

Fire Protection Systems Inspection, Testing and Maintenance Overview

Property Consulting

Marsh Advisory



Not following these guidelines could increase the likelihood of a fire event occurring and could increase the amount of property damage in the event of a fire.

Introduction

Fire protection systems are critical components in safeguarding property from the effects of a fire event. Regular inspection, testing, and maintenance of these systems is essential to ensure their reliability and effectiveness. This guideline provides an overview of the best practices and standards for fire protection systems, emphasizing the importance of a proactive approach to property conservation and loss mitigation.

What is fire protection?

- ▶ Fire protection systems are used to extinguish, control, or in some cases, entirely prevent fires from occurring or spreading. Fire Suppression Systems have a wide range of applications, and as such, there are many different types of suppression systems for different occupancies and hazards.

Where are the common uses/areas of application?

- ▶ This applies to all occupancies with some examples such as warehousing, residential, electrical rooms, commercial cooking, mechanical areas, exterior covered areas, manufacturing.

Why regular fire protection inspection, testing, and maintenance is important

- ▶ Fire safety inspections can identify potentially hazardous situations and help to ensure they are addressed on a continuous basis. Fire equipment and system inspection and testing can help ensure the protection equipment is properly placed, is serviceable, and will operate if needed. NFPA 25 contains information on water-based fire system inspection and testing. Those personnel assigned plan responsibilities should be trained in its implementation. NFPA has reported that **57%** of major fires have led back to the lack of inspection, testing, and maintenance of fire protection equipment.

Who are the right contractors/internal employees?

- ▶ It is essential that facilities personnel who are familiar with the fire protection equipment and location be present to escort the licensed inspector. The licensed inspector will provide documentation supporting certification, per NFPA 25 and other local jurisdictional requirements. Following the inspection, the contractor(s) are to submit a report evaluating each component(s) inspected. The report is to indicate any issues identified during the inspection process. It is the responsibility of the facilities department to review this report in detail and correct any deficiencies in a timely manner (when/ if applicable).



Supporting pictures (examples):



Electric Fire Pump



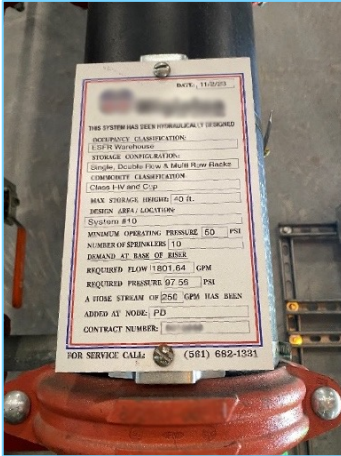
Diesel Fire Pump



**Quell System
Sprinkler Risers**



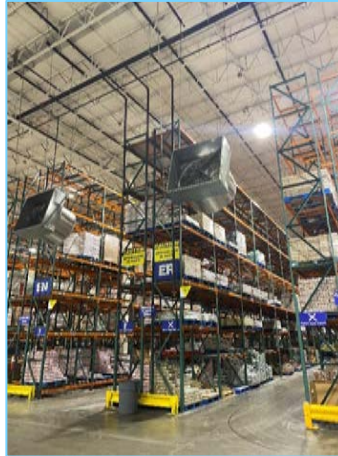
**Wet-Pipe Sprinkler
Risers (ESFR)**



Hydraulic Placard



**Dry-Pipe
Sprinkler Riser**



**In-Rack Automatic
Sprinklers (Three Levels)**



**Linear Heat Detection
Cable (155 F)**



**Locked in the
Open Position Back
Flow Preventers**



**Locked in the
Open Position Post
Indicator Valve**



**Fire Protection Water
Storage Tank (Full)**

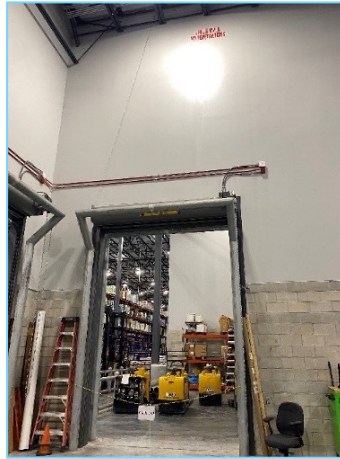


Private Fire Hydrant

Supporting pictures (examples):



Locked Ball Valve - Diesel Fuel Tank (Diesel Fire Pump)



Fire Door Link Placement



Monthly Fire Extinguisher Checks and Annual Inspection Tag



Fire Alarm Panel

References:

- ▶ NFPA 10, Standard for Portable Fire Extinguishers
- ▶ NFPA 13, Standard for the Installation of Sprinkler Systems
- ▶ NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection
- ▶ NFPA 22, Standard for Water Tanks for Private Fire Protection
- ▶ NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
- ▶ NFPA 72, National Fire Alarm and Signaling Code
- ▶ NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants
- ▶ FM DS, 2-81 Fire Protection System Inspection, Testing and Maintenance

Examples of information listed within applicable NFPA Standards:

		Equipment Type	Equipment	Ref.	Details for Tests or Inspections	
Weekly		Fire Alarm System	Visual Inspection: Control Equipment: Fire alarm systems connected unmonitored for alarm, supervisory, and trouble signals.	NFPA 72 / 14.3.1	Visual inspection of control Panel for Normal Status	
		Fire Pumps	Electrical Systems Normal	NFPA 25 / 8.2.2	Visual Inspection	
			Steam Pump System	NFPA 25 / 8.2.2	Visual Inspection	
			Diesel Driven Pump 30 min Run Test	NFPA 25 / 8.3.2.4	Start diesel fire pump and Run at churn for 30 min. Alternate which set of batteries are used to start the fire pump each week. Verify all alarms were received.	
		Water-Based Systems	Sprinklers	Visual Inspection: All Control Valves that are not locked or supervised	NFPA 25 / 13.1.1.2	Visually inspect all control valves to ensure they are in the open position.
			Fire Protection Valves, Valve Components, Trim Inspections	Any Fire Protection Control valve that is not locked open or supervised	NFPA 25 / 13.1.1.2	Visually inspect all valves to ensure they are in the open position.
				Master Pressure Reducing if not locked or supervised	NFPA 25 / 13.5.4.1	Visually inspect all valves to ensure they are in the open position.
			Backflow Prevention Assemblies	Control Valves (Locked/Supervised)	NFPA 25 / 13.1.1.2	Visually inspect all control valves to ensure they are in the open position
			Water Storage Tanks	Low Temperature alarms	NFPA 72 / 9.2.3.3	Inspect and record the temperature of water in tanks without supervised low temperature alarms during heating season.

		Equipment Type	Equipment	Ref.	Details for Tests or Inspections
			Fire Pumps	Electric Pump 10 Minute Run Test (Churn Test)	NFPA 25 / 8.3.2.3
	Portable Fire Extinguishers	Visual inspection of all Fire Extinguishers	NFPA 10 / 7.2.1.2	Overall Visual inspection of all fire extinguishers.	
Monthly	Portable Fire Extinguishers Water-Based Systems	Location in Designated Place	NFPA 10 / 7.2.2	Ensure the fire extinguisher is in its proper location.	
		No Obstruction to Access or Visibility	NFPA 10 / 7.1.4.1	Visually inspect to make sure there is nothing blocking the fire extinguisher.	
		Safety Seals and Tamper Indicators Not Broken or Missing	NFPA 10 / 7.2.2.4	Visually inspect to make sure the seals and tampers are not broken or missing.	
		Pressure Gauge Reading or Indicator in the Operable Range or Position	NFPA 10 / 7.2.2	Visually inspect to ensure the Pressure gauge is in the green or positive position.	
		Examination for Obvious Physical Damage, Corrosion, Leakage or Clogged Nozzle	NFPA 10 / 7.2.2.3	Visually inspect for physical damage.	
		Condition of Tires, Wheels, Carriage, Hose and Nozzle Checked (For Wheeled Units)	NFPA 10 / 7.2.2	Visually inspect for physical damage as listed.	
		Sprinklers	Gauges and locked or supervised valves (Wet, Dry, Preaction, and Deluge Systems)	NFPA 25	
Water-Based Systems	Valves, Valve Components, Trim Inspections	All Locked or Supervised Control Valves	NFPA 25 / 13.3.2.1.1	Visually inspect all valves to ensure they are in the open position.	
	Valves, Valve Components, Trim Inspections	Tamper Switches	NFPA 25 / 13.1.1.2	Visually inspect all valves to ensure they are in the open position.	
		Dry, Deluge, and Preaction Valves that are locked or supervised	NFPA 25 / 13.4.5.1.2	Visually inspect all valves to ensure they are in the open position.	
	Backflow Prevention Assemblies	Control Valves (Locked/Supervised)	NFPA 25 / 13.3.2.1.1	Visually inspect all valves to ensure they are in the open position.	
	Standpipe	Control Valves (Locked/Supervised)	NFPA 25 / 13.3.2.1.1	Visually inspect all control valves to ensure they are in the open position.	
	Sprinklers	Gauges	NFPA 25 / 13.2.4.1.1	Visually inspect gauges to ensure still reading pressure, and in place.	
	Water Storage Tanks	Water level in tanks	NFPA 72 / 9.2.1.2	Visually inspect all control valves to ensure they are in the open position.	

		Equipment Type	Equipment	Ref.	Details for Tests or Inspections
Quarterly	Water-Based Systems	Sprinklers / Alarms	Function Test: Mechanical Water Flow Devices	NFPA 25 / 13.2.3.1.1	Turn / Operate the sprinkler valve from its normal open position. Verify that the tamper switch and water flow alarm was received.
			Alarm Devices	NFPA 25 / 13.2.3.1.1	Physically activate and function test all fire alarms and verify alarms were received.
			Fire Department Connections	NFPA 25 / 13.8.1	Visually inspect that they are clear of obstructions and damage. Check that automatic drain valve is in place and operating properly.
			Pressure Reducing and Relief Valves	NFPA 25 / 13.5.6.2.3	Visually inspect that they are still in place and not damaged.
		Valves, Valve Components	Function Test Low Air Pressure Alarms, Quick Opening Devices, Priming Water	NFPA 25 / 13.4.5.2.3	Operate each device and verify that the alarm was received.
			Alarm Valves (Exterior Bells)	NFPA 25 / 13.4.1.1	Visually inspect to ensure tamper switches are still operational and reporting back their monitoring status.
		Fire Pump System	Engine crankcase breather	NFPA 25 / 8.1.1.2.12	Visual Inspection
		Water Storage Tanks	Exterior of the tank, supporting structure, vents, foundation, and catwalks or ladders	NFPA 25 / 9.2.4.1	Inspect for signs of obvious damage or weakening.
			Water level in tanks	NFPA 25 / 9.2.1.3.1	Inspect water level in tanks equipped with supervised water level alarms.
			Low Temperature alarms	NFPA 25 / 9.2.2.1	Inspect and record the temperature of water in tanks with supervised low temperature alarms during heating season.

		Equipment Type	Equipment	Ref.	Details for Tests or Inspections
Semiannually	Water-Based Systems	Valve, Valve Components	Valve Supervisory Switches	NFPA 25 / 13.3.3.5.1	Visually inspect and test. A distinctive signal shall indicate movement from the valve's normal position during either the first two revolutions of a handwheel or when the stem of the valve has moved one-fifth of the distance of its normal position.
	Automatic Fire Alarm Systems	Fire Alarm Systems	Transient Suppressors	NFPA 72 / 14.3.1	Visually inspect for damage
			Control Unit Trouble Signals	NFPA 72 / 14.3.1	Verify trouble signals are operational
			Emergency Voice/Alarm Com. Equip.	NFPA 72 / 13.3.1	Physically test out voice system
			Remote Annunciators	NFPA 72 / 14.3.1	Activate the alarm and verify all annunciators are activating
		Batteries	Sealed Lead-Acid	NFPA 72 / 14.4.3.2	Visually inspect for deterioration, leaking, and damage.
		Initiating Devices	Air Sampling Smoke Detectors	NFPA 72 / 14.3.1	Physically function test and activate each device. Verify the alarms are reporting back.
			Electromechanical Releasing Devices	NFPA 72 / 14.3.1	Physically function test and activate each device. Verify the alarms are reporting back.
			Duct Detectors	NFPA 72 / 14.3.1	Verify that detector is rigidly mounted. Confirm that no penetrations in a return air duct exist in the vicinity of the detector.
			Fire Extinguishing System(s) or Suppression System(s) Switches	NFPA 72 / 14.3.1	Physically function test and activate each device. Verify the alarms are reporting back.
			Fire Alarm Boxes (Pull Stations)	NFPA 72 / 14.3.1	Activate each pull station by pulling the station and verifying the alarm reports back.
			Heat Detectors	NFPA 72 / 14.3.1	Physically function test and activate each device. Verify the alarms are reporting back.
			Smoke Detectors	NFPA 72 / 14.3.1	Physically function test and activate each device. Verify the alarms are reporting back.
			Interface Equipment	NFPA 72 / 14.3.1	Physically function test and activate each device. Verify the alarms are reporting back.

		Equipment Type	Equipment	Ref.	Details for Tests or Inspections
			Portable Fire Extinguishers	Determine Hydro-testing Date	NFPA 10 / 8.3.1
		Ensure in Proper Operating Condition. Empty and Recharge all Stored Pressure Loaded	NFPA 10 / 7.8.1	Annual Extinguisher Inspection includes full breakdown of the extinguisher. Ensure in Proper Operating Condition. Empty and Recharge all Stored Pressure Loaded Stream Fire Extinguishers	
		Stream Fire Extinguishers			
Annual	Fire Alarm Systems	Control Equipment: Building Systems Connected to Supervising Station	Functions, Fuses, Interface Equipment, Lamps & LEDs, Primary (Main)	NFPA 72 / 14.3.1	Functions, Fuses, Interface Equipment, Lamps & LEDs, Primary (Main). Verify all alarms report back.
			Power Supply, Transponders	NFPA 72 / 14.3.1	Function test the Power Supply
		Batteries	Functional Testing	NFPA 72 / 14.3.1	Function Test the Batteries
		Emergency Voice/Alarm Communications Equipment	Functional Testing	NFPA 72 / 14.4.3.2	Physically test out voice system
		Remote Annunciators	Functional Testing	NFPA 72 / 14.4.3.2	Activate the alarm and verify all annunciators are activating
		Initiating Devices	Function Test Duct Smoke Detectors, Electromechanical Releasing Devices	NFPA 72 / 14.4.3.2	Physically function test and activate each device. Verify the alarms are reporting back
			Function Test Fire Extinguishing System(s) or Suppression System(s) Switches	NFPA 72 / 14.4.3.2	Physically function test and activate each device. Verify the alarms are reporting back
			Function Test Fire Alarm Boxes (Pull Stations)	NFPA 72 / 14.4.3.2	Pull all pull stations and verify this activates the alarm and reports back.
			Function Test All Detectors: Smoke, Heat, Gas, Flame & Others	NFPA 72 / 14.4.3.2	Physically function test and activate each device. Verify the alarms are reporting back
		Alarm Notification Devices	Function Test Audible Devices, Visible Devices	NFPA 72 / 14.4.3.2	Physically function test and activate each device. Verify the alarms are reporting back and all devices are annunciating.
Annual	Water-Based Systems	Sprinklers	Main Drain Function Tests for sprinkler systems.	NFPA 25 / 13.2.2	Fully open and close all valves. Allow the system to drain before resetting. For Dry systems, time how long it takes from the time the valve is open for the water flow alarm to activate and water to reach the valve.
			Record trip times for Dry systems		
			Visual Inspection of all Pipes, Fittings, Hangers/Seismic Bracing	NFPA 25 / 6.2.4.1	Visually inspect for damage, hanging pipe, missing brackets, ensure everything is in place as it should be.
			Function Test Mechanical Water Flow Devices	NFPA 25 / 13.3.3.1	Fully open and close the sprinkler valve and verify the water flow alarms are reporting back.
			Visual inspection of all Sprinklers and Spare Sprinklers	NFPA 25 / 5.2.1.1	Visually inspect all sprinkler heads. Look for heads that are in the wrong position, damaged, corroded, blocked, coated, or missing.
		Standpipe	Piping	NFPA 25 / 6.1.1	Visually inspect all standpipes for damage or deterioration.
			Hose Racks	NFPA 25 / 6.2.5.1	Visually inspect all hose rack for damage and accessibility.
			Hose Connections/Hose Valves	NFPA 25 / 6.1.1.2	Visually inspect for damage
			Hose/Hose Nozzles	NFPA 25 / 6.1.1.2	Unroll all hoses, visually inspect for damage. Flow water through hoses.
			Main Drain Test, Hose Valves, Valves (All Types)	NFPA 25 / 13.2.2	Turn valves on the hose connections to open and test water flow.
Backflow Prevention Assemblies	Function Test Full Forward Flow Test	NFPA 25 / 13.7.2.1	Flow test any backflow prevention device		
Fire Pump System	Fire Pump Annual Full Flow Test with plotted curve, Annual Maintenance, Test main pressure relief valve	NFPA 25 / 8.1.1.2	Conduct a full flow test on the fire pump. A plotted pump curve should be provided from the test.		
Water Storage Tanks	Expansion Joints, Exterior Surfaces	NFPA 25 / 9.1.1.2	Visually inspect for leaks and cracks, Inspect for signs of degradation.		

3 Year Cycle	Equipment Type	Equipment	Ref.	Details for Tests or Inspections
	Water Storage Tanks	Interior of Steel Tanks without corrosion protection	NFPA 25 / 9.2.5.1.1	Stencil the last known date of an interior paint job on the exterior of the tank.

5 Year Cycle	Equipment Type	Equipment	Ref.	Details for Tests or Inspections	
	Fire Alarm Systems	Change Out of Batteries Required	NFPA 72 / 14.3.1	Change Out of Batteries Required	
	Portable Fire Extinguishers	Hydrostatic Testing of Carbon Dioxide, Wet Chemical and Foam	NFPA 10 / 8.3.1	Conduct Hydro test by emptying extinguisher, cleaning, filling w water, and testing under pressure.	
		Stored-Pressure Extinguishers Requiring 6 Year Internal Examination	NFPA 10 / 7.3.3.1	Extinguishers will be opened, emptied clean, and 5 year maintenance performed.	
		Hydrostatic Testing of Cartridges Associated With Portable Fire Extinguishers and Wheeled Units	NFPA 10 / 8.3.2	Conduct Hydro test by emptying extinguisher, cleaning, filling w water, and testing under pressure.	
	Water-Based Systems	Sprinklers	Internal Obstruction Investigation	NFPA 25 / 14.3	Sprinkler piping should be opened and internally inspected for corrosion on the inside of the pipe every 5 years. Or risk analysis.
			Test Gauges - Test or Replace	NFPA 25 / 13.1.1.2	Replace all gauges or have them tested at the 5-year frequency
			Check Valves - Test or Replace	NFPA 25 / 13.4.2.1	Replace all check valves or send out for testing.
		Valves, Valve Components, Trim Inspections	Strainers	NFPA 25 / 13.4.5.1.4	Strainers should be cleaned and replacement considered.
			Filters	NFPA 25 / 13.4.5.1.4	Filters should be replaced.
			Function Test Pressure Reducing Valves/Relief Valves (Full Flow)	NFPA 25 / 13.5.1.2	Pressure Reducing Valves should be function tested to verify they operate.
		Standpipe Full Flow Test Point	Test Hose Connection Pressure Reducing Valves (Full Flow)	NFPA 25 / 13.5.3.2	Fully Flow water through all hoses by opening and operating the valve
			Hydrostatic Test Manual/Dry Standpipes	NFPA 25 / 13.8.5	Fill the pipe with water and conduct a hydro-static test. The pressure should be monitored during this testing to look for drops in pressure.
		Standpipe Hoses	5 Year Test for New Hoses and Every 3 Years Thereafter	NFPA 25 / 6.3.1.1	Conduct flow tests through all hoses.
		Water Storage Tanks	Interior of Steel Tanks with corrosion protection	NFPA 25 / 9.2.5.1.2	Stencil the last known date of an interior paint job on the exterior of the tank.

6 Year Cycle	Equipment Type	Equipment	Ref.	Details for Tests or Inspections
	Portable Fire Extinguishers	Hydro-test of Dry Chemical and Clean Agent Extinguishers	NFPA 10 / 7.3.3.1	Conduct Hydro test by emptying extinguisher, cleaning, filling w water, and testing under pressure.

Long Term Cycle	Equipment Type		Equipment	Ref.	Details for Tests or Inspections
	Water-Based Systems	Sprinklers	Function Test (Send away sample) Sprinkler heads that are Standard Response Sprinkler Head At 50 Years and Every 10 Years Thereafter	NFPA 25 / 5.3.1.1.1	A sample of sprinkler heads in this category should be pulled and sent away to be tested. This should be compared with the cost to replace as some may need replaced anyways.
			Function Test (Send away sample) Dry Type Sprinkler Head At 20 Years and Every 10 Years Thereafter	NFPA 25 / 5.3.1.1.1.5	A sample of sprinkler heads in this category should be pulled and sent away to be tested. This should be compared with the cost to replace as some may need replaced anyways.
			Function Test (Send away sample) Quick Response Head At 20 Years and Every 10 Years thereafter. Or in accordance with manufacturer's requirements.	NFPA 25 / 13.4.5.3.2	A sample of sprinkler heads in this category should be pulled and sent away to be tested. This should be compared with the cost to replace as some may need replaced anyways.

Inspection/ testing and maintenance checklist example:

Property Name: _____ Inspector: _____

Property Address _____

Date: __/__/20__

Inspections: Daily

Valve (Cold Weather/Heating Season Only)

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Enclosure, not equipped with a low temperature alarm, is inspected during cold weather to verify a minimum temperature of 40°F (4°C)
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Inspections: Weekly

Backflow

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Isolation valves are in open position and locked or supervised
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Master Pressure-Regulating Device

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Downstream pressures are in accordance with design criteria ____psi
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Supply pressure is in accordance with design criteria ____psi
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Free of damage or leaks
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Trim in good operating condition

Control Valves

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	In the correct (open or closed) position
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Sealed
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Accessible
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Post Indicator Valves (PIVs) are provided with correct wrenches
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Free from damage or leaks
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Proper signage

Inspections: Monthly

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Gauges are in good operating condition
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Gauges: normal unsupervised air and nitrogen pressure maintained ____psi

Control Valves (Locked or Supervised)

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	In the correct (open or closed) position
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Locked or supervised
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Post Indicator Valves (PIVs) are provided with correct wrenches
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Accessible
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Free from damage or leaks
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Proper signage

Inspections: Quarterly

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Waterflow alarm and supervisory devices are free of damage
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Gauges — normal air and nitrogen pressure that is supervised by a constantly attended location is maintained ____psi
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Gauges — normal water pressure is maintained ____psi

			Alarm Valves/Riser Check			
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Gauges — normal water pressure maintained
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Free of damage
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	In appropriate open or closed position
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Retard chamber/alarm drains not leaking

			Control Valves (Electronically Supervised)			
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	In the correct (open or closed) position
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Electronically supervised
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Accessible
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Post Indicator Valves (PIVs) are provided with correct wrenches
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Free from damage or leaks
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Proper signage

			Fire Department Connections			
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Visible and accessible
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Coupling/swivels operate correctly
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Plugs/caps are in place
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Gaskets are not damaged
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Automatic Drain Valve in place and operating properly
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Identification signs are in place
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Interior is clear of obstructions (unless locked)
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Clapper(s) operates correctly
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Check valve is not leaking
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Visible piping supplying the fire department connection is undamaged

			Pressure-Reducing Valve			
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	In the open position and not leaking
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Maintaining downstream pressure
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	In good condition, with hand wheel installed and unbroken

Inspections: Annual

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Hydraulic design information sign is securely attached to riser and legible
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			Sprinklers (visible)			
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	No damage or leaks
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Free of corrosion, foreign material, or paint
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Installed in proper orientation
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Fluid in glass bulbs
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Spare sprinklers — proper number and type, including installation wrench
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	No paint or coating other than that applied by the manufacturer
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Loading — sprinklers are free of dust
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Escutcheons/cover plates are present and installed correctly
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Minimum clearance between sprinklers and storage – 18 inches.

			Hangers/ Seismic Bracing			
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Not damaged or loose

Pipes and Fittings (visible)

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	In good condition and no external corrosion
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	No leaks or mechanical damage
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Correct alignment — no external loads
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Heat trace per manufacturer's requirements

Building

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Wet piping not exposed to freezing temperatures
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Ice Plug Inspections

Fire Department Connections

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Interior of connection with locked plugs or caps is free of obstructions
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Inspections: Five Years

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Alarm valve interior including strainers, filters, and restriction orifice
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Check valve — internal moves freely and in good condition
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Obstruction inspection — no foreign or obstructing material found
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Backflow — internal inspection

Testing

Test: Quarterly

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Alarm devices — water motor gong
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Main drain test: if the sole supply is through a backflow preventer or pressure-reducing valve Static ____psi Residual ____psi
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Do main drain test results differ more than 10% from previous test?

Master Pressure-Regulating Device

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Partial flow test performed to exercise valve
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Test: Semiannual

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Alarm device (vane, paddle, and pressure switch type) — inspector's test or bypass opened and observed flow
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Valve supervisory switches function

Test: Annual

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	All control valves operated through full range of motion and returned to normal position
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Backflow — forward flow test at a minimum flow rate of the system demand
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Valve status test performed
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Antifreeze solution has been tested
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Sprinkler pressure-reducing valve — partial flow test
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Supervisory switches function

Main Drain Test

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Static ____psi Residual ____psi Do main drain test results differ more than 10% from previous test?
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Master Pressure-Regulating Device

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Full flow test compared to previous test results
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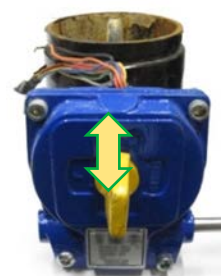
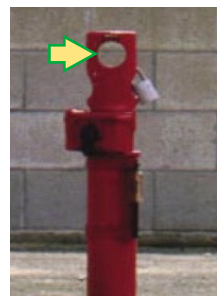

Test: Five Years




<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Gauges tested or replaced
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Sprinkler pressure-reducing valve — full flow test compared to previous test results

Fire protection valves inspection list example:

Facility	Location	Date

Inspection Type		
Weekly	Visually inspect all valves for the full open position. Outside screw and yoke valves (OS&Y) and Indicating Butterfly Valves (IBV) should be visually checked at close range.	<input type="checkbox"/>
Monthly	Operationally test Post Indicator valves (PIV), Wall Post Indicator valves (WPIV), Non-indicating (NIV), and Underground valves (UV), for the fully open position and leave them in the fully open position. Testing requires unlocking the valve, closing it three turns before fully reopening it, backing it off one-quarter of a turn, and relocking it. Note - "Left Hand" valves turn to the left (anti-clockwise) to close.	<input type="checkbox"/>

 <p>Stem Up = Open ✓</p> <p>Stem Down = Closed</p>	 <p>Indicator in same direction as pipe = Open ✓</p>	 <p>Unobstructed hole = Open ✓</p>	 <p>Handle shows direction of Open ✓</p>
<p>Outside Screw & Yoke (OS&Y)</p>	<p>Indicating Butterfly Valve (IBV)</p>	<p>Post Indicator Valve Assembly (PIVA)</p>	<p>Non-indicating Valve (NIV)</p>

 <p>Window shows Open = Open ✓</p> <p>Window shows shut = Closed</p>	 <p>Window shows Open = Open ✓</p>	 <p>Use "T bar" to check if Open ✓</p>
<p>Post Indicator Valve (PIV)</p>	<p>Wall Post Indicator Valve (WPIV)</p>	<p>Underground Valve (UV) Also known as curb box valve</p>

Example fire pump weekly inspection:

Property Name: _____ Inspector: _____

Property Address _____

Date: __/__/20__

Inspections: Weekly

Pump House

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Heat in pump room is 40°F (4°C) or higher
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Ventilation louvers are free to operate
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Excessive water does not appear on the floor
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Coupling guard is in place
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Heat in pump room is not less than 70°F (21°C) for diesel engine pump without engine heater

Pump Systems

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Pump suction, discharge, and bypass valves are open
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	No piping or hoses leak
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Fire pump leaking one drop of water per second at seals
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Suction line pressure is within acceptable range
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	System line pressure is within acceptable range
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Suction reservoir is full (Tank)
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Wet pit suction screens are unobstructed and in place
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Waterflow test valves are in closed position, hose connection valve is closed, and the line to test valves is free of water

Electrical Systems

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Controller pilot light (power on) is illuminated
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Transfer switch normal power light is illuminated
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Isolating switch for standby power is closed
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Reverse-phase alarm light is not illuminated
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Normal-phase rotation light is illuminated
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Oil level in vertical motor sight glass is within acceptable range
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Pressure maintenance (jockey) pump has power

Diesel Engine Systems

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Diesel fuel tank is at least two-thirds full
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Controller selector switch is in "auto" position
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Voltage readings for batteries (2) are within acceptable range
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Charging current readings are within acceptable range for batteries
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Pilot lights for batteries are "on" or battery failure pilot lights are "off"
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	All alarm pilot lights are "off"
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Record engine running time from meter
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Oil level is within acceptable range in right angle gear drive pumps
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Crankcase oil level is within acceptable range
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Cooling water level is within acceptable range
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Electrolyte level in batteries is within acceptable range
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Battery terminals are free of corrosion

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Water-jacket heater is operational
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Battery cranking voltage exceeds 9 volts for a 12-volt system and 18 volts for a 24-volt system
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Water pump(s) is not leaking
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Jacket water heater operational
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Flexible hose and connections are in good operating condition
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Check lube oil heater for operation
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Oil lube level is within acceptable range
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Check for water in diesel fuel tank

Fire pump weekly (diesel) / monthly* (electric) churn test example:

Property Name: _____ Inspector: _____

Property Address _____

Date: __/__/20__

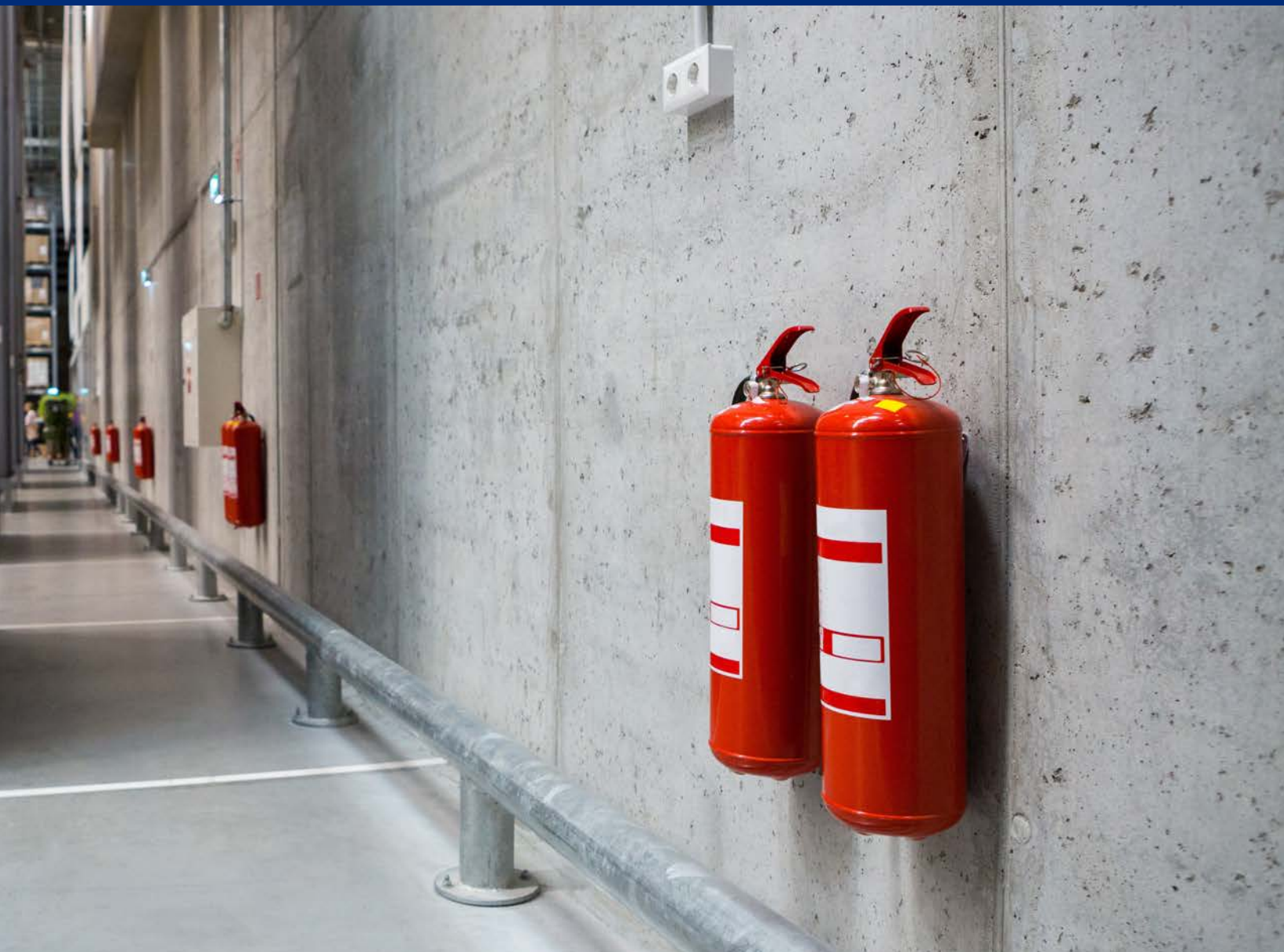
			Pump Systems			
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Record pump starting pressure _____psi
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Operate fire pump for 10 minutes (30 minutes for diesel pump)
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Check packing gland tightness (Packing – 1 drip a second)
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Record suction pressure from gauge in ____psi
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Record discharge pressure from gauge in ____psi
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Check for unusual noise or vibration
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Check packing boxes, bearings, or pump casing for overheating
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Record pressure switch or pressure transducer and compare with pump discharge gauge
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Record pumps highest ____psi and lowest ____psi pressure on the fire pump control log
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Circulation relief valve functions correctly
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Check fuel system solenoids for proper operation
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Check tank float switch for proper operation

			Electrical Systems			
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Record time controller is on first step (for reduced voltage or reduced current starting)
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Observe time for motor to accelerate to full speed
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Record time pump runs after starting for pumps having automatic stop Feature

			Diesel Engine Systems			
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Record time for diesel engine to crank
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Record time for diesel engine to reach running speed
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Check oil pressure gauge, speed indicator and water and oil temperatures while engine is running
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Check heat exchanger for cooling water flow
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	Operate speed governor (internal combustion engine only)

Fire pump weekly (diesel) / monthly* (electric) inspection form example:

SPRINKLERS	Automatic Sprinklers	Spare heads available? <input type="checkbox"/> Yes <input type="checkbox"/> No		Obstructed by high piling (18- to 36-in. Clearance)? <input type="checkbox"/> Yes <input type="checkbox"/> No			
		Heat adequate to prevent freezing (40° F min.)? (Note broken windows, etc.) min. temp. _____		Water Pressure	Psi at yard level: _____		
		Any heads disconnected or needed:		Comments:			
DRY-PIPE VALVES	Valve Room Properly Heated?	No. 1 Min.: 42° F/6° C Measured: _____ F/C	No. 2 Min.: 42° F/6° C Measured: _____ F/C	No. 3 Min.: 42° F/6° C Measured: _____ F/C	No. 4 Min.: 42° F/6° C Measured: _____ F/C		
	Air Pressure	No. 1 Min.: _____ psi/bar Measured: _____ psi/bar	No. 2 Min.: _____ psi/bar Measured: _____ psi/bar	No. 3 Min.: _____ psi/bar Measured: _____ psi/bar	No. 4 Min.: _____ psi/bar Measured: _____ psi/bar		
WATER SUPPLIES	Fire Pump	Fire pump pressure: Start _____ Stop _____			Packing cool? <input type="checkbox"/> Yes <input type="checkbox"/> No		
		Jockey pump pressure: Start _____ Stop _____			Fuel tank level (3/4 min.) _____		
		Pump room properly heated? (____° F/C min.) Temp. ____° F/C		Properly ventilated? <input type="checkbox"/> Yes <input type="checkbox"/> No		Fire pump started on automatic? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Tank or Reservoir	Full? <input type="checkbox"/> Yes <input type="checkbox"/> No		Time to overflow tank: _____ Mins.		Heating system in use? <input type="checkbox"/> Yes <input type="checkbox"/> No	
		Temp. at cold water return (should be 42° F [6° C] min.): _____			Circulation good? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Inside Hose	In good condition? <input type="checkbox"/> Yes <input type="checkbox"/> No			Accessible? <input type="checkbox"/> Yes <input type="checkbox"/> No			



Summary

This document has provided some recommended steps, considerations, and tips to help understand the importance of regular inspection, testing, and maintenance for fire protection systems and the associated requirements per NFPA 25. Note that this is not an exhaustive list of recommendations.

For more information and customized guidance please contact your local Marsh representative.



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