
221118 POTABLE WATER SYSTEM DISINFECTION

Part 1 – GENERAL

1.1 Description

A. This section details the guidelines and expectations for the disinfection of all potable water systems after renovation or new installation on Johns Hopkins University Homewood Campus. Project conditions and requirements vary, thus precluding the absolute adherence to the items identified herein in all cases. However, unless there is adequate written justification and approval from the JHFRE Engineering and Energy Department, it is expected that these guidelines will govern the design and specifications.

1.2 Submittals

N/A

1.3 Quality Assurance

A. New and renovated plumbing work shall adhere to the current International Plumbing Code requirements for Disinfection of Potable Water Systems or the American Water Works Association Standards C651 Disinfection of Potable Water Systems or C652 Disinfection of Water Storage Facilities as applicable.

B. Potable water piping, fittings, and devices' water contact surfaces shall be protected from contamination during transportation, storage and the installation process. Plumbing materials contaminated with mud, dirt, or other visible contaminants shall not be used unless they are fully decontaminated prior to installation.

C. Faucets, urinals, and toilets utilizing electronic actuating shall be operational prior to conducting the flushing and disinfection processes. If the design and function of electronic actuating devices interferes with or prohibits adequate flushing, bypass devices or valves shall be installed for flushing and disinfecting of the potable water system.

1. The entire facility's potable water system shall be substantially complete prior to conducting flushing and disinfecting procedures.

2. Water coolers and fountains shall NOT be connected to the potable water system prior to conducting flushing and disinfection of the potable water system. The water supply for water coolers and fountains shall be disinfected and flushed prior to connecting water coolers.

D. JHFRE shall be notified in 11 working days advance for potable water system disinfection.

Part 2 – PRODUCTS

2.1 Chlorine test strips may be used for determining disinfectant levels from 50 ppm to 200 ppm in the potable water system.

A. An FAS-DPD free chlorine test kit must be used for determining levels below 50ppm.

B. The disinfectant solution pH shall be determined by use of a calibrated pH meter, pH test strips, or a phenol red pH test kit.

2.2 Liquid bleach (sodium hypochlorite) shall be used for making chlorine disinfection solutions. Use of other chlorine sources must receive prior approval from JHFRE.

Part 3 – EXECUTION

3.1 Prior to disinfecting the potable water plumbing system, all piping shall be flushed with clean potable water with sufficient velocity to flush all visible debris and discolored water from the system.

3.2 Hot water supply piping loops and recirculation systems that have pumps, heat exchangers, or other chemically sensitive mechanical components shall not be disinfected by use of elevated chemical disinfectants.

A. Hot water supply loops and recirculation systems shall be disinfected by recirculating 140° F or higher hot water for 24 hours. Upon completion of recirculating hot water for 24 hours, hot water shall be allowed to flow from all hot water fixtures for a minimum of five minutes. If due to design this is not feasible, the hot water supply loops shall be disinfected by use of chlorine as noted in paragraph 3.3.

3.3 The potable water system shall be disinfected by introducing a chlorine solution that results in an initial free chlorine residual of between 50 ppm and 200 ppm, a pH of between 7.2 and 8.5 standard pH units, and total alkalinity of 80 to 140 ppm throughout the plumbing system, (excluding components noted in paragraph 1.5). Free chlorine residual shall be tested throughout the facility at available faucets, hose bibs and other water taps. After adequate free chlorine residual has been verified to be within 50 ppm and 200 ppm throughout the potable water system, the system shall be valved off and unused for between 24 and 48 hours.

A. Free chlorine residual shall be tested after 24 hours from a minimum of 25% of fixtures on each floor of the facility being disinfected. If final disinfectant residual tests at less than 10 ppm, repeat steps in paragraph 3.3.

B. Once the final disinfectant residual is tested at 10 ppm or greater from tested fixtures, flush the disinfectant from the system with clean potable water until the residual is equal to that of the incoming water, which is approximately 1.0 ppm free chlorine.

C. All water with elevated chlorine shall be discharged to the sanitary sewer. Discharge of potable water with elevated chlorine shall NOT be disposed of through the stormwater system.

Standards

D. After the system is flushed, two bacteriological samples shall be collected from each floor of the facility from the potable water system. Water samples shall be analyzed by a certified laboratory for potable water bacteriological analysis. A copy of the laboratory sample results shall be provided to JHU.

E. The potable water system can be put into service upon receipt of satisfactory laboratory test results.