

**Figure 5-397.157**

**Structural Tube Railing (Design T-1) And Concrete Parapet (Type P-2, T1-4)  
(With Integral End Post)**

Approved, and signed, March 30, 2010. Last date revised: April 17, 2013

**Revised 04-17-2013**

This standard was updated to convert reinforcing bar marks from metric to U.S. customary bar designations.

**Re-Approved 03-30-2010**

Under GENERAL NOTES:

- Changed 4<sup>th</sup> note (now 3<sup>rd</sup> note) *from*: Finish all edges of rail with ½” “VEE”..... *to*: Finish all edges of rail with ½” “CHAMFER”.....
- Changed 5<sup>th</sup> note (now 4<sup>th</sup> note) *from*: Max. spacing of concrete DEFLECTION joints shall be 20 ft. *to*: Max. spacing of concrete CONTROL joints shall be 10 ft.
- Changed 7<sup>th</sup> note (now 5<sup>th</sup> note) : Added “SEE SPECIAL PROVISIONS.” to the end of the note.
- Changed 8<sup>th</sup> note (now 6<sup>th</sup> note) *from*: Structural steel per MnDOT spec. 3310..... *to*: Structural steel “AND PLATE WASHERS” per Mn/DOT spec. 3310.....
- Changed 12<sup>th</sup> note (now 10<sup>th</sup> note) : Replaced the words “RAILING CONCRETE” with “BARRIER CONCRETE” within the sentence.
- Changed numbered notes ② & ③: Replaced the words “DEFLECTION JOINTS” with “RAILING JOINTS” within the sentences.
- Added numbered note ④: See special provisions for joint sealing requirements.
- Removed note: “See superstructure sheet for joint spacing”.
- ALL OF THE GENERAL NOTES: Have been updated and rearranged to reflect the “Active Voice”.

At the “CONTROL JOINT” (previously called Deflection Joint)

- Changed the “DEFLECTION JOINT” to a “CONTROL JOINT” and removed the R1601E & R1602E reinforcement on each side of the control joint.
- Changed the note *from*: ⌀ “Deflection” Joint. *to*: ⌀ “Control Joint 10’-0” max. spacing.”
- Changed the note *from*: See “Deflection” Joint Details. *to*: See “Control” Joint Details.
- Added section D-D.

Throughout the sheet: Changed the structural steel tube designation *from*: “TS” *to*: “HSS”.

At the Base Plate detail:

- Changed the Base Plate dimensions *from*: 1’-2 ½” x 9 ½” *to*: 1’-4” x 9 ½”, keeping the post centered in the 1’-4” direction and no change in the 9 ½” direction.
- Changed the Base Plate holes *from*: 1 3/16” dia. *to*: 1 3/16” x 2” slotted holes with 2 ¼” dimension from the edge of the plate to the center of the slotted holes. (Slotted direction of the holes along length of railing).

At the Anchor detail:

- Changed the note *from*: “2” Thread Proj. (Typ.)” *to*: “2” Min. 2 ¼” Max. Thread Proj. (Typ.)”
- Added note: 3” Dia. x ¼” (15/16”ID) Circular Plate Washer Per Mn/DOT spec.3310.

At Section G-G:

- Rotated the section on the sheet for directional correctness to match the other details on the sheet and added “Anchor Bar Alternate” under the title.
- Added an additional Section G-G Detail to the sheet showing an optional “Anchor Plate Alternate”.

Replaced and relocated the “Deflection Joint Details” with “Control Joint Details” showing the vee joint details.

In the Bill of Reinforcement For Parapet:

- Changed the bar length *from*: 5’11” *to*: 6’-1” at the R1602E location correcting the total length.

**Revised 10-22-2009**

Under GENERAL NOTES:

- Added note: "THE METAL RAILING SHALL BE CONTINUOUSLY GROUNDED, SEE THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS."

**Re-Approved 10-09-2009**

Under GENERAL NOTES:

- changed 8<sup>th</sup> note from: “STRUCTURAL STEEL PER Mn/DOT SPEC. 3309. STRUCTURAL TUBES ARE A.S.T.M. A500, GRADE B PER Mn/DOT SPEC. 3362” to “STRUCTURAL STEEL PER Mn/DOT SPEC. 3310. STRUCTURAL TUBES ARE A.S.T.M. A500, GRADE B PER Mn/DOT SPEC. 3361”.
- Deleted numbered note ④ and added new note ④ reading: “SUBSTITUTION OF CHEMICAL ANCHOR RODS FOR CAST-IN-PLACE ANCHORAGE IS NOT PERMITTED”.

At Section B-B: Changed the dimension from the top of the concrete parapet to the top longitudinal reinforcement from 5” to 4”.

At Sections C-C and D-D: Enlarged the details for clarity.

Added Section G-G: showing the ¼” x 1½” x 1’-2” anchorage bar assembly.

At “Anchor Detail”: Removed reference to chemical anchorages. Added the ¼” x 1½” x 1’-2” bar assembly to the detail with note 7/8” x 10” ANCHOR RODS, Mn/DOT SPEC. 3385 TYPE C, WITH TWO HEX NUTS AND WASHERS”. Added section arrows for section G-G.

At “Base Plate” Detail: Changed the size of the weld from 5/16 to 3/8 at the weld symbol.

**Revised 06-14-2006**

Changed standard title: STRUCTURAL TUBE RAILING (DESIGN T-1) AND CONCRETE PARAPET (TYPE P-2) (WITH INTEGRAL END POST) *to* STRUCTURAL TUBE RAILING (DESIGN T-1) AND CONCRETE PARAPET (TYPE P-2, TL-4) (WITH INTEGRAL END POST)

At INSIDE ELEVATION VIEW: changed drawing to show DEFLECTION JOINT is spaced 1'-0" (MIN.) from centerline of rail post.

At ANCHOR DETAILS: added anchor rod dimensions.

Under GENERAL NOTES:

- changed LENGTH OF "TYPE P-2 RAILING CONCRETE (3Y46 OR 3Y46A)" FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE PARAPET. *to* LENGTH OF "TYPE P-2 (TL-4) RAILING CONCRETE (3Y46 OR 3Y46A)" FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE PARAPET.
- changed LENGTH OF "STRUCTURAL TUBE RAILING, DESIGN T-1" FOR ... *to* LENGTH OF "STRUCTURE TUBE RAILING DESIGN T-1" FOR ...
- changed GUARDRAIL CONNECTION TO BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS. *to* GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO "TYPE P-2 (TL-4) RAILING CONCRETE (3Y46 OR 3Y46A)".

- changed PRICE BID FOR "STRUCTURAL TUBE RAILING, DESIGN T-1" INCLUDES ... *to* PRICE BID FOR "STRUCTURE TUBE RAILING DESIGN T-1" INCLUDES ...
- changed ALL MATERIAL IN THE CONCRETE PARAPET IS INCLUDED IN ... *to* ALL MATERIAL IN THE CONCRETE PARAPET IS LISTED IN ...

**Revised 07-02-2004**

At STRUCTURAL TUBE RAIL DETAIL

- Changed two weld symbols.

At RAIL SLEEVE DETAIL

- Changed TS 9" x 3" x  $\frac{1}{4}$ " (PLATE WITH  $\frac{3}{16}$ " PLATE FOR  $9\frac{3}{8}$ " x  $3\frac{3}{8}$ " FINISHED SIZE). *to* TS 9" x 3" x  $\frac{1}{4}$ ", PLATED TO  $9\frac{3}{8}$ " x  $3\frac{3}{8}$ " FINISHED SIZE – OR - FORMED TUBE  $9\frac{3}{8}$ " x  $3\frac{3}{8}$ " x  $\frac{1}{4}$ "

At RAIL END DETAIL

- Changed weld symbol
- Changed  $\frac{1}{4}$ " PLATE, BEVEL OUTSIDE EDGE *to*  $\frac{1}{4}$ " PLATE
- Changed 2" *to*  $\frac{3}{4}$ "
- Changed CL  $\frac{1}{2}$ " DIA. WEEP HOLE AT UNDERSIDE CENTER (TYP.) *to* CL  $\frac{1}{2}$ " DIA. WEEP HOLE ON UNDERSIDE AT  $\frac{3}{4}$ " FROM BACK FACE OF TYBE (TYP.)

**Approved, and signed, December 18, 2003**