

**STANDPIPE SHOP DRAWINGS
2003 NFPA 14, 2006 IBC, IFC**

Items listed require standpipe system shop drawing revisions or manufacturer product cut sheets verifying listing by a nationally recognized testing laboratory. *Answers in letter form are not acceptable.* **Starting construction before plans approval may be considered as just cause by the State to issue a stop work order. [Rule 0780-2-3-.03(2)]**

Submittal Requirements

1. Provide plans & specifications through the electronic plans submittal portal **or** provide one (1) full size paper copy of plans, one copy of specifications, one pdf copy on a CD accompanied with a letter of certification stating that the pdf copy is an identical copy of the paper copy. The documents submitted are to include the responsible managing employee's signature and number, one copy of hydraulic calculations, one copy of manufacturer's cut sheets verifying fire protection listings for above-ground piping, fittings, valves, devices, gauges, hoses, hangers, etc.
2. The standpipe system shop drawings must be reviewed and approved by the fire protection engineer of record processed with the engineer's shop drawing review stamp prior to the submittal to the State Fire Marshal's Office.

Above-Ground

1. Provide a standpipe system schematic as it enters the building to the top most outlet of each standpipe. Include the fire department connection (FDC), all isolation valves, tamper switches, gauges, drains, and outlets. Provide the elevation of each standpipe outlet.
2. Identify the class and type of the standpipe system (Class I, II, or III; automatic, semi-automatic, manual, wet, dry). [NFPA 14 5.3]
3. Where a manual standpipe system is provided, each hose connection must have a conspicuous sign that reads "Manual Standpipe for Fire Department Use Only." [NFPA 14 5.4.2]
4. Where required by the AHJ, automatic or semi-automatic systems must have listed waterflow and supervisory alarms. [NFPA 14 5.7.1]
5. Manual standpipe systems must have an approved water supply accessible to a fire department pumper. [NFPA 14 9.1.2]
6. Where a zoned system is used, see NFPA 14 7.9. Each zone requiring pumps must be provided with a separate pump. [NFPA 14 7.9.1]
7. The minimum size for standpipes is:
 - A. Class I and III – 4 in. minimum. [NFPA 14 7.6.1]
 - B. Combined system – 6 in. minimum. [NFPA 14 7.6.2] For fully sprinklered buildings – 4 in. minimum if the system is hydraulically calculated. [NFPA 14 7.6.3]

- C. Branch lines must be sized hydraulically but may be no less than 2½ in. [NFPA 14 7.6.4]
8. Separate standpipes must be provided in each required exit stairway. [NFPA 14 7.4]
9. The location and protection of piping must be as follows (connections from fire pumps and sources outside the building should be made at the base of the standpipe). [NFPA 14 Sections 6.1 and A6.1]
 - A. Dry standpipes must not be concealed unless the piping integrity is monitored with supervisory air pressure. [NFPA 14 6.1.1]
 - B. Standpipes and lateral piping supplied by standpipes must be located in enclosed exit stairs or protected to the same degree as stairs. [NFPA 14 6.1.2.2]
 - C. Protection of lateral piping to 2½” hose connections in sprinklered buildings can be omitted, and piping connecting standpipes to 1½” hose lines can be omitted. [NFPA 14 6.1.2.2.1 and NFPA 6.1.2.2.2]
 - D. Piping for standpipes must not be run under buildings. [NFPA 14 6.1.2.6] Where it's absolutely necessary to run pipe under buildings, special precautions must be taken that include arching the foundation walls over the pipe, running in covered trenches, etc. [NFPA 14 6.1.2.6.1]
 - E. To minimize or prevent pipe breakage where subject to earthquakes, the standpipe system must be protected in accordance with NFPA 13. [NFPA 14 6.1.2.5]
10. Where two or more standpipes are installed in the same building, they must be interconnected. [NFPA 14 7.5.1] The FDC should be arranged to supply all interconnected standpipes. [NFPA 14 A.7.5, Figures A.7.1(a), A.7.1(b), and A.7.1(c)]
11. Where standpipes are supplied by tanks at the top of the building or zone, the standpipes must also be interconnected at the top. [NFPA 14 7.5.2] Check valves must be installed at the base of each standpipe to prevent circulation. [NFPA 14 7.5.2.1]
12. Provide isolation valves supervised with a tamper switch for each standpipe. [NFPA 14 6.2.2]
13. Pipe or tube material must meet or exceed one of the standards listed in NFPA 14 Table 4.2.1.
14. Piping and fittings must be listed for the maximum pressure demands of the system. [NFPA 14 4.2.3.1 and 4.3.3.3]
15. Installation requirements for valves are as follows. [NFPA 14 Chapter 6]
 - A. An indicating-type valve and check valve must be installed at each water supply. [NFPA 14 6.2.1]
 - B. Combined sprinkler/standpipe systems must have an individual control valve and check valve at each sprinkler connection. [NFPA 14 6.2.5.1]

- C. A Post Indicator Valve must be installed for the water supply and be at least 40 ft from the building. [NFPA 14 6.2.6.1]
 - D. Valves must be supervised by one of the methods in NFPA 14 6.2.7.
16. Pressure regulating devices must be listed. [NFPA 14 4.9]
17. A valved outlet for a pressure gauge must be installed on the upstream side of the pressure regulating device. [NFPA 14 5.6.2]
18. Specify the method of support and provide seismic restraints where required. [NFPA 14 6.4.1, 6.1.2.5, 2002 NFPA 13 9.3, 9.3.4, and 2006 IBC 1613] For support of horizontal piping see NFPA 14 6.4.2.
19. A FDC must be installed as follows. [NFPA 14 6.3.3 and 6.3.5]
- A. The FDC must be on the street side of the building and have a designated sign. [NFPA 14 6.3.5.1]
 - B. One or more FDCs must be provided for each zone of a Class I or III standpipe system.
 - C. Automatic-Wet and Manual-Wet Standpipe Systems: On the system side of system control valve, check valve or any pump, but on the supply side of any isolated valves required in NFPA 14 6.2.2.
 - D. Automatic-Dry Standpipe Systems: On the system side of the control valve and check valve and or supply side of the dry pipe valve.
 - E. Semiautomatic-Dry Standpipe Systems: On the system side of the deluge valve.
 - F. Manual-Dry Standpipe Systems: Directly connected to system piping.
 - G. See also Item 10 of this checklist.
 - H. High-rise buildings must have two remotely located FDCs. [NFPA 14 7.13.2]
20. Provide a pressure gauge at the top of each standpipe and on each discharge pipe from a pump or tank. [NFPA 14 5.6] Additional pressure gauges at the base of the system are desirable for high-rise buildings. [NFPA 14 A.5.6]
21. Each gauge must be controlled by a valve with a draining arrangement. [NFPA 14 5.6.1.2]
22. Identify the standpipe drainage method. All low points and trapped piping must be drainable. All drains must discharge to an approved location. [NFPA 14 7.12 and 7.12.2.1] Provide a main drain test connection. [NFPA 14 7.12.3] The main drain must be sized in accordance with NFPA 14 Table 7.12.2.2.
23. A 3 in. diameter drain riser must be installed adjacent to each standpipe equipped with pressure regulating devices. [NFPA 14 7.12.1]
24. Locations for hose connections must be as follows.

- A. Hose connections and hose stations must be unobstructed and located between 3 ft and 5 ft from the floor. [NFPA 14 7.3.1]
 - B. Class I systems must be located (NFPA 14 7.3.2):
 - 1. At each intermediate landing between floor levels in every required exit stair
 - 2. On each side of the wall adjacent to the exit opening of two hour fire rated horizontal exits
 - 3. At the highest landing of stair which accesses roof and on the roof where the stairwell does not have access to the roof
 - C. In buildings other than covered mall buildings, in each exit passageway at the entrance from the building areas into the passageway.
 - D. In covered mall buildings, at the entrance to each exit passageway or exit corridor and at the interior side of the public entrance from the exterior to the mall.
 - E. Class II systems must be provided with 1½” hose connections within 130 feet measured along the path of travel of every floor. [NFPA 14 7.3.3]
 - F. Class III hose stations must be provided as for Class I and II systems. Hose stations may be equipped with a 2½” x 1½” reducer and a cup attached with a chain in fully sprinklered buildings and the 130 feet travel distance limitation shall not apply. [NFPA 14 7.3.4]
25. Class II and III standpipes must be equipped with listed 1½” hose (100 ft.) and a rack attached and ready for use. [NFPA 14 4.6.2.1 and 4.6.3.1]

Calculations

- 1. Provide calculations with the minimum flow rates required by NFPA 14 7.10.
 - A. Class I and III: 500 gpm for the first standpipe and 250 gpm for each additional with a total not to exceed 1250 gpm for unsprinklered buildings and 1000 gpm for sprinklered buildings. [NFPA 14 7.10.1.1.1 and 7.10.1.1.3]
 - B. Class II: 100 gpm for the most remote hose connection. [NFPA 14 7.10.2.1.1] No additional flow is required where more than one hose connection is provided.
- 2. The calculations for the maximum flow rate for individual connections are:
 - A. 250 gpm for 2½” hose connections. [NFPA 14 7.10.3.1 and NFPA 14 7.10.1.2]
 - B. 100 gpm for 1½” hose connections. [NFPA 14 7.10.3.2]
- 3. Provide calculations with minimum and maximum pressure limits.
 - A. A minimum residual pressure of 100 psi is required for the hydraulically most remote 2½” hose connection at 500 gpm and 65 psi residual pressure for the hydraulically most remote 1½” hose connection at 100 gpm. [NFPA 14 7.8.1.1]

- B. Pipe schedule designed standpipe systems must have piping sized in accordance with the pipe schedule in Table 7.8.2.1 to provide the required water flow rate at a minimum residual pressure 100 psi at the highest 2½” hose connection and 65 psi at the highest 1½” hose connection. [NFPA 14 7.8.2.1]
- C. Pipe schedule designs shall be limited to wet standpipes for buildings that are not high-rise buildings. [NFPA 14 7.8.2.2]
- D. Where the residual pressure at 1½” hose connections exceeds 100 psi, an approved pressure-regulating device must be provided to limit the residual pressure. [NFPA 14 7.8.3.1]
- E. Where the static pressure at the hose connection exceeds 175 psi, an approved pressure-regulating device must be provided to limit the static and residual pressures to 100 psi for 1½” hose connections and 175 psi for other hose connections. [NFPA 14 7.8.3.2]
- F. The pressure on the inlet side of the pressure regulating device must not exceed the device’s rated working pressure. [NFPA 14 7.8.3.3]
- G. The maximum pressure at any point in the system at any time shall not exceed 350 psi. [NFPA 14 7.2]