

SECTION 33 05 25 – BORING AND JACKING

This section is for boring and jacking pipes larger than 4-inch with or without a carrier pipe. It does not include compaction auger, hydraulic push rod, jetting or air ram techniques. It also does not include tunneling which must be designed structurally for each case.

For crossing under a Michigan highway, see MDOT Standard Specifications for Constructions and contact the MDOT regional office for requirements.

For crossing under a railroad, contact the specific railroad company's engineering department; most railroads follow American Railroad Engineers Association (AREA) specifications.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

- A. This section includes the major items listed below for a pipe crossing under a [street] [highway] [railroad] [], without disturbing the surface:
 - 1. Casing pipe.
 - 2. Carrier pipe.
- B. Related sections include the following:
 - 1. Division 31 Section “Earthwork.”
 - 2. [Division 33 Section “Water Distribution System.”]
 - 3. [Division 33 Section “Storm Sewer System.”]
 - 4. [Division 33 Section “Sanitary Sewer System.”]

1.3 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the work of this section shall comply with the following:
 - 1. ASTM Standard Specifications:
 - a. A139 - Electric-Fusion(Arc)- Welded Steel Pipe (NPS in 4 in. and Over).
 - b. D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - 2. MDOT:
 - a. 2012 Standard Specifications for Construction.
 - b. Standard Plans.

1.4 DEFINITIONS

SPECIFIER: May be deleted if a casing pipe is not used.

A. Terms:

1. Carrier Pipe: The [water main] [storm sewer] [sanitary sewer] [force main] pipe which is inserted into the casing pipe.
2. Casing Pipe: The larger diameter pipe which is installed by boring and jacking.

1.5 SUBMITTALS

- A. Design Data: Grout mixture.
- B. Certification: Pipe materials.

1.6 QUALITY ASSURANCE

- A. Fabrication and Installation Personnel Qualifications:
 1. Trained and experienced in the fabrication and installation of the materials and equipment.
 2. Knowledgeable of the design and the reviewed Shop Drawings.

PART 2 - PRODUCTS

1.7 CASINGS

- A. Casing Pipe:
 1. Welded Steel Pipe:
 - a. ASTM A139, Grade B steel.
 - b. Minimum yield strength: 35,000 psi.
 - c. Welded leakproof joints.
 2. Wall Thicknesses: Highway crossings:

Normal, Size inches	Outside Diameter, inches	Minimum Wall Thickness, inches
6	6.625	0.188
8	8.625	0.188
10	10.750	0.188
12	12.750	0.188
14	14.000	0.250
16	16.000	0.250
18	18.000	0.250
20	20.000	0.250
24	24.000	0.250
30	30.000	0.312
36	36.000	0.312

- a. Railroad Crossings:

Normal, Diameter, inches	Coated or Cathodically Protected, inches	Uncoated and Unprotected, inches
Under 14	0.188	0.251
14 & 16	0.219	0.282
18	0.250	0.313
20	0.281	0.344
22	0.312	0.375
24	0.344	0.407
26	0.375	0.438
28 & 30	0.406	0.469
32	0.438	0.501
34 & 36	0.469	0.532
38, 40 & 42	0.500	0.563
48	0.563	0.626
54	0.625	0.688

3. Smooth wall steel pipes with a nominal diameter of over 54 inches will not be permitted.
4. Joints: Welded and watertight.

1.8 FILL, BACKFILL AND BEDDING MATERIALS

- A. Grout: [As required by permit agency] [].
- B. Backfill for Boring, Jacking or Tunneling Pits:
 1. Within Road or Railroad Right-Of-Way:
 - a. Sand: 100% passing 3/8-inch sieve; less than 10% loss by wash.
 - b. MDOT 902 Granular Material Class II.
 2. Other Areas, Except As Indicated On the Drawings: Excavated material if suitable.
- C. Bedding For Pipe:
 1. Sand: 100% passing 3/8-inch sieve, less than 10% loss by wash.
 2. Pea Gravel: 100% passing 3/8-inch sieve, 100% retained on No. 8 sieve.
 3. Lean grout.

PART 3 - EXECUTION

1.9 BORING, JACKING OR TUNNELING PIT

- A. Minimum Length: Sufficient to accommodate one length of pipe plus jacks and blocking or auger and equipment, as appropriate.
- B. Location of Pit Face - Minimums:
 1. County Road: 10 feet from near edge of pavement.
 2. State Highway.

- a. Interstate or Dual: 30 feet from near edge of pavement.
 - b. Others: As indicated on Drawings or required by governing agency's permit.
 3. Other Locations: As indicated on Drawings or as regulated by local jurisdiction.
 - C. Finished Grade: Original elevation, except as otherwise specified.
 - D. Compact backfill 95% maximum density as determined by the modified Proctor method, ASTM D1557.
- 1.10 OPERATIONAL REQUIREMENTS
- A. Boring Operations:
 1. Concurrent with placement of casing pipe or uncased pipe.
 2. Leading edge of pipe: Must precede auger by 1/2 diameter of the pipe.
 - B. Jacking Operations:
 1. Continuous, 24-hour operation, 7 days a week, unless otherwise approved by Engineer.
 2. Line and grade: Check every 8 hours.
 3. Control jacking pressures to prevent crushing of pipe joints.
 4. Use of water or jetting: Not permitted.
 5. Use of Bentonite or Similar Materials:
 - a. With approval of method and material by permit agency.
 - b. Coordinate submittal to agency through Engineer.
 6. Bulkhead face of excavation when work is shut down.
 - C. Carrier Pipe Placement Inside Casing Pipe:
 1. Place on skids or chocks.
 2. Contact with casing pipe: Not permitted.
 3. Load transfer from casing pipe to carrier pipe: Prevent.
 - D. Grouting:
 1. Grout voids caused by removal of solid objects within 8 hours.
 2. Grout voids outside casing or uncased pipe when jacking process is completed.
 3. Highway crossing: Fill annular space between inside of casing and carrier pipe with sand, pea gravel, or lean grout upon completion.
 4. Railroad crossing: Grout annular space at ends of casing pipe.

END OF SECTION 330525