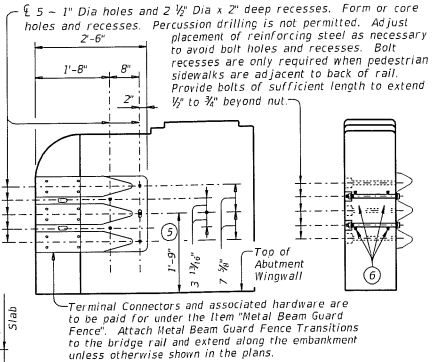
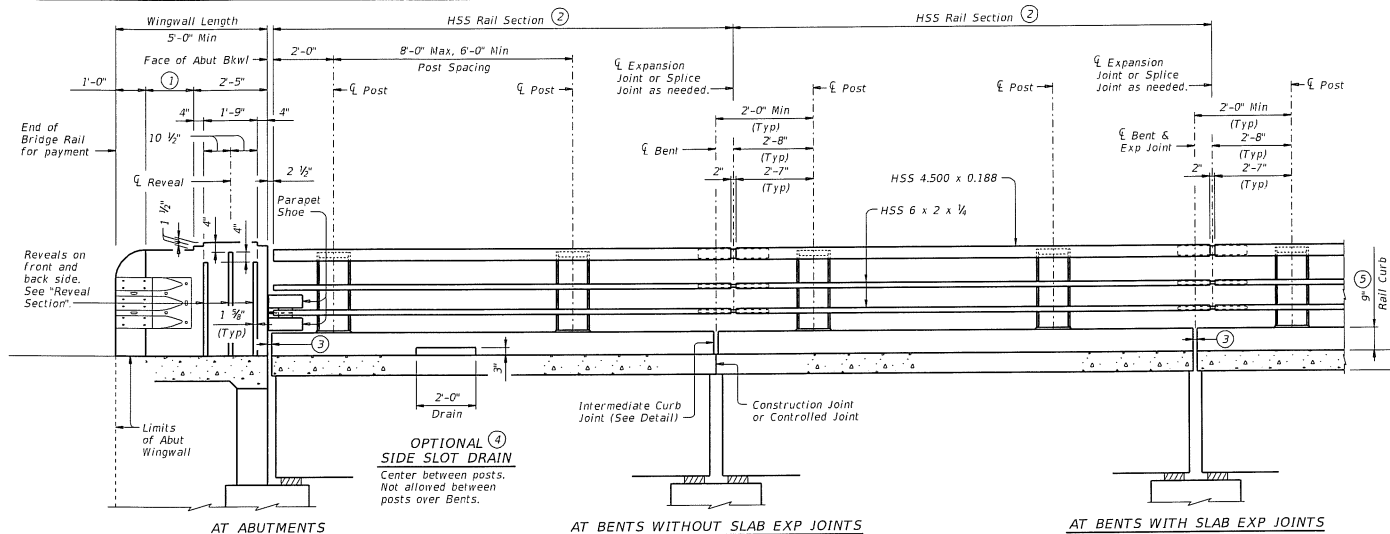
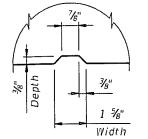


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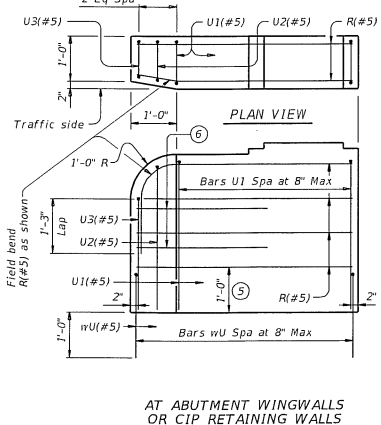
DATE: FILE:



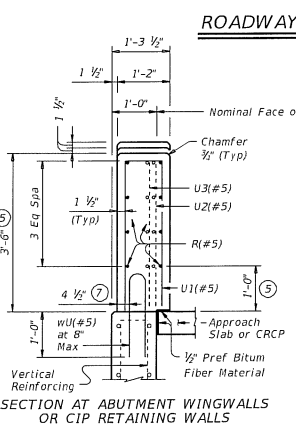
ELEVATION SECTION  
TERMINAL CONNECTION DETAILS  
Reveals not shown for clarity.



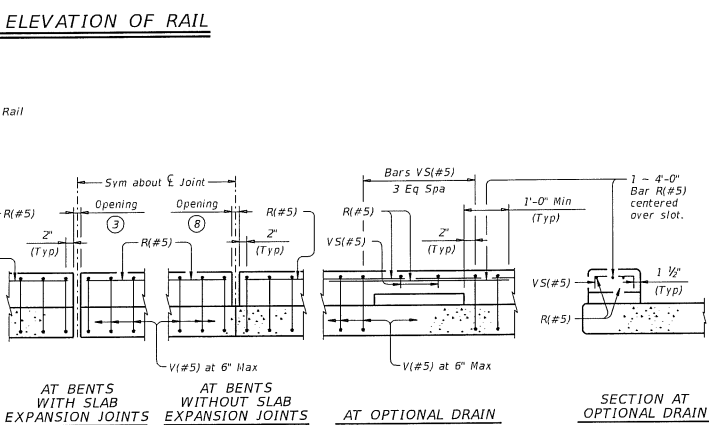
REVEAL SECTION  
(Showing reveal dimensions)



AT ABUTMENT WINGWALLS OR CIP RETAINING WALLS

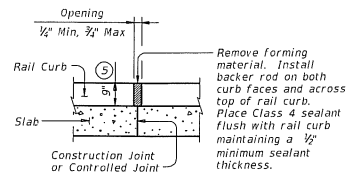


SECTION AT ABUTMENT WINGWALLS OR CIP RETAINING WALLS



AT BENTS WITH SLAB EXP JOINTS  
AT BENTS WITHOUT SLAB EXP JOINTS  
AT OPTIONAL DRAIN  
SECTION AT OPTIONAL DRAIN  
AT POST  
SECTION AT POST

ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



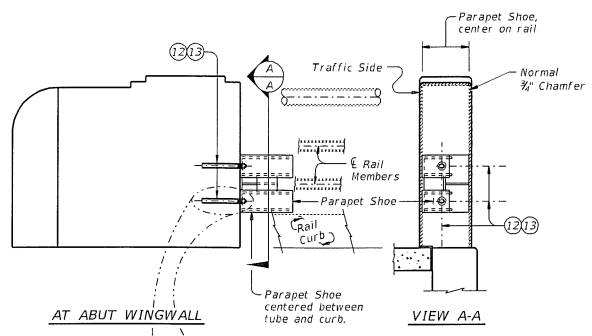
INTERMEDIATE CURB JOINT DETAIL

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

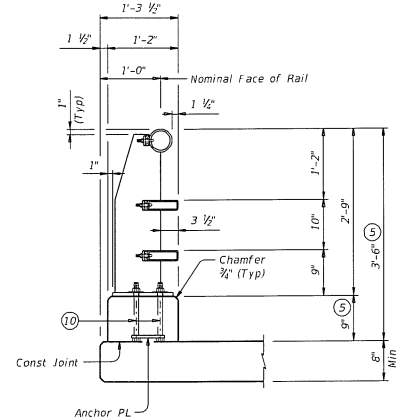
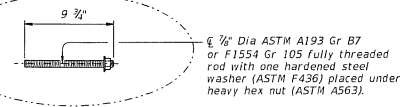
- ① Wingwall length minus 3'-5" (Variable) 1'-7" Min.
- ② HSS rail sections must have at least two posts but not more than four.
- ③ Same as slab joint opening. (5" Max Expansion Joint)
- ④ Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Do not place drains over 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.
- ⑤ Increase 2" for structures with overlay.
- ⑥ 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.
- ⑦ 5 1/2" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.
- ⑧ 1/2" Min, 3/4" Max.
- ⑨ Adjust Bars Z(#5) as necessary to avoid Bars V(#5).
- ⑩ 1/2" Dia Anchor Bolts. See "Anchor Bolt Assembly Details".
- ⑪ Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

		<b>Bridge Division Standard</b>	
<h3>TRAFFIC RAIL</h3>			
<h4>TYPE T2P</h4>			
FILE: r1st023-10.dwg	EN: T2DOT	EX: TAR	DES: JTR
DATE: March 2018	CONF: SECT	NO: 008	REVISION:
REVISED:	DATE:	COUNTY:	SHEET NO.:

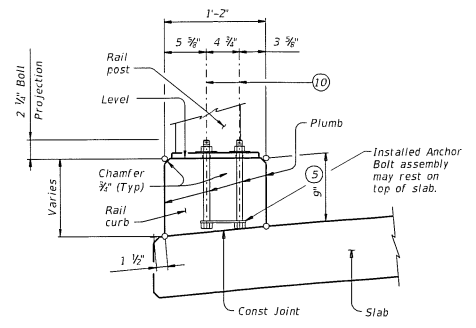
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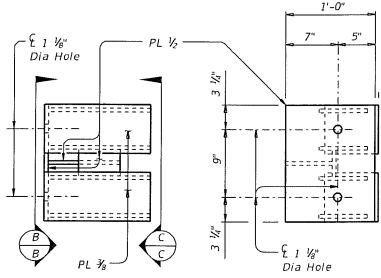
**PARAPET SHOE INSTALLATION**



**SECTION THRU BRIDGE RAIL AT POST**

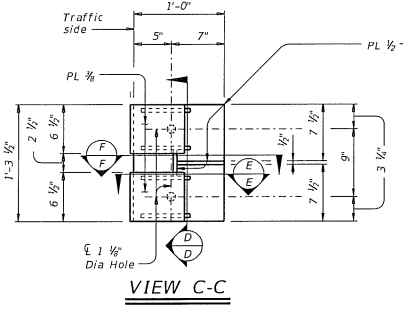


**RAIL CURB FORMING DETAIL**

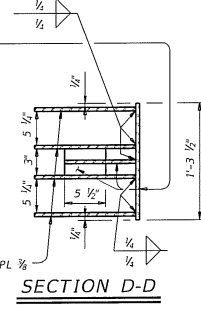


**PARAPET SHOE**

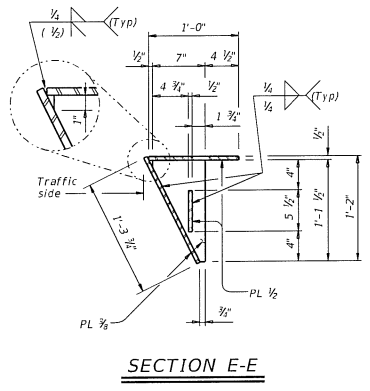
(Parapet Shoe weight = 78 lb each, for contractor's information only).



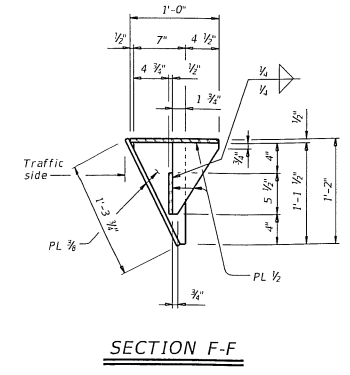
**VIEW C-C**



**SECTION D-D**

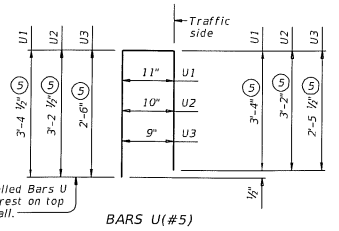


**SECTION E-E**

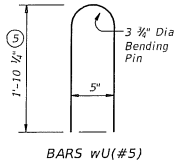


**SECTION F-F**

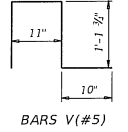
- ⑤ Increase 2" for structures with overlay.
- ⑩ 1/2" Dia Anchor Bolts. See "Anchor Bolt Assembly Details".
- ⑫ Anchor bolts must be 1/2" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with heavy hex nuts and one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into parapet wall with a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".
- ⑬ Install Parapet Shoe after rail has been placed. To ease installation, temporarily brace parapet shoe until the anchorage system achieves manufacturer's recommended curing time. Anchorage system must be assembled with one hardened steel washer (ASTM F436) and one heavy hex nut (ASTM A563) each. Remove temporary bracing after anchorage systems has been firmly tightened.
- ⑭ Length shown for 6 1/2" Min bar embedment with no overlay. Adjust as required.
- ⑮ Increase 2 3/4" for structures with overlay.



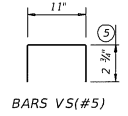
**BARS U(#5)**



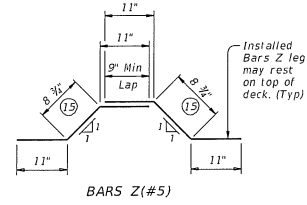
**BARS wU(#5)**



**BARS V(#5)**



**BARS VS(#5)**



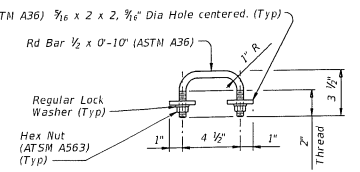
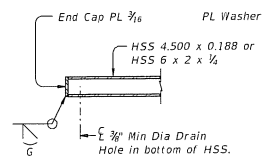
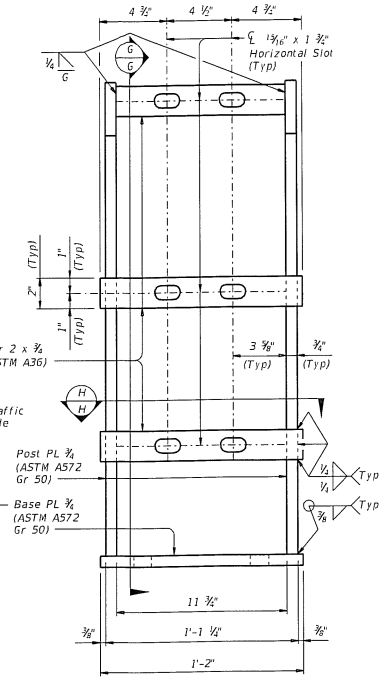
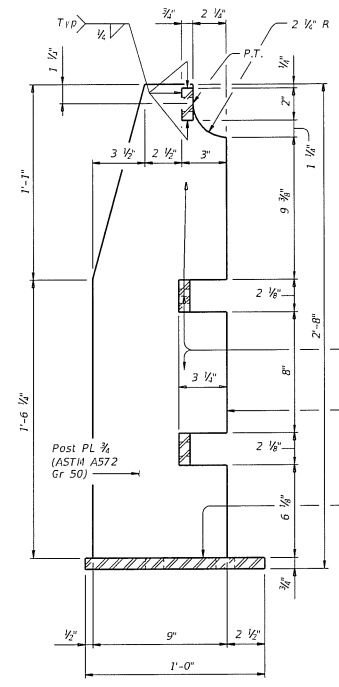
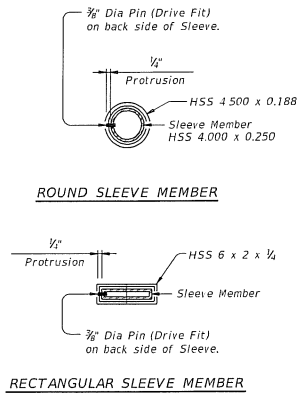
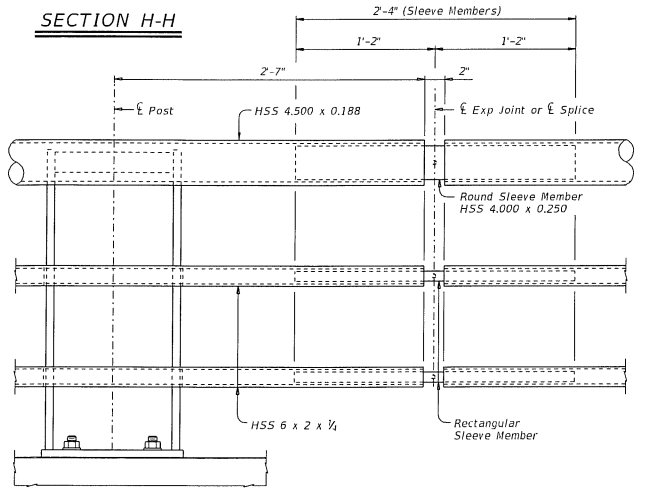
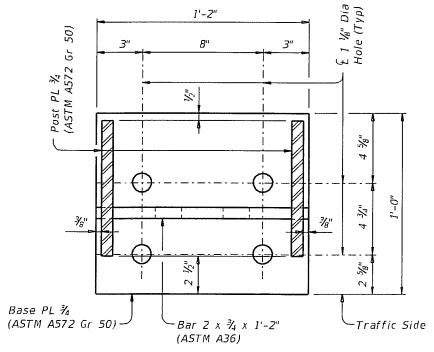
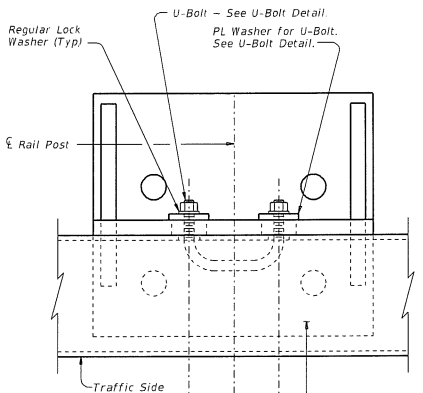
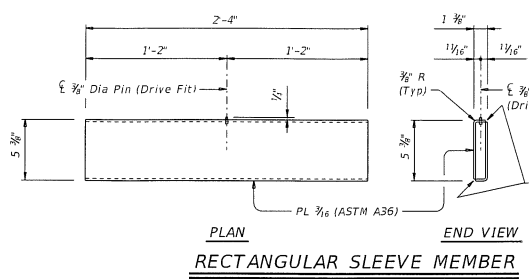
**BARS Z(#5)**

		Bridge Division Standard	
<h2>TRAFFIC RAIL</h2>			
<h3>TYPE T2P</h3>			
FILE: r15tc025-18.dgn	BY: TxDOT	CHK: T&A	DES: JTR
DATE: March 2018	CON: [ ]	SECT: [ ]	TOP: [ ]
INST: [ ]		COUNTY: [ ]	
SHEET NO.			

DATE: FILE:

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DATE: \_\_\_\_\_  
 TITLE: \_\_\_\_\_

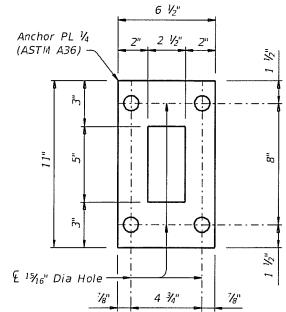


SHEET 3 OF 4

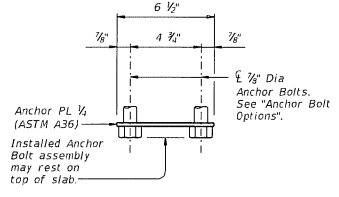
 Texas Department of Transportation		Bridge Division Standard	
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<h3 style="margin: 0;">TYPE T2P</h3>			
FILE: r15rc025.162gn	DATE: TxDOT	BY: TAR	CHK: JFR
REV: 01	DATE: March 2019	BY: sec	CHK: nsp
REV: 02	DATE: n/a	BY: sec	CHK: n/a
REV: 03	DATE: n/a	BY: sec	CHK: n/a

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DATE: \_\_\_\_\_  
 TITLE: \_\_\_\_\_

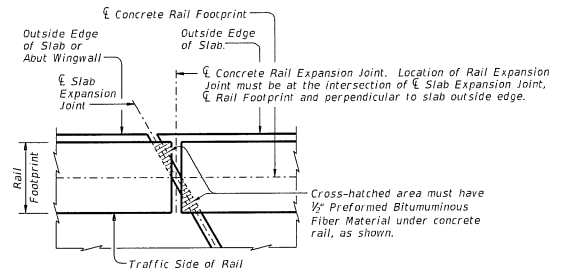


**PLAN OF ANCHOR PLATE**



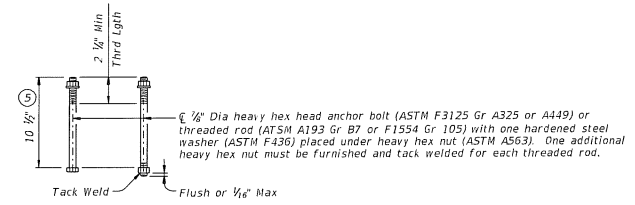
**ELEVATION**

**ANCHOR BOLT ASSEMBLY DETAILS**



**PLAN OF RAIL AT EXPANSION JOINTS**

Example showing Slab Expansion Joints without breakbacks.



**ANCHOR BOLT OPTIONS**

(Showing Anchor Bolts for Base Plate)

⑤ Increase 2" for structures with overlay.

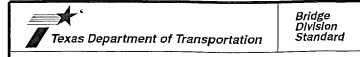
**CONSTRUCTION NOTES:**  
 The face of tubular sections and rail curb must be plumb unless otherwise approved by the Engineer. Steel posts must be square to the top of curb. Use epoxy mortar under post base plates if gaps larger than 1/4" exist.  
 Bend tubes to required radius for curved rails. Shop 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.  
 Provide HSS end caps at parapet.  
 Round or chamfer exposed edges of rail members and rail posts to approximately 1/8" by grinding.  
 Chamfer all exposed concrete corners.

**MATERIAL NOTES:**  
 Provide ASTM A1065 or A500 Gr B for all HSS.  
 Provide Grade 60 reinforcing steel.  
 Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.  
 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.  
 Provide 1/2" Dia ASTM F3125 Gr A325 or A449 bolts for ASTM A193 Gr B7 or F1554 Gr 105 threaded rods with one tack welded heavy hex nut each with one hardened steel washer (ASTM F436) placed under each heavy hex nut. Nuts must conform to ASTM A563 requirements.  
 Provide 1/2" Dia round bar U-bolts (ASTM A36) with plate washers (ASTM A36) and regular lock washers placed under hex nuts that conform to ASTM A563 requirements. See "U-Bolt Detail".  
 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.  
 Provide bar laps, where required, as follows:  
 Uncoated or galvanized - #5 = 2'-0"  
 Epoxy coated - #5 = 3'-0"

**GENERAL NOTES:**  
 This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 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.  
 This railing cannot be used on bridges with expansion joints providing more than 5" movement or on cast-in-place retaining walls, unless otherwise noted.  
 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: 192 plf (total)  
 131 plf (Conc)  
 61 plf (Steel).

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

SHEET 4 OF 4



**TRAFFIC RAIL**

**TYPE T2P**

FILE: t15d005-18.dgn	REV: JHM	DATE: TAR	REV: JTR	DATE: TAR
March 2018	CHG	SEC	ADD	REMOVE
REVISED				
DATE		COVER		SHEET NO.