

METROPOLITAN UTILITIES DISTRICT OF OMAHA
OMAHA, NEBRASKA

SPECIFICATION FOR
COATED AND CEMENT LINED STEEL PIPE AND FITTINGS

1. GENERAL

A. Pipe shall meet the following standards:

Pipe – AWWA C-200 – Supplemented by the following paragraphs.

Coating and Patch Coating – AWWA C-214 and AWWA C-209 and coating notes in this section.

Lining – AWWA C-205 and C-602.

Fittings and Flanges – AWWA C-207 and C-208.

Failure to meet these specifications is cause for rejection.

2. DATA FOR STEEL PIPE

A. Pipe ends shall be as defined in the drawings and specifications.

B. Minimum wall thickness shall be as shown on drawings.

The pipe shall be designed for 150 psi W.W.P. and 180 psi test pressure.

C. Pipe Data

Diameter as indicated on drawings.

Cement–mortar lined pipe shall not have an I.D. after lining less than the specified nominal size.

Steel A-139, Grade C or D.

Design stress will not exceed 55% of minimum yield stress.

3. SUBMITTALS BY MANUFACTURER

A. State in the bid documents the type of pipe wrap to be provided.

B. Provide test reports to the District per AWWA C-200.

C. Furnish three (3) copies of shop drawings for District approval before beginning work on any pipe or fittings.

4. MARKING PIPE

The marking system on individual pipes and fittings shall correspond to the marking designations on the detail drawings.

5. END CAPS AND NIGHT CAPS

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

6. ANODES

The Contractor will furnish and install anodes. Anodes shall be 32-pound magnesium anodes, H-1 Grade A alloy – 0.02% CU maximum; packaged with 85% gypsum, 20% bentonite, and 5% sodium sulfate backfill; with 10 feet of #12 TW covered lead wire attached.

7. PIPE COATING

The pipe coating will meet AWWA C-214 with a minimum thickness of 80 mils.

Exterior surfaces of all pipe will be commercial blasted SSPC-SP-6, primed with Polyken 919-40 primer and wrapped with Polyken innerwrap 989-20 and 2 wraps of Polyken outerwrap 956-30 per AWWA C-214.

For Polyken tape coated pipe, exterior surfaces of fittings will be commercial blasted SSPC-SP-6, primed with Polyken 927 primer and wrapped with 2 wraps of Polyken 930-35 hand wrap per AWWA C-209 specification.

8. RESTRAINED JOINT FOR STEEL PIPE

Restrained joints will be welded.

9. HANDLING STORAGE AND SHIPPING

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.

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.

Pipe 30" in diameter and larger shall be shipped from the manufacturer with stays in each pipe to prevent out-of-roundness and any deflection greater than 1% of the pipe diameter during shipping and initial installation. Pipe shall be stored on padded skids.

Prior to shipment, the pipe will be visually inspected for damaged to the coating. Any areas that appear to be damaged will be given an electrical holiday test of a minimum of 6,000 volts with a 60-cycle current audio detector giving maximum testing voltage 120 times per second. If the test indicates no holidays, and the outer wrap is wrinkled but not torn, no repairs are required. If the test indicates no holiday, and the outer wrap(s) is torn, the damaged layer or layers of the outer wrap shall be removed carefully, cutting with a sharp razor-type utility knife. The area to be patched shall be washed with Xyol, taking care to wash at least 4" of undamaged tape where the hand applied tape wrap will overlap. Cold applied tape (outer wrap) meeting the requirements of AWWA C-209, and compatible with the tape wrapping system, shall then be applied for each layer of tape that has been removed.

When the damaged area shows holiday when tested, the outer layers shall be removed and the innerwrap exposed. The exposed area and overlaps shall then be primed with a light coat of primer. A patch of inner wrap of sufficient size to extend 4 inches from the holidays in all directions shall then be firmly pressed into place. The patch shall then be holiday tested to determine that it is satisfactory. The outer layer of tape shall then be retrimmed to expose the first wrap of tape sufficiently to allow a minimum lap of two inches in all directions. The exposed tape shall then be washed with Xyol and primed. Two layers of outer wrap, with a minimum thickness of 35 mils and conforming to AWWA C-209, shall then be applied.

Pipe shall be transported from the coating plant to the point of delivery on padded bunks with nylon tie-down straps or padded banding to adequately protect the pipe and coating.

10. FIELD WELDING OF STEEL WATER PIPE

A. Qualification of Welding Procedures, Welders, and Welding Operators

All procedures shall meet AWWA C-206 Standards and AWS D1.1 Section 5.

All welders and welding operators to be employed shall be qualified by tests. General requirements for qualification shall be in accordance with AWS D1.1 Section 5. The welders performing the welds shall have proof of testing and certification.

B. Welding Procedure Details

All details shall be in accordance with AWWA C-206 Section 5.

Written welding procedures for all welding applications on the job shall be submitted to the Engineer for approval before any welding takes place.

C. Inspection

All inspection shall be in accordance with AWWA C-206 Section 6.1.

11. FABRICATION OF PIPE

Ends of Lap Joints for Field Welding: 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".

12. SPECIALS AND FITTINGS

Elbows shall be manufactured per AWWA C208, Figures 2C through 2F. Elbows shall be fabricated with a radius of 1 1/2 times the nominal diameter. The minimum center of the bend to end dimension shall be eight (8) feet.

All tees, laterals and outlets shall be reinforced in accordance with ASME Pressure Vessel Code, Section VIII, Paragraph G37 or AWWA M-11, Section 19.4 and 19.5.

13. APPLICATION AND REPAIR OF CEMENT LINING

Application of cement mortar lining after welding of joints and at places where factory cement lining has been removed or damaged shall be restored by the Contractor according to the AWWA C-602.

No bare steel will be exposed on the inside of the pipe upon the completion of the pipe line.