

**VALLECITOS WATER DISTRICT
SECTION 15064 – POLYVINYL CHLORIDE (PVC) PRESSURE PIPE**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section designates the requirements for the manufacture and installation of polyvinyl chloride, abbreviated PVC, pressure pipe.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. 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).
- B. Other sections of the Standard Specifications, not referenced below, shall also apply to the extent required for proper performance of this Work.
 - 1. Section 01300 – Submittals
 - 2. Section 02223 – Trenching, Backfilling, and Compacting
 - 3. Section 03300 – Concrete
 - 4. Section 15000 – Piping Components
 - 5. Section 15041 – Disinfection of Piping
 - 6. Section 15042 – Hydrostatic Testing of Pressure Pipelines
 - 7. Section 15056 – Ductile Iron Pipe and Fittings
 - 8. Section 15057 – Copper, Brass, and Bronze Pipe Fittings and Appurtenances

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. The following standards have been referenced in this Section:
 - 1. VWD Approved Material List
 - 2. AWWA C900-16 PVC Pressure Pipe, 4 In. Through 60 In.
 - 3. AWWA Manual M23 Pipe Design and Installation

1.4 SUBMITTALS

- A. The Contractor shall submit the following information:
 - 1. Manufacturer’s product data and installation instructions.
 - 2. Manufacturer’s certification of compliance, including, but not limited, to the standards referenced herein and of the National Sanitation Foundation (NSF).

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NSF compliance is required for pipe and elastomeric gaskets for all potable water systems.

3. Statement from the pipe fabricator certifying that all pipe will be fabricated subject to a Quality Control Program.
4. Outline of Quality Control Program.

PART 2 - PRODUCTS

2.1 PIPE

- A. PVC pressure pipe, 4-inch through 60-inch, shall be manufactured in accordance with AWWA C900-16, and shall be of the sizes and dimension ratio (DR) shown on the Approved Plans. The pipe shall have integral bell and spigot joints with elastomeric gaskets in accordance with AWWA C900-16 Section 4.3 (Pipe Requirements). The pipe shall conform with the outside diameter of cast-iron pipe unless otherwise specified and shall conform with the wall thickness of DR series 14 through 18.
- B. DR14 (pressure class 305 psi) PVC pipe shall be used unless specifically shown otherwise on the Approved Plans.
- C. Each pipe length shall be marked showing the nominal pipe size and O.D. base, the AWWA pressure class, the maximum allowable axial deflection (in degrees), and the AWWA specification designation. For domestic water application, the seal of the testing agency that verified the suitability of the material for such service shall be included. Pipe shall be within 1 year of the manufactured date.
- D. Pipe for recycled lines shall be purple in color and marked with “RECYCLED WATER” designation in addition to the standard factory labeling required by AWWA and as approved by the District Engineer or their designee.
- E. Lubricant and elastomeric gasket shall be supplied by the pipe manufacturer. Lubricant for pipe insertion shall be food grade and biodegradable.

2.2 FITTINGS

- A. Ductile-iron fittings shall conform to the Standard Specifications. Fittings shall have push-on type joints manufactured specifically for PVC pipe.

2.3 DEFLECTION COUPLINGS

- A. Deflection couplings shall have a maximum allowable deflection of 1.5° at each bell for a maximum of 3° total deflection with each deflection coupling.

2.4 JOINT RESTRAINT SYSTEMS

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- A. Joint Restraint Systems may be used for PVC where shown on the Approved Plans with prior approval of the District and shall conform to the Standard Specifications.

2.5 CONCRETE

- A. Concrete used for thrust, anchor, and support blocks shall conform to the Standard Specifications. Concrete for thrust blocks shall be Class "C".

2.6 TRACER WIRE

- A. Tracer wire materials shall conform to the Standard Specifications.

2.7 WARNING/IDENTIFICATION TAPE

- A. Warning/Identification tape materials shall conform to the Standard Specifications.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATIONS PROCEDURES AND WORKMANSHIP

- A. PVC pipe shall be stored in suppliers' yards and on the job site in accordance with AWWA M23 and the manufacturer's recommendations. Store PVC pipe in the field by supporting the pipe uniformly in accordance with AWWA M23. PVC shall be supported by racks or dunnage to prevent damage to pipe. Pipe shall not be stacked higher than 4 feet or with weight on the bell ends. PVC pipe that has been subjected to excess ultraviolet radiation as identified by color fading or chalking shall not be used. The determination as to the acceptability of PVC pipe shall rest solely with the District Engineer or their designee.
- B. PVC pressure pipe and fittings shall be installed per AWWA Manual M23, and as herein specified
- C. Laying lengths shall be 20 feet. When deep trenches or shoring restrictions hinder the use of the standard length sections, the use of 10-foot and 15-foot lengths shall be allowed with approval from the District Engineer or their designee. Random lengths are not allowed.
- D. The pipe shall not be laid along curves. No deflections at bells, fittings, or of the pipe will be allowed. Use of high deflection couplings or ductile-iron fittings at bends or angle points to be approved by the District Engineer or their designee.
- E. The pipe sections shall be accurately placed in the trench to the true alignment and grades as shown on the Approved Plans. Where the grade is not shown, pipe shall have a cover of 42 inches, for pipe 12 inch and smaller, or 48 inches, for pipe larger than 12 inch, to finished grade or as approved by the District Engineer. The pipe grade shall be approved by the District. The pipe sections shall be placed such that the manufacturers labelling shall be visible, at the top of the pipe.
- F. Tracer wire and warning/identification tape shall be installed on all PVC pressure mains.

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- G. At all times when pipe laying is not in progress, the open end of the pipe shall be closed with a tight-fitting cap or plug to prevent the entrance of foreign matter into the pipe. These provisions shall apply during the lunch break as well as overnight. In no event shall the pipeline be used as a drain for removing water which has infiltrated into the trench. The Contractor shall maintain the inside of the pipe free from foreign materials and in a clean and sanitary condition until its acceptance by the District.
- H. All existing facilities shall be potholed to verify the top, bottom and location for potential conflicts. Information to be submitted to the District Engineer or their designee prior to the installation of the new pipeline. No Inspections will be provided without pothole information.
- I. Pipelines shall be staked at 25 foot maximum intervals including all angle points, appurtenances and grade changes. Stakes to include stationing, offset and top of pipe. Appurtenances shall be staked at mainline and property line. Any appurtenances not perpendicular to the main will require an additional line stake with the property line stake. Additional staking at each high deflection coupling may be required for radii.

3.2 INSTALLATION

- A. The Contractor shall furnish and install all the pipe, closure sections, fittings, valves, and appurtenances shown including pipe supports, bolts, nuts, gaskets, and jointing materials as shown on the Approved Plans and as required to provide a complete and workable installation. All material connected to the pipe and the pipe shall be cleaned before assembly.
- B. Proper care shall be used to prevent damage in handling, moving, and placing the pipe. Hoist pipe with fork lift or other handling equipment to prevent major damage or shorten its service life. A cloth belt sling or a continuous fiber rope shall be used to prevent scratching the pipe. The pipe shall be lowered and not dropped from the truck. Dropped pipe will be rejected.
- C. Trenching, backfilling, and compacting, including the pipe bedding, shall conform to the Standard Specifications. Place and compact a minimum of 4 inches of imported sand for the pipe bedding. Imported sand shall be used for backfill within the pipe zone.
- D. 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.
- E. Prior to laying the pipe, the bottom of the trench shall be graded and prepared to provide uniform bearing throughout the entire length of each joint of pipe. Bell holes of ample dimension shall be dug at each joint to permit proper assembly and inspection of the entire joint. The trench shall have a flat bottom conforming to the grade to which the pipe is to be laid.
- F. Pipe shall be cut by a method recommended in the pipe manufacturer's installation guide, as approved by the District Engineer or their designee. When pipe is cut, and is to be joined to a ductile-iron fitting or another piece of pipe, the end shall be beveled in the field equal

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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 Engineer or their designee before installation.

- G. All fittings and valves shall be independently supported so that the pipe is not subjected to the weight of these appurtenances. All fittings and valves shall have joints that match the type of adjoining pipe.
- H. Concrete thrust blocks shall be placed as follows:
 - 1. As shown on the Approved Plans or where directed by the District Engineer or their designee and shall conform to the requirements of the Standard Specifications and Standard Drawing W-15 and as specified herein.
 - 2. Shall be provided at the location of all angles greater than 5 degrees, at changes in pipe size, ductile-iron fittings, valves, fire hydrants ells, and end of line plugs.
 - 3. The bearing surface shall be against the stable undisturbed ground and the fittings to be anchored. In unstable conditions, the bearing surface shall be as recommended by the Engineer and as directed by the District Engineer or their designee.
 - 4. The concrete shall be placed, unless specifically shown otherwise on the Approved Plans, so that the pipe joints and fittings will be accessible to repairs.

3.3 PIPE JOINT ASSEMBLY

- A. The spigot and bell shall slide together without displacement of the elastomeric gasket. The joint shall be dirt free. The best laying practice is with the bell facing in the direction of laying.
- B. Insert the elastomeric gasket into the groove making sure the gasket is completely seated. Lubrication of the spigot and instruction of use shall be supplied by the pipe manufacturer. The use of excessive lubricant will not be permitted.
- C. The spigot shall be inserted into the bell and forced slowly into position by use of a large bar lever and a wood block across the pipe end. Machine insertion will not be allowed. For large pipe, a come-along with padding that will not scratch the pipe) may be used. Care shall be taken to not “over-stab” the pipe.
- D. All fittings and valves shall have joints that match the type of adjoining pipe.
- E. There shall be no tap within 30 inches of a pipe joint.

3.4 JOINT RESTRAINT SYSTEMS

- A. Joint Restraint Systems shall be installed as shown on the Approved Drawings and in accordance with the manufacturer’s recommendations.

3.5 HYDROSTATIC TESTING

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- A. All pipelines shall pass a hydrostatic pressure test in accordance with the Standard Specifications.

3.6 DISINFECTION

- A. All domestic water pipelines shall successfully be chlorinated in accordance with the Standard Specifications prior to connection to the existing distribution system.

****END OF SECTION****