

APPENDIX A



85 Branch Street
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WATER MAIN DISINFECTION PROCEDURE

The following procedures shall be strictly adhered to after the installation of new water mains, the cleaning and lining of existing water mains, or as directed by the Pawtucket Water Supply Board.

DISINFECTION PREPARATIONS

- a. The contractor shall utilize a by-pass piping system for flushing, filling, testing and chlorination of various sized water mains. The by-pass piping shall consist of corporation stops or valves on the supply line and the main to be filled. A reduced pressure zone device (relief valve between two check valves) shall be installed in the temporary piping system to insure that no water is allowed to return to the supply line. Fire hydrants may be utilized for feed points only if properly flushed and the above by-pass piping is installed. Fire hydrants SHALL NOT be used as sample points. Line valves SHALL NOT be used under any circumstances to fill, flush, test or chlorinate water mains. Newly installed water main SHALL NOT be physically connected to an existing distribution system water main until all flushing, disinfection and testing has been completed.
- b. During construction or cleaning water main sections, joints and valves must be kept CLEAN and DRY as possible.
- c. A corporation stop shall be provided within 5 feet of the beginning of the new main for feeding of the liquid chlorine, and at sampling locations designated by the Pawtucket Water Supply Board Chemist or a member of the Engineering staff. These sampling locations shall be within 10 feet of the end of the section of main to be chlorinated. This will be to provide for sampling points along the main. Hydrants shall not be used for sampling points but may be used as a feed point for chlorination. Copper tubing shall be used for all chlorination and sampling pipe.
- d. Chlorination of valves, fittings, and less than one pipe length (generally 20 feet long), of main shall be disinfected by contact swabbing and/or brushing with a 4-percent NSF-61 approved sodium or calcium hypochlorite solution.
- e. Mains shall be pressure tested to 1.5 times the system working pressure, and shall be required to hold pressure for at least two hours. This shall be verified by a member of the Water Supply Engineering Department.

DISINFECTION OF WATER MAINS, TEMPORARY MAINS, AND SERVICES

All mains and appurtenances shall be disinfected with NSF-61 approved chlorine in accordance with provisions of the American Water Works Association Standard C651, latest revision thereof, AND as follows:

- a. Water mains and services shall be thoroughly flushed. Flushing shall be at a rate sufficient to create a water velocity of at least 3.0 feet per second through the pipe. A turbidity reading of less than 5.00 NTU and a

color of less than 15 Hazen units must be verified by the Water Supply Representative prior to introduction of chlorine.

- b. NSF-61 approved liquid chlorine in the form of sodium hypochlorite with a concentration of 5-15% shall be introduced into the main(s) to be tested. The chlorine solution must come into contact with ALL sections of the main that is to be disinfected. The whole main must be filled with chlorinated water (no air), and the concentration of such water must not be less than 25 milligrams per liter as verified by a Water Supply Representative.
- c. The super chlorinated water must stand isolated in the main for at least twenty four (24) hours. After this MINIMUM retention time, the Water Supply Representative will re-test the concentration of chlorine in the main at all the sampling points. The concentration must be a least 10 mg/L. If concentration is below this level, step (b) must be repeated.
- d. Once the concentration is verified, the super chlorinated water must be flushed from the main through the various sampling points until the concentration of residual chlorine at each sampling point reaches a level of no higher than 1.5 mg/L (or system level) and turbidity of less than 1.00 NTU (or system level) as verified by the Water Supply Representative.
- e. Microbiological testing will be done a minimum of 16 hours after step (d) has been completed, but BEFORE the main is put into service. A Water Supply Representative will obtain samples at all sampling points along the main for analysis to determine if coliform bacteria is present. These samples are tested in accordance with the Enzyme Substrate Coliform Test (SM-9223B) and, if required, the Standard Heterotrophic Plate Count Procedure (SM-9215B). Within 24 hours the results will be made available by the Water Supply Chemist. If results indicate the presence of coliform bacteria, further flushing will be required, and new samples must be obtained. Once the main has been certified by the Water Supply Chemist, the main may be place into service with permission of the Chief Engineer.
- f. Under certain conditions, an emergency type chlorination may be conducted with the written approval of the Chief Engineer.

DISPOSING OF HEAVILY CHLORINATED WATER

FINAL FLUSHING - Disposal of heavily chlorinated water shall be in in accordance with provisions of the American Water Works Association Standard C651, latest revision thereof, AND as follows:

Heavily chlorinated water that possibly may discharge as runoff to any body of water, river or stream shall be neutralized by treating with sulfur dioxide. Such locations shall be determined by the Water Supply Representative. The primary choice of neutralizing agent is sulfur dioxide but the contractor may use, if requested, an approved substitute as listed in AWWA Std. C655, latest revision. The chlorine residual of the discharge flow shall be continuously monitored to allow the adjustment of the sulfur dioxide feed to thoroughly neutralize the water discharge. Otherwise, all other heavily chlorinated water will be discharged as runoff to the roadway surface or to the sewer system which shall be in accordance with the current rules and regulations governed by the local sewer authority. The following list is of the streets in Pawtucket that have drains that empty directly into a river and therefore any discharge must be de-chlorinated before entering into the drainage system.

List of Streets in Pawtucket with Storm Drains Emptying into River
All Heavily Chlorinated Water Must Be Dechlorinated Prior to Discharge

<u>Street</u>	<u>Section of Street</u>
Archer St.	Clews to Maplecrest
Arland Ave. (North not South)	Rice to Pinecrest
Armistice Blvd.	All of the Street
Central Ave.	Arland to Diana
Daggett Ave.	Huthinson to Central
Daggett Ave.	Winsor to Stafford
Daggett Ave.	Lindesta to Eddington
Eddington St.	All of the Street
Fenwood Ave.	All of the Street
Grosvenor Ave.	All of the Street
Grotto Ave.	Power to Legion Dr.
Huthinson Ave.	All of the Street
Leather Ave.	All of the Street
Liverpool St.	Bristol to London
London Ave.	All of the Street
Manton St.	All of the Street
Maplecrest Dr.	Archer to Karen
Maryland Ave.	All of the Street
Nathael Ave.	All of the Street
Parkside Ave.	All of the Street
Pearson Ave.	All of the Street
Piave St.	All of the Street
Rice St.	Kirk to Arland
Riverview Ave	All of the Street
Roosevelt Ave.	Exchange to Leather
School St.	Exeter to Beverage Hill
Service Rd.	All of the Street
Smithfield Ave.	Piave to Grotto
Stafford St.	All of the Street
Talcott Ave.	All of the Street
Terrace Ave.	All of the Street
Varnum Ave	All of the Street



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PAWTUCKET WATER SUPPLY BOARD

WATER MAIN DISINFECTION PROCEDURE SUMMARY

A. PRESSURE TEST:

NOTIFY PWSB LABORATORY THAT MAIN IS READY FOR TESTING & DISINFECTION. 1.5 TIMES THE SYSTEM WORKING PRESSURE FOR 2 HOURS. COMPLIANCE CHECKED BY THE WATER SUPPLY BOARD ENGINEERING DEPT.

B. FLUSHING:

FLUSH AT VELOCITY OF AT LEAST 3.0 FEET PER SECOND. TURBIDITY AND COLOR WILL BE VERIFIED BY WATER SUPPLY REPRESENTATIVE. TURBIDITY MUST BE LESS THAN 5.00 NTU AND COLOR LESS THAN 15 UNITS BEFORE CHLORINE CAN BE ADDED.

C. CHLORINATION:

ADD NSF-61 APPROVED LIQUID CHLORINE TO OBTAIN A MINIMUM CONCENTRATION OF 25 mg/L. WATER SUPPLY REPRESENTATIVE WILL TEST FOR COMPLIANCE. ALLOW TO STAND FOR 24 HOURS. RESIDUAL MUST BE NOT LESS THAN 10 mg/L. WATER SUPPLY REPRESENTATIVE WILL TEST FOR COMPLIANCE.

D. MICROBIOLOGICAL SAMPLING:

FLUSH HEAVILY CHLORINATED WATER FROM MAIN, UNTIL CHLORINE IS NO HIGHER THAN 1.50 mg/L (or system level) AND TURBIDITY IS LESS THAN 1.00 NTU (or system level). ONCE MAIN HAS BEEN ALLOWED TO STAND FOR A MINIMUM OF 16 HOURS, THE WATER SUPPLY REPRESENTATIVE WILL TAKE SAMPLE(S) FOR COLIFORM BACTERIA (AND HPC, IF REQUIRED) TESTS. WATER SUPPLY CHEMIST WILL ADVISE OF COMPLIANCE WITHIN 24 HOURS.

E. COMPLIANCE AND CERTIFICATION:

WATER SUPPLY CHEMIST WILL SEND DISINFECTION CERTIFICATE TO WATER SUPPLY ENGINEERING.

WATER SUPPLY ENGINEERING WILL ADVISE WATER SUPPLY T&D SUPERVISOR OR CONTRACTOR TO TIE IN AND PLACE MAIN IN SERVICE.

NO MAIN SHALL BE TURNED ON WITHOUT WATER SUPPLY CHEMIST CERTIFICATE OF COMPLIANCE.

NOTE: IF COLIFORM TESTING IS POSITIVE, STEPS C. AND D. MUST BE REPEATED.