

SECTION 02235

HORIZONTAL BORING AND JACKING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Work under this section includes the installation of the casing and carrier pipe where indicated as special highway crossing or railroad crossings on the drawings.

1.02 RELATED WORK

- A. Section 02221 - Trenching, Backfilling and Compacting.
- B. Section 02713 - Water Lines
- C. Section 0272 – Sanitary Sewers and Force Mains

1.03 PERMITS

- A. The Owner shall obtain the crossing permits required by the railroad, Local County or Tennessee Department of Transportation for construction of the crossing.
- B. All work within the railroad or highway right-of-way shall be in accordance with the agency's requirements, including construction materials and methods, clean-up, and all additional bonds and insurance coverage required.

1.04 REFERENCES

- A. ASTM A 53 - Pipe, Steel, Black and Hot dipped, Zinc Coated Welded and Seamless.
- B. ASTM A 139 - Welded Steel Pipe

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Casing Pipe: ASTM A 252 Grade 2 or equal, welded, and minimum yield strength of 35,000 psi. Pipe shall not be used or reject pipe.

- 1. Size & Thickness

Carrier Pipe Size Nominal I.D. <u>Inches</u>	Minimum Casing Pipe Size Nominal I.D. <u>Inches</u>	Minimum Casing Wall Th. <u>Inches</u>
4	12	0.250
6	14	0.312
8	16	0.375
10	20	0.375
12	22	0.406
14	24	0.406
16	30	0.469
20	36	0.500
24	36	0.500
30	36	0.500
36	42	0.500

Larger size casing shall be used if needed by Contractor to facilitate construction.

- B. Carrier Pipe: Ductile iron, mechanical joint or push-on joint (restrained).
- C. Carrier Pipe Bracing: Skids shall either extend the full length of pipe less the bell and spigot portion or have three or more sets equally spaced. Skids shall be treated timber (for ground contact) or manufactured integral band and spacers/skids. Treated timber skids shall have a minimum bearing or contact surface width of: 2 inches for carrier pipes up to 12 inches in dia., and 4 inches for carrier pipes greater than 12 inches in dia. Manufactured units shall be comprised of stainless steel or epoxy coated carbon steel bands and polymer plastic spacers. For both types, the number of spacers/skids that are equally spaced around the carrier pipe shall be 4 for up to 12 inches in dia. and 6 or more for greater than 12 inches in dia. All bolts, nuts, washers, straps and any other fastener shall be T-304 stainless steel. Metal bands shall not contact the carrier pipe

unless separated by an insulating material.

PART 3 - EXECUTION

3.01 PERFORMANCE

- A. Construct crossings within rights-of-ways as required by permits and these specifications. Open pits and trenches shall conform to Section 02221 from the initial opening to placing backfill and cleanup.
- B. The boring machine to be used shall be in good mechanical condition and capable of drilling the within the required limits of accuracy. The limits of accuracy shall be 1 percent in vertical grade and 2 percent in lateral alignment providing the flow line direction and grade is maintained. The casing shall be forced into the bored hole to give a tight fit against the earth sides of the bored hole. Any voids that develop around the exterior of the casing pipe shall be filled with an approved pressure grout mix.
- C. The pipe may be installed by jacking a pipe as a casing and inserting a carrier pipe. Approval in writing by the Engineer shall be obtained in advance of starting the work. All applicable the requirements for boring shall apply to jacking. In any case, the Contractor shall retain full responsibility for the adequacy of his jacking operations, equipment and materials. The casing pipe shall be carefully inspected to ensure that the carrier pipe can be properly placed.
- D. The assembled and joined pipe shall be placed only by such method that will keep the joint in compression. Any method that could cause the joined the pipe to separate while being placed will not be permitted. Skids shall be provided for the carrier pipe during installation into the casing pipe. Skids shall be of sufficient thickness to allow for clearance between the bells of the carrier pipe and the casing bottom.
- D. Seals shall be provided at the ends of the casing pipe subsequent to completion of the carrier pipe testing. Seals shall be water tight and composed of non-shrink grout or sealed neoprene rubber sheets with 1/2 inch wide stainless steel bands.

END OF SECTION