



Kerrville Fire Marshal

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Section 8

Fire Sprinkler Underground

Inspection Requirements

This guide does not replace, nor supersede any codes and/or ordinances adopted by the City of Kerrville, or determinations and positions of the Fire Chief or Fire Marshal.

Minimum Required Inspections

1. Hydrostatic Test
2. Flush
3. Visual
4. Fire Sprinkler Underground Final

Fire Sprinkler Underground Hydrostatic Test

5. All new fire service mains shall be tested hydrostatically at not less than 200 psi pressure for a minimum or two hours, or at 50 psi pressure in excess of the maximum static pressure when the maximum required static pressure exceeds 150 psi.
6. A plus or minus more than 5 psi pressure loss or leaks will result in a failed inspection.
7. All piping must be exposed, with all joints and thrust blocks exposed, and labeling of the pipe must be visible and turned upward.
8. Hydrostatic test shall be made by the installing contractor in the presence of a representative of the Kerrville Fire Marshal's Office.
9. Hydrostatic test of the fire sprinkler underground lines shall be required at the same time the visual inspection is performed. **NO EXCEPTIONS.** The piping will be allowed to be center loaded to prevent pipe movement.
10. Hydrostatic test shall be conducted prior to the cover of the underground pipe. If a hydrostatic test is completed after the piping system is covered and fails, the piping will be required to be uncovered, regardless of cover.

Fire Sprinkler Underground Disinfection and Bacteriological Testing

11. All underground fire mains connected to any City water utility line must be disinfected and pass bacteriological testing in conformance with *City of Kerrville Standard Specifications Section 821.03 Disinfection of Potable Water Lines*.

City of Kerrville Standard Specifications

Section 821.03 Disinfection of Potable Water Lines: *The Contractor shall protect all piping materials from contamination during storage, handling and installation. Prior to disinfection, the pipeline interior shall be clean, dry and unobstructed. All openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the close of the day's work.*

Water for the Work shall be metered and furnished by the Contractor. However, fees for water usage will be waived on Capital Improvement Projects.

The Contractor, at his expense, will supply the test gauges and the Sodium hypochlorite conforming to ANSI/AWWA B300, which contains approximately 5 percent to fifteen percent available chlorine. Calcium

Hypochlorite conforming to AWSI/AWWA B300, which contains approximately 65 percent available chlorine by weight, may be used in granular form or in 5g tablets for 16" diameter or smaller lines.

During construction, granules or tablets shall be placed in the pipe for disinfection. Water mains and appurtenances must be completely installed, flushed, disinfected, and satisfactory bacteriological sample results received prior to permanent connections being made to the active distribution system.

A. Procedure and Dosage: *Connection to the existing system will be allowed with a valve arranged to prevent the strong disinfecting dosage from flowing back into the existing water supply piping. The valve shall be kept closed. No other connection shall be made until the disinfection of the new line is complete and the water samples have met the established criteria. The valve shall remain closed at all times. The new pipeline shall not be filled by opening the valve to the existing system. The new pipeline shall be filled completely by using an existing service or by installing a new service. Regardless of the method used, a backflow prevention device shall be installed. Every part of the line shall contain a minimum concentration of 500 ppm available chlorine.*

The disinfecting solution shall be retained in the piping for at least 24 hours and all valves, hydrants, services, stubs, etc. shall be operated so as to disinfect all their parts. After this retention period, the water shall contain no less than 25 parts per million chlorine throughout the treated section of the pipeline.

The heavily chlorinated water shall then be carefully flushed from the potable water line until the chlorine concentration is no higher than the residual generally prevailing in the existing distribution system or approximately one part per million. Proper planning and appropriate preparations in handling, diluting, if necessary, and disposing of this strong chlorine solution is necessary to insure there is no injury or damage to the public, the water system or the environment. Additionally, an authorized representative of the City must witness the flushing.

Approval for discharge of the diluted chlorine water or heavily chlorinated water into the wastewater system must be obtained from the Water and Wastewater Utility Department. The line flushing operations shall be regulated by the Contractor so as not to overload the wastewater system or cause damage to the odor feed systems at the lift stations.

B. Bacteriological Testing: *After final flushing of the strong disinfecting solution, water samples from the line will be tested for bacteriological quality by the city and must be found free of coliform organisms before the pipeline may be placed in service. One test sample will be drawn from the end of the main and additional samples will be collected at intervals of not more than 1000 feet along the pipeline. All stubs shall be tested before connections are made to existing systems.*

The Contractor, at its expense, shall install sufficient sampling taps at proper locations along the pipeline. Each sampling tap shall consist of a standard corporation cock installed in the line and extended with a copper tubing gooseneck assembly. After samples have been collected, the gooseneck assembly may be removed and retained for future use.

Samples for bacteriological analysis will only be collected from suitable sampling taps in sterile bottles treated with sodium thiosulfate. Samples shall not be drawn from hoses, fire hydrants or unregulated sources. The City, at its expense, will furnish the sterile sample bottles and collect the test samples. Testing fees will be paid by the Contractor at the time of sampling.

If the initial disinfection fails to produce acceptable sample test results, the disinfection procedure shall be repeated. Before the piping may be placed in service, satisfactory test results must be obtained.

An acceptable test sample is one which: (1) the chlorine level is similar to the level of the existing distribution system; (2) There is no free chlorine and (3) the total coliform count is zero. An invalid sample is one, which has excessive free chlorine, silt or non-coliform growth. If invalid sample results are obtained from any pipe, the Contractor may, with the concurrence of the Inspector, flush the line

and then collect a second series of test samples for testing by the City. After this flushing sequence is completed, any pipe with one or more failed samples must be disinfected again in accordance with the approved disinfecting procedure followed by appropriate sampling and testing of the water.

The City of Kerrville Laboratory will notify the assigned City of Kerrville Inspector in writing of all test results. The inspector will subsequently notify the Contractor of all test results. The Laboratory will not release test results directly to the Contractor.

12. All underground piping shall be thoroughly flushed **PRIOR TO** connecting to the system risers or other aboveground piping system(s). If the underground piping is connected to the system riser, both the overhead and underground piping shall be flushed in accordance with the requirements of *NFPA 13* and *NFPA 24*.
13. The flush of the underground piping shall be completed prior to any overhead fire sprinkler inspections.
14. The minimum flow rate shall not be less than the water demand of the rate of the system, or not less than that necessary to provide a velocity of 10 ft/s, whichever is greater. See *Table 1*.
15. Flush shall be made by the installing contractor in the presence of a representative of the Kerrville Fire Marshal's Office.
16. Proper methods and equipment to perform the flush must be used. All piping used to flush must be properly secured or restrained. Hoses may not be used. Field Fire Inspector must approve of flushing method and equipment.
17. Visual inspection of the installation shall be performed **PRIOR TO** cover. If the piping and joints are covered prior to installation, you will be required to uncover the piping for inspection, regardless of cover. **NO EXCEPTIONS.**
18. All underground piping and joints must be uncovered and exposed, with labeling of the pipe legible from grade.
19. All thrust blocks will be visually inspected and must be uncovered and exposed to grade.
20. Depth of bury of the pipe shall be measured and verified.
21. All ductile iron, retaining rods, and other non-plastic components shall be externally coated for corrosion and poly-wrapped.

Table 1
Flow Required to Produce a Velocity of 10 ft/s in Pipes

Nominal Pipe Size (in.)	Flow Rate (gpm)
4	390
6	880
8	1560
10	2440
12	3520