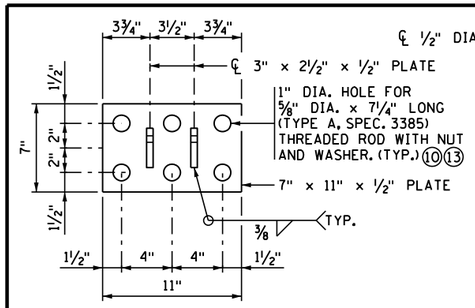
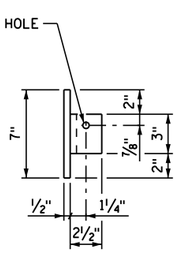
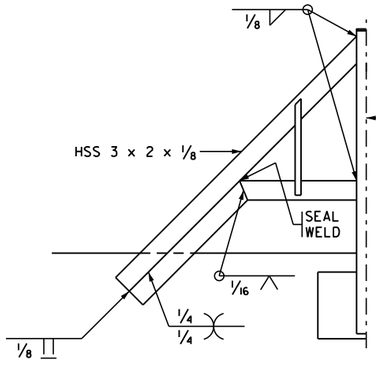
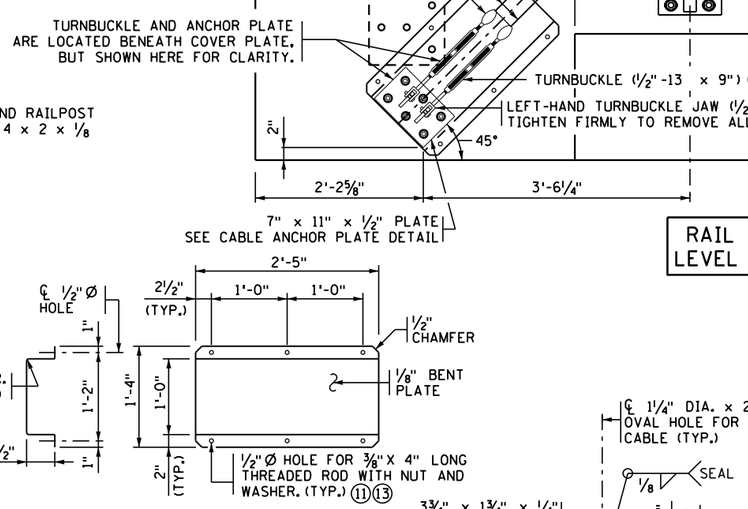


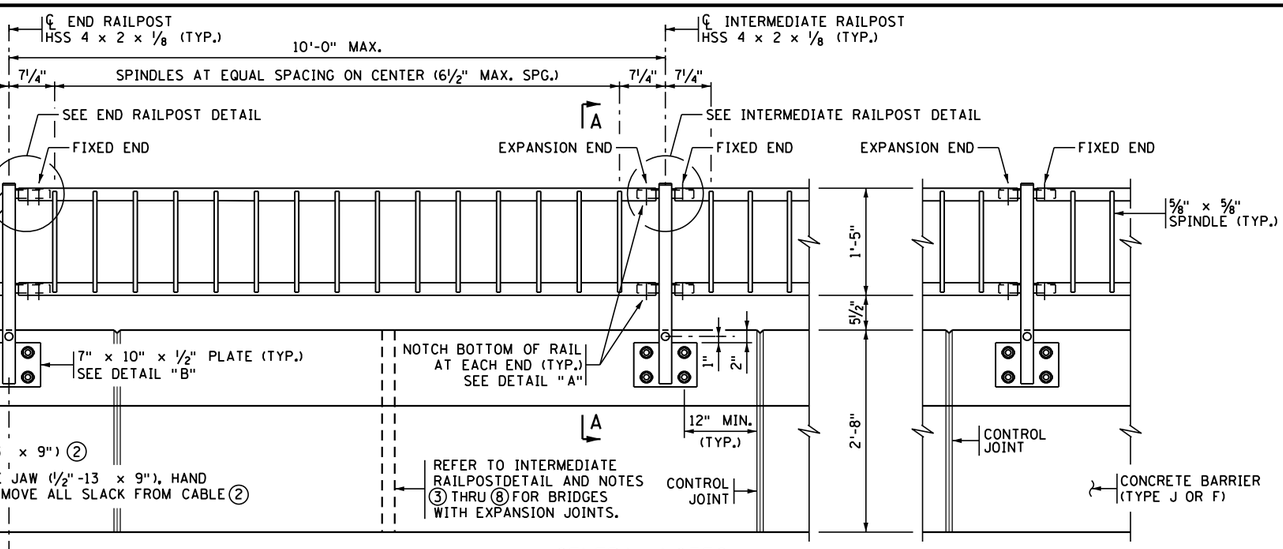


CABLE ANCHOR PLATE DETAIL



WELDS AT END PANEL

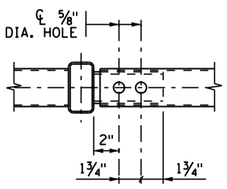




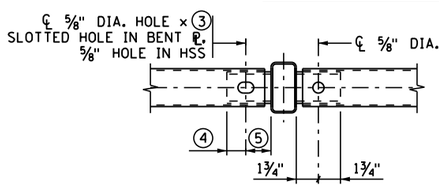
OUTSIDE ELEVATION OF RAILING

RAIL AND BARRIER COMBINATION MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350.

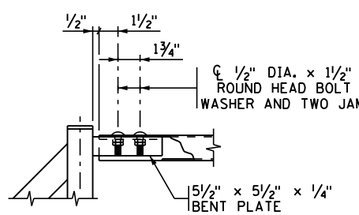
COVER PLATE DETAIL



FIXED END

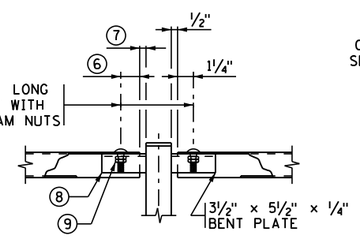


EXPANSION END FIXED END



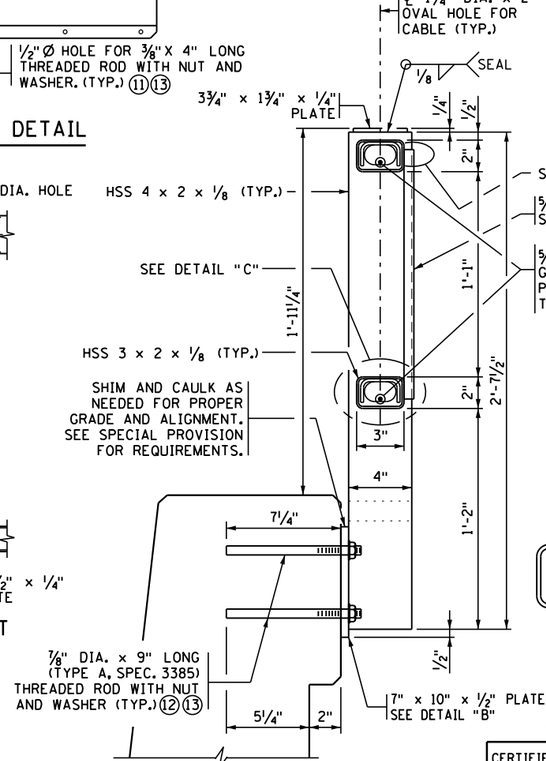
END RAILPOST DETAIL

TOP AND BOTTOM RAIL CONNECTIONS ARE SIMILAR

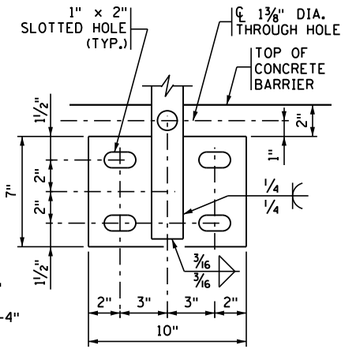


INTERMEDIATE RAILPOST DETAIL

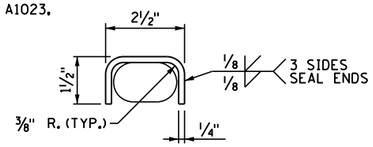
TOP AND BOTTOM RAIL CONNECTIONS ARE SIMILAR



SECTION A-A

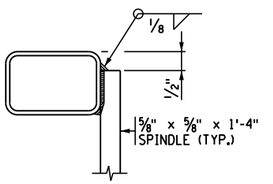


DETAIL "B"



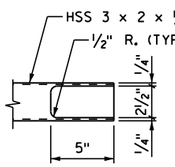
DETAIL "C" - BENT PLATE

(HSS TUBE RAIL NOT SHOWN)



DETAIL "D"

(TYP. TOP AND BOTTOM RAIL)



DETAIL "A"

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS; SEE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

REFER TO SUPERSTRUCTURE AND CONCRETE BARRIER SHEETS FOR ADDITIONAL DETAILS AND RAILPOST AND/OR CONTROL JOINT SPACING.

MEASURE PAYMENT LENGTH OF "STRUCTURAL TUBE RAILING (DESIGN T-2)" FROM CABLE ANCHOR PLATE TO CABLE ANCHOR PLATE.

PROVIDE A500, GRADE B STRUCTURAL STEEL TUBING. PROVIDE ALL OTHER STRUCTURAL STEEL PER SPEC. 3306.

GALVANIZE THREADED RODS, BOLTS, NUTS AND WASHERS PER SPEC. 3392. GALVANIZE ALL OTHER STRUCTURAL STEEL PER SPEC. 3394 AFTER FABRICATION. SEAL WELD ALL SURFACES PRIOR TO GALVANIZING.

STRAIGHTEN ALL RAILING MEMBERS AFTER FABRICATION AND GALVANIZING TO WITHIN ⅛" IN 10 FT. BY MECHANICAL MEANS WITHOUT DAMAGE TO ZINC COATING.

SEE SPECIAL PROVISIONS FOR COATING TO BE APPLIED TO METAL RAILING.

IF SPECIAL SURFACE FINISH IS APPLIED TO CONCRETE BARRIER, COAT TURNBUCKLE COVER PLATE WITH MATCHING COLOR PER METAL RAILING COATING SPECIAL PROVISIONS. IF SPECIAL SURFACE FINISH IS NOT APPLIED TO BARRIER, LEAVE TURNBUCKLE COVER PLATE WITH GALVANIZED FINISH.

INSTALL RAILPOSTS AND SPINDLES NORMAL TO GRADE.

① ½" X 13 COARSE THREAD GALVANIZED FORGED ELECTROLINE STUD SOCKET ASSEMBLY WITH PLUG & SLEEVE, GD-331-X, EXTRA IMPROVED PLOW STEEL WITH MIN. BREAKING STRENGTH OF 10,540 LBS.

② GALVANIZED JAW AND JAW TURNBUCKLE PER ASTM F1145 TYPE 1, GRADE 1 WITH MIN. BREAKING STRENGTH OF 11,000 LBS. USE ONE TURNBUCKLE ON EACH END OF EACH CABLE.

③ 1¼" (AT TYP. EXP. END) OR 3" (AT EXP. END AT EXPANSION JOINT)

④ 1½" (AT TYP. EXP. END) OR 2½" (AT EXP. END AT EXPANSION JOINT)

⑤ 2" (AT TYP. EXP. END) OR 3" (AT EXP. END AT EXPANSION JOINT)

⑥ 1½" (AT TYP. EXP. END) OR 2½" (AT EXP. END AT EXPANSION JOINT)

⑦ ½" (AT TYP. EXP. END) OR 1½" (AT EXP. END AT EXPANSION JOINT)

⑧ 3½" × 5½" × ¼" BENT PLATE (AT TYP. EXP. END)
5½" × 6½" × ¼" BENT PLATE (AT EXP. END AT EXPANSION JOINT)

⑨ AT EXPANSION END PROVIDE 1/16" GAP BETWEEN UNDERSIDE OF BENT PLATE AND UPPER NUT TO ALLOW LATERAL MOVEMENT OF THE RAIL.

⑩ 5" MINIMUM EMBEDMENT, TORQUE TO 30 FT. LBS.

⑪ 3" MINIMUM EMBEDMENT, TORQUE TO 20 FT. LBS.

⑫ 7¼" MINIMUM EMBEDMENT, TORQUE TO 80 FT. LBS.

⑬ ADHESIVE ANCHORAGE WITH ANCHOR ROD PER SPEC. 3385, TYPE A WITH HEX NUT AND WASHER. PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHORAGE NO LESS THAN EMBEDMENT SHOWN REGARDLESS OF CHARACTERISTIC BOND STRENGTH. DRILL THROUGH REINFORCEMENT (IF ENCOUNTERED) TO ACHIEVE MINIMUM EMBEDMENT. ENSURE HEX NUT IS IN CONTACT WITH THE ADJACENT SURFACE AND TORQUE TO VALUE SHOWN UNLESS A HIGHER TORQUE IS RECOMMENDED BY THE MANUFACTURER. PROOF LOAD TO 6.0 KIPS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.

REVISED: FEBRUARY 27, 2019

APPROVED: DECEMBER 02, ~~2015~~

STATE BRIDGE ENGINEER

FIG. 5-397.158(A)

CERTIFIED BY _____ DATE
LICENSED PROFESSIONAL ENGINEER
NAME: LIC. NO.

TITLE: STRUCTURAL TUBE RAILING (DESIGN T-2) FOR CONCRETE J OR F BARRIER

DES:	DR:	APPROVED:	BRIDGE NO.
CHK:	CHK:		
SHEET NO. OF SHEETS			