

VALLECITOS WATER DISTRICT
SECTION 15042 – HYDROSTATIC TESTING OF PRESSURE PIPELINES

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This section includes hydrostatic pressure and leakage testing of pressure pipelines and appurtenances.

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 technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
 - 1. Section 01300 –Submittals
 - 2. Section 15041 – Disinfection of Piping

1.3 SUBMITTALS

- A. Submit shop drawings, test bulkhead locations, pipe attachment details, methods to prevent excessive pipe wall stresses, blocking to overcome thrust conditions and design calculations.

PART 2 – PRODUCTS

2.1 TEST EQUIPMENT

- A. Provide calibrated pressure gauges, calibrated recorder, pipes, pumps, water meters, and other equipment necessary to perform the hydrostatic pressure test.

PART 3 – EXECUTION

3.1 TESTING PREPARATION

- A. All labor, materials, tools, and equipment for testing shall be furnished by the Contractor.
- B. Prior to hydrostatic pressure testing new pipelines which are to be connected to existing pipelines, isolate the new pipeline from the existing pipeline by means of test bulkheads, test plates, or blind flanges. Continue with connection work after the new pipeline has been successfully tested and approved by the District.
- C. The Contractor shall provide the District Engineer of their designee with a minimum of 2 days' notice prior to the requested date and time for any preliminary hydrostatic test and 5 days' notice prior to the requested date and time for hydrostatic pressure tests.
- D. Subject the pipeline and appurtenances to a hydrostatic pressure test after the pipe has been laid and backfilled with a 24" minimum of cover for required restraint. Allow concrete pipe anchors, collars, encasements and thrust blocks to cure for at least 5 days prior to testing. The Contractor shall be responsible for determining thrust blocks have

VALLECITOS WATER DISTRICT
SECTION 15042 – HYDROSTATIC TESTING OF PRESSURE PIPELINES

reached their optimal strength for testing of the pipeline. Existing facilities will be operated under direction of the District Engineer or their designee only.

- E. Contractor shall provide source of water, shall make all connections with the water source, transporting the water, and all other arrangements concerning the water to be used for the pipeline hydrostatic pressure test. Use only metered potable water for the hydrostatic pressure test. Provide a reduced pressure backflow prevention assembly if source of potable water is from District waterlines. Provide temporary piping to convey and dispose of the water used in the pipeline. Disconnect and remove temporary piping after successful completion of the hydrostatic pressure test.
- F. No testing will be allowed against District valves. All testing shall be performed in the presence of the District Engineer or their designee.
- G. All pipelines shall be satisfactorily tested prior to the placement of final pavement.

3.2 CLEANING

- A. Before conducting hydrostatic pressure tests, flush pipes with water to remove dirt and debris. Maintain a flushing velocity of at least 3 fps for water testing. Flush pipes for time period as given by the formula:

$$T = \frac{2L}{3}$$

in which:
T = flushing time (seconds)
L = pipe length (feet).

3.3 LENGTH OF TEST SECTION

- A. Due to excessive length or elevation difference, it may be necessary to test the pipeline in sections. In any one test, do not exceed more than 2,500 feet, the distance between closed valves, or as directed by the District Engineer or their designee. In any one section, conduct the test in so that no pipe section is tested at less than the required test pressure, nor more than 1-1/2 times the pipe pressure class.

3.4 INITIAL PIPELINE FILLING

- A. Maximum rate of filling with test fluid shall not cause water velocity in pipeline to exceed 1 foot per second. Expel air from the pipeline while filling and prior to testing. Provide necessary outlets to fill and test pipeline. The following table has been provided to relate the velocity filling rate to an equivalent volume flow rate.

Filling Rate in gpm equivalent to filling velocities of 1fps.

Nominal Size (inches)	Flow Rate Q (gpm)
4	38
6	88
8	158
12	353
16	624

VALLECITOS WATER DISTRICT
SECTION 15042 – HYDROSTATIC TESTING OF PRESSURE PIPELINES

- B. Allow 24 hours for the water filled pipeline to soak and release entrapped air prior to testing. Pipelines with cement-mortar lining shall be filled with water and placed under a minimum pressure of 25 psi for at least 72 hours prior to the hydrostatic pressure test.
- C. Cement-mortar lined pipe shall not be filled with water until a minimum period of 24 hours has elapsed after the last joint in any section has been made. Steel pipelines shall not be tested before the mortar lining and coating on all of the pipe lengths in the line have attained an age of 14 days.
- D. The same water used for chlorination of the pipeline may be used to fill the line for hydrostatic pressure testing.

3.5 PRELIMINARY TEST

- A. Prior to scheduling a hydrostatic pressure test, the Contractor shall demonstrate to the District Engineer or their designee that the pipeline can maintain the required test pressure with zero leakage for a duration of 4-hours.
- B. The preliminary test should be discontinued if a large quantity of water is required to increase the pressure during testing. The source of the problem, such as entrapped air, leakage at joints, or broken pipe, should be identified and corrected.

3.6 PRESSURE AND DURATION OF TEST

- A. After a Preliminary Test has been performed and approved by the District Engineer or their designee, the pipeline shall be subjected to a field hydrostatic pressure of 225 psi or 50 psi in excess of the maximum operating pressure of the pipe being tested, whichever is greater, for a period of 1-hour. Maximum operating pressure to be determined by the District.
- B. Maintain the pipeline test pressure for 1-hour with zero leakage.

3.7 ALLOWABLE LEAKAGE

- A. The allowable leakage for aboveground and buried piping having threaded, soldered, welded, flanged, push-on joint, mechanical joint, and elastomeric gasket joint shall be zero.

3.8 BULKHEAD AND TEMPORARY EQUIPMENT REMOVAL

- A. After a satisfactory hydrostatic pressure and leakage test and disinfection: drain the water; remove test bulkheads, temporary valves and piping, and other test facilities; connect to existing facilities; and restore the pipe coatings.

****END OF SECTION****