FIRESAFETY

INSPECTION AND MAINTENANCE OF WATER SUPPRESSION SYSTEMS

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1. GENERAL

1.01 This practice outlines the requirements for the inspection, maintenance, and testing of water fire suppression systems.

1.02 This practice is being issued to replace BSP 770-330-300, Issue 2, November 1980 and to update inspection and maintenance intervals of water suppression systems. Whenever this practice is reissued, the reason(s) for reissue will be stated in this paragraph.

1.03 When repairs or alterations affecting any water systems are in progress, provisions should be made to keep the fire suppression systems in service. When alterations are complete, an inspection of the entire system shall be made in order to verify that it has been restored to operating condition. Notification should be made to the fire department during any out-of-service period.

1.04 It is advisable to notify the fire department of the installations of any fire protection systems in order that they may familiarize themselves with the layout of the system. The fire department should know the extent of protection, the location and arrangement of control valves, and the locations of connections for fire department use.

2. VALVES

2.01 Curb Box Valve - The location of the curb box valve should be clearly indicated by a sign on a nearby wall or by a marker. The cap over the valve should also be clearly marked. Quarterly visual inspection should be made to ensure that the valve is open.

2.02 Free access to the pit should be maintained and the pit should be clear of water and protected against freezing. Quarterly, a visual check should be made to ensure that the valve is in the open position and that the pit is not filled with water.

2.03 Post Indicator Valves - Annually the following procedures should be performed.

(a) Lubricate the stem of the valve and the indicating mechanism.

(b) Close and reopen the valve with the proper wrench to ensure operation. When valve is reopened, it shall be brought to its full open position (as sometimes the spring of the rod detaches from the valve itself and the indicator may read "OPEN" when the valve is closed).

(c) When the post indicator valve is in closed position, a check should be made to assure positive shutoff, and when reopened it should be checked for flow.

2.04 Water Supply Control Valves - Quarterly, each water supply control valve should be checked to ensure that it is in the open position and that a seal (wire or plastic) is in place.

Annually the following procedures should be performed for each water supply control valve.

(a) Lubricate the valve stem.

(b) Close and reopen each valve to full open position.

2.05 Exterior valves subject to freezing weather should be closed in the fall and the exposed pipes drained. The drain valves on the exposed piping should be left slightly open. In the spring, these valves should be opened and cleaned.

3. SPRINKLER SYSTEMS

3.01 Sprinkler Heads - Storage is not allowed within 18 inches of any sprinkler head. Where there is any possibility of damage to a sprinkler head, a guard should be installed.

3.02 Annually, sprinkler heads should be inspected to see that they are clean, free from corrosion, not painted, and not damaged. Check that an adequate supply of spare sprinkler heads is on hand.

(1) The following guidelines may be used for stocking of spare sprinkler heads:

SYSTEM SIZE	REQUIRED SPARES
1 to 300 heads	6
301 to 1000 heads	12
1000 heads and above	24

(2) Different types of heads are available as indicated below and judgment should be exercised regarding the compatibility of spare heads with the design of existing system.

TEMPERATURE RATING ^{O}F	TEMPERATURE CLASSIFICATION	COLOR CODE
135 to 170	Ordinary	Uncolored
175 to 225	Intermediate	White
250 to 300	High	Blue
325 to 375	Extra High	Red

(3) A special sprinkler head wrench should always be used when removing or installing sprinkler heads as other types of wrenches may damage the head.

3.03 Every 25 years, a sample test should be made to determine that the sprinkler heads are functional. About 10 percent of the total heads should be removed from the lines and replaced with new heads. The removed heads should be tagged, carefully packed, and sent to the Underwriters' Laboratories (UL), Northbrook, Illinois, for testing. If test results from UL indicate the sampled heads are still functional within their original limits, the remainder of the original heads may be left installed. If the test results indicate that the sprinkler heads have deteriorated, it will be necessary to replace all the sprinkler heads that are of approximately the same age. This test should be repeated every 5 years after the initial 25-year test until such time as the sprinkler heads require replacing.

3.04 supply Branch Piping - Annually, the following inspection procedures should be performed for sprinkler branch piping:

(a) Visually inspect the piping for leakage, corrosion, and mechanical damage.

(b) Check that hangers are tight and in good condition.

(c) Flow tests should be made from test pipes located at the top of the system and at the main drain valves of the systems. Proper flow from the test pipe at the top of the system should indicate sufficient water supply at that point and also test the alarm system. The test at the 2-inch main drain

valves should include recording of the pressure gauge readings with the valve closed and with unrestricted flow of water with the drain valve wide open. Allow full drain flow for at least 2 minutes until gauge stabilizes. Close the drain valve and note

the pressure again. Pressure should build up promptly to normal static reading. If the readings vary materially from previously established or normal readings, the condition should be investigated with the building engineers to determine if a design problem exists and the appropriate course of action.

(1) These tests are designed to show whether or nor the normal supply is available on the systems and to indicate the possible presence of closed valves or other obstructions in the supply piping.

(2) In some multistory buildings, flow tests may indicate that city water pressure is not great enough to overcome the static pressure.

3.05 Dry Pipe System - The inspection and maintenance of sprinkler control valves are included in Part 2. For dry pipe systems, the following should be completed:

(a) Perform the following on all dry pipe valves:

Quarterly check the system air pressure. If pressure cannot be maintained, the system should be checked for leakage and necessary repairs made.

Every three years trip test, clean, and reset dry pipe valve (during warm weather).

(b) Perform the following on all quick opening devices:

Annually check operation of quick opening devices which accelerate the tripping of dry pipe valves. The manufacturer's instructions for testing and resetting the device should be carefully followed.

3.06 Outside Open Sprinklers - Annually the outside open sprinkler systems should be tested (during warm weather). Before making the test, care should be exercised to make sure that all windows and doors through which water might enter are tightly closed. All telephone equipment near windows and doors should be covered or otherwise properly protected, and proper precautions taken to prevent damage from discharge or accumulation of water on sidewalks, streets, areaways, or adjoining buildings. The tests should indicate whether or not the sprinklers and piping are in good condition and free from clogging. Any piping or sprinkler heads found clogged should be removed, cleaned, and replaced. The fire department and the building occupants should be notified prior to making the tests. It may be well to give consideration to discussing the test with adjacent property owners and their tenants. Care should be exercised in testing outside open-head systems to minimize water staining of building walls.

3.07 Water Flow Alarm - Water flow alarm devices on wet pipe systems shall be tested quarterly by opening the inspectors test pipe. Outside water flow alarms and water motor gongs should not be tested in cold weather, if subjected to freezing temperatures. Electric alarm devices should be tested at regular intervals by means of a test

switch. All electrical wiring, gongs, transformers, and batteries associated with the alarm system shall be maintained in operating condition.

4. FIRE PUMPS

4.01 Quarterly, run the pump for a long enough time to indicate proper operation (minimum of 1 minute) . During this period, check for leakage and general condition of the pump bearings, packing, suction pipe strainers, and control equipment. Make note of any change in discharge pressures.

4.02 Quarterly inspect packing or seal and shaft for condition and leakage. Check pump for proper operation.

4.03 Annually conduct a test with the pump running at full capacity. Where the suction supply is from public service mains, care should be exercised to assure that the test does not draw the residual suction pressure at the pump below 20 psi.

(a) The end valve of each standpipe system, generally located at the roof level, should be opened to establish that there is a free flow of water. Adequate provision must be made for carrying off water to avoid damage.

(b) The pump should be operated 15 minutes before flow capacity is checked. The pump should be in operation not less than 1 hour (total time) during the capacity test.

(1) Manual or automatic controllers should be put through at least one manual operation and one automatic operation on automatic controllers.

(2) The electric motor should be checked for proper voltage and full load amperes to ensure it is not in excess of nameplate amperes. Moving parts should be checked for overheating.

5. TANKS

5.01 Quarterly an inspection should be made to check the water level, air pressure, and during freezing weather (if applicable) check the heating of the tank enclosure.

5.02 Annually check the heating equipment to ensure that the proper temperature in the tank may be maintained during freezing weather.

Note 1: The prevention of freezing in the riser or the formation of ice in the tank itself is extremely important. Freezing in the riser could cut off the supply of water to the system, while the formation of a layer of ice on the water may impede or prevent the flow from the tank.

Note 2: When repair work is done to the tank, special care should be exercised to prevent any debris from falling into the tank. When the tank is drained for internal painting, the outlet to the discharge

pipe should be covered to prevent material from falling into the riser. If possible, some temporary means of supplying water to the sprinkler system should be provided during the time the tank is out of service for painting. When the tank has been refilled after emptying, the main tank valve should be opened wide and the discharge pipe should be thoroughly flushed through a drain or hydrant to make sure that no debris or other foreign material remains in the riser.

5.03 Every 2 years inspect the inside of the tank (if hand hole is available) for rust, corrosion, or oil accumulations. Check general conditions. Replace gauge glass and washers as needed.

6. STANDPIPES

6.01 Fire Department Connection - Quarterly check to make sure that caps are in place, threads are in good condition, and the check valve is not leaking.

6.02 Piping System - Annually check for leakage, corrosion, and damage.

6.03 Every 5 years hydrostatically test the dry portion of piping in a wet standpipe system between the check valve and the fire department connection (Siamese connection).

6.04 For dry systems, conduct a hydrostatic test of the piping system every 5 years.

7. STANDPIPE STATIONS

7.01 Hose Valves - Annually check valves at hose connections to ensure that they are closed tightly.

7.02 Automatic Drip Valves - Annually check drip connection at hose valves to determine that they are open and that no water is leaking past the valve into the hose.

7.03 Fire Hoses - Annually perform the following for all fire hoses:

(a) Remove, inspect, and/or rerack each lined/unlined fire hose as follows:

(1) For lined and unlined hose, check for approval label which should be affixed to the hose, the date of the manufacturer of the hose, and manufacturer's identification.

(2) For unlined hose, check for indications of moisture, giving special attention to the loop close to the point where the hose is connected to the valve. If there is discoloration of the hose at the valve, twist the hose by hand at the point of connection. Tearing would indicate need for removal of the defective section and resetting of the coupling.

(3) Wipe the hose rack, pipe fittings, and hose cabinets with a damp or treated dustcloth. Vacuum the exterior of the unlined hose.

(b) Inspect the threads of the couplings for damage or defects. They should be adjusted so that they can be easily tightened by hand. Oil or grease should not be used for lubrication as they are likely to cause deterioration of the hose and rubber washers. Threaded fittings shall be cleaned of corrosion or foreign matter.

(c) Examine rubber washers, both at the hose valves and at the nozzles, to see if they are pliable.

(d) Check the nozzle for full opening and closure.

(e) Enter the date of the inspection and inspector s name or initials on the E-5962 tag attached to the rack or cabinet.

7.04 Every 5 years hydrostatically test lined fire hoses by means of a power or hand pump.

Note: Remove all air from the hose before starting test. Air under pressure becomes greatly compressed which, if suddenly released by a hose bursting, can cause violent whipping of the hose.

7.05 Every 12 years unlined linen hose on exposed racks and every 15 years unlined linen hose on enclosed racks should be replaced. Replacement could be required at shorter intervals depending on hose location, its exposure to sunlight, or other conditions which would cause more rapid deterioration. Replacement should be made with the same length of lined hose sized to fit on the existing hose rack.