

STANDARD SPECIFICATIONS

SECTION 15064

PVC PRESSURE DISTRIBUTION PIPE

PART 1 - GENERAL

A. Description

This section includes materials, installation, and testing of polyvinyl chloride (PVC) distribution pipe.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

1.	Trenching, Backfilling, and Compacting:	02223
2.	Jacked Casing:	02315
3.	Concrete:	03300
4.	Painting and Coating:	09900
5.	Chlorination of Domestic Water Mains for Disinfection:	15041
6.	Hydrostatic Testing of Pressure Pipe:	15042
7.	Ductile-Iron Pipe and Fittings:	15056
8.	Copper, Brass and Bronze Pipe, Fittings, and Appurtenances:	15057
9.	Combination Air and Vacuum Release Assembly:	15089
10.	Manual Valves:	15100
11.	Domestic and Recycled Facilities Identification:	15151

C. Approved Manufacturers

1. North American Pipe Corporation
2. Vinyltech
3. Certainteed

D. Application

1. Class 200 PVC Pipe shall be used unless specifically shown otherwise on the plans.
2. PVC pipe shall be used as a valve can riser.

E. Reference Standard

Conform to AWWA C900, "Polyvinyl Chloride (PVC) Pressure Pipe, 4-inch through 12-inch for Water," unless noted otherwise below.

PART 2 - MATERIALS

A. PVC Pipe

1. PVC pipe shall be manufactured in accordance with AWWA C900. The pipe shall have gasket bell end or plain end with elastomeric gasket coupling.
2. Laying lengths shall be 20 feet with the manufacturer's option to supply up to 15% random (minimum length 10 feet).
3. Each pipe length shall be marked showing the nominal pipe size and O.D. base, the AWWA pressure class, and the AWWA specification designation (AWWA C900). For domestic water application, the seal of the testing agency that verified the suitability of the material for such service shall be included.
4. Pipe for recycled lines shall be purple in color and marked as detailed in Section 15151.

B. Fittings

1. Fittings shall be ductile-iron conforming to Section 15056.
2. Bell size shall be for Class 200 cast-iron equivalent PVC pipe, including the rubber-ring retaining groove.
3. All castings shall be marked CI/PVC AWWA C110.

C. Manual Valves

Manual valves shall conform with Section 15100.

D. Rubber Rings

Rubber rings for use in the PVC couplings and fittings shall conform to the requirements of ASTM D 1869.

E. Service Saddles

All service saddles shall be designed for use on C900 PVC pipe and in accordance with Section 15057.

F. Lubricants

Lubricant for pipe insertion shall be food grade, and biodegradable.

PART 3 - EXECUTION

A. General

1. The contractor shall install all the pipe, closure sections, fittings, valves, and appurtenances shown including pipe supports, bolts, nuts, gaskets, and jointing materials.
2. At all times when the work of installing pipe is not in progress, all openings into the pipe and the ends of the pipe in the trenches or structure shall be kept tightly closed to prevent the entrance of animals and foreign materials. The contractor shall maintain the inside of the pipe clean, sanitary, and free from foreign materials until its acceptance by the District.
3. Where closure sections are required by the contractor's installation operations, the sections shall be installed in accordance with the applicable sections of these specifications.
4. The pipe sections shall be laid in the trench to true alignment and grade in accordance with the drawings. Where the grade is not shown, pipe shall have a cover of 30 inches to subgrade in paved areas and 48 inches in unpaved areas. The pipe grade shall be approved by the District.
5. The pipe shall not be laid along curves at a radius less than that listed below:

The minimum-radius curves are determined by the limit of 2-degree deflection for PVC pipe joints with factory-assembled bell couplings:

<u>Length of Pipe Section</u>	<u>Minimum Curve Radius</u>
20 feet	573 feet
10 feet	287 feet

For curves of smaller radius, use high- deflection couplings or ductile-iron fittings.

B. Installation

1. Trenching, backfilling, and compacting shall be in accordance with Section 02223 and as specified herein.
2. Proper care shall be used to prevent damage in handling, moving, and placing the pipe. Tools and equipment satisfactory to the District representative shall be provided and used by the contractor.
3. The contractor shall take all necessary precautions to prevent the pipe from floating due to water entering the trench from any source; shall assume full responsibility for any damage due to this cause; and shall pay for and perform the work to restore and replace the pipe to its specified condition and grade if any displacement occurs due to floating.

4. Place and compact a minimum of 4 inches of imported sand for the pipe bedding per Section 02223.
 5. Excavate bell holes at each joint to permit proper assembly and inspection of the entire joint.
 6. Pipe shall be cut by a method recommended in the pipe manufacturer's installation guide, as approved by the District representative. When pipe is cut and is to be joined to a cast-iron fitting or another piece of pipe the end shall be beveled in the field or place of manufacture to create a beveled end equal in quality to the machined ends of the pipe as furnished by the manufacturer. Such machining shall not result in undercutting the wall thickness and must be approved by the District representative before installation.
 7. All connecting parts of pipe, rings, couplings, and castings shall be cleaned before assembly. After bearing has been obtained, couplings shall be assembled in a proper manner (as determined by the District representative). The use of excessive lubricant will not be permitted, and the assembly of the couplings and rings shall be in accordance with the manufacturer's recommendations. Lubricant and rubber rings shall be supplied by the pipe manufacturer. All fittings and valves shall have joints that match the type of adjoining pipe.
 8. All fittings and valves shall be supported so that the pipe is not subjected to the weight of these appurtenances.
 9. Concrete thrust blocks of the size shown on MNWD standard drawing W-12 and as specified herein shall be provided at the location of all cast-iron fittings, valves, fire hydrants, and end of line plugs.
 10. Imported sand shall be used for backfill within the pipe zone per Section 02223.
 11. Manual valves shall be installed in accordance with Section 15100.
 12. Native earth backfill shall be placed and compacted within the trench zone in accordance with Section 02223. All backfill within 24 inches of a valve shall be clean, washed sand.
- C. Installations within Jacked Casing
1. Certain portions of the project, such as crossings of some roads, highways, and railroads, may be required to be installed within a jacked casing pipe.
 2. The casing size and type shall be in accordance with Section 02315.
 3. Work shall not proceed without permission of the District representative. Refer to MNWD standard drawing W-13.
 4. All pipe installed within a casing shall have restrained joints.

D. Combination Air and Vacuum Relief Valves

1. Air release valve assemblies and combination air and vacuum valves shall be installed at each point in the pipeline as shown on the drawings or as specified by the District representative.
2. The tap for the air valves shall be made in a level section of pipe no closer than 18 inches to a bell, coupling, joint, or fitting.
3. Air release valve assemblies shall be installed in accordance with MNWD Standard drawing W-9 and Section 15089.

E. Blow Off Assemblies

1. Either in-line type or the end-of-line type blow off assemblies shall be installed in accordance with the standard drawings at locations noted on the plans and at such additional locations as required by the District representative for removing water or sediment from the pipeline.
2. The assembly shall be installed in a level section of pipe.
3. The tap for blow off in the line shall be no closer than 18 inches to a valve, coupling, joint, or fitting.
4. Blow offs shall not be connected to any sewer, submerged in any stream, or installed in any manner that will permit back siphoning into the distribution system.
5. Blow offs shall be installed in accordance with MNWD standard drawing W-10 and the applicable sections of these specifications.

F. Pipe Identification

Warning and locator tape shall be installed on all on-site recycled water pipelines and domestic water piping installed within the limits of a non-potable irrigation system. The pipe identification shall be in accordance with Section 15151.

G. Locator Wire

A bare 10-gauge solid copper wire shall be placed continuously on the top center of the pipe. The wire shall not be spliced at any point, and shall be continuous from riser to riser. The wire shall be brought to the surface at valve locations and shall be accessible by removing the valve can cover. The wire shall be brought up the outside of the valve well and folded over between the inside of the valve can and the valve well. The wire shall be brought to within 6 inches of finish grade. The wire shall also be tapped in place by means of a plastic adhesive tape, placed at 10 foot intervals.

H. Thrust Blocks

1. Thrust blocks shall be constructed where shown on the drawings, or where directed by the District representative and as specified herein. In general, thrust blocks will be placed at all angles greater than 5 degrees, at changes in pipe size, at fittings, at hydrant ells, and at valves.
2. The area and design of the bearing surface shall be per MNWD standard drawing W-12.

3. The bearing surface shall be against undisturbed ground in all cases, except where unstable conditions are encountered. In unstable conditions, the bearing surface shall be as directed by the District representative.
4. Unless otherwise directed by the District representative, the blocking shall be placed so that the pipe and fitting joints are accessible for repair.
5. Metal harness of tie rods and pipe clamps shall be used to prevent movement if shown on the plans or directed by the District representative.
6. Exposed non-steel rods and clamps shall be coated with bituminous mastic per Section 09900.
7. Reinforcing steel tie-down rods shall be used on all line valves.
8. The depth of thrust blocks below valves shall conform with the size of the valve and shall be cut into the side of the trench a minimum of 12-inches on each side.
9. Concrete for thrust blocks shall be Class "A" per Section 03300.

I. Slope Protection

1. Slope protection shall be installed where shown on the plans in accordance with Section 02223, wherever the profile of the ground surface above the pipeline exceeds 20% and where no pavement or other surfacing is to be laid over the facility.
2. The installation of the slope protection shall be considered a part of the work, and the contractor shall include the expense in the contract cost.
3. A reinforced concrete encasement may be used as directed by the District representative. The encasement shall extend to within 1-foot of the ground surface and to within 1-foot of the toe of slope in which the pipe is constructed.

J. Chlorination

All domestic water pipelines shall successfully be chlorinated in accordance with Section 15041 prior to connection to the existing distribution system.

K. Hydrostatic Testing

All pipelines shall pass a hydrostatic pressure test in accordance with Section 15042.

END OF SECTION