STANDARD SPECIFICATION
SECTION 15253 STEEL PIPE FOR MINOR APPLICATIONS

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes materials, fabrication, installation, and testing of steel pipe used inside and outside of pressure reducing stations, meter stations, and for other miscellaneous buried appurtenances. The steel pipe shall be cement mortar lined and either di-electric coated, cement mortar coated, or shop prime coated. This section describes steel pipe not specified in Standard Specification Section 15061. Size range is 4- to 12-inch nominal pipe size.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Standard Drawings.

B. Record Drawings and Submittals: STD SPEC 01300.

C. Miscellaneous Metalwork: STD SPEC 05121.

D. Painting and Coating: STD SPEC 09900.

E. Polyethylene Sheet or Tube Encasement: STD SPEC 09954.

F. Polyethylene Tape Pipe Coating: STD SPEC 09957.

G. Corrosion Control for Buried Piping: STD SPEC 13110.

H. General Piping Requirements: STD SPEC 15050.

I. Steel Transmission Pipe: STD SPEC15061.

J. Flexible Pipe Couplings: STD SPEC 15122.

K. Disinfection of Piping: STD SPEC 15141.

L. Pressure Testing of Piping: STD SPEC 15144.

M. Installation of Steel Transmission Pipe: STD SPEC 15251.

1.03 SUBMITTALS

A. Submit submittal packages in accordance with Standard Specification Section 01300.

B. Submit piping layout drawings showing location and dimensions of all pipe and fittings. Include laying lengths of valves and other equipment determining piping dimensions. Label or number each fitting or piece of pipe and provide the following information for each item:

1. Material of construction, with ASTM or API reference and grade.

2. Wall thickness of steel pipe and fittings.

3. Details of lining and coating.

4. Manufacturer's certificates of compliance with referenced pipe standards, e.g., ASTM A 53, ASTM A 135, API 5L.

5. Call out weld sizes and dimensions of grooved ends, flanges, fittings, joint harnesses, annular thrust ring plates, and butt strap closures.

C. Shop drawings of all pipe and fittings shall be submitted to the District's Representative for review. The Contractor and Engineer of Work shall both review and mark the review action taken, before submitting to District. Shop drawings shall be complete in all respects. If the shop drawings show any deviations from the requirements of the Drawings and Standard Specifications because of standard shop practices or other reasons, the deviations and the reasons therefore shall be set forth in the Shop Drawing Submittal Form included in Standard Specification Section 01300.

1.04 INSPECTION AND FIELD VERIFICATION

A. The District’s Representative or his authorized representative may inspect materials, fabrication, and testing at the manufacturer’s plant.

B. Where new pipelines are to be connected to existing waterlines of the District, the Contractor shall verify in the field the location, elevation, pipe material, pipe outside diameter, and any other characteristics of the existing waterline before proceeding with the pipe fabrication or installation. This field verification shall be performed in the presence of the District’s Representative. Adjust and align the new piping as necessary to meet the field conditions and provide all required material, labor, and equipment to make the connection.

PART 2 - MATERIALS

2.01 STEEL PIPE

Pipe shall be black carbon steel conforming to ASTM A 53, Type E or S, Grade B; API 5L, Grade B; or ASTM A 135, Grade B. Pipes shall be standard weight per ASME B36.10.

2.02 STEEL FITTINGS

A. Steel fittings are defined as a special piece of pipe other than a normal straight section. Elbows, crosses, tees, and reducers are fittings.

B. Fittings shall be butt-welded conforming to ASME B16.9. Material shall be wrought steel conforming to ASTM A 234, Grade WPB. Wall thickness shall be the same as the pipe.

2.03 CEMENT FOR INTERIOR MORTAR LINING

Use cement conforming to ASTM C 150, Type II. Minimum cement mortar lining thickness for steel pipe and fittings shall be 5/16 inches.

2.04 CEMENT FOR EXTERIOR MORTAR COATING

Use cement conforming to ASTM C 150, Type II. Minimum cement mortar coating thickness for buried steel pipe and fittings shall be 1-1/4 inches. Coating within one bolt length of a flange shall be held to a thinner application to allow for assemble of all bolts.

2.05 POLYETHYLENE TAPE PIPE COATING (DI-ELECTRIC COATED)

See Standard Specification Section 09957.

2.06 FLANGES

A. Provide flanges that match the flange of the connecting valve or other equipment.

B. Provide welding neck flanges for attachment to wrought steel fittings. Provide welding neck or slip on flanges for attachment to pipe. Slip on flanges shall be double welded. Flange material shall conform to ASTM A 105, A 181, or A 182. Flanges shall be flat faced.

C. Class 150 flanges shall comply with AWWA C207, Class E or ASME B16.5, Class 150.

D. Class 300 flanges shall comply with AWWA C207, Class F or ASME B16.5, Class 300.

2.07 BOLTS, NUTS AND GASKETS FOR FLANGES

See Standard Specification Section 15050.

2.08 INSULATING FLANGE KITS

See Standard Specification Section 13110.

2.09 OUTLETS

A. For threaded outlets 3 inches and smaller, use a thredolet type per AWWA Manual M11 (Current Edition), Chapter 13. Outlets shall be 3000 pound WOG forged steel per ASTM A 105 or ASTM A 216, Grade WCB. Threads shall comply with ASME B1.20.1, NPT. Outlets shall be Bonney Forge Co. "Thredolet", Allied Piping Products Co. "Branchlet", or District approved equal. Do not use pipe couplings for outlets.

B. For flanged outlets 4 inches and larger, use a tee with a welding neck flange.

2.10 MECHANICAL CLAMP-TYPE COUPLINGS

Mechanical clamp-type couplings for grooved end pipe shall be ductile iron, ASTM A 536, Grade 65-45-12. Bolts shall conform to ASTM A 183, 110,000 psi tensile strength. Gaskets shall be EPDM (ethylene propylene diene monomer) conforming to ASTM D 2000. Couplings shall conform to AWWA C606 for flexible, square cut grooved joints in IPS steel pipe. Couplings shall be Victaulic Style 77, or District approved equal.

2.11 TYPE OF PIPE JOINTS

A. Joints in vaults shall be flanged to connect to valves and other equipment.

B. Joints between pipe, fittings, and welding neck flanges shall be full penetration butt weld. Joints between pipe and slip on flange shall be fillet welds to the interior and exterior.

C. Provide grooved end pipe where mechanical clamp-type couplings are to be used. Grooved end joint shall be flexible, square cut per AWWA C606, Table 2.

D. Provide plain end pipe where flexible pipe couplings are to be used. Couplings and harnesses shall conform to Standard Specification Section 15122.

E. Provide butt strap closures to connect sections of pipe laid from opposite directions and to adjust the field lengths to meet the conditions of the installation. Butt straps shall be the same thickness and material as the pipe wall, at least 10 inches wide, rolled to fit the outside cylinder diameter in two half sections, and shall be centered over the plain ends of the pipe sections they are to join. Weld a 5-inch threaded, steel, standard half coupling to the interior and exterior of the top butt strap half section to provide access for mortar lining the inside of the joint. Provide a threaded steel plug for the coupling.

2.12 PAINTING AND COATING APPLIED IN SHOP

A. Wrap exterior surfaces of buried pipe with polyethylene tape pipe coating and apply cement mortar overcoat where shown on the Drawings as di-electric coated per Standard Specification Section 09957. Apply coating in shop.

B. Cement mortar coat buried pipe where shown on the Drawings. Apply coating in shop.

C. Coat the exterior bare surfaces of the pipe per Standard Specification Section 09900, System No. 15 (primer coat only). Apply primer in shop to a 2-mil dry film thickness.

D. Coat inside surfaces of threaded outlets and blind flanges per Standard Specification Section 09900, System No. 5. Apply coating in shop.

E. Coat the grooved ends of pipe to be in contact with mechanical clamp-type couplings per Standard Specification Section 09900, System No. 5. Apply coating in shop.

F. Coat the ends of plain end pipe where flexible pipe couplings are to be installed per Standard Specification Section 09900, System No. 5. Apply coating in shop.

2.13 POLYETHYLENE ENCASEMENT

See Standard Specification Section 09954.

2.14 CORROSION CONTROL COMPONENTS

See Standard Specification Section 13110.

2.15 MARKING TAPE

Use detectable marking tape consisting of one layer of aluminum foil laminated between two colored layers of inert plastic film. The lamination bond should be strong enough that the layers can not be separated by hand. Tape shall be a minimum of 5 mils thick and 6 inches wide. Tape shall bear a continuous, printed message every 16 to 36 inches warning of the installation buried below. Tape shall be Terra Tape, Linetec, or District approved equal.

PART 3 - EXECUTION

3.01 FABRICATION, ASSEMBLY, AND ERECTION

A. Beveled ends for butt welding shall conform to ASME B16.25. Remove slag by chipping or grinding. Surfaces shall be clean of paint, oil, rust, scale, slag, and other material detrimental to welding. When welding the reverse side, chip out slag before welding.

B. Fabrication shall comply with ASME B31.3, Chapter V. Welding procedure and performance qualifications shall be in accordance with Section IX, Articles II and III, respectively, of the ASME Boiler and Pressure Vessel Code.

C. Apply full penetration weld to exterior joint of butt welded pipe, fittings, and welding neck flanges. Apply fillet welds to the interior and exterior circumference of the pipe and slip on flanges. Minimum size of fillet weld shall be equal to the steel cylinder thickness. Complete each pass around the entire circumference of the pipe before commencing the next pass. Use electrodes recommended by the pipe fabricator. Do not deposit more than 1/8-inch of throat thickness per pass. The minimum number of passes or beads in the completed weld shall be as follows:

Steel Cylinder Thickness (inch)	Minimum Number of Passes for Welded Joints
0.2500 and Less	2
Greater than 0.2500	3

D. Use the shielded metal arc welding (SMAW) process for welding.

E. Welding preparation shall comply with ASME B31.3, paragraph 328.4. Limitations on imperfections in welds shall conform to the requirements in ASME B31.3, Table 341.3.2, and paragraph 341.4 for visual examination.

F. Identify welds in accordance with ASME B31.3, paragraph 328.5.

G. Clean each layer of deposited weld metal prior to depositing the next layer of weld metal, including the final pass, by a power-driven wire brush.

H. Welding electrodes shall comply with AWS A5.1.

I. After shop fabrication and prior to shop applied linings and coatings, test each welded joint by the liquid penetrant method. Conform to the requirements specified in ASTM E 165. The materials used shall be either water washable or nonflammable. Products “Spotcheck” by the Magnaflux Corporation or “Met-L-Check Flaw-Findr” by the Met-L-Check Company. Chip out all defects, reweld, and retest the section affected until it shows no leaks or other defects.

3.02 DELIVERY AND TEMPORARY STORAGE OF PIPE

Lift pipe with wide belt slings. Do not use cable slings or chains. Support the pipe on wooden blocks and secure it from rolling. Do not roll or drop the pipe on the ground or allow the pipe to fall from the delivery trucks. Do not remove the plastic caps placed over the ends until the pipe is ready to be placed in the trench or installed in the vault.

3.03 INSTALLING BURIED PIPE

See Standard Specification Section 15251 for installation requirements of buried steel pipe. Install the pipe with butt straps, metallic bond wires, marking tape, and other appurtenant items for the installation. Wrap buried valves and flanges with polyethylene material per Standard Specification Section 09954. Repair polyethylene material damaged during construction.

3.04 INSTALLING PIPE IN VAULTS

A. Install pipe in vaults without springing, forcing, or stressing the pipe or any adjacent connecting valves or equipment. Provide temporary supports and place the assembled piping at the correct grade and position in the vault.

B. Provide pipe supports per Standard Specification Section 05121.

3.05 INSTALLING FLANGED JOINTS

See Standard Specification Section 15050 for installation instructions.

3.06 INSTALLING INSULATING FLANGE KITS

Install insulating flange kits with coatings per Standard Specification Section 13110.

3.07 INSTALLING MECHANICAL CLAMP-TYPE COUPLINGS

A. Install mechanical clamp-type couplings in accordance with the manufacturer's recommendations and the following.

B. Clean oil, grease, and dirt from the grooved ends of pipe. Repair any damage or holidays in the shop applied coating before installing couplings. Apply the coupling manufacturer's gasket lubricant to the gasket exterior including lips, pipe ends, and housing interiors.

C. Lubricate threads of bolts and nuts with oil or graphite prior to installation. Uniformly tighten bolts and nuts alternately and evenly until coupling segments are seated. Apply torque to nuts with a calibrated torque wrench as recommended by the coupling manufacturer.

3.08 INSTALLING FLEXIBLE PIPE COUPLINGS

Install flexible pipe couplings and joint harnesses where shown per Standard Specification Section 15122.

3.09 INSTALLING CORROSION CONTROL COMPONENTS

Install bond wires, anodes, and test stations per Standard Specification Section 13110.

3.10 PAINTING AND COATING

A. Coat exterior surfaces of bare steel pipe in vaults per Standard Specification Section 09900, System No. 10. Apply finish coats in the field.

B. Coat exterior surfaces of mechanical clamp-type couplings, flexible pipe couplings, and joint harnesses the same as the adjacent pipes.

3.11 PRESSURE TESTING

See Standard Specification Section 15144 for pressure testing requirements. Test pipe for minor applications at the same time that the primary pipelines are tested.

3.12 DISINFECTION

See Standard Specification Section 15141 for chlorination requirements.

END OF SECTION