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LEVELS DISPLAYED

1	2021	60	63
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RAIL DATA FOR HORIZONTAL CURVES

RAIL MEMBERS	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	To required radius (1)
	Over 700' thru 1400'	7'-3"	or to chords shown (1)
	Thru 700'	Zero	To required radius (1)

(1) Shop drawings required (may be submitted as 11"x 17" prints provided they are clearly legible).
 For railing not requiring shop drawings, erection drawings showing rail member section lengths, post spacing, and anchor bolt setting shall be submitted to the Area Engineer for approval. If rail member requires shop and erection drawings, these drawings shall be submitted to the Bridge Engineer for approval.

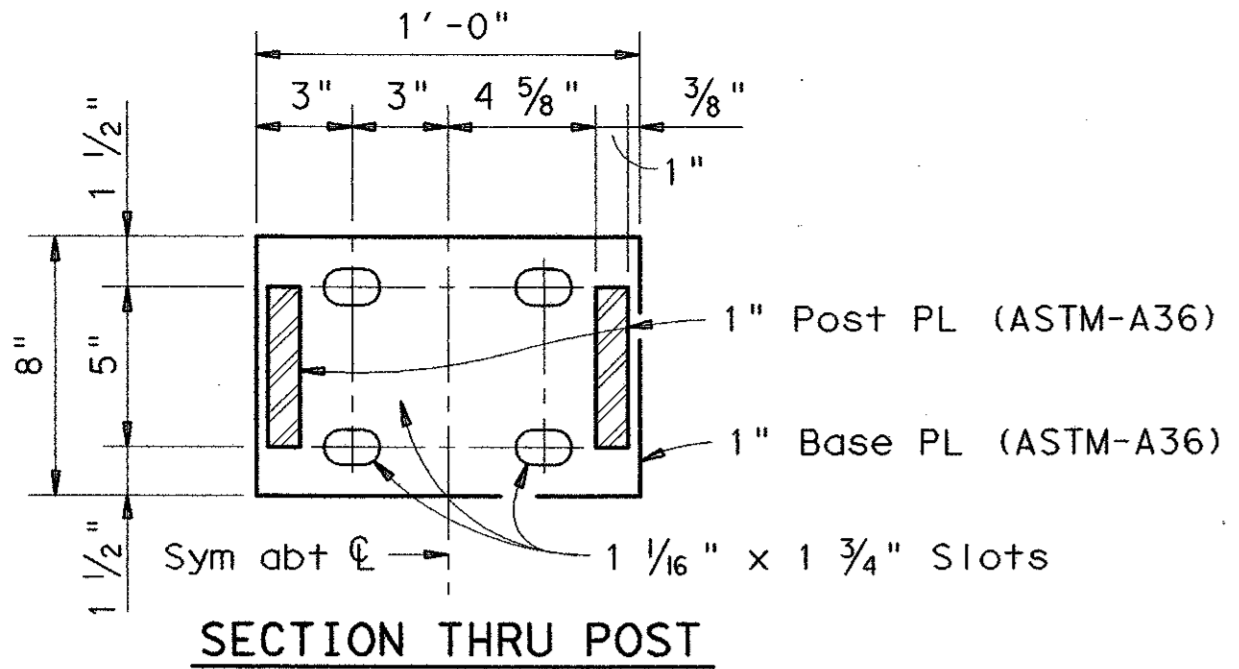
GENERAL NOTES:

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. The T4(S) and can be used for design speeds of 50 mph and greater.
 Rail Type T4(S) is comprised of the following parts: concrete parapet and wing terminal wall, all reinforcing shown, including that embedded in the slab or wingwalls, MBGF connections, rail member, posts, and all anchorage provisions including bolts, nuts and washers. All these parts are included in price bid per linear foot of rail.
 All open ends of the rail shall be capped.
 All steel components except reinforcing shall be painted per

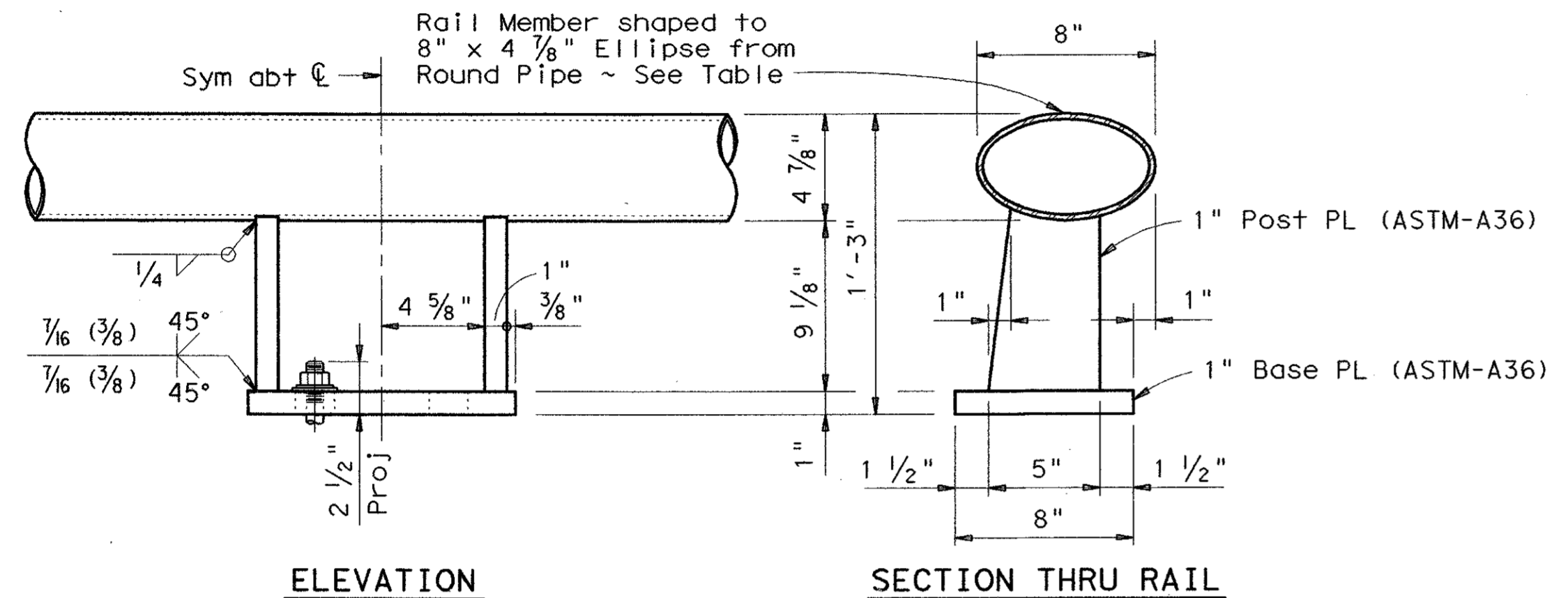
M Surface Finishes for Structures sheet.

unless otherwise shown on plans.
 Anchor bolts shall be 3/4" Dia ASTM A325 bolts (or A321 threaded rods with one tack welded hex nut each) with one hex nut and one 2" O.D. washer plus one hardened steel washer at each bolt. Nuts shall conform to A563 requirements. The untapped blanks shall be galvanized prior to cutting the threads. Threads for bolts and nuts shall have Class 2A and 2B fit tolerances in accordance with ANSI B1.1.
 All concrete shall be Class "C". Chamfer all exposed corners. Epoxy coat Bars V and U if slab bars are epoxy coated. All reinforcing shall be Grade 60.
 Face of rail, posts and parapet shall be vertical transversely unless otherwise approved by the Engineer. Rail posts shall be perpendicular to top of adjacent concrete parapet grade. Grout may be used under rail post base plates if necessary.
 Rail member sections shall include not less than two posts nor more than four.
 Exposed edges of rail members and rail posts shall be rounded or chamfered to approximately 1/16" by grinding.
 Average weight of railing with no overlay: 187 plf (Conc) 25 plf (Steel).

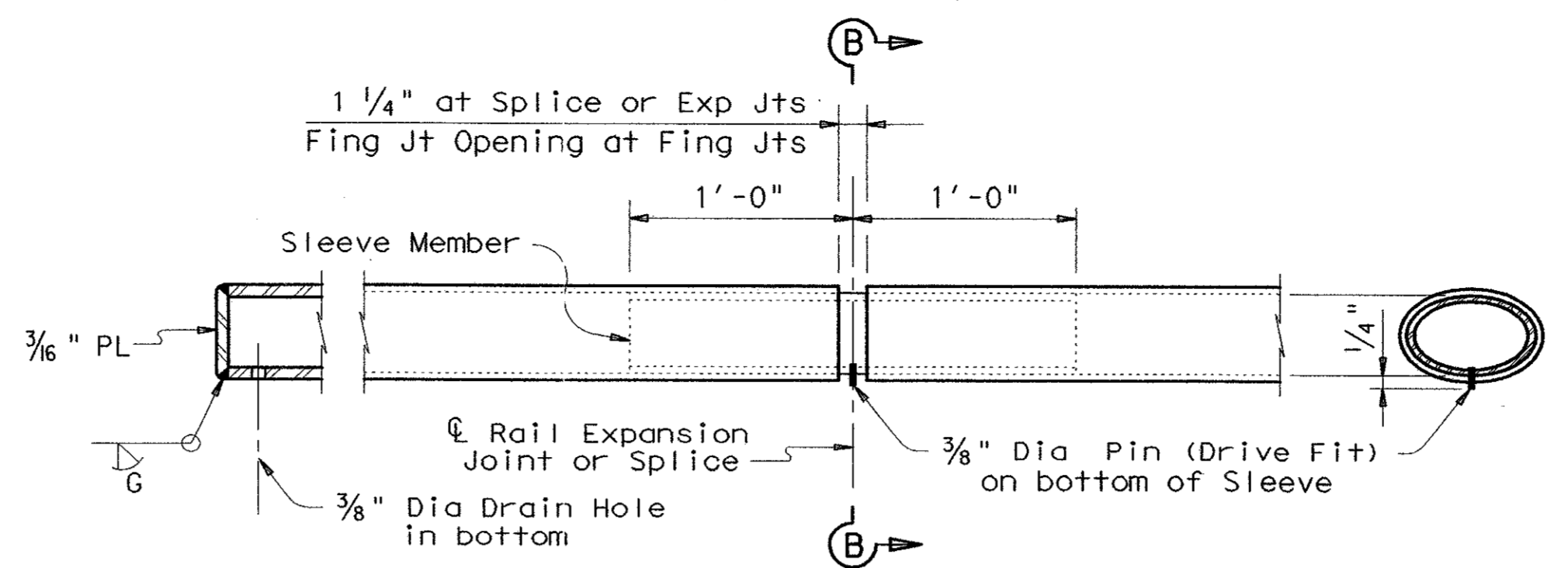
M See Surface Finishes for Structures sheet for rail paint schemes and colors.



SECTION THRU POST



ELEVATION SECTION THRU RAIL RAIL POST & ANCHORAGE DETAILS

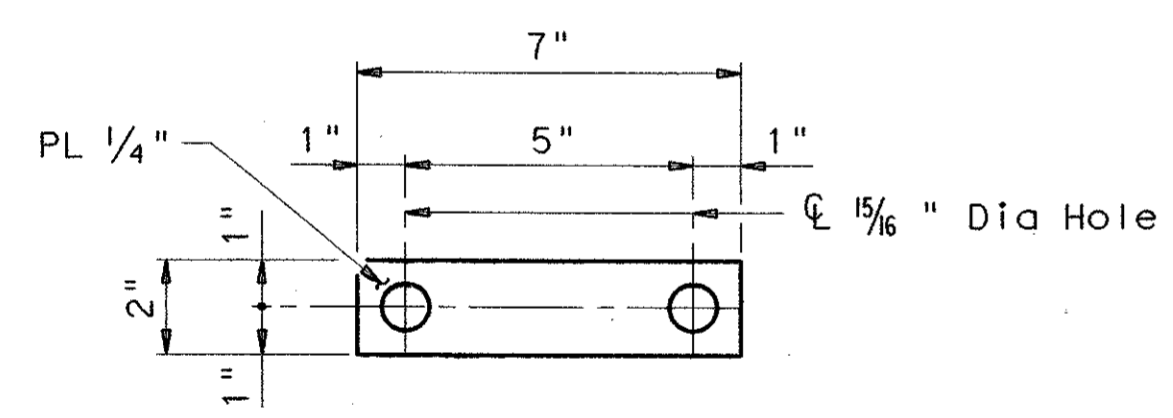


AT RAIL ENDS AT SPLICE OR EXP JTS SECTION B-B

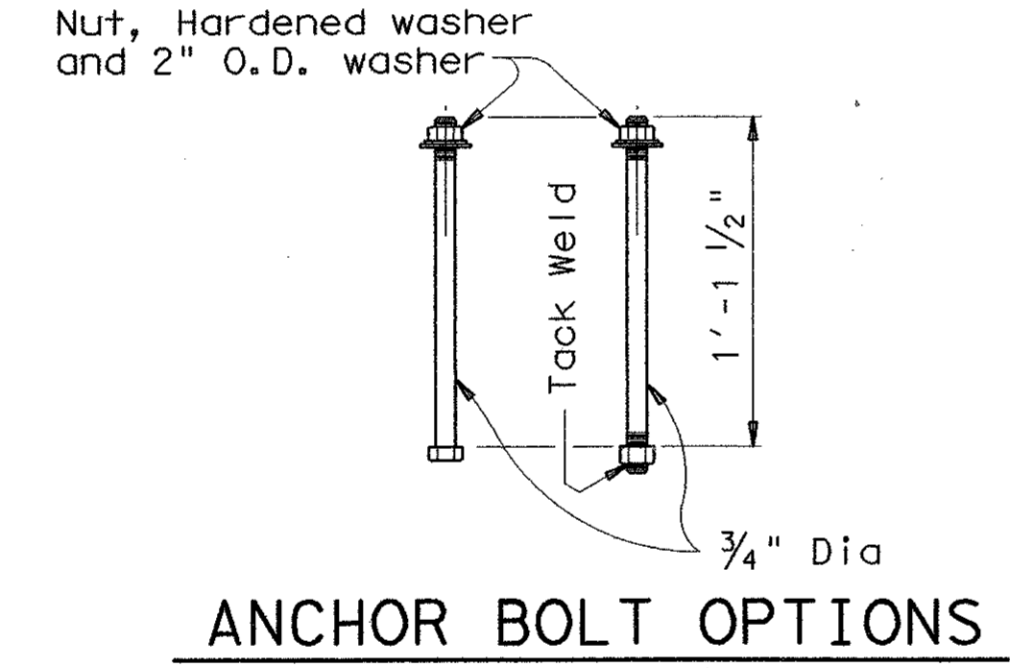
TUBE FABRICATION DETAILS

TUBE & SLEEVE MEMBERS		
Material	Material	Thickness
8" x 4 7/8" Ellipse	Sleeve Member	
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	0.216"

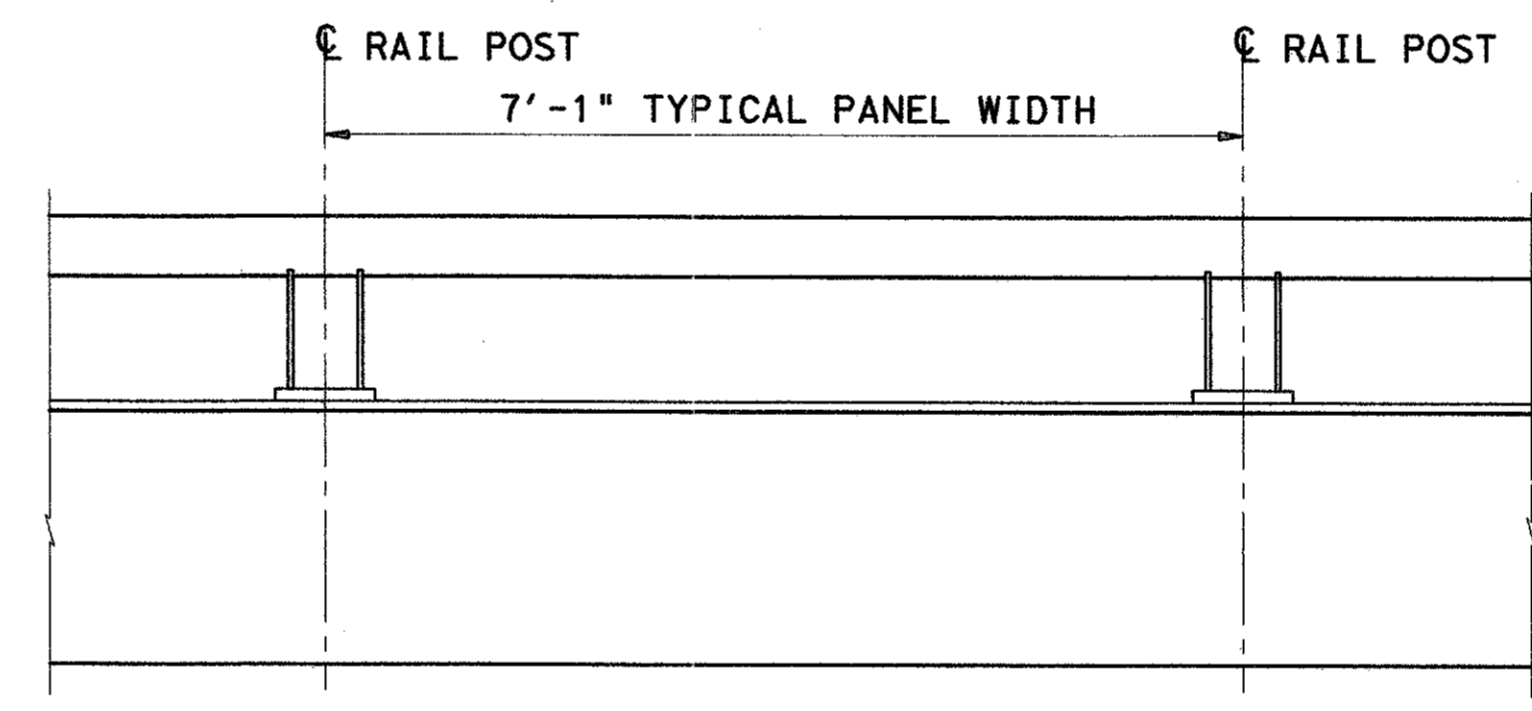
Note: Other sections of equal or greater strength are acceptable for sleeves. The major and minor diameters of the rail member may vary +/- 0.1875 inches from plan dimension. However, the difference between the outside diameters of the sleeve and the inside diameters of the rail shall not exceed 0.125 inches along the major or minor axis. Gaps exceeding this amount up to 0.25 inches are permissible along the 45° axes of the sleeves.



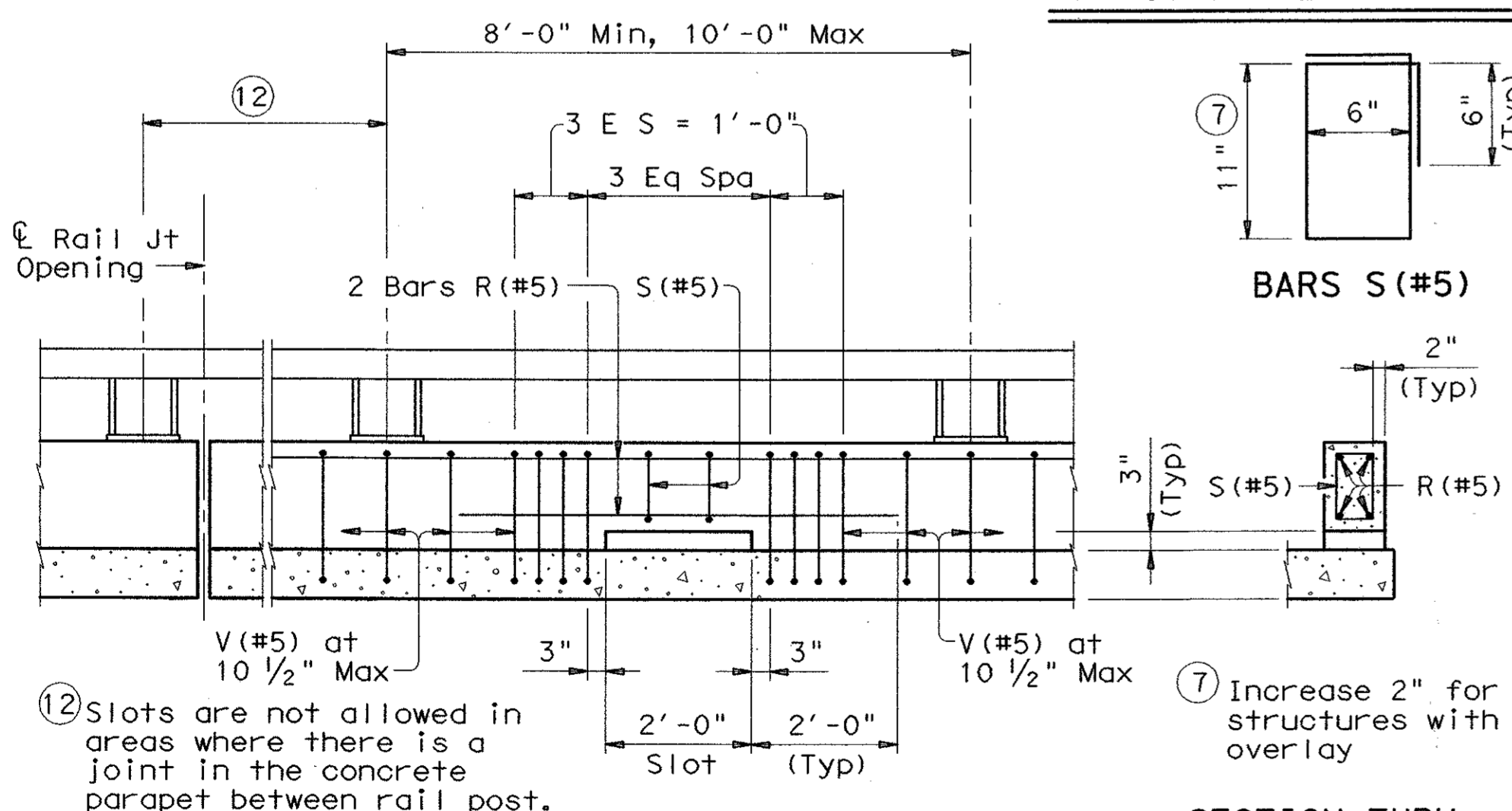
BOLT ANCHORAGE PLATE



ANCHOR BOLT OPTIONS



M TYPICAL RAIL ELEVATION TYPE T4(S) MOD B



ELEVATION SECTION THRU SIDE SLOT DRAIN

OPTIONAL SIDE SLOT DRAIN DETAILS

Note: Side Slot Drains must be centered between rail post 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.



Texas Department of Transportation
 Bridge Division

TRAFFIC RAIL (STEEL)

TYPE T4(S) (MOD) B

M MODIFIED ITEMS

FILE: r1stdel3.dgn	DN: JJP	CK: RLR	DN: JTR	CK: DWM
© TxDOT February 2003	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	COUNTY	CONTROL	SECT	JOB
				HIGHWAY