

- ITEM 660.20060029 FURNISHING, DELIVERING AND INSTALLING 6-INCH NOMINAL DIAMETER STEEL WATER MAIN WITH FLANGED AND WELDED JOINTS.**
- ITEM 660.20080029 FURNISHING, DELIVERING AND INSTALLING 8-INCH NOMINAL DIAMETER STEEL WATER MAIN WITH FLANGED AND WELDED JOINTS.**
- ITEM 660.20120029 FURNISHING, DELIVERING AND INSTALLING 12-INCH NOMINAL DIAMETER STEEL WATER MAIN WITH FLANGED AND WELDED JOINTS.**
- ITEM 660.20200029 FURNISHING, DELIVERING AND INSTALLING 20-INCH NOMINAL DIAMETER STEEL WATER MAIN WITH FLANGED AND WELDED JOINTS.**
- ITEM 660.20300029 FURNISHING, DELIVERING AND INSTALLING 30-INCH NOMINAL DIAMETER STEEL WATER MAIN WITH FLANGED AND WELDED JOINTS.**

DESCRIPTION

Under this item, the Contractor shall furnish, deliver and install steel pipe with stainless steel tips and/or with flanges where shown on the plans and as directed by the NYC - DEP, Bureau of Water and Sewer Operations (BWSO). This item shall also include, but be not limited to, coating, lining, hydrostatic testing, final cleaning and disinfection and water sampling.

A. Applicable Standards:

American Society for Testing Materials.

- ASTM A 53 Specification for Pipe, Steel, Black and Hot- Dipped, Zinc-Coated
Grade B Welded and Seamless
- ASTM A 139 Specification for Electric-Fusion (ARC)-Welded Steel Pipe
Grade B (Sizes 4 inches and Over)
- ASTM A 181 Specification for Forging, Carbon Steel for General Purpose Piping,
- ASTM A 193 Specification for Alloy-Steel and Stainless Steel Bolting
Materials for High Temperature Service,
- ASTM A 240 Specification for Heat-Resisting Chromium-Nickel Stainless Steel Plate,
Sheet and Strip for Pressure Vessels,
- ASTM A 320 Specification for Alloys-Steel Bolting Materials for Low-Temperature
Service
- ASTM A 105 Standard Specifications for Forgings. Carbon Steel for Piping
Components

American National Standards Institute/American Water Works Association.

- ANSI/AWWA C200/A22.00 Steel Water Pipe 6 inches and Larger,
AWWA C651 Disinfecting Water Mains.

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N.Y.C.-D.E.P. - Bureau of Water & Sewer Operations Standard Specifications:

- Standard Water Main Specification, latest revision
- Specifications for Furnishing, Delivering and Laying Steel Pipe and Appurtenances, latest revision.

B. As-Built Record Drawings (Permanent Work Only)

The Contractor shall submit one complete set of reproducible ink record drawings on 3 mil mylar and electronically in *pdf* format for DEP records. These drawings shall provide accurate information regarding the water main work completed and shall conform to the standard size of 24-inch by 36-inch using a 1:40 horizontal and 1:4 vertical scales. Preparation of all such records or as-built drawings shall be the responsibility of the Contractor, and they shall become property of NYC DEP, BWSO.

C. Processing submittals.

Contractor's submittals shall be processed in accordance with the Bureau's requirements titled: "Supervision of Construction and Processing Contractors' Submittals by Consultants and other Agencies", copy of which can be obtained by request from NYCDEP, BWSO.

MATERIALS FURNISHED BY THE DEPARTMENT

The following materials will be furnished by the Department to the Contractor on the grounds of a storage yard designated by the Engineer:
- corporation stops

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The Contractor shall do all loading, hauling and unloading of materials furnished by the Department, payment for which is deemed included in the payment for other items under this contract.

Material received by the contractor from a Department Storage Yard for use on this contract which was not incorporated into the work shall be returned to the Yard. Failure to return the material shall result in a deduction from contract payments equal to three (3) times the sale price effective upon this contract's date of completion.

MATERIALS FURNISHED BY THE CONTRACTOR.

Materials furnished by the Contractor shall be delivered to the site for installation. Prior to ordering any material or equipment for the water main work, the Contractor shall submit for approval shop drawings and catalog cuts covering all materials and fabrication details, including pipe geometry and installation procedure. Any material, equipment and fabrication work shall be furnished by approved vendors.

Steel Pipes shall conform to the standard requirements of NYC DEP, BWSO "Standard Specifications for Steel Pipes and Appurtenances", latest revision, and AWWA C200. Pipe shall have a minimum wall thickness of 3/8-inch or as indicated on the plans. Ends shall be prepared for welded joints with stainless steel tips and/or for flanged joints as shown on contract drawings.

Installation of welded joints shall be done in accordance with NYCDEP-BWSO Standard Drawing No.48407-Z, latest revision.

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The water main shall be sand blasted, primed and lined on the interior, and cleaned, sand blasted, and either Epoxy and Polyutherane Coated (bridge supported water mains) or Tape Coated on the exterior (underground installed watermains) as per NYCDEP, BWSO " Standard Specifications for Furnishing, Delivering and Laying Steel Pipes and Appurtenances" latest revision.

Flanges for flanged joints, where called on the Contract Drawings, shall be standard forged steel hub slip-on flanges in accordance with NYC DEP, BWSO "Standard Specifications for Steel Pipes and Appurtenances", latest revision, and AWWA C207, latest revision. Class E. Flanges shall be made from seamless forgings which meet the requirements of the Standard Specifications for Forgings, Carbon Steel for General-Purpose Piping, ASTM Designation A181-87, Class 70 or the Standard Specification for Forgings, Carbon Steel for Piping Components, ASTM Designation A105-87.

Flanges shall be flat faced and shall be welded front and back with continuous fillet weld size equal to the pipe wall thickness. Flanges shall be spot faced or back faced at the rear; such facing shall not reduce the min. flange thickness by more than 1/16-inch Dimensions of flanges shall conform to Class E hub-type slip on flanges in accordance with ANSI/AWWA C207-86 except for insulated flanged joints. For insulated flanged joints the bolt hole diameter shall be increased 1/16-inch for flanges of pipes 16-inch dia. or less and 1/8-inch for flanges of pipes greater than 16-inch diameter. For flanges for outlet connections see NYCDEP, BWSO Standard Drawing No.38226-Y-A, latest revision; for flanges for insulated flanged joints see Standard Drawing No.46104-W, latest revision.

Each flange joint shall be drilled and tapped for 1/4-inch for subsequent air testing as shown on Standard Drawing No.35310-C-Y.

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Center gaskets shall be full faced rubber with cotton cloth insert or epoxy/glass, 1/8-inch thick, with bolt holes and bolt circle to match the AWWA Standard Class E type flanges. Material for gaskets shall be cotton cloth-reinforced SBR rubber, Style 159 with a min. 220 kV/cm dielectric strength and a 50,038 psi compressive strength as manufactured by Garlock Inc., Mechanical Packing Division, Palmyra, N.Y. 14522-9355; Pipeline Seal & Insulator, Houston, TX 77201, or approved equal.

Bolts, nuts and washers for un-insulated joints shall be carbon steel to meet the requirements of Standard Specification for Carbon Steel Bolts and Studs, 60,046 psi tensile strength, ASTM Designation A307, Grade B for bolts, and Grade A for nuts.

INSULATING JOINTS

Connection between steel and ductile iron pipes, between flange at the casing pipe and restrained flange at the water main and between the water main pipe and expansion joint shall be made by insulated flange joint as shown on NYCDEP-BWSO Standard Drawing 46104-W, latest revision.

For insulated joints, bolts and washers shall be stainless steel Type 304 and meet the requirements of the Standard Specification for Alloy Steel Nuts and Bolts for High-Pressure and High Temperature Service, ASTM A193, Grade B8A, Class 1A.

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Nuts, for insulated joints, shall be Type 303 stainless steel and meet the requirements of the Standard Specification for Carbon and Alloy Steel Nuts and Bolts for High-Pressure and High Temperature Service, ASTM A-194, Grade 8FA, Class 1A, with a thread fit of Class 2B and with a machined washer face. The nuts shall also be heavy hex head series in accordance with the dimensions of ANSI B18.2.2.

Sets of insulating sleeves and washers shall include the following items per bolt:

- a. One full length mylar insulating sleeve, with a wall thickness of 1/32-inch
- b. Two insulating washers, phenolic, 1/8-inch thick, with outside diameter 1/32-inch larger than that of the adjacent stainless steel washers,
- c. Two stainless steel washers, annealed, Type 304, 1/8-inch thick.

The insulating sleeves and washers shall be as manufactured by Central Plastics Co., Shawnee, Oklahoma 74801, PSI Products, Inc., Texas, Allstate Gasket & Packing Inc., Hicksville, New York, or approved equal.

Coating and testing of insulated joints shall be done as specified in BWSO Standard Drawing No. 46104-W, latest revision.

WELDED JOINTS

1. Steel pipes 30 inches in diameter and larger shall be field welded using fillet welded field lap joint as shown on the NYC DEP-BWSO Standard Drawing No.35310-C-Y, latest revision.

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Field welded lap joints shall be air-tested as specified in the NYC DEP-BWSO Standard Specification for "Furnishing, Delivering and Laying Steel Pipes and Appurtenances", latest revision.

2. Steel pipes with diameters less than 30 inches shall be field welded, where indicated on the plans using Stainless Steel Tips Class 304 L as shown on NYC DEP-BWSO Standard Drawing No.48407-Z, latest revision. Field weld shall be full penetration butt weld and shall be X-rayed after completion to the satisfaction of the Engineer. The electrodes for welding stainless steel to stainless steel (field weld) shall be of the type E308L stainless steel.

Electrodes for welding stainless steel to carbon steel (shop weld) shall be of the type E309L stainless steel.

FINAL TESTING

The completed steel water main shall be tested. Testing shall be in strict accordance with the requirements of the NYC DEP- BWSO "Standard Water Main Specifications", latest revision, and NYC DEP Standard Specifications for Steel Pipes and Appurtenances", latest revision. Welded pipe field joints shall be X-rayed for pipes up to and including 20-inch diameter or air-tested at a pressure of 40 psi applied through the 1/4-inch tapped hole for pipes 30 inches and larger. The flanged pipe joints shall be tested for strength and leakage at a test pressure of 1034 kPa for a minimum of 2 hours, unless the time period is extended by the Engineer.

The Contractor shall repair all leakage discovered under the test and repeat the test at no extra cost to the City until no leakage can be observed.

The Contractor shall furnish all apparatus, material and labor, with the exception of "City" water, necessary for making the tests.

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DISINFECTING THE SYSTEM

After the system is approved, the entire installation shall be flushed and thoroughly disinfected. The disinfection shall eliminate all evidence of bacteria indicative of human or animal contamination as shown by testing of samples taken from the water main. The cleaning and disinfection of the pipe shall be as specified by NYC DEP, BWSO "Standard Water Main Specifications", Form No.6, Paragraph 2, latest revision.

The water main shall be flushed, after the disinfection has been completed. The Contractor shall be responsible for the collection of water samples and delivery of same to a testing laboratory selected the Engineer.

For underground installation, only after satisfactory completion of water main work can the concrete slab of the bridge be poured. The water main shall be empty during the installation of the concrete slab and the sidewalk.

For bridge supported water mains, their supports (hangers and/or sliding supports) must be adjusted to accommodate bridge deflection due to the slab and sidewalk.

Only after supports are properly adjusted to the satisfaction of the Engineer can the water mains be put into service.

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METHOD OF MEASUREMENT

The quantity to be paid for under this item shall be the number of linear feet of steel pipe measured along the axis of the pipe that is furnished, delivered, installed, tested and disinfected in accordance with the specifications.

BASIS OF PAYMENT

The unit price bid per linear foot shall include the cost of furnishing and laying the steel pipe, furnishing and installing joint materials, disinfecting and pressure testing, all labor materials and equipment necessary to complete the work as specified and ordered by the Engineer, except the following: casing pipe, insulation, spider guides, and Straub-Flex Couplings which will be paid for separately under their appropriate items.