**Chapter 28 Systems Acceptance**

28.1 Approval of Sprinkler Systems and Private Fire Service Mains

The installing contractor shall do the following:

Notify the authority having jurisdiction and the property owner or the property owner's authorized representative of the time and date testing will be performed

Perform all required acceptance tests (see Section 28.2)

Complete and sign the appropriate contractor's material and test certificate(s) (see Figure 28.1)

Remove all caps and straps prior to placing the sprinkler system in service

FIGURE 28.1 Contractor's Material and Test Certificate for Aboveground Piping.

28.2 Acceptance Requirements

28.2.1\* Hydrostatic Tests

28.2.1.1

Unless permitted by 28.2.1.3 through 28.2.1.5, all piping and attached appurtenances subjected to system working pressure shall be hydrostatically tested at 200 psi (14 bar) and shall maintain that pressure without loss for 2 hours.

28.2.1.2

Loss shall be determined by a drop in gauge pressure or visual leakage.

28.2.1.3

Portions of systems normally subjected to system working pressures in excess of 150 psi (10 bar) shall be tested as described in 28.2.1.1, at a pressure of 50 psi (3.4 bar) in excess of system working pressure.

28.2.1.4

Where cold weather will not permit testing with water, an interim air test shall be permitted to be conducted as described in 28.2.2. This provision shall not remove or replace the requirement for conducting the hydrostatic test as described in 28.2.1.1.

28.2.1.5\*

The test pressure shall be read from a gauge located at the low elevation point of the system or portion being tested. The pressures in piping at higher elevations shall be permitted to be less than 200 psi (14 bar) when accounting for elevation losses. Systems or portions of systems that can be isolated shall be permitted to be tested separately.

28.2.1.6\*

Additives, corrosive chemicals such as sodium silicate, or derivatives of sodium silicate, brine, or similar acting chemicals shall not be used while hydrostatically testing systems or for stopping leaks.

28.2.1.7

Piping between the exterior fire department connection and the check valve in the fire department inlet pipe shall be hydrostatically tested in the same manner as the balance of the system. After repair or replacement work affecting the fire department connection, the piping between the exterior and the check valve in the fire department inlet pipe shall be isolated and hydrostatically tested at 150 psi (10 bar).

28.2.1.8\*

When systems are being hydrostatically tested, tests shall be permitted to be conducted with pendent or horizontal sidewall sprinklers or plugs installed in fittings. Any plugs shall be replaced with pendent or horizontal sidewall sprinklers after the test is completed.

28.2.1.9

When deluge systems are being hydrostatically tested, plugs shall be installed in fittings and replaced with open sprinklers after the test is completed, or the operating elements of automatic sprinklers shall be removed after the test is completed.

28.2.1.10

Provision shall be made for the proper disposal of water used for flushing or testing.

28.2.1.11\* Test Blanks

28.2.1.11.1

Test blanks shall have painted lugs protruding in such a way as to clearly indicate their presence.

28.2.1.11.2

The test blanks shall be numbered, and the installing contractor shall have a recordkeeping method ensuring their removal after work is completed.

28.2.1.12

When subject to hydrostatic test pressures, the clapper of a differential-type valve shall be held off its seat to prevent damaging the valve.

28.2.2 Dry Pipe and Double Interlock Preaction System(s) Air Test

28.2.2.1

In addition to the standard hydrostatic test, an air pressure leakage test at 40 psi (2.7 bar) shall be conducted for 24 hours. Any leakage that results in a loss of pressure in excess of 11/2 psi (0.1 bar) for the 24 hours shall be corrected.

28.2.2.2

Where systems are installed in spaces that are capable of being operated at temperatures below 32°F (0°C), air or nitrogen gas pressure leakage tests required in 28.2.2 shall be conducted at the lowest nominal temperature of the space.

28.2.2.3

Pipe or tube specifically investigated for suitability in dry pipe and double interlock preaction system(s) and listed for this service, shall be permitted to be tested in accordance with their listing limitations.

28.2.3 System Operational Tests

28.2.3.1 Waterflow Devices

Waterflow detecting devices including the associated alarm circuits shall be flow tested through the inspector's test connection and shall result in an audible alarm on the premises within 5 minutes after such flow begins and until such flow stops.

28.2.3.1.1

Where a fire alarm system is monitoring waterflow, an alarm signal shall activate in accordance with the requirements of the adopted fire alarm code.

28.2.3.2\* Dry Pipe Systems

28.2.3.2.1

A working test of the dry pipe valve shall be made by opening the inspector's test connection.

28.2.3.2.2

Where a quick opening device is present, the trip test described in 28.2.3.2.1 shall be sufficient to test the quick opening device as long as the device trips properly during the test.

28.2.3.2.3\*

The test shall measure the time to trip the valve and the time for water to be discharged from the inspector's test connection. All times shall be measured from the time the inspector's test connection is completely opened.

28.2.3.2.3.1\*

Dry systems calculated for water delivery in accordance with 8.2.3.6 shall be exempt from any specific delivery time requirement.

28.2.3.2.4

The results shall be recorded using the contractor's material and test certificate for aboveground piping (see Figure 28.1) and the general information sign (see Figure A.28.6).

28.2.3.3 Deluge and Preaction Systems

28.2.3.3.1

The automatic operation of a deluge or preaction valve shall be tested in accordance with the manufacturer's instructions.

28.2.3.3.2

The manual and remote control operation, where present, shall also be tested.

28.2.3.4 Main Drain Valves

28.2.3.4.1

The main drain valve shall be opened and remain open until the system pressure stabilizes.

28.2.3.4.2\*

The static and residual pressures shall be recorded on the contractor's material and test certificate (see Figure 28.1) and the sprinkler system general information placard (see Figure A.28.6).

28.2.3.5 Operating Test for Control Valves

All control valves shall be fully closed and opened under system water pressure to ensure proper operation.

28.2.4 Pressure-Reducing Valves

28.2.4.1

Each pressure-reducing valve shall be tested upon completion of installation to ensure proper operation under full flow and no-flow conditions.

28.2.4.2

Testing shall verify that the device properly regulates outlet pressure at both maximum and normal inlet pressure conditions.

28.2.4.3

The results of the flow test of each pressure-reducing valve shall be recorded on the contractor's material and test certificate (see Figure 28.1).

28.2.4.4

The results shall include the static and residual inlet pressures, static and residual outlet pressures, and the flow rate.

28.2.5 Backflow Prevention Assemblies

28.2.5.1

The backflow prevention assembly shall be forward flow tested to ensure proper operation.

28.2.5.2

The minimum flow rate shall be the system demand, including hose stream allowance where applicable.

28.2.6 Exposure Systems

Operating tests shall be made of exposure protection systems upon completion of the installation, where such tests do not risk water damage to the building on which they are installed or to adjacent buildings.

28.3 Automated Inspection and Testing Devices and Equipment

28.3.1

Automated inspection and testing devices and equipment installed on the sprinkler system shall be tested to ensure the desired result of the automated inspection or test is realized.

28.3.1.1

Automated inspection devices and equipment shall be shown to be as effective as a visual examination.

28.3.1.2

Automated testing devices and equipment shall produce the same action required by this standard to test a device.

28.3.1.2.1

The testing shall discharge water where required by this standard and NFPA 25.

28.3.2

Failure of automated inspection and testing devices and equipment shall not impair the operation of the system unless indicated by an audible and visual trouble signal in accordance with NFPA 72.

28.3.3

Failure of a system or component to pass automated inspection and testing devices and equipment shall result in an audible and visual trouble signal in accordance with NFPA 72.

28.3.4

Failure of automated inspection and testing devices and equipment shall result in an audible and visual trouble signal in accordance with NFPA 72.

28.4 Instructions

The installing contractor shall provide the property owner or the property owner's authorized representative with the following:

All literature and instructions provided by the manufacturer describing proper operation and maintenance of any equipment and devices installed

\*NFPA 25

28.5\* Hydraulic Design Information Sign (Hydraulic Data Nameplate)

28.5.1

The installing contractor shall identify a hydraulically designed sprinkler system with a permanently marked weatherproof metal or rigid plastic sign secured with corrosion-resistant wire, chain, or other approved means.

28.5.2

Such signs shall be placed at the alarm valve, dry pipe valve, preaction valve, or deluge valve supplying the corresponding hydraulically designed area.

28.5.3

The sign shall include the following information:

Location of the design area or areas

Size (area) of or number of sprinklers in the design area

Discharge densities over the design area or areas

Required flow and residual pressure demand at the base of the riser or fire pump where applicable

Occupancy classification or commodity classification and maximum permitted storage height and configuration

Hose stream allowance included in addition to the sprinkler demand

Name of the installing contractor

28.6\* General Information Sign

28.6.1

The installing contractor shall provide a general information sign used to determine system design basis and information relevant to the inspection, testing, and maintenance requirements required by NFPA 25.

28.6.1.1

Such general information shall be provided with a permanently marked weatherproof metal or rigid plastic sign, secured with corrosion-resistant wire, chain, or other acceptable means.

28.6.1.2

Such signs shall be placed at each system control riser, antifreeze loop, and auxiliary system control valve.

28.6.2

The sign shall include the following information:

Name and location of the facility protected

Occupancy classification

Commodity classification

Presence of high-piled and/or rack storage

Maximum height of storage planned

Aisle width planned

Encapsulation of pallet loads

Presence of solid shelving

Flow test data

Presence of flammable/combustible liquids

Presence of hazardous materials

Presence of other special storage

Location of venting valve

Location of auxiliary drains and low point drains on dry pipe and preaction systems

Original results of main drain flow test

Original results of dry pipe and double interlock preaction valve test

Name of installing contractor or designer

Indication of presence and location of antifreeze or other auxiliary systems

Where injection systems are installed to treat MIC or corrosion, the type of chemical, concentration of the chemical, and where information can be found as to the proper disposal of the chemical

28.6.3

Combination hydraulic design information and general information are permitted.

28.6.4

The sign shall include the following information:

Location of the design area or areas

Size (area) of or number of sprinklers in the design area

Discharge densities over the design area or areas

Required flow and residual pressure demand at the base of the riser

Occupancy classification or commodity classification and maximum permitted storage height and configuration

Hose stream allowance included in addition to the sprinkler demand

Name of the installing contractor