APPROVED JANUARY 9, 2019
STATE DESIGN ENGINEER

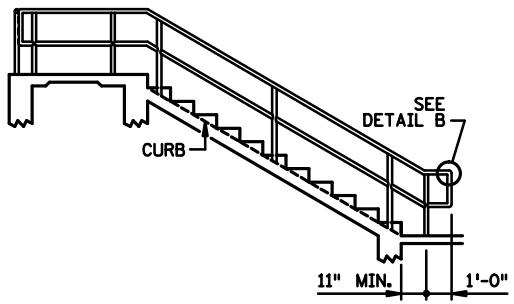
STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

PIPE RAILING

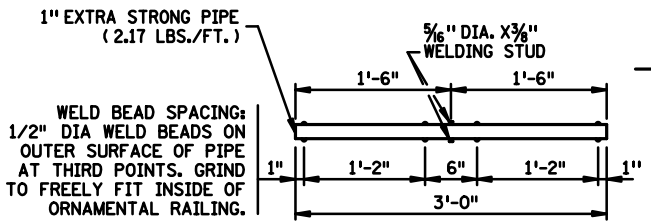
PEDESTRIAN RAILING FOR STAIRS AND RAMPS
(AT GRADE)

SPECIFICATION REFERENCE
2471
3385

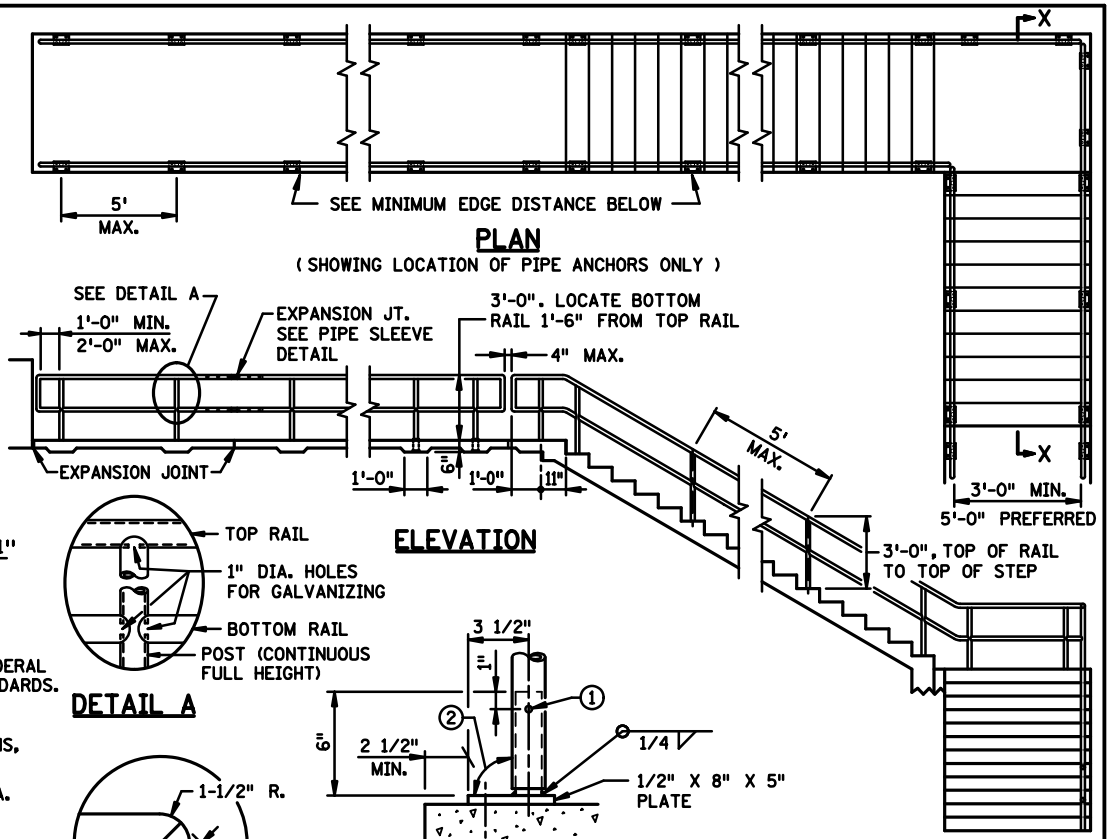
STANDARD PLATE NO.
8400F



SECTION X-X



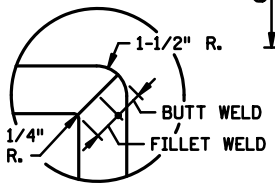
PIPE SLEEVE DETAIL



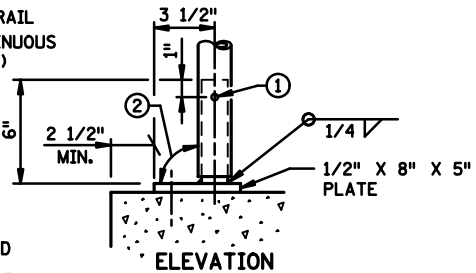
PLAN
(SHOWING LOCATION OF PIPE ANCHORS ONLY)

ELEVATION

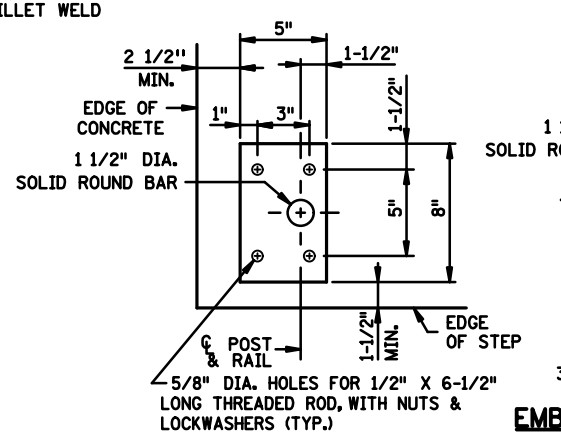
DETAIL A



DETAIL B

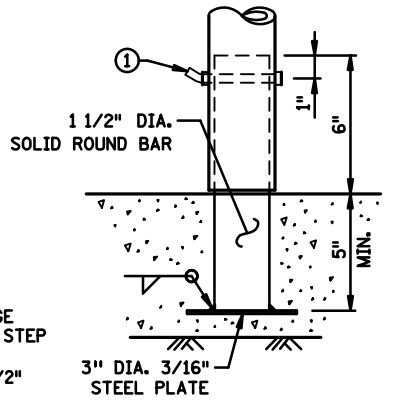


ELEVATION



PLAN

BASE PLATE ANCHOR OPTION



EMBEDDED ANCHOR OPTION

NOTES:

CONSTRUCT RAILING AND STAIRS TO MEET ALL STATE AND FEDERAL BUILDING CODES AND AMERICANS WITH DISABILITIES ACT STANDARDS.

THIS RAILING IS NOT SUITABLE FOR OSHA FALL PROTECTION.

REFER TO OTHER PLAN SHEETS FOR TREAD & RISER DIMENSIONS, POST LOCATIONS AND EXPANSION JOINT LOCATIONS.

FURNISH AND INSTALL POSTS AND RAILS WITH 1-1/2" NOM. DIA. STANDARD PIPE AT 2.72 LBS. PER LIN. FT., PER SPEC. 3362.

PROVIDE STRUCTURAL STEEL PER SPEC. 3306.

FABRICATE PER SPEC. 2471.

MITER ALL CONNECTIONS, FULL BUTT WELDED AND GROUND SMOOTH.

NOTIFY MNDOT TO SHOP INSPECT RAILING BEFORE AND AFTER GALVANIZING.

GALVANIZE BOLTS, NUTS, WASHERS AND ANCHORS PER SPEC. 3392. GALVANIZE PLATES, SOLID BARS, PIPE SLEEVES, PIPE RAILING AND ALL OTHER STRUCTURAL STEEL PER SPEC. 3394, AFTER FABRICATION. PROVIDE VENT HOLES AS NECESSARY.

PROVIDE RAILING EXPANSION JOINT SLEEVES AT CONCRETE EXPANSION JOINT LOCATIONS AS INDICATED ON THE PLAN.

ADHESIVE ANCHORAGE WITH 1/2" DIA. 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 5" 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 30 FT-LBS UNLESS A HIGHER TORQUE IS RECOMMENDED BY THE MANUFACTURER. PROOF LOAD TO 2.8 KIPS.

(1) DRILL 5/16" DIA. HOLE THRU POST AND POST ANCHOR AFTER ASSEMBLY. PROVIDE 1/4" DIA. BOLT AND NUT PER SPEC 3391, TYPE A. BEND END OF BOLT AFTER SECURING NUT TO PREVENT BOLT FROM BEING REMOVED.

(2) SET POSTS VERTICAL, UNLESS OTHERWISE NOTED. SHIM AS REQUIRED TO PREVENT WOBBLE.