

**CLEANING AND DISINFECTION OF
STRUCTURES**

1. GENERAL

1.1 Work Included

.1 Cleaning of Water Retaining Structures

- .1 The Contractor shall include cost for removal of construction materials, pressure washing, power, disposal of waste debris, water and any other systems required for successful cleaning of structures. Water will be made available to the Contractor for one cleaning at no cost

.2 Disinfection of Water Retaining Structures

- .1 The Contractor shall include cost for water conveyance/fill system, chemicals, power, dechlorination, and disposal of water and any other system required for successful disinfection of structures. Water will be made available to the Contractor for one test at no cost. Related Codes

- .1 AWWA C651 Disinfecting Water Mains
.2 AWWA C652 Disinfection of Water Storage Facilities
.3 AWWA C653 Disinfection of Water Treatment Plants

1.2 Coordination

- .1 Coordinate with other Divisions to ensure there are no conflicts in the Work.
.2 Refer to Section 15200-000-Process Piping for Disinfection of related Piping Systems.

1.3 Schedule of Items to be Cleaned

- .1 The Contractor shall clean all water retaining structures in the WTP as well as the clearwell structure outside of the WTP and the clearwell conduit connecting the WTP to the clearwell.

1.4 Schedule of Items to be Disinfected

- .1 The Contractor shall disinfect all items for the following commodities which will be used for the conveyance or storage of potable water and residuals: BWS, FTR, FW, FIN BWW, CWS, SLU and SUP. Additional structures that required disinfection shall include the clearwell structure outside of the WTP and the clearwell conduit connecting the WTP to the clearwell.

**CLEANING AND DISINFECTION OF
STRUCTURES**

1.5 Entry into Existing Structures

- .1 Where work is undertaken within existing structures used for the storage or conveyance of potable water, they shall be disinfected prior to being put back into service.

2. MATERIALS

2.1 Water

- .1 Water for disinfection will be provided by the City (only for one test). Contractor shall be responsible for all systems required for the conveyance of the available water and fill system from an acceptable water extraction point. The water shall be free from all suspended and deleterious material. The water can be obtained from the existing water supply system after consultation with the Contract Administrator. Contractor shall provide a plan of water extraction from the existing system and acquire approval of the plan from the Contract Administrator.

2.2 Calcium Hypochlorite

- .1 Calcium hypochlorite shall comply with AWWA B-300.

2.3 Sodium Hypochlorite

- .1 Sodium hypochlorite shall comply with AWWA B-300.

3. EXECUTION

3.1 Applicable Standards

- .1 Except as otherwise specified, the work shall be undertaken in accordance with the following codes:
 - .1 AWWA C651 Disinfecting Water Mains
 - .2 AWWA C652 Disinfection of Water Storage Facilities
 - .3 AWWA C653 Disinfection of Water Treatment Plants.

3.2 Cleaning

- .1 All structures shall be thoroughly cleaned prior to final acceptance.
- .2 All construction material not part of the permanent structure shall be removed.

CLEANING AND DISINFECTION OF STRUCTURES

- .3 The surfaces of walls, floor and roof of structures shall be cleaned using a high pressure jet, sweeping, scrubbing or equally effective means.

3.3 Disinfection of Structures

- .1 The structure shall be disinfected prior to final filling of the structure and commissioning.
- .2 A solution of 200 mg/L available chlorine shall be applied directly to the surfaces of all parts of the structure including the underside of the roof. The solution shall be applied by suitable brushes or spray equipment, and shall thoroughly coat all surfaces. The disinfected surfaces shall remain in contact with the solution for at least 30 minutes before the structure is washed with water.

3.4 Disposal of Chlorinated Water

- .1 After the disinfection process is complete, the heavily chlorinated water shall be drained and disposed of in a manner approved by the Contract Administrator.
- .2 Heavily chlorinated water shall not be discharged without first obtaining the permission of regulatory authorities. Dispose of disinfecting water in an acceptable manner that will protect the public and receiving waters from harmful or toxic concentrations of chlorine.
- .3 If other disposal methods are impractical, dechlorinate the chlorinated water using methods outlined in AWWA C653.

3.5 Filling of Structures

- .1 Immediately following the disposal of the heavily chlorinated water, the structure shall be filled with potable water in accordance with Contract Administrator's directions.
- .2 Potable water used for filling of the structures shall be sampled to ensure that no bacteriological contamination exists in the fill water prior to placement in the structures.

3.6 Bacteriological Testing

- .1 After the chlorination procedure is complete and the structure has been filled with potable water, duplicate samples shall be taken at least 30 minutes apart and shall be tested for coliforms in accordance with the Standard Methods for the Examination of Water and Wastewater.
- .2 Bacteriological testing is to be performed at an approved laboratory that is able to perform the tests. Transportation and testing of samples are at Contractor's expense.
- .3 Contractor shall be responsible for all sampling, testing and laboratory analyses.

**CLEANING AND DISINFECTION OF
STRUCTURES**

3.7 Disinfection

- .1 If the initial disinfection fails to produce satisfactory bacteriological samples, the structure shall be refushed and water resampled.
- .2 If check samples show the presence of coliform organisms, then the main or structure shall be redisinfectied until satisfactory results are obtained.
- .3 All costs associated with the redisinfection and testing shall be borne by the Contractor.

3.8 Placing Into Service

- .1 No piping, structure or tank that is required to be disinfected shall be placed into service until bacteriological samples indicate the absence of contamination.

3.9 Entry into Existing or Previously Disinfected Potable Watermains or Structures

- .1 Where entry is required either into existing potable water storage structures or piping or into previously disinfected new structures, the Contractor shall assure that the following measures are taken:
 - .1 All personnel shall wear clean, dirt-free protective overalls and disinfected, clean rubber footwear. Such footwear shall be reserved solely for use within the affected areas and shall not be worn in undisinfected areas.
 - .2 All tools and equipment shall be clean, grease free and spray disinfected before use. Equipment which shows evidence of fuel, oil or grease leakage shall not be used.
 - .3 The immediate area surrounding the access point for the structures concerned shall be cleaned and spray disinfected prior to the start of work. All previously disinfected footwear, tools, or equipment removed outside this area of the affected structures shall be redisinfectied on return.
 - .4 Disinfection of footwear, tools, equipment and access areas shall be by spraying with a 200 mg/L concentrated chlorine/water solution.
 - .5 Workmen who show signs of illness shall not work within the affected structures or surrounding access area.

END OF SECTION