



Directive: 21-1 Fire Protection

Responsible Office: Design & Construction

Last Revised Date: October 2021

SUMMARY

This Directive provides the consultants with the requirements of the State University Construction Fund for SUNY projects. The requirements detailed within are to be implemented into the project's specifications and/or drawings. The intent is not for the specifications or drawings to reference back to this document for compliance nor is it intended to override or amend the local or state codes where either is more stringent.

TABLE OF CONTENTS

Contents

SECTION 1 - CODE AND REFERENCE STANDARDS.....	3
A. References	3
SECTION 2 - FIRE PROTECTION SYSTEMS.....	3
A. General Requirements/Regulations.....	3
B. Sprinkler Systems	3
C. Standpipe Systems	4
D. Fire Pump	4
E. Water Supply.....	5
F. Calculations.....	5
SECTION 3 - PIPING REQUIREMENTS	6
A. General.....	6
B. Fire Protection Inside Building Wet or Dry	6
C. Fire Protection Beneath Floor Slab	6

SECTION 1 - CODE AND REFERENCE STANDARDS

A. References

1. Refer to Directive 1B-1, "Requirements Relating to Building Code"
2. Refer to Directive 2-3 "Site Utilities"
3. Codes, Standards, Regulations and Guidance:
 - a. Building Code of NYS (BCNYS)
 - b. Fire Code of NYS (FCNYS)
 - c. National Fire Protection Association (NFPA) Standards

SECTION 2 - FIRE PROTECTION SYSTEMS

A. General Requirements/Regulations

1. Provide fire protection systems designed and stamped by a NYS licensed professional engineer.
2. Fire protection piping is not to be routed over any electrical or telecommunication equipment as per NEC/NFPA-70.
 - a. Fire suppression not serving the electrical or telecommunication rooms is not to be routed through those rooms.
3. Location of the exterior audible device needs to be coordinated with the campus and the local fire department and clearly identified on the drawings.
4. Documents need to call out the Fire Department connection size and type. Location, size and type needs to be coordinated with the local fire department.
5. Design sprinkler and standpipe systems to minimize the use of pressure-regulating devices.

B. Sprinkler Systems

1. Provide quick response sprinkler heads for light hazard occupancies per the FCNYS.
2. Preferred sprinkler layouts are tree system. Gridded and looped systems are not acceptable.
3. Electrical Room
 - a. Coordinate with the campus if they have any specific requirements for fire protection in electrical rooms.
 - b. Sprinklers can be omitted from electrical rooms when all the following requirements are met:
 - 1) The room is dedicated to electrical equipment only.
 - 2) Only dry-type electrical equipment is used.
 - 3) Equipment is installed in a 2-hour fire-rated enclosure including protection for penetrations.
 - 4) Storage is not permitted in the room.
4. Generator Room

- a. If the FCNYS exception for omitting sprinklers from a generator room is not applied, then it will require a dry sprinkler system or dry heads for freeze protection to be provided.
5. Elevator Hoistways and Machine Rooms
 - a. See NFPA 13 and the BCNYS for details on specific sprinkler requirements of elevator hoistways and machine rooms.
 - b. Identify on the fire protection documents whether the elevator is utilized for passengers, service-freight, or both.
 - 1) In buildings where a single elevator is provided, the elevator is to be considered a combination passenger/service-freight.
 - c. Identify on the fire protection documents if an elevator is a Fire Service Access Elevator or Occupant Evacuation Elevator.
 - d. If a traction elevator is specified, the documents must identify if the suspension means are non-combustible or that a rating of not less than a FT-1 is to be provided.

C. Standpipe Systems

1. Where a standpipe is required by the Building Code due to its height, provide a Class I manual wet standpipe in fully sprinklered buildings where the highest occupied floor is less than 75 feet above the lowest level of fire department vehicle access and the responding fire department can provide the system demand from their pumper per NFPA 14.
2. Where a Class I or Class III standpipe is installed provide a hose connection at the highest landing of stairways with stairway access to the roof or on roofs with a slope less than 4 in 12, where stairways do not access the roof, provide a dry hose connection on the roof. Only one standpipe is required to serve the roof. When selecting which standpipe to extend to roof select the most centrally located. Provide an additional hose connection at the top of the most hydraulically remote standpipe for testing purposes.
3. Confirm and document the stairway standpipe hose connection locations (floor landing or intermediate landing) and type with the local Fire Department.
4. Drawings need to clearly indicate pipe routing of the drain from the flow test connection to an appropriate discharge location.
5. Drain Riser shall terminate with full-size elbow to grade with a splash block or receptor that will receive the full flow from the drain riser. If the drain terminates outdoors coordinate with the campus.

D. Fire Pump

1. Per NFPA 20, provide a 2-hour rated separation of the fire pump room; unless the building is fully sprinklered then provide a 1-hour rating.
2. Provide a circulation relief valve which discharges to a drain, per NFPA 20.
3. Determine if a pressure relief valve is required per NFPA 20, if it is, discharge to exterior location with adequate drainage area which will not pose a hazard or nuisance.
4. Coordinate location of and the access to the Fire Pump Room with the local fire department.
 - a. Direct outdoor access is preferred.

- b. Where direct outdoor access is not possible, provide a rated enclosed passageway directly from exterior or a rated stairway. The rating of the passageway is to be the same as the rating of the fire pump room.
5. Drawings are to clearly indicate required clearances around the fire pump and any other associated equipment.
6. Provide ventilation in the fire pump room or house.
7. Locate test header in a location with adequate exterior drainage area which will not pose hazard or nuisance.
8. Alternate power source is required for all Fire Pumps, this source of power shall be provided from an Emergency Generator.

E. Water Supply

1. Fire protection is to be provided with a separate dedicated service from domestic system.
2. Indicate location of the Post Indicating valve in the main line serving the fire protection system, and coordinate with the local Fire Department for the location.
3. Provide electrically supervised post indicator valve in the location prescribed per NFPA 24.
4. If the fire protection main line is connected within 1,700 feet of an auxiliary water source or the system is chemically treated, then provide a double check valve assembly or reduced pressure zone assembly without strainers installed.
5. Pressure regulating valves on the service mains are not to be used.
6. Valve and supply pipe are to be in areas which are maintained to 40 DegF minimum.
7. Heated valve enclosures are to be used only when valves and main piping cannot be located indoors, and the use of such needs to be coordinated with the Construction Fund.

F. Calculations

1. Design the system using the NPFA 13 Hydraulic Calculation Method.
2. Submit the documentation listed in NFPA 13 Chapter "Plans and Calculations" with the Design Manual and Pre-Bid submission. In addition, provide the following:
 - a. Provide a floor plans identifying calculation nodes corresponding to the submitted calculations. Floor plans showing nodes need to show full pipe routing from the hydrant used for pressure test to the critical area in the building used for calculations.
 - b. Clearly indicate on the floor plans, piping profiles or the flow diagrams the pipe elevation at each node where an elevation change occurs. Include the elevation of the test hydrant.
3. Perform and submit water supply test (per NFPA 13 Annex A) prior to Schematic Design, along with preliminary hydraulic calculations to determine the need for a fire pump.
4. Provide a 10 psi pressure safety factor between the available municipal water supply curve and the total system demand point to account for seasonal fluctuations.
5. Confirm with the Campus and the water supplier if actual data for seasonal fluctuations is available.
6. When designing the fire protection system all options to reduce system pressure loss to avoid a fire pump should be investigated (pipe sizes, device pressure drop, etc.).

7. Confirm system design will not cause the residual pressure in the water supply main to drop below 20 psi.

SECTION 3 - PIPING REQUIREMENTS

A. General

1. Valve and equipment connections shall be made with unions for threaded and soldered piping or flanges for welded piping
2. Where more than one material is indicated for a given application; either or both may be specified at Consultants discretion.
3. Weld-o-lets and thread-o-lets are permitted for steel branch connections 2 or more sizes smaller than the main. Holes for weld-o-lets and thread-o-lets shall be machined (torch cutting not acceptable). Copper branch connections shall be made with tee fittings (mechanically extracted collars not acceptable).
4. See Directive 2-3 "Site Utilities" for more information on site piping requirements.

B. Fire Protection Inside Building Wet or Dry

1. All sizes:
 - a. Steel or Galvanized Steel, schedule 40, Grade A, Type E or S, ASTM A53, A106, Cast Steel, Steel or Ductile Iron Fittings, Threaded, Welded or Groove Joints.

C. Fire Protection Beneath Floor Slab

1. All sizes:
 - a. Ductile Iron, Class 52, Cement Lined Asphaltic Coating, AWWA C151, Ductile Iron fittings, Mechanical Joint Lock with thrust blocks.
 - b. PVC, Schedule 40, Pressure Pipe AWWA C900 or C905, PVC fittings, Bell and Spigot with thrust blocks.