

SECTION 02320

UTILITIES INSTALLED IN BORING OR TUNNELING OPERATION

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Tunneling, Boring and Jacking Installations of Utilities Placed in Casings, Including Installations Beneath Railroad Crossings.
- B. Casings, Carrier Pipe, Filter Fabric, and Related Material Requirements.

1.2 RELATED SECTIONS

- A. Section 01500 - Construction Facilities and Temporary Controls: Water control in excavations.
- B. Section 02160 – Excavation Support Systems.
- C. Section 02178 – Steel Sheet Pile Boring and Jacking Pits/Cofferdams.
- D. Section 02222 – Excavation.
- E. Section 02223 – Backfilling.
- F. Section 02225 – Trenching.
- G. Section 02279 – Filter Fabric.
- H. Section 02722 – Storm Sewerage Systems.
- I. Section 02831 – Chain Link Fences and Gates.
- J. Canadian National Railway Specifications for Pipelines.

1.3 REFERENCES

- A. AWWA - M11 - Manual of Practice - Steel Pipe Design and Installation.
- B. AWWA C200 - Standards for Steel Water Pipe 6 inches and Larger.
- C. ASTM A36 - Standard Specifications for Structural Steel.
- D. ASTM A139 - Standard Specifications for Electric Fusion Welded Steel Pipe – 4 inches and Larger.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300 - Submittals.
- B. Submit shop drawings and product data for all items to be installed and/or constructed within this Section.

- C. Product data shall include information on casing (sleeve), filter fabric, and flowable fill.

#### 1.5 MEASUREMENT AND PAYMENT

- A. 54 inch Steel Casing Pipe and 36 inches C 76-V R.C.P. Storm Sewer:
  - 1. Basis of Measurement: At the unit price bid per linear foot of pipe casing installed.
  - 2. Basis of Payment: Includes all labor, material, and equipment necessary to excavate and install support systems for jacking and receiving pits, stone, and riprap for the pits as shown on the plans, install jacking equipment, boring, jacking, remove and replace chain link fencing and gates, and installation of utility pipe to the line and grade as indicated on the plans, and filling voids between the utility pipe and the casing. Also includes backfilling the jacking pit and removing the sheet piling and support system.

#### 1.6 PREPARATION AND FIELD MEASUREMENTS

- A. See plans for locations where casing pipe is required.
- B. Verify alignment of proposed utility, required grades, and location and depths of end points. Verify alignment and depths comply with applicable permits for crossings in public or private rights-of-way.
- C. Verify location of existing utilities and structures that may cause interference.
- D. Verify approval and permitting from Canadian National Railway for Work in their right-of-way, also beneath their tracks. Notify railroad at least 3 working days prior to commencing work at (248) 452-4990.

#### 1.7 COORDINATION

- A. Coordinate Work and traffic with Canadian National Railway for work beneath their tracks and in their right-of-way.

#### 1.8 REGULATORY REQUIREMENTS

- A. Perform Work within public or private right-of-way in accordance with the authority having jurisdiction. Obtain construction permits as required.
- B. Perform Work in Canadian National Railway right-of-way or tracks in accordance with Canadian National Railway specifications for pipeline crossing.

### 2. PART 2 PRODUCTS

#### 2.1 CASING: WELDED STEEL

- A. Welded longitudinal plate pipe, steel pipe having a minimum yield strength of 35,000 psi meeting ASTM A-36 and/or ASTM A139 - Grade B. Hydrostatic test in accordance with AWWA C-200.
- B. Wall thickness and diameter are to be as shown on plans. Minimum wall thickness shall be 0.812 inches.

#### 2.2 CARRIER PIPE

- A. As specified in pipe schedules or on plans.
- B. Carrier piping under railroad right-of-way in casing pipe shall be premium joint.

2.3 ACCESSORIES

- A. Backfill: Around casing ends, seal as detailed on plans.
- B. Flowable Fill: Shall have minimum compressive strength of 50 psi at 3 days and 150 psi at 28 days. Shall conform to the special provision of MDOT flowable fill.

3. PART 3 EXECUTION

3.1 JACKING/BORING INSTALLATION WITH STEEL PIPE SLEEVE

- A. Construct and maintain jacking/boring pits as required. Adequately clear Site required for pits as needed to perform the Work. Size pits for boring machine, frames, reaction blocks, minimum 2 sections of pipe and with sufficient room for working. Provide safety ladder, meeting OSHA and MIOSHA Standards.
- B. Locate pits such that no damage occurs to trees, poles (not specified for removal) or structures in the immediate area.
- C. Construct pits with sheeting and bracing as required for proper support in accordance with Section 02178 – Steel Sheet Pile Boring and Jack Pits/Cofferdams, and as needed to sufficiently support reaction blocks.
- D. Place crushed rock or approved bedding to sufficiently support equipment and protect pit floor.
- E. Employ guide timbers and rails for maintaining pipe line and grade.
- F. Place reaction blocks perpendicular to axis of pipe.
- G. Employ hydraulic jacks of sufficient power to apply jacking pressure.
- H. Jacking frames shall be built to match end of pipe and evenly distribute pressure over pipe end. Apply jacking pressure such that pipe is not broken or forced out of alignment.
- I. Jack pipe sleeve upgrade unless approved by the Engineer.
- J. Jacking operation shall be continuous 24 hours without stopping to prevent seizure of sleeve.
- K. Excavation/boring shall be done from inside of pipe or sleeve, not to exceed 6 inches ahead of sleeve. Minimize voids and disturbances to surrounding material and use pressure grouting or sand to repair excessive voids.
- L. Cut the bottom of the excavation accurately to line and grade. Pipe sleeve not meeting line and grade shall be rejected.
- M. Attach adjoining sections of pipe sleeve with a continuous weld. Check finished sleeve by pouring water through pipe.
- N. Support utility (carrier) pipe on a minimum of 3 each 1 inch x 2 inches hand wood slats banded to the pipe with 5/8 inch stainless steel banding.
- O. Completely fill annular space around pipe with MDOT standard flowable fill.

- P. Restore pits upon completion and approval of installation. Backfill per Section 02223 - Backfilling. Provide support for pipe outside casing per trench requirements as specified and/or as on plans.
- Q. Remove chain link fencing. Restore new chain link fencing and gates per Section 02831 – Chain Link Fencing and Gates and as indicated on the proposed plans.

3.2 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01400 – Quality Control.
- B. Accurately record location of casing ends and inverts.

3.3 PROTECTION

- A. Protect installation after placement prior to completion of backfilling and restoration of pit site.

END OF SECTION