SECTION 02445 - BORING AND JACKING PIPE

PART 1 - GENERAL

1.1 Section Includes: Furnishing and installing bored and jacked or open-cut pipeline casings, including installation of carrier pipe within the casings, at locations shown.

1.2 Related Work:

A. SECTION 02316 - TRENCHING, BACKFILLING AND COMPACTION
B. SECTION 02370 – EROSION CONTROL

1.3 Reference Standards: All Work under this Section shall conform to the following:

A. Field Welding of Steel Water Pipe, (AWWA C206-03).

1.4 Submittals: Submit under provisions of Section 01000.

A. Submit casing pipe manufacturer's certification stating the pipe class and wall thicknesses and that all specified tests have been made and the results thereof comply with the requirements of this Specification.

B. Submit manufacturer's material specifications and installation instructions for pipe spacers and end seals.

1.5 Site Conditions:

A. All Work under this Section shall conform fully to applicable OSHA rules and regulations.

B. Conduct all Work in strict conformance with applicable rules and regulations, with applicable permits, and under supervision of highway or railroad officials having jurisdiction over the Work.

C. Provide traffic protection by means of suitable signs, barricades, and lights.

D. Do not interfere with highway operation and do not weaken the roadbed or structure.

PART 2 - PRODUCTS

2.1 Casing Pipe: Welded steel, smooth wall, un-coated pipe conforming to ASTM A139, Grade B, except that the hydrostatic test is not required.

A. Unless otherwise specified on the Drawings, casing wall thickness shall be 0.25 inch for 12 inch NPS and smaller, 0.375 inch for 14 inch NPS through 24 inch NPS, and 0.50 inch for 26 inch NPS and larger.

B. Casings for railroad crossings shall be Standard Weight (STD) for sizes up to 24 inch NPS and Extra Strong (XH) Weight for 24 inch NPS and larger.

C. Diameter shall be NPS size as indicated on the Drawings.

D. Pipe shall be furnished with beveled ends for field-butt welding.

2.2 Carrier Pipe: Ductile iron pipe with push-on joints, conforming to other Sections of these Specifications, as applicable, except that carrier pipe 24 inch diameter or less shall have Field Lok Gaskets by U.S. Pipe or Fast Grip Gaskets by American Cast Iron Pipe Co.

2.3 Casing Spacers: Type 304 stainless steel spacers with PVC liners and abrasion resistant, low friction polymer runners. Center restrained type, as manufactured by Cascade Waterworks Mfg. Co., PowerSeal Type 304, the BWM Co. Model SS, or Advance Products & Systems, Inc. (Two spacers per pipe joint).

2.4 End Seals: Flexible Rubber End Seal by Maloney, or an equal approved by City Engineer, and all stainless steel hardware.

PART 3 - EXECUTION

3.1 Preparation:

A. Perform demolition, clearing and grubbing as required.

B. Install erosion and sediment control measures as required.

C. Remove pavement only as necessary for excavating bore pit and installing the casing and pipeline appurtenances. Cut all asphalt pavements in straight, uniform lines by means of a jack hammer or suitable pavement cutter. Cut concrete pavements to a depth of at least 2 inches along the cut line with a rotary saw, after which the pavement may be broken with a jack hammer or suitable pavement cutter.

D. Provide protection of utilities as follows;

(1) Contact all local utility owners and with their assistance, locate underground structures, pipes and utility lines, and mark them in advance. Excavate and expose underground utilities in test pits to verify locations and depths.

(2) Promptly correct damage to utilities or structures, to provide a condition at least equal to the original condition before the damage occurred. Should the Contractor fail to promptly correct the damage, the Owner may correct the damage and back-charge the Contractor for costs incurred for the correction.

3.2 Techniques of Construction: Unless otherwise specified, the construction techniques (for whichever Method of Installation is used) shall be the Contractor's choice. However, the Work must be performed using generally accepted, and safe, construction procedures using adequate equipment, by experienced workmen, and in conformance with applicable permit requirements and all federal, state, and local laws.

3.3 Installation by Open Cut Method: Use the open-cut method for crossing a roadway or stream only when specifically shown on the Drawings or directed by the City Engineer when permission has been obtained from the governing authority for a specific highway or roadway crossing.

A. Cut pavement and excavate trenches in accordance with Section 02316. Provide suitable sheeting and bracing where necessary. Keep the Work de-watered at all times.

B. The bottom of the trench shall be evenly graded to a depth of approximately 6-inches below the bottom of the casing in order to accommodate bedding materials. Bedding material shall be compacted crushed stone.

C. Accurately lay the casing pipe on the prepared bed to the alignment and grade indicated and securely block in place to prevent movement during the succeeding phase of the backfilling operation.

D. Backfill over the casing shall conform to requirements of Section 02316 for casings and pipelines under pavement, or shall be placed in accordance with the requirements of DOT permits, whichever are more stringent.

E. Pavement replacement shall conform to the requirements herein, but shall not be less than applicable DOT requirements unless specific written approval is received.

F. Make all arrangements for diversion of traffic and control of traffic during the making of the crossing, all in accordance with the requirements described herein.

G. In the event that open-cut road crossings cannot be completed in one day, cover the open section of trench with steel plates of such size and thickness as to safely withstand heavy traffic over the trench and remain in place under such heavy traffic.

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3.4 Installation by Boring and Jacking Method: Use the boring and jacking method where a crossing is designated on the Drawings, unless Open-Cut is specified or directed by the City Engineer. The boring-and-jacking method of installation of casing for the carrier pipe shall be a "dry" operation without use of hydraulic jetting to soften, loosen or sluice away the material to be excavated.

A. Excavate suitable bore pits or trenches in accordance with Specification Section 02316. Provide suitable sheeting and bracing where necessary. Keep the Work de-watered at all times. Provide suitable traffic signs, barricades, and lights for protection of all open excavations and to conform to all permit conditions.

B. Excavate and remove whatever material is encountered in the bore pit and boring excavation, including rock, and extend excavation no farther than two feet ahead of the casing pipe.

C. Limit minimum diameter of the boring excavation to the outside diameter of the casing pipe as closely as practical.

D. Remove excavated material from the boring as the excavation progresses. Accumulation of excavated material within the casing pipe will not be permitted.

E. Should appreciable loss of ground occur as a result of boring and jacking operations, immediately fill the voids with soil cement using a 1 part cement to 5 parts granular soil ratio. Mix and place the soil cement as rapidly as possible after loss of ground.

F. If blasting operations are required, apply for and obtain all required permits for handling explosives and performing blasting operations. The use of explosives on a state or interstate highway right-of-way is prohibited unless approved in writing by Owner and authorized by a separate DOT blasting permit obtained by the Contractor.

3.5 Alignment and Grade:

A. Install casing pipe at the location and grade shown on the Drawings. Variations in the installed position of the casing from the line and grade shown on the Drawings will be permitted only if approved by the City Engineer. However, the Contractor shall be responsible for any costs of related realignment of pipelines which may result from misaligned casings.

B. If site conditions are suitable, leave casing pipe exposed at both ends until inspected and approved by the City Engineer and DOT or railroad inspector. Otherwise, provide temporary backfill, then re-excavate and expose both ends for inspection when requested to do so.

C. Assist the City's representative in obtaining a dimensioned as-built drawing showing horizontal and vertical location of both ends of the casing.

D. Fill all abandoned casings with sand and plug ends with masonry or concrete at least 12 inches depth or by welded steel plate.

3.6 Welding: Steel casing pipe shall be field-butt welded by experienced welders generally according to AWWA C206, Section 5: Welding-Procedure Details. Field joints shall be continuous, circumferential welded to result in a joint meeting the minimum strength requirements of the base metals and which is completely watertight.

3.7 Installation of Carrier Pipe:

A. Notify the City Engineer as least two (2) days prior to installation of the carrier pipe and obtain City Engineer's approval prior to proceeding with sealing and backfilling. Install carrier pipe only in the presence of City's Representative.

B. Provide a minimum of 2 stainless steel spacers per section of pipe. Mount spacers and install pipe in strict accordance with manufacturer's written instructions.

C. After inspection by the City's Representative, seal casing ends against entrance of foreign material by means of flexible rubber end seal.

D. Installation, testing, and disinfection of carrier pipe shall be as specified in other Sections of these Specifications, as applicable.

3.7 Backfilling: Permanently backfill the bore pits and trenches immediately after approval of the casing and carrier pipe installation by the City Engineer. Backfilling and compaction shall be as specified in Section 02316 of these Specifications and applicable DOT or railroad permits.

3.8 Restoration and Clean-up: Remove all material not used and all rubbish of every description for the job site. Restore all private and public facilities and structures that have been disturbed to as good a condition as existed prior to the Work.

END OF SECTION