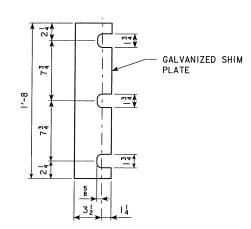


ELLIPTICAL TUBE WITH RAILING POST AND ANCHORAGE DETAILS



SHIM PLATE DETAIL

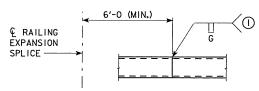
PROVIDE 2-16" GALVANIZED STEEL
SHIMS FOR EACH RAIL POST, TO BE USED AS REQUIRED.

JOINT OPENING TO MATCH WIDTH OF SUPPORTING SLAB JOINT OPENING PLUS 3" (IF SLAB OPENING OCCURS AT SAME LOCATION). 14" MIN. AT ALL OTHER LOCATIONS 1'-0 SLEEVE MEMBER, 47" × 8 ELLIPSE MIN. SEE TABLE I RAILING, SEE TABLE 1 (TYP) € 4" P DRAIN HOLE € RAILING AT HIGH SIDE OF SPLICE JOINT 1.5 x 3" ¢ (TYP.) (IF RAIL IS LEVEL STAINLESS STEEL 1'-9 OR NEARLY LEVEL PLACE SPRING PIN (DRIVE DRAIN HOLE ON BOTH FIT) ON BOTTOM

ELLIPSE RAILING SPLICE

B

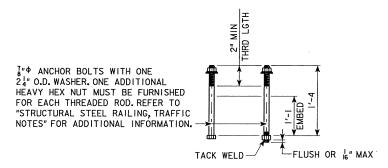
THE MAJOR AND MINOR DIAMETERS OF THE RAILING MEMBER MAY VARY +/- 0.1875 INCHES FROM PLAN DIMENSIONS. HOWEVER, THE DIFFERENCE BETWEEN THE OUTSIDE DIAMETERS OF THE SLEEVE AND THE INSIDE DIAMETERS OF THE RAILING SHALL NOT EXCEED 0.125 INCHES ALONG THE MAJOR OR MINOR AXIS. THE MAXIMUM GAP ALONG THE 45° AXIS OF THE SLEEVE MAY BF " MAX.



OF SLEEVE

RAILING SHOP SPLICE DETAIL

(1) ONE SHOP SPLICE PER PANEL IS PERMITTED WITH MINIMUM 85 PERCENT PENETRATION. THE WELD MAY BE SQUARE GROOVE, DOUBLE VEE GROOVE, OR SINGLE GROOVE. GRIND SMOOTH.



CAST-IN-PLACE ANCHOR BOLT OPTIONS

TABLE I		
APPROVED RAILING MATERIAL		
4 ⁷ × 8	SLEEVE MEMBER	
ELLIPSE RAILING	(AT RAILING SPLICE)	
MATERIAL	MATERIAL	THICKNESS
6" DIA. STD. PIPE ASTM-A53 E OR S GRADE B	ASTM-A53-B	0.353"
	A36 OR A500 GR. B	0.339"
	API-5LX52	0.224"
6" DIA., 0.280" WALL THICKNESS ASTM-A50I	ASTM-A53-B	0.353"
	A36 OR A500 GR. B	0.339"
	API-5LX52	0.224"
6§" O.D. × O.188" TUBE API-5LX52	ASTM-A53-B	0.339"
	A36 OR A500 GR. B	0.325"
	API-5LX52	0.216"

SIDES OF SPLICE)

STRUCTURAL STEEL RAILING, TRAFFIC NOTES:

STRUCTURAL STEEL BARRIER JOINTS ARE TO BE LOCATED AS SHOWN

THE STRUCTURAL STEEL RAILING IS TO BE BID ON A PER LINEAR FOOT BASIS MEASURED FROM END TO END OF STEEL RAILING.

THE NUMBER OF LINEAR FOOT OF STRUCTURAL STEEL RAILING INSTALLED WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER FOOT BASED ON PLAN QUANTITIES.

PRICE BID FOR "STRUCTURAL STEEL RAILING, TRAFFIC" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, AND ALL EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAILING IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.

ALL RAILINGS, POSTS, SLEEVES, BASE PLATES, AND SHIMS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A123.

OPTIONAL CAST-IN-PLACE ANCHOR BOLTS TO COMPLY WITH ASTM F1554 GRADE 105. HEX NUTS TO COMPLY WITH ASTM A563 GRADE DH. WASHERS TO COMPLY WITH ASTM F436. GALVANIZING IN ACCORDANCE WITH ASTM F2329.

ANCHOR BOLTS SHALL BE TO DIA., A193 GR. BT, BE FULLY THREADED WITH HEAVY HEX NUTS AND ONE HARDENED WASHER AND ONE 24" O.D. WASHER EACH. EMBED THREADED RODS 102" MIN. INTO CONCRETE PARAPET. ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM F2329. ADHESIVE BONDING MATERIAL SYSTEM SHALL BE IN ACCORDANCE WITH MATERIALS I.M. 491.11. INSTALLED ANCHORS SHALL BE CAPABLE OF OBTAINING AN ULTIMATE LOAD PER THREADED ROD OF 36 KIPS IN TENSION FOR THE SPACING AND EDGE DISTANCE SHOWN IN THE PLANS. INSTALL AND FIELD TEST ANCHORS IN ACCORDANCE WITH THE DEVELOPMENTAL SPECIFICATION, "INSTALLING ADHESIVE-BONDED ANCHORS AND DOWELS FOR TRAFFIC RAILINGS".

TESTING NOTE FOR TUBE STEEL:

THE RESULTS OF THE FOLLOWING TEST SHALL BE SUBMITTED AS A CERTIFIED TEST REPORT TO THE CENTRAL MATERIALS OFFICE IN AMES ALONG WITH A CERTIFIED MILL TEST REPORT. IN ADDITION, A I FOOT LONG TUBE SAMPLE FROM THE FABRICATING SHOP SHALL ALSO BE SUBMITTED TO THE CENTRAL MATERIALS OFFICE IN AMES FOR VERIFICATION TESTING.

TESTING IS NOT REQUIRED FOR HOT ROLLED TUBE STEEL CONFORMING TO

ALL COLD FORMED TUBE STEEL SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM E436 - "DROP-WEIGHT TEAR TESTS OF FERRITIC STEELS", EXCEPT WITH THE FOLLOWING MODIFICATIONS:

ALL TESTS SHALL BE PERFORMED BY THE PRODUCING MILL PRIOR TO FABRICATION. MATERIAL SAMPLES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 PRIOR TO TESTING.

THE TESTING SHALL BE CONDUCTED AT A TEMPERATURE OF O DEGREES FAHRENHEIT ON A 3" x 1'-0 SPECIMEN.

IF THE AVERAGE PERCENT SHEAR AREA FALLS BELOW 50 PERCENT THE MATERIAL REPRESENTED BY THESE TESTS SHALL BE REJECTED.

ALL MATERIALS SHALL BE ACCEPTED ON THE BASIS OF COMPLYING TEST RESULTS AND CERTIFIED MILL TEST REPORT.

TO FACILITATE ACCEPTANCE AND REJECTION OF MATERIAL, THE MANUFACTURER OF THE STRUCTURAL STEEL SHAPE SHALL IDENTIFY THE PRODUCT WITH THE STEEL HEAT NUMBER THAT IS TRACEABLE AT THE TIME OF ACCEPTANCE. THE HEAT NUMBER SHALL BE PLACED AT INTERVALS NOT TO EXCEED 4'-0.

DESIGN FOR VARIABLE SKEW (L.A.)

 $137'-9 \times VARIES$ WELDED GIRDER BRIDGE 137'-9 SIMPLE SPAN

TRAFFIC RAILING DETAILS STA. 4502+63.37, BASELINE U.S. 67 RAMP D NOVEMBER 2016

SCOTT COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION DESIGN SHEET NO. 35 OF 42 FILE NO. 30253 DESIGN NO. 1617

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