

General Notes

PIPE RAILING & POSTS: Pipe Rails and Posts shall be in accordance with ASTM A53 Grade B for standard weight pipe and ASTM A500 Grade B, C or D or ASTM A501 for structural tube. For curved longitudinal alignments the top and bottom rails and handrails shall be shop bent to match the alignment radius.

BASE PLATES: Base Plates shall be in accordance with ASTM A36 or ASTM A709 Grade 36.

COATINGS: The railing shall be hot-dip galvanized after fabrication in accordance with AASHTO M111. All nuts, anchor bolts, and washers shall be hot-dip galvanized in accordance with AASHTO M232.

ANCHOR BOLTS: Anchor bolts shall be in accordance with ASTM F1554 Grade 36. Headless anchor bolts for Adhesive Anchors shall be threaded full length. Cutting of reinforcing steel is permitted for drilled hole installation. All anchor bolts shall have single self-locking hex nuts. Tack welding of the nut to the anchor bolt may be used in lieu of self-locking nuts. All nuts shall be in accordance with ASTM A563 or ASTM A194. Flat Washers shall be in accordance with ASTM F436. After the nuts have been snug tightened, the anchor bolt threads shall be distorted to prevent removal of the nuts. Distorted threads and tack welds shall be coated with a zinc rich paint. Mechanical anchors may be allowed. Submit calculations by a professional engineer and manufacture data for proposed mechanical anchor to the engineer for approval along with the shop drawings.

RESILIENT AND NEOPRENE PADS: Resilient and Neoprene pads shall be in accordance with Specification Section 932, except that testing of the finished pads shall not be required. Neoprene pads shall be durometer hardness 60 or 70.

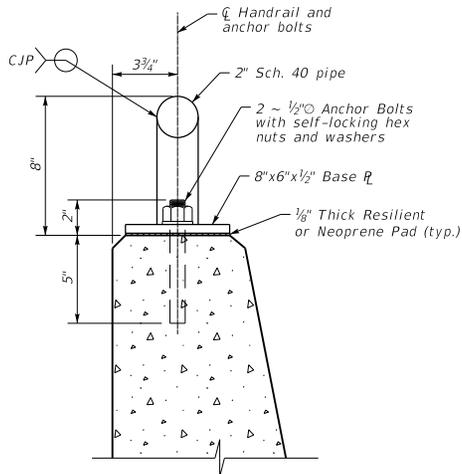
JOINTS: All fixed joints are to be welded all around and plug welds ground smooth. Remove burrs and weld splatter, additionally remove any sharp edges on rails to prevent injury. Expansion Joints shall be spaced at a maximum of 20'-0". Field splices similar to the expansion joint detail may be approved by the Engineer to facilitate shipping and handling, but rails must be continuous across a minimum of two posts.

WELDING: All welding shall be in accordance with the American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition). Weld metal shall be E60XX or E70XX. Nondestructive testing of welds is not required.

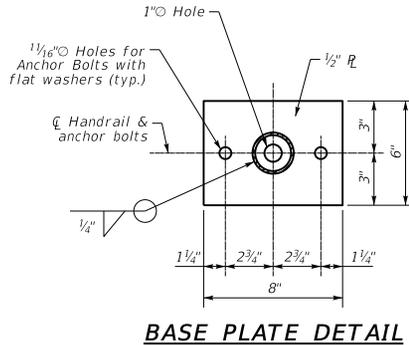
SHOP DRAWINGS: Details addressing project specific geometry (line & grade) showing post and expansion joint locations must be submitted by the Contractor for the Engineer's approval prior to fabrication of the railing. Shop drawings shall be in accordance with the Specifications.

PAYMENT: Steel handrail shall be paid for under the contract unit price for Steel Handrail, LF. Payment for the handrail will be plan quantity measured as the length along the center line of the top rail, and includes rails, posts, rail splice assembly, base plates, anchor bolts, nuts, washers, resilient or neoprene pads and all incidental materials and labor required to complete installation of the handrail.

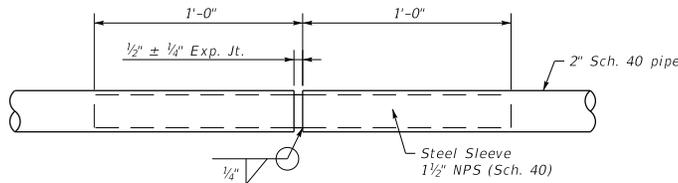
RAILING MEMBER DIMENSIONS TABLE			
MEMBER	DESIGNATION	OUTSIDE DIMENSION	WALL THICKNESS
Posts and Rails	2" NPS (Sch. 40)	2.375"	0.154"
Rail Joint/Splice Sleeves	1 1/2" NPS (Sch. 40)	1.900"	0.145"



TYPICAL SECTION

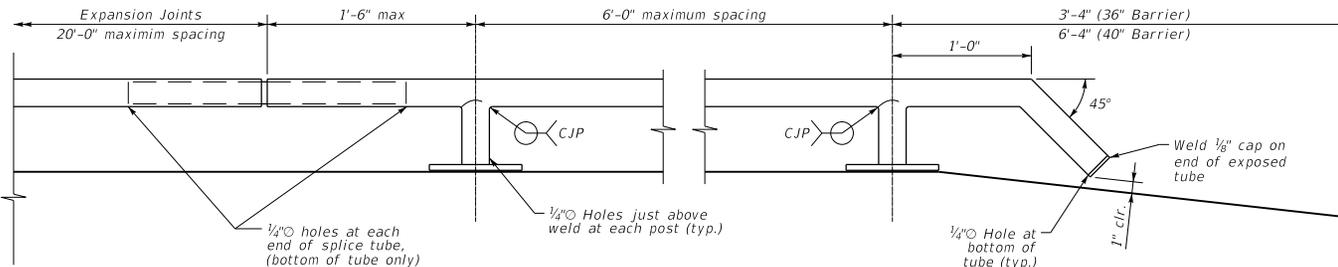


BASE PLATE DETAIL



EXPANSION JOINT

*Note: Expansion Joints shall be placed at bridge expansion joint locations and shall match Bridge Expansion Joint Size. This handrail shall not be used where bridge expansion and contraction will leave less than 6 inch overlap in handrail joint.



ELEVATION

KENTUCKY DEPARTMENT OF HIGHWAYS		
STEEL HANDRAIL		
STANDARD DRAWING NO. BHS-016		
SUBMITTED	<i>Bob Adams</i> DIRECTOR DIVISION OF STRUCTURAL DESIGN	02-26-20 DATE
APPROVED	<i>[Signature]</i> STATE STRUCTURAL ENGINEER	02-26-20 DATE