

SECTION 2
DIVISION 21
FIRE SUPPRESSION

(SEE SECTION 02-28 FOR FIRE ALARM STANDARDS)

DIVISION 21 - FIRE SUPPRESSION

(NOTE: **SEE SECTION 02-28 FOR FIRE ALARM STANDARDS**)

Note: This is a guide for Designers only. Contents shall not be used in lieu of specifications as part of the Designer's contract documents.

SECTION 21 0510 - MECHANICAL GENERAL – FIRE SUPPRESSION

PART 1 - GENERAL

1.1 GENERAL DESIGN CRITERIA

- A. Fire suppression systems are life safety systems and therefore are not subject to the energy conservation criteria applicable to other mechanical/plumbing systems.
- B. The fire suppression systems do not require a Life Cycle Cost Analysis.
- C. All fire suppression systems shall comply with the requirements of the applicable NFPA standards.
 - 1. All fire suppression systems shall comply with the applicable DOI/State Fire Marshal's Office requirements. See the following website for the latest documentation:
<http://www.ncdoi.com/osfm/engineering/documents/sprinkler%282008%29.pdf>.

1.2 STANDARDS

- A. Automatic sprinkler systems shall comply with NFPA 13 – Standard for the Installation of Automatic Sprinkler Systems.
- B. Standpipe and hose valve systems shall comply with NFPA 14 – Installation of Standpipes and Hose Systems.
- C. Fire pump systems shall comply with NFPA 20 – Installation of Centrifugal Fire Pumps.
- D. Fire water storage tanks shall comply with NFPA 22 – Water Tanks for Private Fire Protection.
- E. Site fire water systems shall comply with NFPA 24 – Installation of Private Fire Mains and Their Appurtenances.
- F. Automatic suppression systems for data rooms and server locations shall comply with NFPA 2001 and all appropriate NFPA standards.
- G. Laboratory suppression systems shall comply with NFPA 45 and all appropriate NFPA standards.
- H. All fire suppression systems shall comply with the North Carolina Department of Insurance, Office of State Fire Marshal document titles FIRE SPRINKLER AND SUPPRESSION SYSTEMS, latest edition.

1.3 DESIGN SUMMARY

- A. Fire protection systems shall be designed in accordance with the requirements of NFPA.
- B. Fire protection systems for State-owned facilities (facilities other than the Community Colleges) shall be submitted to the North Carolina Department of Insurance, State Property Fire Fund Division, 410 North Boylan Ave., Raleigh, NC 27603-1212 (919)733-3901 for review and approval at each phase of design.

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- C. Designer shall solicit input from local fire officials when developing fire protection plans for State-owned facilities.
- D. Sprinkler system design shall be shown on fire protection plans, and not included on floor plans of other trades.
- E. Provide a summary sheet with, at the minimum, the following information for each fire sprinkler zone: hazard classification, water application density, available water flow and pressure (static and residual data) as determined by a recent (within one year) water flow test, and test hydrant locations.
- F. Indicate the size and location of any fire pumps required.
- G. Indicate the location of all standpipes, tamper switches and flow switches. Provide a riser diagram for multistory (more than one floor) buildings.
- H. Capacities of equipment shall be described on drawings by the way of equipment schedules. Pump rooms shall be shown large scale plans (1/4" = 1'-0" minimum) with piping larger than 2 inches in diameter drawn double line. All valves and appurtenances (tamper and flow switches) shall be properly indicated. Backflow prevention and flow control devices shall also be shown.
- I. Ensure that "normally closed" type sprinkler valves are used when installed valve is designed to be normally shut/closed.

PART 2 - PRODUCTS

2.1 SYSTEM

- A. As required by NFPA 13 and 24, the sprinkler system shall typically include the following:
 - 1. An alarm check valve with outside water motor gong.
 - 2. A post indicator valve located 40 feet from building walls.
 - 3. A fire department connection on the system side of the water supply check valve.
 - 4. Fire department connections shall be on the street side of buildings and shall be located and arranged so that hose lines can be readily and conveniently attached to the inlets.
 - 5. All sprinkler flow and tamper switches shall be furnished and installed under Division 13, and wired under Division 26.
 - 6. Valves shall comply with the requirements listed in the appropriate NFPA standards and the OSFM documents. All valves shall be fitted with polished brass tags with the stamp-engraved system abbreviation and sequenced valve number. Valve tags shall be attached with brass chains or "S" hooks.
 - 7. Piping shall comply with the requirements listed in the appropriate NFPA standards and the OSFM documents.
 - 8. Dry valve gasket kits from valve manufacturer to be supplied at installation.
 - 9. Manufacturer supplied replacement packing gland kits be provided with each fire pump installed.
 - 10. CPVC (Blazemaster-Plastic Piping) shall not be used in campus sprinkler installation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Specify that sprinkler heads be centered in ceiling tiles unless specific locations make this impossible.
- B. All associated valves for Fire Department Connections and/or Test Header Connections are to be located in Fire Pump Room or Fire Sprinkle Riser Room, no underground valves of these types are permitted.

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- C. Pipe all fire sprinkler drain lines to the exterior of buildings. All exterior drain openings shall be directed towards a solid surface.