SECTION 33 13 00
DISINFECTING OF WATER UTILITY DISTRIBUTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes disinfection of potable water distribution and transmission system; and testing and reporting results.

B. Related Sections:
1. Section 33 11 00 - Water Utility Distribution Piping: Piping Product and Execution requirements for installation, testing, of water distribution piping.
2. Section 33 12 13 - Water Service connections.

1.2 REFERENCES

A. American Water Works Association:
1. AWWA B300 - Hypochlorites.
2. AWWA B301 - Liquid Chlorine.
3. AWWA B302 - Ammonium Sulfate.
4. AWWA B303 - Sodium Chlorite.
5. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
6. AWWA C651 - Disinfecting Water Mains.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit procedures, proposed chemicals, and treatment levels for review.

C. Test Reports: Indicate results comparative to specified requirements.

D. Certificate: Certify cleanliness of water distribution system meets or exceeds specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Disinfection Report:
1. Type and form of disinfectant used.
2. Date and time of disinfectant injection start and time of completion.
3. Test locations.
4. Name of person collecting samples.
5. Initial and 24 hour disinfectant residuals in treated water in ppm for each outlet tested.
6. Date and time of flushing start and completion.
7. Disinfectant residual after flushing in ppm for each outlet tested.

C. Bacteriological Report:
1. Date issued, project name, and testing laboratory name, address, and telephone number.
2. Time and date of water sample collection.
3. Name of person collecting samples.
4. Test locations.

5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
6. Coliform bacteria test results for each outlet tested.
7. Certify water conforms, or fails to conform, to bacterial standards of authority having jurisdiction.

D. Water Quality Certificate: Certify water conforms to quality standards of authority having jurisdiction, suitable for human consumption.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with AWWA C651; maintain one copy of document on site.

PART 2 PRODUCTS

2.1 DISINFECTION CHEMICALS

A. Chemicals: AWWA B300, Hypochlorite, AWWA B301, Liquid Chlorine, AWWA B302, Ammonium Sulfate, and AWWA B303, Sodium Chlorite.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify piping system has been cleaned, inspected, and pressure tested.

C. Perform scheduling and disinfecting activity with start-up, water pressure testing, adjusting and balancing, and demonstration procedures, including coordination with related systems.

3.2 INSTALLATION

A. Provide and attach required equipment to perform the Work of this Section.

B. Perform disinfection of water distribution system.

C. Introduce treatment into piping system.

D. Maintain disinfectant in system for 24 hours minimum.

E. Flush, circulate, and clean until required cleanliness is achieved; use municipal domestic water. The new system must be thoroughly flushed until no trace of dirt or foreign matter is visible. The sterilizing agent used must produce a solution of water and chlorine of not less than 50 parts per million available chlorine throughout the entire new piping system. Prior to flushing, the chlorine residual shall be measured. If it is less than 25 ppm, the system shall be redisinfected using 50 ppm available chlorine in accordance with AWWA standards. After the chlorine solution has remained in the new piping system for at least 24 hours, the lines shall be thoroughly flushed until the normal residual chlorine in the system is measured.

F. Replace permanent system devices removed for disinfection.

3.3 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

B. Disinfection, Flushing, and Sampling:

1. Notify Engineer, Owner and testing agency 72 hours in advance of test and have witness test.
2. Disinfect pipeline installation in accordance with AWWA C651. Use of liquid chlorine is not permitted.
3. Upon completion of retention period required for disinfection, flush pipeline until chlorine concentration in water leaving pipeline is no higher than that generally prevailing in existing system or is acceptable for domestic use.
4. Legally dispose of chlorinated water. When chlorinated discharge may cause damage to environment, apply neutralizing chemical to chlorinated water to neutralize chlorine residual remaining in water.
5. After final flushing and before pipeline is connected to existing system or placed in service, employ an approved independent testing laboratory to sample, test, and certify water quality suitable for human consumption. A minimum of two samples shall be collected from each sampling site for total coliform analysis. The number of sites depends on the amount of new construction but must include all dead end lines, be representative of the water in the newly constructed mains, and shall be collected a minimum of every 1,200 linear feet. These samples must be collected at least 24 hours apart and must show the water line to be absent of total coliform bacteria.
6. If the membrane filter method of analysis is used for the coliform analysis, non-coliform growth must also be reported.
7. The chlorine residential must also be measured and reported.
8. If the non-coliform growth is greater than 80 colonies per 100 milliliters, the sample result is invalid and must be repeated.
9. All samples must be analyzed by a State certified laboratory.
10. Results of the bacterial examination shall be forwarded to the South Carolina Department of Health and Environmental Control with the engineer's letter of certification. Upon receipt of acceptable results of the test and receipt of the final certification letter from the engineer, a representative from DHEC will conduct a final inspection of the project at which time the representative will obtain additional samples for bacterial examination. No taps into the new piping system shall be made before a written "approval to place into operation" is received from DHEC.

END OF SECTION