



**INSIDE ELEVATION OF RAILING**  
 CONCRETE WEARING COURSE NOT SHOWN  
**RAIL MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350**

**GENERAL NOTES**

FOR PAYMENT OF "TYPE P-2 (TL-4) BARRIER CONCRETE (3Y46 OR 3Y46A)" MEASURE LENGTH OF CONCRETE BARRIER BETWEEN END FACES. CONCRETE PARAPET = 396 LBS./FT. (0.098 CU. YDS./FT.)

FOR PAYMENT OF "STRUCTURAL TUBE RAILING DESIGN T-1" MEASURE LENGTH OF RAIL FROM END TO END OF TUBING, DO NOT DEDUCT FOR JOINTS.

FINISH ALL EDGES OF RAIL WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

MAX. SPACING OF CONCRETE CONTROL JOINTS SHALL BE 10 FT.

PROVIDE CORRECT ALIGNMENT FOR ANCHORAGES BY PLACING THEM ACCURATELY AND NORMAL TO GRADE. SEE SPECIAL PROVISIONS.

PROVIDE STRUCTURAL STEEL AND PLATE WASHERS PER Mn/DOT SPEC. 3310. PROVIDE STRUCTURAL TUBES PER A.S.T.M. A500, GRADE B AS SPECIFIED IN Mn/DOT SPEC. 3361.

GALVANIZE BOLTS, NUTS, AND WASHERS PER Mn/DOT SPEC. 3392.

GALVANIZE ALL OTHER STRUCTURAL STEEL PER Mn/DOT SPEC. 3394, AFTER FABRICATION.

PROVIDE GUARDRAIL CONNECTION STRUCTURAL STEEL PER Mn/DOT SPEC. 3306.

GUARDRAIL CONNECTION AND NAME PLATE IS INCIDENTAL TO "TYPE P-2 (TL-4) BARRIER CONCRETE (3Y46 OR 3Y46A)".

PRICE BID FOR "STRUCTURAL TUBE RAILING DESIGN T-1" INCLUDES ANCHORAGES AND ALL MATERIAL ABOVE TOP OF CONCRETE BARRIER.

ALL MATERIAL IN THE CONCRETE BARRIER IS LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

SEE SPECIAL PROVISIONS FOR PAINT REQUIREMENTS.

CONTINUOUSLY GROUND THE METAL RAILING AS DIRECTED IN THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

- ① MAKE THICKNESS THE SAME AS SLAB IN SECTION B-B.
- ② 1" AT RAILING JOINTS, AT EXPANSION JOINTS, MAKE 1" LARGER THAN GAP IN EXPANSION JOINTS.
- ③ 5" AT RAILING JOINTS AND 8" AT EXPANSION JOINTS.
- ④ SUBSTITUTION OF CHEMICAL ANCHOR RODS FOR CAST-IN-PLACE ANCHORAGE IS NOT PERMITTED.
- ⑤ SEE SPECIAL PROVISIONS FOR JOINT SEALING REQUIREMENTS.

**BILL OF REINFORCEMENT FOR PARAPET**

BAR	NO.	LENGTH	SHAPE	LOCATION
R1601E	---	5'-7"	BENT	PARAPET VERTICAL
R1602E	---	6'-11"	BENT	PARAPET VERTICAL
R1603E	---	4'-11"	BENT	PARAPET VERTICAL
R1604E	---	8'-7"	BENT	PARAPET VERTICAL
R1605E	- SER. OF 2	7'-11" TO 8'-3"	BENT	PARAPET VERTICAL
R1606E	- SER. OF 2	7'-3" TO 7'-5"	BENT	PARAPET VERTICAL
R2207E	---	6'-7"	BENT	PARAPET END
R1608E	---	2'-9"	BENT	PARAPET END LONGIT.
R1609E	---	---	---	PARAPET LONGITUDINAL
R1610E	---	---	---	PARAPET LONGITUDINAL
R1611E	---	---	---	PARAPET LONGITUDINAL
R1612E	---	---	---	PARAPET LONGITUDINAL

REVISED:  
 APPROVED: MARCH 30, 2010  
 STATE BRIDGE ENGINEER

**RAIL SLEEVE DETAIL**

CERTIFIED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: \_\_\_\_\_ LIC. NO. \_\_\_\_\_

STRUCTURAL TUBE RAILING (DESIGN T-1) AND CONCRETE PARAPET (TYPE P-2, TL-4) (WITH INTEGRAL END POST)

DESIGNED BY \_\_\_\_\_ DRAWN BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_  
 SHEET NO. \_\_\_ OF \_\_\_ SHEETS  
 BRIDGE NO. \_\_\_\_\_

FIG. 5-397.157