

SECTION 02675

DISINFECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Disinfection of potable water system.
- B. Test and report results.

1.02 REFERENCES

- A. AWWA A100: AWWA Standard for Water Wells.
- B. AWWA B300: AWWA Standard for Hypochlorites.
- C. AWWA B301: AWWA Standard for Liquid Chlorine.
- D. AWWA C651: AWWA Standard for Disinfecting Water Mains.
- E. AWWA C652: AWWA Standard for Disinfection of Water-Storage Facilities.
- F. State of Utah: Public Drinking Water Regulations, Part 2, Section 12.

1.03 DEFINITIONS

- A. Disinfectant Residual: The quantity of disinfectant in treated water.
- B. ppm: Parts per million.

1.04 SUBMITTALS

- A. Contractor's evidence of experience in disinfection.
- B. Bacteriological laboratory's evidence of certification.
- C. Disinfection Report: 3 copies including:
 - 1. Date issued.
 - 2. Project name and location.
 - 3. Treatment contractor's name, address and phone number.
 - 4. Type and form of disinfectant used.
 - 5. Time and date of disinfectant injection started.
 - 6. Time and date of disinfectant injection completed.
 - 7. Test locations.

8. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
9. Time and date of flushing start.
10. Time and date of flushing completion.
11. Disinfectant residual after flushing in ppm for each outlet tested.

D. Bacteriological Report: 3 copies including:

1. Date issued.
2. Project name and location.
3. Laboratory's name, certification number, address, and phone number.
4. Time and date of water sample collection.
5. Name of person collecting samples.
6. Test locations.
7. Time and date of laboratory test start.
8. Coliform bacteria test results for each outlet tested.
9. Certification that water conforms or fails to conform to bacterial standards of State of Utah public drinking water regulations.
10. Bacteriologist's signature.

1.05 QUALITY ASSURANCE

- A. Affidavit by manufacturer that disinfectant conform to AWWA standards.
- B. Bacteriological Laboratory: Certified by State of Utah.

1.06 PRODUCT HANDLING

- A. Store and protect disinfectant in accordance with manufacturer's recommendations to protect against damage or contamination. Do not use unsuitable disinfectant.
- B. Follow all instruction labeling for safe handling and storage of disinfectant materials.

1.07 REGULATORY REQUIREMENTS

- A. Conform to State of Utah public drinking water regulations.

PART 2 PRODUCTS

2.01 DISINFECTANT

- A. Liquid Chlorine: AWWA B301 with chlorine 99.5 percent pure by volume.

- B. Sodium Hypochlorite: AWWA B300 with not less than 100 grams per liter available chlorine.
- C. Calcium Hypochlorite: AWWA B300 with 65 to 70 percent available chlorine by weight in granular form.
- D. Powder, tablet, or gas according to manufacturer's specification.

PART 3 EXECUTION

3.01 PREPARATION

- A. Prior to starting the disinfection procedure ensure the potable water system is completed, cleaned, tested in accordance with Section 02660 and ready for disinfection.
- B. Ensure that the pipeline to be disinfected is not connected to the existing system.

3.02 DISINFECTION OF WATER LINES

- A. Use on of the approved methods in AWWA C651.
- B. Chlorination shall provide a minimum of 25 ppm residual after 24-hours contact in the pipeline. In general, this residual may be expected with an application of 50 ppm although some conditions may require more.
- C. Chlorine, in the form of a 1% slurry of high test calcium hypochlorite (HTH, Perchloron, Pittchlor, etc.) shall be fed into the pipeline in such a manner as to mix with the water flowing in the pipeline. (A 1% slurry results from mixing 1 pound of the calcium hypochlorite with 7.50 gallons of water.)
- D. The following table provides information as to the required quantity of slurry to be used per 100 feet of pipe to provide a chlorine concentration of 50 ppm:

PIPE SIZE (inches)	VOL OF 100 FT LENGTH (gallons)	REQUIRED AMOUNT OF SLURRY (gallons)
4	65	0.33
6	147	0.74
8	261	1.3
10	408	2.0
12	588	3.0
16	1044	5.2

- E. During the process of chlorinating the pipeline all valves and other pipeline appurtenances shall be operated several times to provide sufficient contact with the chlorinating agent.

3.03 DISINFECTION OF CULINARY WELLS

- A. Use one method defined under AWWA A100 as approved by City Engineer.
- B. Do not start disinfection until well is thoroughly cleaned.
- C. Use a disinfecting solution containing a minimum of 50 ppm residual chlorine.

3.04 DISINFECTION OF WATER STORAGE RESERVOIRS

- A. Use one method defined under AWWA C652, as approved by City Engineer.
- B. Do not start disinfection until water storage tank is thoroughly cleaned.
- C. Provide and use necessary safety equipment for workers in contact with disinfectant or gasses they may produce.

3.05 QUALITY CONTROL - BACTERIOLOGICAL TEST

- A. No samples for testing shall be taken sooner than 24 hours after system flushing.
- B. Sample water at each of the following locations, as applicable:
 - 1. Where water enters system.
 - 2. Ends of piping runs.
 - 3. Remote outlets.
- C. Analyze water samples in accordance with State of Utah requirements. Two (2) samples, 24 hours apart, will be taken at each location.
- D. If bacteriological test proves water quality to be unacceptable, repeat system treatment.
- E. Water systems shall not be accepted or placed into service until a negative bacteriological test is made on water taken. Repeat dosing as necessary until a negative test is obtained. Provide a copy of the negative bacteriological test to City Engineer.

The Public Works Department will perform bacteriological sampling on all new water distribution system infrastructure intended to become part of the community's water system. All locations for sampling will be determined by water department personnel. The cost for each sample will be billed to Developer / Contractor.

3.06 FLUSHING AND DISPOSAL OF DISINFECTANT

- A. After the 24 hour retention period, flush the chlorinated water from the main until chlorine measurements show the concentration in the water leaving the main is no higher than that generally prevailing in the system or is acceptable for domestic use.
- B. Legally dispose of disinfecting water and ensure no chlorine buildup or damage to the environment.
- C. Failing to flush the line may require Contractor to replace all gaskets and valves within the system at Contractor's expense.