METROPOLITAN UTILITIES DISTRICT OF OMAHA
OMAHA, NEBRASKA

SPECIFICATIONS FOR COATED AND CEMENT LINED STEEL PIPE AND FITTINGS FOR WATER DISTRIBUTION SERVICE

NOTE: This document has undergone a comprehensive formatting update as of 10/20/2025. Please review all sections for changes.

1.0 General

1.1 Purpose and Scope. This specification defines the minimum requirements for the material, procurement, logistics, and assurances of coated and cement lined steel pipe and fittings used within the District's municipal water system. Throughout this specification, 'pipe' and 'fittings' shall refer to steel pipe and fittings, respectively, unless otherwise specified.

1.2 Applicable Codes and Standards. The requirements of all referenced documents shall apply, except where superseded or supplemented herein. In case of conflict, these specifications shall govern. Unless otherwise specified, all external documents referenced shall be their latest edition.

2.0 Materials

2.1 Conformance.

2.1.1 Steel pipe shall conform to:
(1) AWWA C200 *Steel Water Pipe, 6 In. and Larger*
(2) ASTM A139 *Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over),* Grade C or Grade D

2.1.2 Tape coating and patch coating shall conform to:
(1) AWWA C209 *Tape Coatings for Steel Water Pipe and Fittings*
(2) AWWA C214 *Machine-Applied Polyolefin Tape Coatings for Steel Water Pipe*

2.1.3 Cement-mortar lining shall conform to:
(1) AWWA C205 *Cement-Mortar Protective Lining and Coating for Steel Water Pipe—4 In. and Larger—Shop Applied*
(2) AWWA C602 *Cement–Mortar Lining of Water Pipelines in Place—4 In. and Larger*

2.1.4 Fittings and flanges shall conform to:
(1) AWWA C207 *Steel Pipe Flanges for Waterworks Service, Sizes 4 In. Through 144 In*
(2) AWWA C208 *Dimensions for Fabricated Steel Water Pipe Fittings*

2.2 Submittals by Manufacturer.

2.2.1 Bid documents shall specify the type of pipe wrap to be provided.

2.2.2 Test reports shall be provided to the District in accordance with AWWA C200.

2.2.3 Submit one hard copy and one digital copy of shop drawings for District approval prior to beginning work on any pipe or fittings.

3.0 Pipe

3.1 Design.

3.1.1 Pipe shall be designed for a minimum 150 psi working pressure and 180 psi test pressure.

3.1.2 Pipe diameter, pipe ends, and minimum wall thickness shall conform to the drawings and specifications.

3.1.3 Design stress shall not exceed 55% of minimum yield stress.

3.2 Lining.

3.2.1 Pipe shall have a cement-mortar lining conforming to AWWA C205.

3.2.2 Cement–mortar lined pipe shall not have an inner diameter after lining less than the specified nominal size.

3.3 Coating.

3.3.1 Pipe coatings shall be machine-applied and meet the requirements of AWWA C214.

3.3.2 The coating system shall have a minimum thickness of 80 mils and consist of the following:

(1) A prime coat of Polyken 1019 liquid adhesive
(2) An inner-layer of Polyken 989-20
(3) An outer-layer of two (2) wraps of Polyken 956-30

3.3.3 For pipes over 54” in diameter, a middle-layer of Polyken 955-30 shall be applied prior to the application of the outer-layer.

3.4 Marking. The marking system on individual pipes and fittings shall correspond to the marking designations on the detailed drawings.

4.0 Joints and Fittings

4.1 Restrained Joints. Restrained joints shall be welded.

4.2 Fittings.

4.2.1 Elbows shall conform to AWWA C208, Figures 3A through 3D, and have a radius of 1.5 times the nominal diameter. The minimum center-to-end dimension must be 8 feet.

4.2.2 All tees, laterals and outlets shall be reinforced in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 or Chapter 7 of AWWA M11 *Steel Pipe: A Guide for Design and Installation*.

4.3 Coating.

4.3.1 Fittings shall be coated with a hand-applied tape system in accordance with AWWA C209.

4.3.2 The coating system shall consist of the following:

(1) A prime coat of Polyken 1027 liquid adhesive
(2) Two (2) wraps of Polyken 930-35

5.0 Installation

5.1 Field Welding.

5.1.1 Qualification. All welding procedures, welders, and welding operators shall be qualified in accordance with AWWA C206, Section 4. This includes meeting the requirements of American Welding Society (AWS) D1.1 *Structural Welding Code-Steel*, as referenced by AWWA C206. The Contractor shall maintain and provide proof of testing and certification for all qualified personnel upon request.

5.1.2 Welding Procedure Details. All welding details shall conform to AWWA C206, Section 4.6. Written welding procedures for all on-site applications shall be submitted to the Design Engineer for the project or the Senior Design Engineer for approval before any welding begins.

5.1.3 Inspection. All inspection shall be in accordance with AWWA C206, Section 5.1.

5.1.4 Lap Joints. The inside circumference of the bell end shall not exceed the outside circumference of the spigot end by more than 0.4” or less than 0.1”.

5.2 Caps. The Contractor shall provide end or night caps as required. These end caps will seal like a normal joint in the appropriate pipe. Caps shall be used at night or during non-pipelaying periods as well as at the end of different stages of construction.

5.3 Cement Lining Repair. The contractor shall repair or restore all cement mortar lining that has been removed, damaged, or disturbed during field welding or other installation activities. All work shall be performed in accordance with AWWA C602. No bare steel shall be exposed on the inside of the pipeline upon completion of the project.

5.4 Anodes.

5.4.1 The Contractor shall furnish and install 32-pound magnesium anodes in accordance with the following M.U.D. standards and specifications:

(1) CS 8.3.1 *Magnesium Anode Placement & Test Lead Detail (Gas & Water).*
(2) CS 8.3.3 *Trace Wire, Anode and Test Lead Attachment Methods for Steel, Ductile Iron and Cast Iron Water Mains.*
(3) MUD 119 *Materials for Specifications*.

6.0 Handling, Shipping, Delivery, and Storage

6.1 Handling.

6.1.1 Pipe shall be handled with wide belt slings or rubber padded forklifts. Chains, cables, or other equipment likely to cause damage to the pipe or coating shall not be used.

6.1.2 Pipe shall be supported at proper intervals when lifted so that excessive deflection does not take place and crack the cement mortar lining. Pipe deflection shall not exceed 1% of the diameter.

6.2 Shipping.

6.2.1 Inspection. The manufacturer shall visually inspect the pipe coating for damage. Any suspected damage or visible defect shall be inspected for holidays using a high-voltage detector in accordance with NACE SP0274. All coating damage, including tears and holidays, shall be repaired in accordance with AWWA C209 prior to shipment.

6.2.2 Pipe shall be transported on padded bunks with nylon tie-down straps or padded banding to adequately protect the pipe and coating.

6.2.3 Pipe 24” in diameter and larger shall be shipped from the manufacturer with stulls in each pipe to prevent out-of-roundness and any deflection greater than 1% of the pipe diameter during shipping and initial installation.

6.3 Delivery. The District reserves the following rights in the event of the delivery of non-conforming pipe and/or fittings. Neither action shall result in charges to the District.

6.3.1 Refusal of Delivery. The District can refuse any and all loads at the time of delivery if they are found to be out of specification.

6.3.2 Rejection after Inspection. The District can reject any and all loads that are out of specification after it has had a reasonable opportunity to inspect them following delivery.

6.4 Storage.

6.4.1 Pipe and fittings shall be stored in a manner as to prevent damage to them. Pipe and fittings shall not be stored directly on the ground. Instead, they shall be stored on suitable supports that are padded (e.g., pallets, timbers, etc.). The storage area shall be a relatively smooth, level surface free of stones, debris or other materials that could damage the pipe or fittings.

6.4.2 All materials shall be used on a first-in, first-out (FIFO) basis. The oldest inventory in stock shall be used before newer stock to ensure proper stock rotation and prevent material obsolescence.

7.0 Warranties and Guarantees

7.1 Warranty. The manufacturer shall warrant pipe and/or fittings for a minimum period of five (5) years after delivery to the jobsite or the District’s storage yard. Within this period, costs accrued by the District for replacement or repair of pipe and/or fittings found to have defects in material and workmanship and/or not complying with this specification and/or the manufacturer’s documents shall be the responsibility of the manufacturer.

7.2 Affidavit of Compliance. If requested by the District, the manufacturer shall provide an affidavit with each pipe and/or fitting shipment that all materials comply with the requirements of this specification. The affidavit shall include the manufacturer’s production code, including the day, month, and year of production, and all material testing results required by the applicable AWWA standards.