

Chapter 7 Private Fire Service Mains

7.1 General.

7.1.1 Minimum Requirements.

7.1.1.1 This chapter shall provide the minimum requirements for the routine inspection, testing, and maintenance of private fire service mains and their appurtenances.

7.1.1.2 Table 7.1.1.2 shall be used to determine the minimum required frequencies for inspection, testing, and maintenance.

7.1.2 **Common Components and Valves.** Common components and valves shall be inspected, tested, and maintained in accordance with Chapter 13.

7.1.3 **Obstruction Investigations.** The procedures outlined in Chapter 14 shall be followed where there is a need to conduct an obstruction investigation.

7.1.4 **Fire Hose.** Fire hose shall be maintained in accordance with NFPA 1962.

7.1.5 **Impairments.** The procedures outlined in Chapter 15 shall be followed wherever such an impairment to protection occurs.

7.2 Inspection and Corrective Action.

7.2.1 **General.** Private fire service mains and their appurtenances shall be inspected at the intervals specified in Table 7.1.1.2.

7.2.2* **Procedures.** All procedures shall be carried out in accordance with the manufacturer's instructions, where applicable.

7.2.2.1 Exposed Piping.

7.2.2.1.1 Exposed piping shall be inspected annually.

7.2.2.1.2 Piping shall be inspected for the following conditions:

- (1) Leaks
- (2) Physical damage
- (3) Corrosion
- (4) Restraint methods

7.2.2.1.2.1 Where any deficiency is noted, the appropriate corrective action shall be taken.

7.2.2.1.3 Piping installed in areas that are inaccessible for safety considerations due to process operations shall be inspected during each scheduled shutdown.

Table 7.1.1.2 Summary of Private Fire Service Main Inspection, Testing, and Maintenance

Item	Frequency	Reference
Inspection		
Backflow preventer		Chapter 13
Check valve		Chapter 13
Control valve		Chapter 13
Fire department connection		Chapter 13
Hose houses	Quarterly	7.2.2.8
Hydrants (dry barrel and wall)	Annually and after each operation	7.2.2.4
Hydrants (wet barrel)	Annually and after each operation	7.2.2.5
Mainline strainers	Annually and after each significant flow	7.2.2.3
Monitor nozzles	Semiannually	7.2.2.7
Pipe and fittings (exposed)	Annually	7.2.2.1
Valve supervisory devices		Chapter 13
Test		
Backflow preventer		Chapter 13
Control valve		Chapter 13
Hydrants	Flow, annually	7.3.2
Monitor nozzles	Flow, annually (range and operation)	7.3.3
Piping (exposed and underground) (flow test)	5 years	7.3.1
Valve status test		Chapter 13
Valve supervisory devices		Chapter 13
Maintenance		
Backflow preventer		Chapter 13
Check valve		Chapter 13
Control valve		Chapter 13
Hydrants	Annually	7.4.2
Mainline strainers	Annually and after each operation	7.2.2.3
Monitor nozzles	Annually	7.4.3

7.2.2.2* Underground Piping.**7.2.2.3* Mainline Strainers.**

7.2.2.3.1 Mainline strainers shall be inspected and cleaned after each system flow exceeding that of a nominal 2 in. (50 mm) orifice.

7.2.2.3.2 Mainline strainers shall be removed and inspected annually for plugging, fouling, and damaged and corroded parts.

7.2.2.4 Dry Barrel and Wall Hydrants. Dry barrel and wall hydrants shall be inspected annually and after each operation for the following conditions:

- (1) Inaccessibility
- (2) Presence of water or ice in barrel, which could indicate a faulty drain, a leaky hydrant valve, or high groundwater table)
- (3) Improper drainage from barrel
- (4) Leaks in outlets or at top of hydrant
- (5) Cracks in hydrant barrel
- (6) Tightness of outlet caps
- (7) Worn outlet threads
- (8) Worn hydrant operating nut
- (9) Availability of operating wrench

(10) Corrosion detrimental to hydrant integrity

7.2.2.4.1 Where any deficiency is noted, the appropriate corrective action shall be taken.

7.2.2.5 Wet Barrel Hydrants. Wet barrel hydrants shall be inspected annually and after each operation for the following conditions:

- (1) Inaccessibility
- (2) Leaks in outlets or at top of hydrant
- (3) Cracks in hydrant barrel
- (4) Tightness of outlet caps
- (5) Worn outlet threads
- (6) Worn hydrant operating nut
- (7) Availability of operating wrench

(8) Corrosion detrimental to hydrant integrity

7.2.2.5.1 Where any deficiency is noted, the appropriate corrective action shall be taken.

N7.2.2.6* Dry Hydrants. Dry hydrants shall be inspected at least quarterly and maintained as necessary to keep them in good operating condition. [1142, 2017]

N7.2.2.6.1 Thorough surveys shall be conducted, to reveal any deterioration in the water supply situation in ponds, streams, or cisterns. [1142, 2017]

N7.2.2.6.2 Vegetation shall be cleared for a minimum 3 ft (0.9 m) radius from around hydrants. [1142, 2017]

N7.2.2.6.3 The reflective material marking the hydrant and signage shall be inspected at least annually to verify that it is being maintained in accordance with 8.4.7 of NFPA 1142. [1142, 2017]

N7.2.2.6.4 Hydrant risers shall be protected from ultraviolet (UV) degradation by painting or other measures. [1142, 2017]

N7.2.2.6.5* The hydrants shall be flow tested at least annually with an approved pump to ensure that the minimum design flow is maintained. [1142, 2017]

7.2.2.7 Monitor Nozzles. Monitor nozzles shall be inspected semiannually for the following conditions:

- (1) Leakage
- (2) Physical damage
- (3) Corrosion

7.2.2.7.1 Where any deficiency is noted, the appropriate corrective action shall be taken.

7.2.2.8 Hose Houses. Hose houses shall be inspected quarterly for the following conditions:

- (1) Inaccessibility
- (2) Physical damage
- (3) Missing equipment

7.2.2.8.1 Where any deficiency is noted, the appropriate corrective action shall be taken.

7.3 Testing.

7.3.1* Underground and Exposed Piping Flow Tests. Underground and exposed piping shall be flow tested at minimum 5-year intervals.

7.3.1.1 Any flow test results that indicate deterioration of available waterflow and pressure shall be investigated to the complete satisfaction of the authority having jurisdiction to ensure that the required flow and pressure are available for fire protection.

7.3.1.2 Where underground piping supplies individual fire sprinkler, standpipe, water spray, or foam-water sprinkler systems and there are no means to conduct full flow tests, tests generating the maximum available flows shall be permitted.

7.3.2 Hydrants. Hydrants shall be tested annually to ensure proper functioning.

7.3.2.1 Each hydrant shall be opened fully and water flowed until all foreign material has cleared.

7.3.2.2 Flow shall be maintained for not less than 1 minute.

7.3.2.3 After operation, dry barrel and wall hydrants shall be observed for proper drainage from the barrel.

7.3.2.4 Full drainage shall take no longer than 60 minutes.

7.3.2.5 Where soil conditions or other factors are such that the hydrant barrel does not drain within 60 minutes, or where the groundwater level is above that of the hydrant drain, the hydrant drain shall be plugged and the water in the barrel shall be pumped out.

7.3.2.6 Dry barrel hydrants that are located in areas subject to freezing weather and that have plugged drains shall be identified clearly as needing pumping after operation.

7.3.3 Monitor Nozzles.

7.3.3.1 Monitor nozzles that are mounted on hydrants shall be tested as specified in 7.3.2.

7.3.3.2 All monitor nozzles shall be oscillated and moved throughout their full range annually to ensure proper operability.

7.4 Maintenance.

7.4.1 General. All equipment shall be maintained in proper working condition, consistent with the manufacturer's recommendations.

7.4.2 Hydrants.

7.4.2.1 Hydrants shall be lubricated annually to ensure that all stems, caps, plugs, and threads are in proper operating condition.

7.4.2.2* Hydrants shall be kept free of snow, ice, or other materials and protected against mechanical damage so that free access is ensured.

7.4.3 Monitor Nozzles. Monitor nozzles shall be lubricated annually to ensure proper operating condition.

7.5 Component Action Requirements.

7.5.1 Whenever a component in a private fire service system is adjusted, repaired, reconditioned, or replaced, the action required in Table 7.5.1 shall be performed.

7.5.2 Where the original installation standard is different from the cited standard, the use of the appropriate installing standard shall be permitted.

7.5.3* Where a main drain is not provided, other equivalent means of flow testing shall be permitted.

7.5.4 The actions of 7.5.1 shall not require a design review, which is outside the scope of this standard.

Table 7.5.1 Summary of Component Action Requirements

Component	Adjust	Repair/ Recondition	Replace	Test Criteria
Water Delivery Components				
Pipe and fittings (exposed and underground)	X	X	X	Hydrostatic test in conformance with NFPA 24 Flush in conformance with NFPA 24 or NFPA 20, as appropriate
Hydrants	X	X	X	Hydrostatic test in conformance with NFPA 24 Waterflow in conformance with NFPA 24 Inspect for proper drainage
Monitor nozzles	X	X	X	Flow test to confirm required coverage
Mainline strainers	X	X	X	Flow test downstream of strainer
Fire department connection	X	X	X	See Chapter 13
Alarm and Supervisory Components				
Valve supervisory device	X	X	X	Operational test for conformance with NFPA 24 and/or NFPA 72
System-Indicating Components				
Gauges			X	Verify at 0 psi (0 bar) and system working pressure
System Housing and Protection Components				
Hose houses	X	X	X	Verify integrity of hose house and hose house components
Hose		X		Repair and test hose in accordance with NFPA 1962
Hose			X	No action required
Structural Components				
Thrust blocks	X	X	X	Test at system working pressure
Tie rods	X	X	X	Test at system working pressure
Retainer glands	X	X	X	Test at system working pressure
Informational Components				
Identification signs	X	X	X	Verify conformance with NFPA 24