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SOUTHINGTON WATER DEPARTMENT

SPECIFICATIONS FOR

CHLORINATION AND DECHLORINATION

PART1: GENERAL

1.1 DESCRIPTION

A. This contains the procedures for chlorinating and de-chlorinating water mains and large water services.

1.2 REFERENCES

- A. American Water Works Association, AWWA B301 Standard for Liquid Chlorine.(latest version)
- B. American Water Works Association, AWWA C651 Standard for Disinfecting Water Mains.(latest version)
- C. American Public Health Association, American Water Works Association, and Water Pollution Control Federation, Standard Methods For the Examination of Water and Wastewater

1.3 QUALITY ASSURANCE

- A. The Contractor or their employees will at their expense collect bacteriological samples under the supervision of the Southington Water Department inspector.
- B. State of Connecticut Department of Public Health Services approved laboratories will perform bacteriological testing. They will test for standard heterotrophic plate counts along with absents / present coliform tests.
- C. **All samples must be absent of total coliform organisms and under 500 colonies in the heterotrophic plate count to pass**

1.4 APPROVED CHLORINATION METHODS

A. Continuous Feed Method

1. This method is to used for all projects over 72 feet in length

2. A proportion mixture of chlorine solution and water is mixed so that a minimum of 50 mg/l of free chlorine concentration is placed into the main and appurtenances to be chlorinated. See table 4 in AWWA C651 and double the amounts to get the right concentration.

3. The Southington Water Department prefers that Sodium Hypochlorite solution at 12.5% strength be used for the continuous feed method.

4. Feed lines shall be constructed of material capable of withstanding the corrosion caused by concentrated chlorine solutions and the maximum pressure caused by the pumps

5. The mixture shall be injected into the main with a chemical feed pump designed for feeding chlorine mixtures.

6. Retain the concentrated chlorinated water in the main for 24 hour period.

7. At the end of the 24 hour period, treated water shall contain no less than 10 mg/l free chlorine throughout the main.

8. All valves and hydrants within the treated area shall be operated by Southington Water Personnel to ensure disinfection of the appurtenances.

9. Flush out main at end of 24 hour period until water has chlorine residual less than 2.5 mg/l total

chlorine and a pH less than 9.2.

B. Tablet Method

1. **This method can be used only for projects under 72 feet in length.**
2. Do not use this method unless interior of pipe, fittings and valves can be kept clean and dry.
3. Average Chlorine Dose: Approximately 25 mg/l free chlorine. See table 2 in AWWA C651 for the number of tablets needed to obtain the concentrations.
4. The tablets shall be attached by **food-grade adhesive**. There shall be adhesive on the broad side of the tablets which are attached to the inside top of each end of any given pipe.
5. Seal ends of pipelines that contain tablets to prohibit entry.
6. Fill water main **slowly** and let sit for 24 hours
7. Flush out main at end of 24 hour period until water has chlorine residual less than 2.5 mg/l total chlorine and a pH less than 9.2.

PART 2: EXECUTION

1.5 DISINFECTION

- A. Contractor shall notify Southington Water Department 3 working days before performing chlorination and de-chlorination.
- B. Contractor shall arrange with Southington Water Department personnel for the installation of all taps necessary for chlorine injection, sampling and air expulsion.
- C. Contractor shall provide an injection point not more than 10 feet from the start of a project, along with the necessary copper tubing to reach a safe work area. **At the end of this project the copper must be removed at the injection tap and the corporation tap turned off.**
- D. Contractor shall provide a sample point for every 1200 feet of pipe, plus one for each branch of the water main. Fire hydrants may be used if a device is attached to the nozzle and is approved by the Southington Water Department. Blow-offs are acceptable.
- E. If required the contractor shall supply the necessary jumper and backflow preventer for the filling and disinfection of the new pipe from the distribution system. If water from distribution system is not available, the contractor shall provide potable water which has less than 2.5 mg/l chlorine residual and a pH less than 9.2.
- F. Contractor shall arrange for Southington Water personnel to completely fill and flush the new pipe thus removing all air pockets. To accomplish this main should be flushed to a velocity of 2.5 feet per second. See table 3.1 of AWWA standard C651 for the amount of flow need to obtain velocity. The Contractor at no time shall be permitted to operate any valves or hydrants.
- G. Contractor shall provide adequate drainage to remove water from the work area.

1.6 FINAL FLUSH AND DISCHARGE OF CHLORINATED WATER

- A. Following the 24 hour chlorination period, all chlorinated water shall be flushed by Southington Water Department personnel to a location established by the contractor. The contractor is responsible for the ability to collect and dispose of the water properly.
- B. No discharge of chlorinated water to any storm sewer or natural watercourse will be allowed. If there is a surface water body within 200 feet of the discharge the contractor will be responsible for containment of the water.
- C. Approved Discharged Methods
 1. Discharge into existing sanitary sewer manholes will be allowed only after strict compliance with all applicable local, state and federal regulations are met.
 - a. Maintain minimum 1 foot vertical air gap between end of discharge pipe and manhole frame.

- b. Do not cause surcharge or disrupt sewer service.
 - c. Flow rate into sanitary sewer may not exceed 0.25mgd.
2. If no sanitary sewer is available, an on-site tank or detention pond may be used to hold discharge water until chlorine naturally dissipates or can be treated with de-chlorination chemicals.
- a. Maintain 12 inches of freeboard above water level in on-site tank or detention pond to prevent overflowing due to rainfall.
 - b. Tank or detention pond may not be emptied into the environment until chlorine residual tested within 15 minutes of sample collection from at least 3 representative location of the tank or pond is non-detectable (<0.10 mg/l) as required by Part VI Section D of the General Discharge Permit.
3. When sanitary sewers and detention ponds are not available, de-chlorinate chlorinated water, store, or discharge following AWWA, local, state and federal regulations.

1.7 BACTERIOLOGICAL ANALYSES:

- A. After the 24 hour disinfection period and all chlorine solution has been thoroughly flushed, the bacteriological sampling and analysis of the new or replaced water main shall be performed at the contractor's expense.
- 1. Bacteriological sampling shall be made by the Contractor's competent person(s) in full accordance with AWWA C651- section 5. Bacteriological Tests shall be done under the supervision of the Southington Water Department.
 - 2. Analysis shall be performed by an independent commercial laboratory certified by the State of Connecticut Department of Public Health Services.
 - 3. The laboratory shall perform analysis on each sample for a standard heterotrophic plate count test along with the absent / present total coliform test.
 - 4. Two sets of samples shall be taken every 1200 feet along the chlorinated main, plus from every main branch off the main. Fire hydrants may be used if a device is attached to the nozzle and is approved by the Southington Water Department.
 - 5. The first set shall be taken immediately after the main is has been flushed. The second set shall be taken a minimum 16 hours after the first set.
- B. The Contractor shall give all sample results to the Southington Water Department for review and approval.
- 1. A sample has passed as long as it is absent of Coliform bacteria and the Heterotrophic Plate Count bacteria (HPC) show less than 500 hundred colonies.
 - 2. If any sample fails to produce satisfactory bacteriological results, the main shall be re-flushed by Southington Water Department personnel and new samples shall be taken at the contractor's expense.
 - 3. If any check sample fails to produce acceptable results, then the main shall be re-chlorinated by the continuous feed method at the contractor's expense until satisfactory results are obtained- that being two consecutive sets of acceptable samples taken a minimum of 16 hours apart.
 - 4. Once the results are deemed acceptable by the Southington Water Department staff, then you may proceed to the pressure testing of your project.