

Quick Guide for Fire Sprinkler Inspection Requirements

Key Deficiencies with NFPA References

NFPA 25 2017 & NFPA 13/72 2016



The purpose of this guide is to help you determine if the system will work as intended. This is a quick reference field guide, with select abbreviated sections of NFPA 25, 13, 72 and the plumbing code.

Inspectors should familiarize themselves with NFPA *25 ITM Water-Based Fire Protection Systems*. Historical fire data confirms that properly designed, installed, and maintained fire sprinkler systems have a significant record of saving lives and reducing property loss from fire.

Regular Fire Sprinkler Testing is Required by the International Fire Code, State Code & Chicago Code

Chapter 9, Fire Protection Systems of the 2015 International Fire Code requires water based fire protection systems to be inspected, tested and maintained at regular intervals in accordance with NFPA 25: Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems. Regular testing is also required statewide* through the Illinois Office of the State Fire Marshal's adoption of NFPA 101: Life Safety Code, Section 9.75 (2000 edition). All automatic fire sprinkler systems, standpipe systems and fire pumps must be inspected and maintained in accordance with NFPA 25.

**No Home-Rule exemption.*

INSPECTION

Item	Frequency	Refere
Gauges (dry, and pre-action systems)	Quarterly	13.2.7.1
Gauges (wet pipe and deluge systems)	Quarterly	13.2.7.1
Control valves (sealed or locked) electronic super.	Weekly/Monthly	Table

INSPECTION – Continued

Waterflow alarm devices	Quarterly	5.2.4,
Valve supervisory signal devices	Quarterly	5.2.4
Supervisory signal devices (except valve supervisory switches)	Quarterly	5.2.4
Hydraulic nameplate	Annually	5.2.5
Buildings (Fire Protection 40°F ↑)	Annually (prior to freezing)	4.1.2
Hanger/seismic bracing	Annually	5.2.3
Pipe and fittings	Annually	5.2.2
Sprinklers	Annually	5.2.1
Spare sprinklers	Annually	5.2.1.4
Information sign	Annually	5.2.8
Fire department connections	Quarterly	Table
Valves (all types)	Per Table	Table
Obstruction, internal inspection of piping	Every 5 years	14.2
Heat trace	Per manufacturer	5.2.7

TEST

Item	Frequency	Reference
Waterflow alarm devices (Mechanica/Water Motor Gongs)	Quarterly	5.3.2
Vane and pressure switch-type devices	Semi-Annually	5.3.3.2
Valve supervisory signal devices	Semi Annually	Table

Table 5.1.1.2 Summary of Sprinkler System Inspection, Testing and Maintenance

Supervisory signal devices (except valve supervisory switches)		Quarterly	Table
Main drain		Annually/Quarterly	Table
Antifreeze solution		Annually	5.3.4
Gauges Calibrate and or Replace		5 years	13.2.7.2
Sprinklers (extra-high or greater temperature solder type)		Sample Test 5 years	5.3.1.1.1.4
Sprinklers (fast-response)	Sample	At 20 years and every 10 years thereafter	5.3.1.1.1.3
Sprinklers	Sample	At 50 years and every 10 years thereafter	5.3.1.1.1
Sprinklers	Sample	At 75 years and every 5 years thereafter	5.3.1.1.1.5
Sprinklers (dry)	Sample	At 10 years and every 10 years thereafter	5.3.1.1.1.6
Sprinklers (in harsh environments)	Sample	5 years	5.3.1.1.2
Valves (all types)		Annually	Table
Valve status test		After the control valve is re-opened	13.3.3.4
Heat trace		Per manufacturer's requirements	5.2.6

MAINTENANCE

Valves (all types)	Annually	Table 13.1.1.2
Low-point drains (dry pipe systems)	Seasonal	10.3.6.1
Sprinklers and automatic spray nozzles protecting commercial cooking equipment and ventilation systems	Annually Replace	5.4.1.9 5.4.1.7

Fire Sprinklers

Damaged– i.e., Bent frame/broken deflector.
-NFPA 25 5.2.1.1.1*

Leaking– NFPA 25 5.2.1.1.1

Painted– Paint other than that applied by the manufacturer. -NFPA 25 5.2.1.1.1

Corroded– i.e., Sprinkler has corrosion detrimental to sprinkler performance.
-NFPA 25 5.2.1.1.1

Loaded– Sprinkler head shall be replaced.
-NFPA 25 5.2.1.1.1

Manufacture Date – Located on head.

- 50 years/older** NFPA 5.3.1.1.1
(10 year repeated for older than 50 NFPA 5.3.1.1.1.1)
- 20 years fast response** NFPA 5.3.1.1.1.3
- 5 years extra high 325°F+** NFPA 5.3.1.1.1.4*
- 75 years/older repeated 5 years** NFPA 5.3.1.1.1.5
- 10 years dry sprinklers** NFPA 5.3.1.1.1.6*
(retest/resample at 10 year intervals)
- 5 years harsh/corrosive** NFPA 5.3.1.1.2*
(retest/resample at 5 year intervals)

Proper Clearance – 5.2.1.2.1* Unless greater distances are required by 5.2.1.2.2, 5.2.1.2.3, or 5.2.1.2.4, or lesser distances are permitted by 5.2.1.2.6, clearance between the deflector and the top of storage shall be 18 in. or greater NFPA 13 8.6.6.1
5.2.1.2.2 Where standards other than NFPA 13

Fire Sprinklers Cont'd.

specify greater clearance to storage minimums, they shall be followed.

5.2.1.2.3* Clearance between the deflector and the top of storage shall be 36 in. or greater for special sprinklers

Bulb Has Fluid – Could be empty or half full.
-NFPA 25 5.2.1.2.1

Missing Escutcheon Rings & Plates
-NFPA 13 6.2.7.2 (Rings) 6.2.7.3 (Plates)
-NFPA 25-5.2.1.1.5

Position of Sprinkler – i.e., Head above ceiling tile or hanging through ceiling tile below ceiling line. Any sprinkler that has been installed in the incorrect orientation shall be repositioned
-NFPA 25 5.2.1.1.4

Painted Cover Plate – Fail if not painted from the manufacturer.
-NFPA 13 5.4.1.6
-NFPA 25 5.2.1.1.1

Check for recalled Sprinklers see website.

Missing Components

Spare Sprinkler Box
-NFPA 25 5.2.1.4

Spare Sprinklers in Box – Proper quantity of spare heads:

System has under 300 sprinklers = no less than 6
System has 300-1,000 sprinklers = no less than 12
System has over 1,000 sprinklers = no less than 24
-NFPA 25 5.4.1.5

Spare Sprinkler Wrench

– NFPA 25 5.4.1.5.5

Signage – i.e., all valves Main drain,
Open/Close valve, Inspector test valve.

–NFPA 25 13.8.1

Fire Dept. Connection Caps – FDC should
also be visible and accessible.

–NFPA 25 13.8.1

Hangers – Loose, damaged, missing.

-NFPA 25 5.2.3.2

Waterflow Switches

Missing Cover or Damaged

Waterflow alarm and supervisory signal initiating
devices shall be inspected quarterly to verify that
they are free of physical damage.

-NFPA 25 5.2.4

Unable to Adjust – i.e., device is
mechanically damaged and will not initiate
alarm within 90 sec. ***Water flow may be
required to report less than 90 per local
jurisdiction.**

-NFPA 72 17.12.2 2016

Does Not Report Alarm To Panel – i.e., wiring issue,
mechanical issue with device (bad or missing paddle).

-NFPA 72 17.12.2 2016

Tamper Switches

Missing Cover or Damaged

Waterflow alarm and supervisory signal initiating devices shall be inspected quarterly to verify that they are free of physical damage.

-NFPA 25 5.2.4

Does Not Report Supervisory/trouble at Panel – i.e., Wiring issue or mechanically defective. OS&Y Should report within 2 revolutions.

-NFPA 25 13.3.3.5

Does Not Clear When Valve is Opened – i.e., valve cannot be adjusted /mechanically damaged.

-NFPA 25 13.3.3.5.3

Control Valves

The valve inspection shall verify that the valves are in the following condition:

- (1) In the normal open or closed position
- (2)* Sealed, locked, or supervised
- (3) Accessible
- (4) Post indicator valves (PIVs) are provided with correct wrenches
- (5) Free from external leaks
- (6) Provided with applicable identification

-NFPA 25 13.3.2.2*

Each control valve shall be operated annually through its full range and returned to its normal position.

-NFPA 25 13.3.3.1

Main Drain

Damaged or missing valve – i.e., Broken handle.
-NFPA 25 13.2.3

Proper drainage for main drain –
Recommend drain be piped properly.
-NFPA 25 13.2.4

2” Main Drain Test

Record the static water supply pressure in psi as indicated gauge.

Close the alarm control valve or alarm valve.

Slowly open the main drain fully and allow water flow to stabilize.

Record the residual water supply pressure while water is flowing from the 2” main drain as indicated on gauge in psi.
Close the main drain (slowly).
Record the restored static pressure.

Compare current flow pressure to previous performed main drain results, if pressure has reduced 10% or more main drain is found deficient.
-NFPA 25 13.2.5.3

Wet Pipe System Flow Alarm

Test water flow alarms by opening the inspector's test valve. (Notify alarm company to avoid false alarms). --NFPA 13.2.6.3 Per 4.6.6

Fire Department Connections

Verify connection is visible and accessible, not damaged, caps or plugs are in place, identification sign is in place, and automatic ball drip drain is working properly.

-NFPA 25 13.8.1

Gauges

Date – Gauges shall be replaced every five years or listed every five years by comparison with a calibrated gauge.

-NFPA 25 13.2.7.2

Damaged Gauge – i.e., broken glass/missing glass

-NFPA 25 13.2.7.1

Gauge stuck on zero or some other value

-NFPA 25 13.2.7.1

Missing Gauge

-NFPA 25 13.2.7.1.1

External Piping

Corrosion on external piping – i.e.,

Corrosion buildup on piping.

-NFPA 25 5.2.2.1

External piping leaks – i.e., pinhole leaks

formed as a result of corrosion.

-NFPA 25 5.2.2.1

Damaged piping – i.e., bent or cracked pipe.

-NFPA 25 5.2.2.1

Internal Piping

Assessment of internal metal piping

condition – Minimum every 5 years

-NFPA 25 14.2.1.1

Antifreeze Systems

Antifreeze Systems Annually, before the onset of freezing weather, the antifreeze solution shall be tested

-NFPA 25 5.3.3*

All Antifreeze systems should use listed antifreeze solutions.

-NFPA 25 5.3.3.4

For systems that were installed prior to September 30, 2012, listed antifreeze solutions shall not be required until September 30, 2022, where all of the following conditions are met:

-NFPA 25 5.3.3.4.1(1) and NFPA 25 5.3.3.4.1(2)

Concentration limited to 50% glycerin or 40% propylene glycol. New shall be factory premix solutions. Etc...

Standpipe

Table 6.1.1.2 Summary of Standpipe and Hose Systems

ITM Frequency NFPA 25

Inspection

Cabinet Annually 6.2.1

Control valves Chapter 13

Gauges Weekly/quarterly Chapter 13

Hose Test Annually NFPA 1962

Hose connection Annually 6.2.1

Hose nozzle Annually and after each use NFPA 1962

Hose storage device Annually 6.2.1

Hydraulic design information sign Annually 6.2.3

Hose valves Chapter 13

Hose connection 6.2.1

Piping Annually 6.2.1

Pressure-regulating devices Chapter 13 Test

Test

Flow test 5 years 6.3.1

Hose 5 years/3 years NFPA 1962 4.2.2

Hose connections Annually 6.2.1

Hose valves Chapter 13

Hydrostatic test 5 years 6.3.2

Main drain test Chapter 13

Pressure control valve Chapter 13

Pressure-reducing valve Chapter 13

Supervisory signal devices (except valve supervisory switches) Chapter 13

Valve status test Chapter 13

Valve supervisory devices Chapter 13

Waterflow alarm devices Chapter 13

Maintenance

Hose connections Annually Table 6.1.2

Hose valves Chapter 13

Valves (all types) Annually/as needed Chapter 13

Fire Pump

Table 8.1.1.2 Summary of Fire Pump ITM

Inspection Frequency - Annually

Alignment 8.3.6.4 Cable/wire insulation 8.1.1.2.5

Engine crankcase breather 8.1.1.2.12

Exhaust system and drain condensate trap 8.1.1.2.13

Flexible hoses, fuel tank vents & connections 8.1.1.2.10 & .11

Plumbing parts – in & outside of panels 8.1.1.2.6

Printed circuit board corrosion (PCBs) 8.1.1.2.4

Shaft movement or endplay while running 8.1.1.2.1

Suction screens 8.3.3.7

Weekly Diesel & Electric pump system 8.2.2(3)&(4)

Pump & pump house/room 8.2.2(1)&(2)

Steam pump system 8.2.2(5)

Test Frequency - Annually

Diesel fuel testing 8.3.4 Fire pump alarm signals 8.3.3.5

Main relief valve 8.3.3.3 Power transfer switch 8.3.3.4

Pump performance (flow) 8.3.3

Supervisory signal for high cooling water temp 8.1.1.2.8

Weekly

Pump operation (no flow) Weekly/monthly 8.3.1

Diesel fire pump 8.3.1.1 (30 minutes)

Electric fire pump Weekly/monthly 8.3.1.2 (10 minutes)

Quarterly

Fuel tank, float switch, and supervisory signal for interstitial space 8.1.1.2.7

Maintenance Frequency - Annually

Batteries 8.1.1.2.15 Circulating water filter 8.1.1.2.20

Control and power wiring connections 8.1.1.2.16

Electrical connections 8.1.1.2.2

Controller Per manufacturer 8.5

Diesel engine system Per manufacturer 8.5

Electric motor and power system Per manufacturer 8.5

Engine oil & Filter or 50 operating hours 8.1.1.2.17 & .18

Fuel tank – check for water and foreign materials 8.1.1.2.9

Measure back pressure on engine turbo 8.1.1.2.14

Pressure gauges and sensors 8.1.1.2.21

Pump / motor bearings and coupling or as Required 8.5

Sacrificial anode 8.1.1.2.19

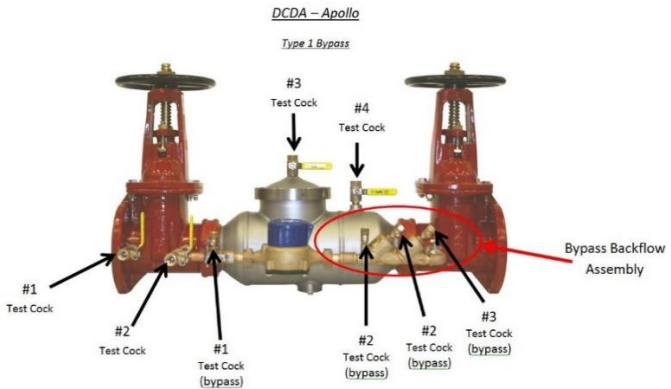
Illinois Plumbing Code - Backflow

Title 77: Public Health

Chapter I: Department of Public Health

Subchapter r: Water and Sewage Part 890 Illinois Plumbing Code section 890.1130 Protection of Potable Water Approval of Devices and Maintenance. All reduced pressure principle (RPZ), reduced pressure detector (RPDA), double check (DCA) and double check detector (DCDA) backflow prevention assemblies shall be tested and approved by a Cross-Connection Control Device Inspector (CCCDI) and at least annually after initial inspection.

Section 890.1130 Protection of Potable Water

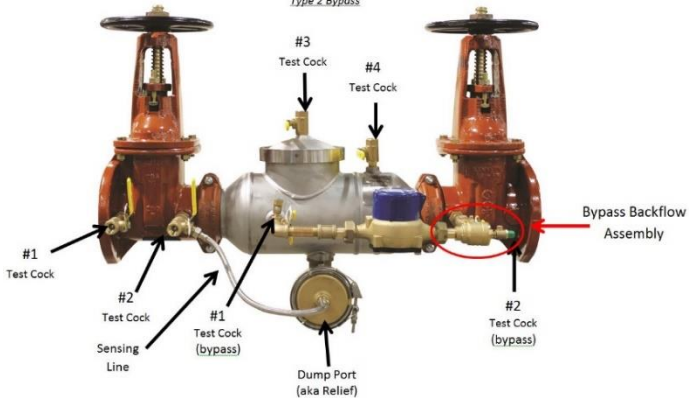


Double Detector Check

This assembly consists of two internally loaded check valves, either spring or internally loaded, weighted, installed as a unit between two tightly closing resilient-seated shutoff valves as an assembly, and fittings with properly located resilient seated test ports or cocks.

RPDA – Apollo

Type 2 Bypass



Reduce Pressure Zone

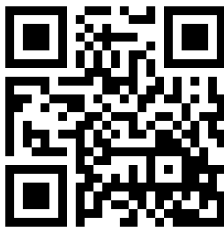
Two independently acting check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and below the first check valve. These units are located between two tightly closed resilient seated shutoff valves, as an assembly, and are equipped with properly located resilient seated test cocks.

(Images courtesy of Chicago Backflow Inc.)

Illinois state law, 225ILCS 317/15 (h), requires a copy of all fire sprinkler system inspection reports to be submitted to local fire officials having jurisdiction. Also, all inspectors are required to be NICET II certified or trained through an approved apprentice program.

Are you checking these items before work begins? Stop any job violating this state law and/or call the state fire marshal.

For more Information, please visit:
www.firesprinklertesting.org



Standards referenced courtesy of NFPA www.nfpa.org

