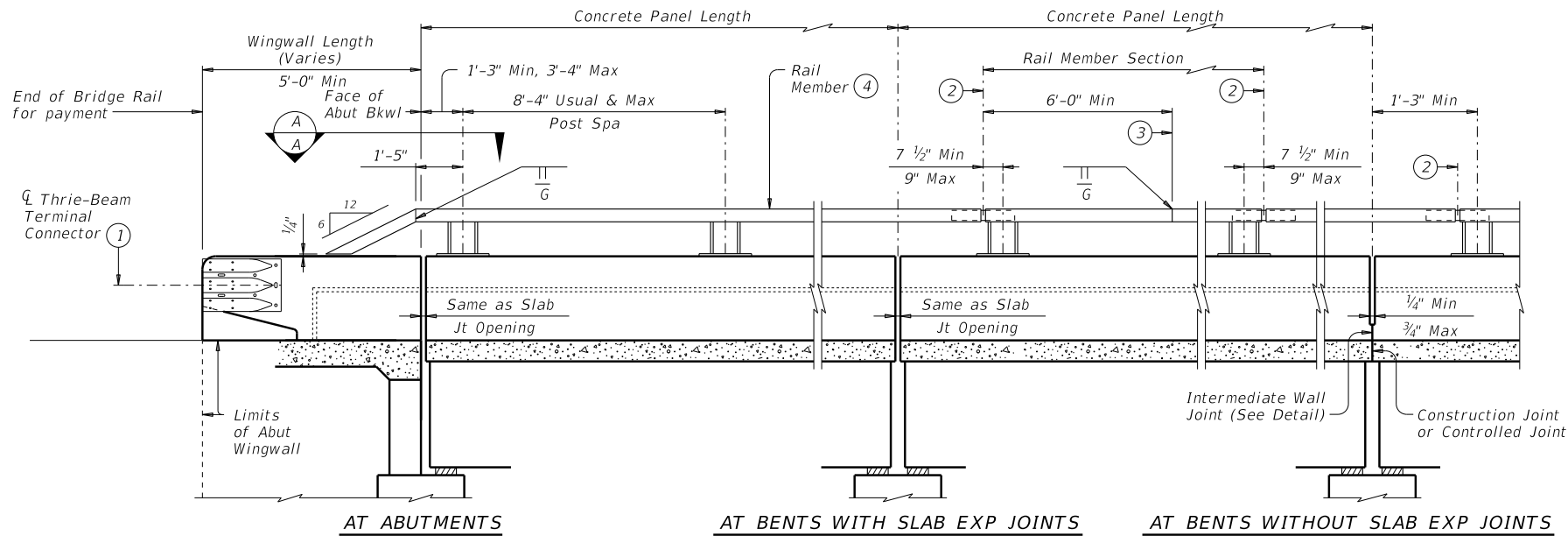


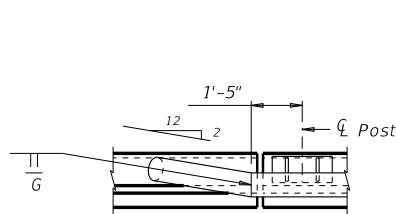
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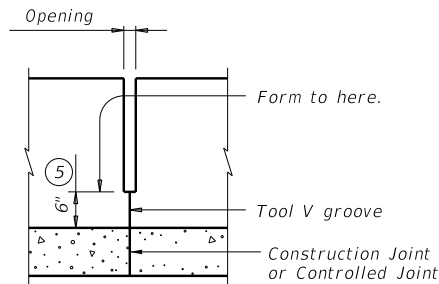


ROADWAY ELEVATION OF RAIL

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

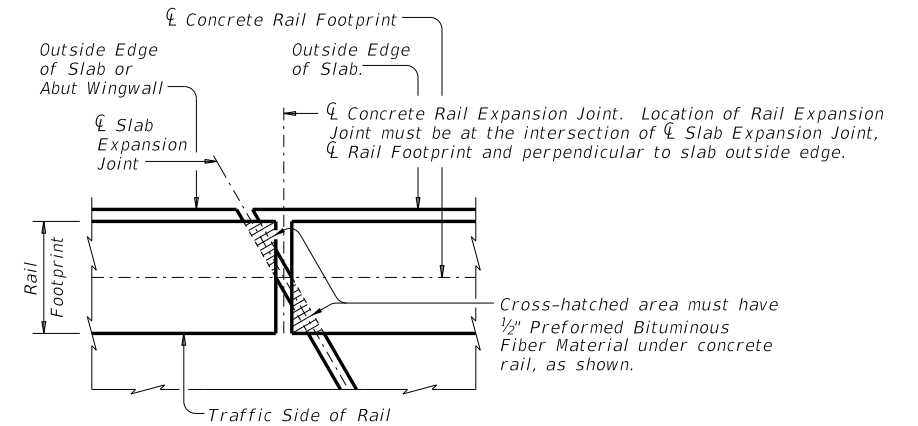


(Showing Rail Member turn-down)
(Rail Member showing Elliptical Tube Option, Rectangular Tube Option similar).



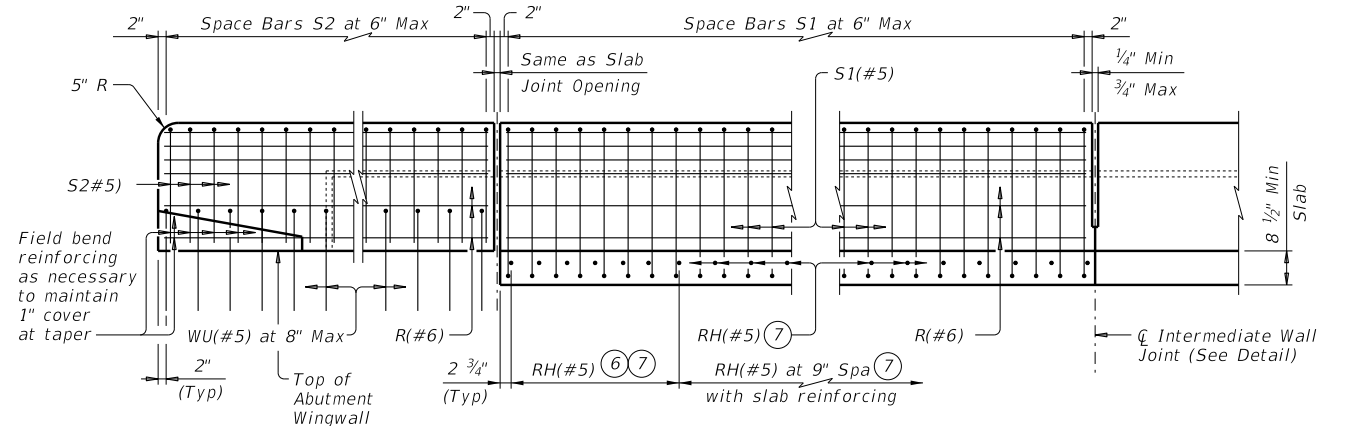
INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.



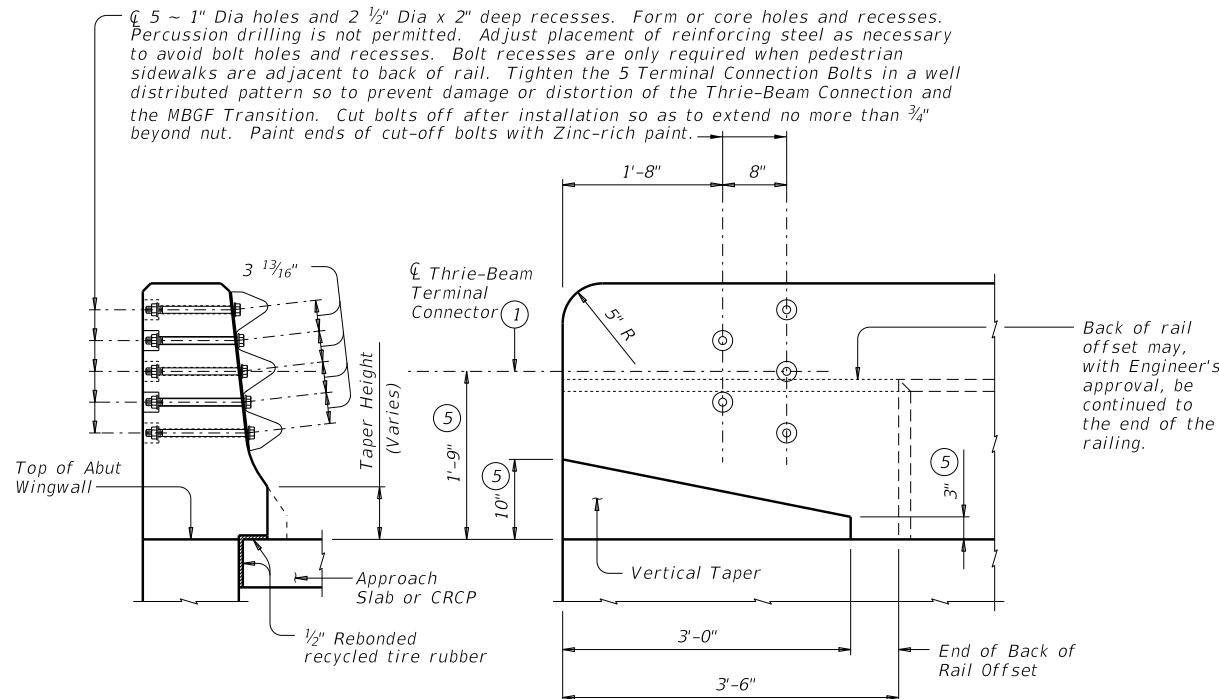
PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.



ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

- 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 unless otherwise shown in the plans.
- ② Concrete expansion joint or splice joint as required.
- ③ One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove, double V groove, or single groove. Grind smooth.
- ④ Unless directed otherwise by the Engineer, the Fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.
- ⑤ Increase 2" for structures with Overlay.
- ⑥ RH(#5) at 7" Spacing = 3'-6" with thickened slab end reinforcing.
- ⑦ Bars RH(#5) are part of rail reinforcing and are included in unit price bid for railing. Bars RH(#5) are in addition to slab overhang reinforcement shown elsewhere. Extend bars RH(#5) 2'-0" Min past centerline of beam/girder. Space and bundle with adjacent slab bars G(#4) and bars A(#4). Match slab bar cover. (Typ)



SECTION

ELEVATION

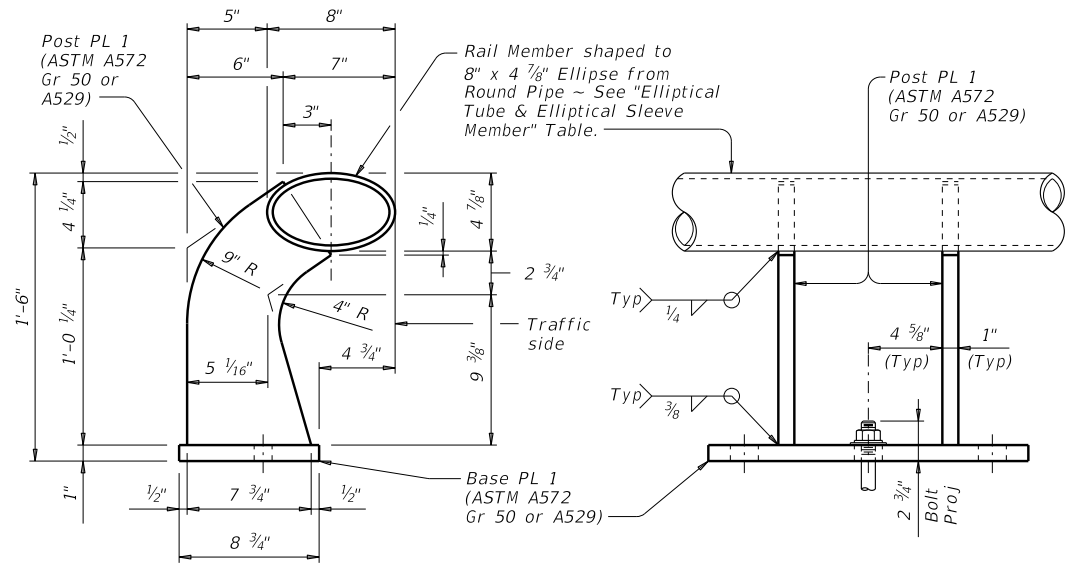
TERMINAL CONNECTION DETAILS

SHEET 1 OF 3

 Texas Department of Transportation				Bridge Division Standard	
TRAFFIC RAIL TYPE T80HT					
FILE: RL-T80HT-19.dgn		DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019		CONT	SECT	JOB	HIGHWAY
REVISIONS					
		DIST	COUNTY		SHEET NO.

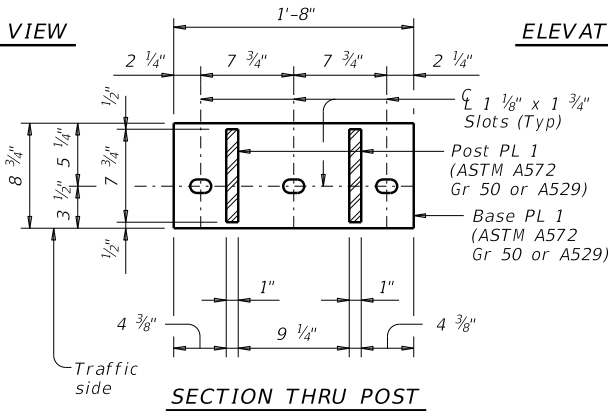
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DATE: FILE:



SIDE VIEW

ELEVATION



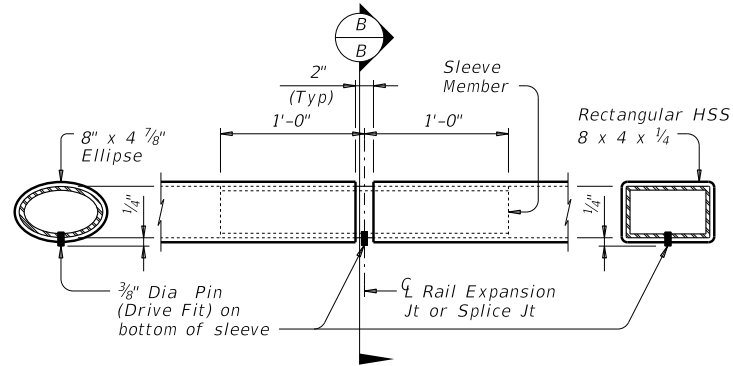
SECTION THRU POST

ELLIPTICAL TUBE WITH RAIL POST AND ANCHORAGE DETAILS

(Showing Elliptical Tube Option)

ELLIPTICAL TUBE & ELLIPTICAL SLEEVE MEMBER		
8" x 4 7/8" Ellipse	Elliptical Sleeve Member	
Material	Material	Thickness
6" Dia Std Pipe ASTM A53 E or S Gr B	ASTM A53 Gr B	0.353"
	ASTM A36 or A500 Gr B	0.339"
	API-5LX52	0.224"
6 5/8" O.D. Pipe x 0.188" API-5LX52	ASTM A53 Gr B	0.339"
	ASTM A36 or A500 Gr B	0.325"
	API-5LX52	0.188"

Notes: Other sections of equal or greater strength are acceptable for elliptical sleeves. The major and minor diameters of the rail member may vary +/- 0.1875" from plan dimension. However, the difference between the outside diameters of the elliptical sleeve and the inside diameters of the rail member cannot exceed 0.25 inches.

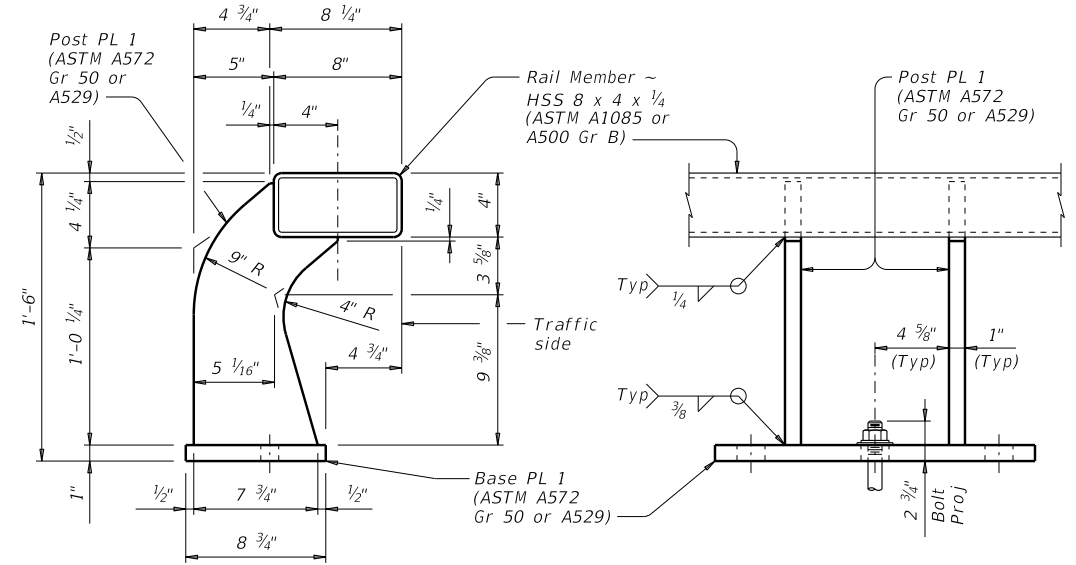


SECTION B-B
(Showing Ellipse
Tube Option)

AT SPLICE OR EXP JTS

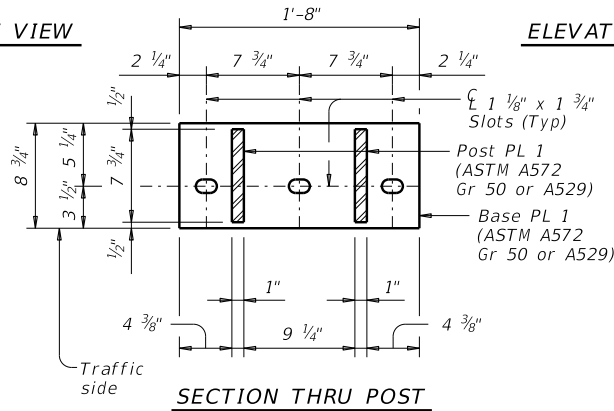
TUBE SPLICE DETAIL ④

SECTION B-B
(Showing Rectangular
Tube Option)



SIDE VIEW

ELEVATION

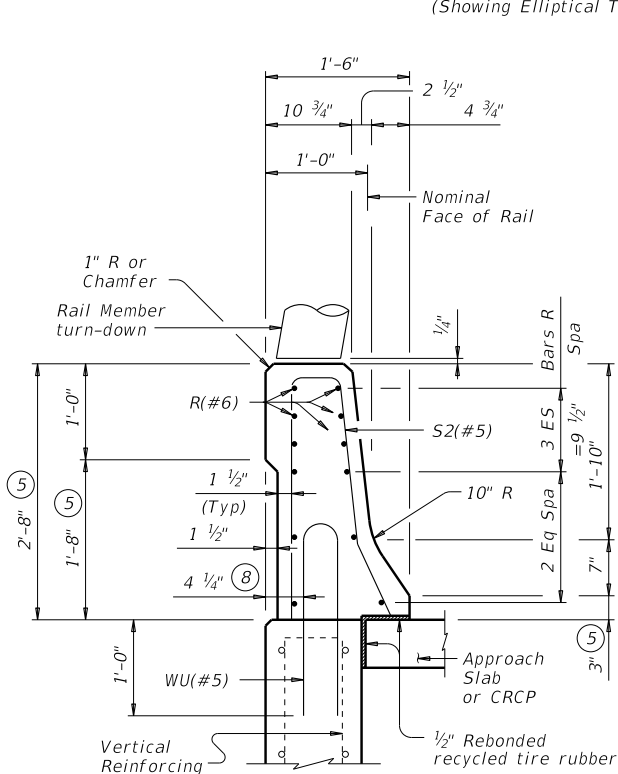


SECTION THRU POST

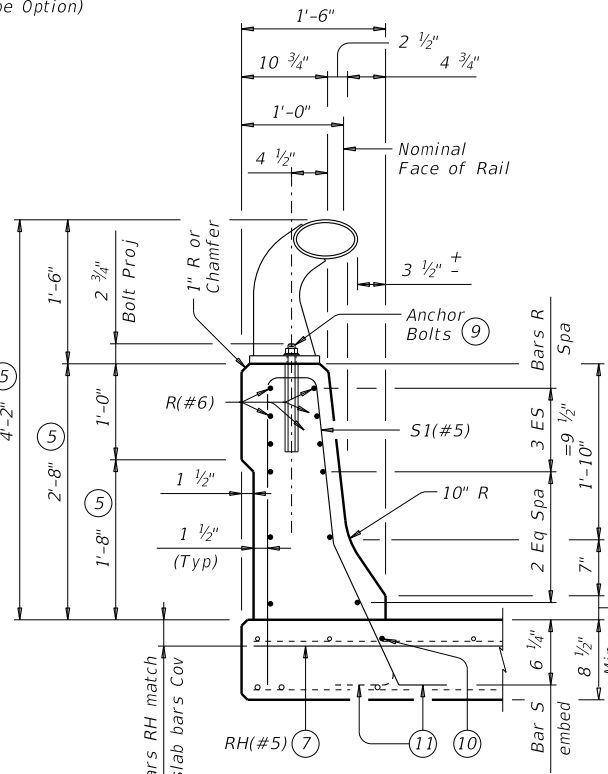
RECTANGULAR TUBE WITH RAIL POST AND ANCHORAGE DETAILS ④

(Showing Rectangular Tube Option)

- ④ Unless directed otherwise by the Engineer, the Fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.
- ⑤ Increase 2" for structures with Overlay.
- ⑦ Bars RH(#5) are part of rail reinforcing and are included in unit price bid for railing. Bars RH(#5) are in addition to slab overhang reinforcement shown elsewhere. Extend bars RH(#5) 2'-0" Min past $\bar{C}$ of beam/girder. Space and bundle with adjacent slab bars G(#4) and bars A(#4). Match slab bar cover. (Typ)
- ⑧ 5 1/4" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls on traffic side of wall.
- ⑨ See "Material Notes" for Anchor Bolt information.
- ⑩ Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.
- ⑪ Bar may be bent or adjusted as shown.
- ⑫ Mounting this rail to retaining walls requires additional details not covered by this standard.

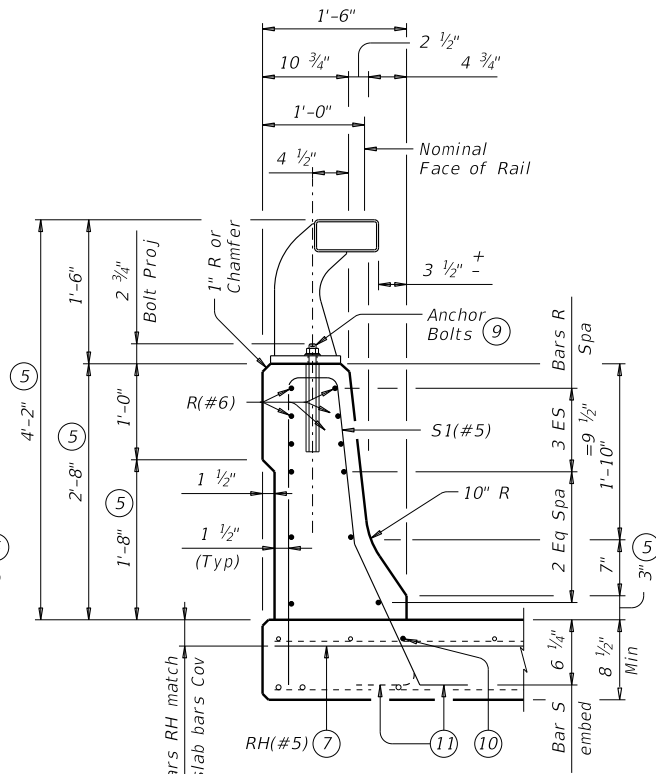


ON ABUTMENT WINGWALLS ⑫



ON BRIDGE SLAB
(Showing Elliptical Tube Option)

SECTIONS THRU RAIL ④ ⑫



ON BRIDGE SLAB
(Showing Rectangular Tube Option)

SHEET 2 OF 3

Texas Department of Transportation		Bridge Division Standard	
TRAFFIC RAIL			
TYPE T80HT			
FILE: RL-T80HT-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONT	SECT	JOB
REVISIONS		HIGHWAY	
DIST		COUNTY	
SHEET NO.			

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DATE: FILE:

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 or to chords shown (16)
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	To required radius (16)

CONSTRUCTION NOTES:

This rail may be slipformed if approved by the Engineer when adhesive anchor bolts are used. At the Contractor's option anchor bolts may be cast with the parapet. See "Material Notes". Slipforming parapet is not allowed if anchor bolts are cast with parapet wall. If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a 3/8" width x 1/4" tall heavy epoxy bead with Type III, Class C or a Type V epoxy. Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed. Rail parapet must be plumb unless otherwise approved. Steel posts must be square to the top of parapet. Use Type VIII epoxy mortar under post base plates if gaps larger than 1/16" 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" by grinding prior to galvanizing. Chamfer all exposed concrete corners.

MATERIAL NOTES:

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over galvanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel". Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer. Anchor bolts must be 7/8" Dia ASTM A193 Gr B7 fully threaded rods with heavy hex nuts, one hardened steel washer (ASTM F436), and one (2 1/4" O.D.) steel washer each. Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into parapet wall with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 10 1/2". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 22 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Optional cast-in-place anchor bolts must be 7/8" Dia ASTM F3125 Gr A325 or A449 bolts (or A193 Gr B7 or F1554 Gr 105 threaded rods with one tack welded heavy hex nut each) with one heavy hex nut and one hardened steel washer (ASTM F436) plus one (2 1/4" O.D.) steel washer at each bolt. Nuts must conform to ASTM A563 requirements. Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere. Provide Grade 60 reinforcing steel. Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized. Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars S1, S2 and WU unless noted otherwise. Provide bar laps, where required, as follows: Uncoated or galvanized ~ #6 = 2'-5" Epoxy coated ~ #6 = 3'-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 MASH TL-5 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. 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. 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: 447 plf total 415 plf (Conc) 32 plf (Steel).

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

SHEET 3 OF 3



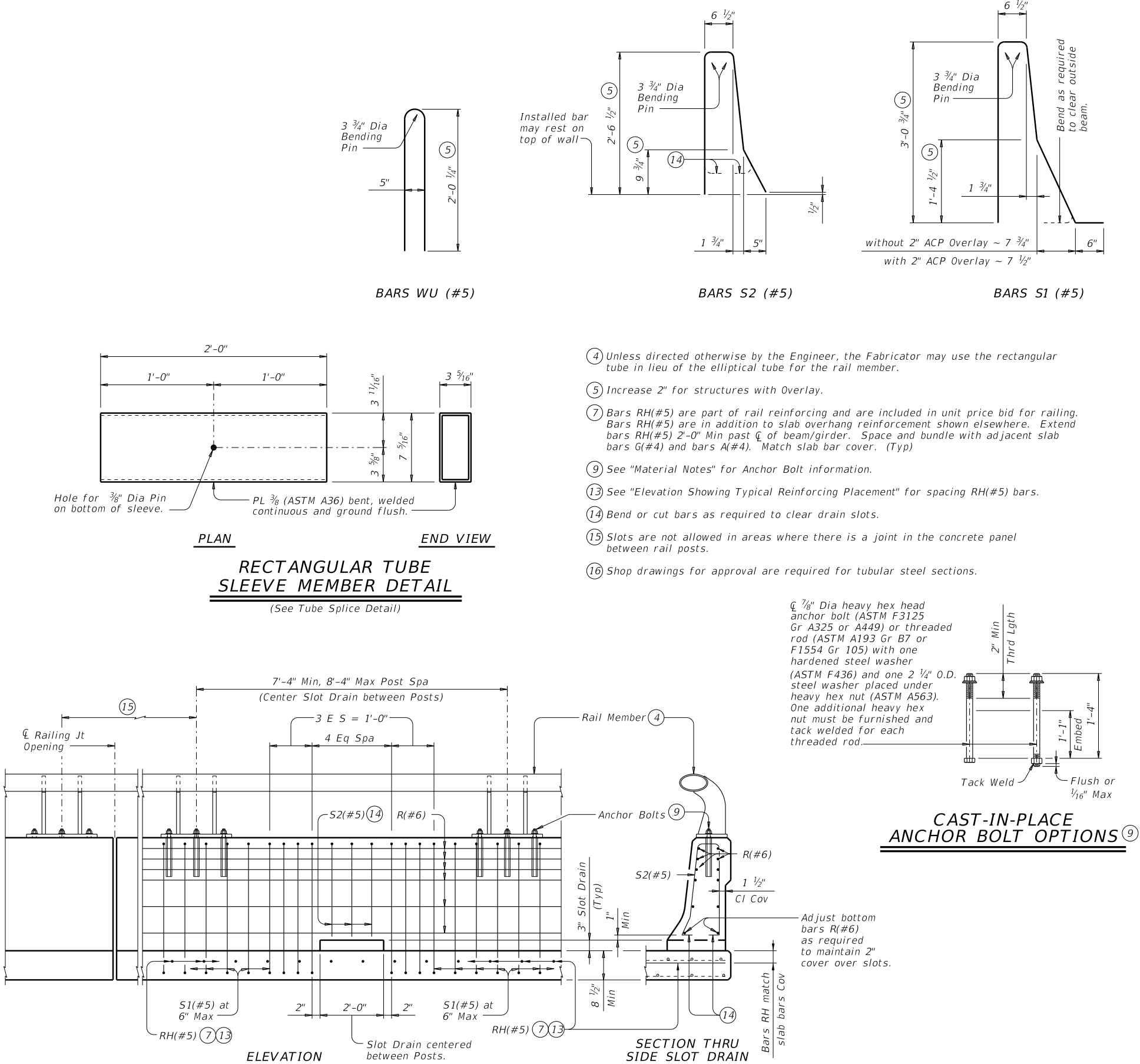
Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T80HT

FILE: RL-T80HT-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
TxDOT September 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.



Note: Center Side Slot Drains 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. Do not place drains 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.