VALLECITOS WATER DISTRICT
SECTION 15041 – DISINFECTION OF PIPING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section describes requirements for disinfection of domestic water mains, services, appurtenances and connections by chlorination and all requirements for bacterial testing of the facilities, and obtaining subsequent clearances for operation issued by the District and all state and local health agencies having jurisdiction.

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 15042 – Hydrostatic Testing of Pressure Pipelines

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. The following standards have been referenced in this Section:

1. AWWA C651 Disinfecting Water Mains

1.4 PROJECT CONDITIONS

A. Discharge of chlorinated water into watercourses or surface waters is regulated by the National Pollutant Discharge Elimination System (NPDES). Apply to cognizant environmental regulation authority and obtain permit for permission to discharge. Disposal of the chlorinated disinfection water and the flushing water is the Contractor's responsibility.

B. Schedule the rate of flow and locations of discharges in advance to permit review and coordination with the District and cognizant regulatory authorities: San Diego County Health Department. If there is any question that the chlorinated discharge will cause damage to the environment, then a reducing agent shall be applied to the water to be wasted to neutralize thoroughly the chlorine residual remaining in the water. See AWWA C651, Appendix B for neutralizing chemicals.

PART 2 - PRODUCTS

2.1 SODIUM HYPOCHLORITE

A. Sodium Hypochlorite solution shall be 10-16% available chlorine by weight.

PART 3 - EXECUTION

3.1 PROCEDURE

A. Before being placed in service or connected to existing facilities, all facilities shall be disinfected using a method approved by the District Engineer of their designee.

B. Contractor shall notify the District two (2) working days prior to chlorination of facilities.

C. All required corporation stops and other plumbing materials necessary for chlorination or flushing of the main shall be installed by and at the expense of the Contractor.

D. All mains shall be thoroughly flushed prior to disinfection.

E. Every service connection served by a main being disinfected shall be tightly shutoff at the curb stop before water is turned into the main. Care shall be taken to expel all air from the main and services during the filling operation.

F. The Sodium Hypochlorite solution shall be applied at a terminus of the system to be chlorinated using an injector which can adjust the amount of solution being injected into the piping system. The solution shall be injected in the appropriate concentration to achieve the specified concentration range of chlorine throughout the entire piping system. Where pumping equipment is used in conjunction with an injector, an integral backflow prevention device shall be installed and connected to the potable water supply. Pumping equipment, piping, appurtenances and all other equipment in contact with potable water shall be disinfected prior to use.

G. Water shall be fed slowly into the pipeline with chlorine applied in amounts to produce a dosage of not less than 50 ppm or more than 100 ppm in all sections of the pipeline and appurtenances.

H. Treated water shall be retained in the system for a minimum of 24 hours and shall contain a chlorine residual of not less than 25 ppm at the end of the retention period in all sections being disinfected. Treated water shall be retained in the system for a maximum of 48 hours.

3.2 CONCURRENT TESTING

A. Disinfecting the mains and appurtenances, hydrostatic pressure testing, and preliminary retention may run concurrently for the required 24-hour period, but in the event there is leakage and repairs are necessary, additional disinfection shall be made by injection of Sodium Hypochlorite solution into the line as provided hereinafter.

3.3 FLUSHING

A. After chlorination, the water shall be flushed from the line, in accordance with AWWA C651, at its extremities until the chlorine concentration in the water leaving the pipe is within 0.5 mg/l of the replacement water. The chlorinated water may be used later for testing other lines, or if not so used, shall be disposed of by the Contractor, as designated in AWWA C651, Section 6.2. The Contractor shall be responsible for all costs to dechlorinate the water before it enters any storm drain or watercourse. The District will not be responsible for loss or damage resulting from such disposal.

3.4 BACTERIOLOGICAL TESTING

A. The Contractor shall provide the services of an acceptable state certified laboratory to take all samples, deliver to laboratory, and provide written test results to the District Engineer or their designee.

B. Perform bacteriologic quality testing after disinfection, final flushing, and refilling of the pipeline in accordance with AWWA C651. Samples shall be taken throughout the length of the new pipeline(s) at locations not more than 1,000 feet apart and at all branches and dead ends. Sample point locations and spacing shall be determined by the District Engineer or their designee and may be adjusted in the field to insure complete representation is achieved.

C. Deliver samples to a certified laboratory within three hours after collecting and have a bacteriologic quality test performed. Test for coliform organisms and perform a heterotrophic plate count for each sample taken. Coordinate the collection of the samples with the laboratory's hours of operation and allow adequate time for the test results.

D. All samples must show the absence of coliform organisms and all heterotrophic plate counts must be less than 500 colonies forming unit/ml.

3.5 ADDITIONAL DISINFECTION

A. If any samples fail the Coliform Bacteria or HPC Tests, the entire pipeline(s) shall be re-flushed by the Contractor and re-sampled as required by the District Engineer or their designee. Additional disinfection may be required. Disinfection procedures as described herein shall continue until satisfactory results are obtained. All re-disinfection, re-flushing and re-sampling required shall be at the Contractor’s expense.

B. Retesting of the system may be required if 90 days have passed between the date of testing and acceptance by the District.

3.6 FINAL CONNECTIONS TO EXISTING MAINS

A. Final connections are allowed following satisfactory bacteriological sample results and proper notification and scheduling with the District. Following the opening of an existing domestic water main, the interior of all accessible pipes and fittings shall be sprayed disinfected or swabbed with a Sodium Hypochlorite solution per AWWA C651, Section 4.10 and 4.11. The drained portion of the existing line and any new section shall be flushed from two directions toward the cut-in, if possible.

B. Within 24 hours of making a connection to an existing waterline, a bacteriologic quality test shall be performed by a state certified laboratory. Collect a sample from the existing waterline at the nearest access point to the connection. If the sample fails the test, the District Engineer or their designee will direct the Contractor to perform corrective action and retest.

C. Any repairs to an existing pipe shall follow disinfection procedures in accordance with AWWA C651, Section 4.11.

****END OF SECTION****