

Disinfection Procedure for Water Distribution Lines

Responsible Administrator: Environmental Health Specialist
Revised: January 2024

Summary: This section outlines the policy and procedures related to the Disinfection Procedure for Water Distribution Lines Program that is administered through the Environmental Health & Safety (EHS) Department.

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1. Program Description

This procedure was developed to assure potable water lines are properly disinfected and meet the American Water Works Association Standard for community water systems.

2. Scope

This procedure includes all underground and above ground potable water lines for new construction projects and major renovation projects. The intent of the program is to ensure compliance with the methods and procedures outlined in ANSI/AWWA Standard C651-05 and meet the bacteriological standards.

3. Definitions

AWWA: American Water Works Association. ANSI: American National Standards Institute

ANSI/AWWA Standard C651-05: The current industry practice for the disinfection of underground potable water distribution lines. Above ground potable water lines: All potable water lines upstream from the water meter.

CFU/ml: Coliform Forming Units per milliliter of water. Potable Water: Water fit for human consumption.

Sample cock: The end of the distribution line used for water sampling.

Slug Method: Calcium hypochlorite tablets are placed in each section of water lines as the lines are installed.

Underground potable water lines: All potable water lines downstream from the water meter.

4. Responsibilities

- Environmental Health and Safety (EHS) is responsible for performing all analytical tests and verifying that the building's plumbing system meets the minimum bacteriological standards as set forth by the California Health and Safety Code.
- Design and Construction Services (D&CS) is responsible for overseeing the entire disinfection procedure including verification of the chlorine residual.
- The general building contractor will provide the personnel, equipment and materials necessary to perform the actual disinfection of the underground lines in compliance with ANSI/AWWA Standard C651-05.
- When a sub-contractor performs the disinfection procedure, it is the joint responsibility of both the general contractor and designated sub-contractor to comply with this procedure.

5. Program Components

5.1 Underground Potable Water Lines

5.1.1 Standard Disinfection Procedure for all Underground Potable Water Lines

- The forms of chlorine that may be used in the disinfection operations are liquid chlorine, sodium hypochlorite solution or calcium hypochlorite granules or tablets.
- The Slug method is preferred by EHS. NOTE: EHS requires the initial Chlorine Residual to be at least 100 ppm (100 mg/L). Tablet or continuous feed methods will require prior approval by EHS prior to the installation of the underground piping.
- The UC Irvine D&CS inspector will verify the chlorine residual at the end of the retention time and issue a flush order. Continuously flush the entire system with clear potable water. The flush water shall be directed into a sanitary sewer system in accordance with the UC Irvine Storm water Management Plan. Alternative methods of collection of the flush water can be utilized with prior approval from EHS.
- Monitor the chlorine residual in the effluent on a periodic basis. When the chlorine residual is equal to the chlorine residual in the distribution system, the system has been properly flushed. The UC Irvine inspector will contact EHS to arrange for bacteriological testing.

5.1.2 Bacteriological Analysis of the Underground Potable Water Lines

- EHS will sample the water system effluent from the sample cock. The Total Coliform Count Method, as summarized in "Standard Methods for the Examination of Water and Wastewater" A.P.H.A., will be used to verify the bacteriological water quality.
- When all samples demonstrate that the water system meets the minimum standards, EHS will sign off on the disinfection procedure.
- The minimum standards are:
 - Total Coliform Count=Zero.
 - Heterotrophic Plate Count: 500 CFU/ml or less.

5.1.3 Emergency Slug Method

- In cases of emergency when the system must be returned to service as soon as possible, a chlorine residual of 325 ppm with a contact time of only 15 minutes may be used with prior approval from EHS (Sec. 10.4 of Std. C651-92). The affected section can be flushed and returned to service if the chlorine residual is not less than 300 ppm when the emergency methods were employed.
- EHS will sample the system to ensure the water meets minimum bacteriological standards after the system has been placed back into service.

5.2 Above Ground Potable Water Lines

5.2.1 Chlorination Procedure for the Above Ground Potable Water Lines

- The UC Irvine D&CS inspector will verify ALL underground distribution lines (upstream from the meter) have been properly disinfected.
- Thoroughly flush the entire building distribution system with clear potable water. When complete, the contractor will then notify the UC Irvine D&CS inspector.
- The UC Irvine D&CS inspector will contact EHS to arrange for bacteriological testing of the new system.

5.2.2 Bacteriological Analysis for the Above Ground Potable Water Lines

- EHS will sample the water system effluent from the sample cock. The Total Coliform Count Method, as summarized in "Standard Methods for the Examination of Water and Wastewater", A.P.H.A. will be used to verify the bacteriological water quality.
- EHS will also conduct a Heterotrophic Plate Count of water samples from the safety showers and eyewash stations. Ensure the drinking fountains, safety shower and eyewash stations have been thoroughly flushed. When all samples demonstrate that the water system meets the minimum standards, EHS will sign off on the disinfection procedure.
- The minimum standards are:
 - Total Coliform Count=Zero.
 - Heterotrophic Plate Count: 500 CFU/ml or less

6. Reporting Requirements

The general contractor will notify Environmental Health and Safety of all scheduled building chlorination procedures at least two days prior to disinfecting the potable water system.

7. References

American Water Works Association

California Laws