

SECTION 804

BORING AND JACKING

I. GENERAL

1.1 DESCRIPTION OF WORK

The Contractor shall furnish all labor, supervision, material (except as herein provided), tools, equipment, supplies, and services; and, shall perform all Work necessary for the installation of casing pipe by bore and jack methods. The casing pipe shall be constructed in accordance with the Contract Documents and the applicable laws, rules, ordinances, standards, and specifications of the Owner and regulatory agencies.

1.2 SUBMITTALS

Submittals shall be made by the Contractor in accordance with the procedures set forth in Section 105 and as follows:

- A. Provide a construction schedule for approval that includes the sequence of installation of the casings and pipelines. Provide a laying schedule that shows necessary deviations from the Drawings due to specific utility conflicts discovered during required exploratory excavations. Include a description of the proposed construction methods, including methods to establish and maintain vertical and horizontal alignment.
- B. Submit each manufacturer's and/or supplier's certification attesting that the pipe and appurtenances meet or exceed the specified requirement. The following information is to be shown on each certificate:
 1. Name and location of the work
 2. Name and address of Contractor
 3. Quantity and date or dates of shipment and/or delivery to which the certificate applies
 4. Name of the manufacturing or fabricating company

Certification shall be in the form of a letter or company-standard form containing all required data and signed by an officer of the manufacturing, fabricating, or supplying company.

If requested by the Owner, and at no additional cost, all laboratory test reports shall show the following information:

1. Date or dates of testing
2. The specified requirements for which testing was performed
3. Results of the test or tests

- C. Manufacturer's catalog cuts, technical data, operation and maintenance data, and/or shop drawings are required for the following system components (shop drawings shall be drawn to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the work):
 1. Pipe
 2. Casing Spacers

- 3. Cathodic Protection (if specified in the Special Provisions or in the Contract Documents)
- 4. Coatings or Wrapping (if specified in the Special Provisions or in the Contract Documents)
- 5. Pipe Closure System
- 6. Grout
- 7. Drilling
- 8. Certified Welders Certificate

D. Products used in this Work shall be produced by manufacturers regularly engaged in the manufacturer of similar items and with a history or quality production acceptable to the Owner.

E. Except as modified herein, all products shall be tested in accordance with the requirements of the referenced standards as applicable.

II. EXECUTION

2.1 GENERAL

- A. The Contractor shall furnish and install a complete jack and bore as shown in the Contract Documents and in accordance with the Contract Documents. The casing pipe shall be laid true to lines and grades except as authorized by the Owner.
- B. The Owner reserves the right to reject defective material shipped to and/or stored on site, and to examine pipe and materials, and determine if the pipe or materials are damaged prior to installation.
- C. The Contractor shall unload, handle, and store pipe and appurtenances in strict accordance with the manufacturer's recommendations.
- D. Proper implements, tools and facilities satisfactory to the Owner and as recommended by the material manufacturer shall be provided and used by the Contractor for the safe and convenient prosecution of the Work.
- E. The Contractor shall inspect the location where the undercrossing is to be installed and familiarize themselves with the conditions under which the work will be performed, any possible obstruction is to be avoided, and with all detail necessary for the orderly prosecution of the work.

2.2 INSTALLATION

- A. The approach and receiving trenches shall be excavated, and the pipe placed at the elevation and grades specified, in accordance with the Drawings and Contract Documents.
- B. Construction shall be performed in such a manner that the pavement surface above the pipe line does not have more than 0.5 inch of settlement when measured with a 10-foot straightedge.
- C. Boring:
 - 1. The casing pipe shall be pushed into the ground with a boring auger rotating within the pipe to remove the spoil. The cutting head shall not be advanced ahead of the casing pipe except for that distance necessary to permit the cutting teeth to cut clearance for the pipe.
 - 2. If unstable soil is encountered during the boring procedure, the cutting head shall be

retracted into the casing to maintain a balance between the pushing pressure and the ratio of pipe advancement to quantity of soil.

3. If voids should develop greater than the outside diameter of the pipe by approximately one inch, the Contractor shall fill the voids with approved pressurized grout material.
4. When augers and cutting heads or similar devices are used for advancing the casing pipe, the front of the pipe shall be provided with mechanical arrangements or devices that will prevent the auger and cutting head from leading the pipe (so that there will be no unsupported excavation ahead of the pipe). The auger and cutting head arrangement shall be removable from the pipe in the event an obstruction is encountered.
5. The operation shall be continuous until the casing is installed.
6. All welding shall be full circumferential penetration weld performed by a certified welder.
7. All circumferential welds shall be visually inspected by a certified welding inspector (CWI), provided by the Contractor.

D. Jacking:

1. A thrust wall shall be constructed normal to the proposed line of thrust.
2. The thrust load shall be imparted to the pipe through a suitable thrust ring that is sufficiently rigid to ensure distribution of the thrust load on the pipe.
3. The thrust wall and jacking system shall be designed to carry the thrust of the jacks to the soil without excessive soil deflection and in such a manner as to avoid any disturbance of adjacent structures or utilities.
4. After the casing pipe has been installed, the Contractor shall measure cuttings removed. If more than 1% of the displaced volume of the casing is removed, the Contractor shall be required to perform grout injection after completion of casing installation to prevent future settlement.

E. Dewatering:

Dewatering shall be performed by the Contractor in compliance with all applicable local, State and Federal rules, regulations and ordinances. Surface drainage shall be diverted away from the execution through the use of dikes, ditches, sumps, or other means.

F. Carrier Pipe Installation:

1. Carrier pipe shall be in compliance with all provisions regarding handling, cleaning, installing, and testing of the specified carrier pipe as specified in the Contract Documents.
2. The carrier pipe shall be supported within the casing so that no external loads are transmitted to the carrier pipe. Support methods shall be in accordance with in the Contract Documents.

3. The ends of the casing pipe shall be sealed in accordance with the Standard Details to provide a barrier against debris and seepage.
4. The carrier pipe shall be electrically isolated from the casing pipe.

2.3 CORROSION PROTECTION

Provisions for corrosion protection shall be as specified in the Special Provisions.

III. MEASUREMENT FOR PAYMENT

- A. Bore and jack casing for water and sewer main installed, , will be considered complete following successful:
 1. Installation of casing pipe by the boring and jacking method, including all incidental items, equipment and Work required to successfully execute and fully complete the crossing for the intended function.
 2. Restoration of the entry and exit sites, including grading, topsoil, mulching and seeding.
 3. In the event of failure to install the casing, the Contractor shall retain possession of any Contractor supplied casing and remove it from the site. The bore holes shall be completely filled with grout or flowable fill to prevent future problems. No payment will be made for the failure of the Contractor to successfully install the casing pipe.
- B. Incidental items will include:
 1. Backfill with suitable or select material,
 2. Blocking,
 3. Casing end seals,
 4. Casing pipe,
 5. Casing spacers,
 6. Certified Welding Inspector,
 7. Dewatering,
 8. Disposal of unsuitable and surplus materials,
 9. Excavation,
 10. Grout,
 11. Installation,
 12. Leak detectors,
 13. Masonry,
 14. Restoration,
 15. Sheetng and bracing,
 16. Site restoration and cleanup,
 17. Stone base, and
 18. Thrust restraint
- C. A single, lump sum payment shall be made following the successful completion as described above.
- D. No partial payments will be made.

End of Section