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**Chief of Fire**

**Steven P. Evans**
**First Deputy Chief**

**Deputy Chiefs**
**Robert Cussen**
**Elton Davis**
**Thomas Clarke**
**Barry Lasky**
**Jeffrey Kite**

**D E P A R T M E N T O F F I R E**

**Ben Walsh, Mayor**

## Fire Sprinkler System Permit Submission Requirements

In accordance with the Uniform Fire Prevention and Building Code of New York State and the National Standard for the Installation of Sprinkler Systems (NFPA 13), all sprinkler contractors performing work on fire sprinkler systems in the City of Syracuse shall apply for a permit through City of Syracuse Permit's Desk (315) 448-8600. All fire sprinkler systems and associated submittal documents for systems installed within the City of Syracuse are subject to the Syracuse Fire Prevention Bureau's review and inspection process. The submitted documents shall be prepared by a professional engineer registered in the State of New York and bare the seal of the design professional in accordance with Article 145 of the New York State Education Law. Supporting documentation shall be submitted with all plan submittals.

The following will describe in general information necessary for our review:

- Written scope of work which includes the design standards, overview of installation, and intent of the system.
- A complete floor plan which includes the use and labeling of each room within the building and all dimensional criteria of the rooms being protected (e.g. length, width, ceiling heights, and wall construction).
- All depicted detail and locations of sprinkler risers, anti-freeze loops, piping, sizes, supports, heads, drains, all styles of valves.
- Manufacturer's equipment and material listing information.
- All obstruction detail and mechanical equipment that could affect sprinkler operations.

Submissions must consist of two (2) sets of all documents (plans, hydraulic calculations, and manufacturer's material information).

The following outlines the in detail what submitted plans shall include:

Working drawings: (extracted from NFPA 13)

Working plans shall be drawn to an indicated scale, on sheets of uniform size, with a plan of each floor, and shall show those items from the following list that pertain to the design of the system:

(1) Name of owner and occupant.
(2) Location, including street address.
(3) Point of compass.
(4) Full height cross section, or schematic diagram, including structural member information if required for clarity and including ceiling construction and method of protection for nonmetallic piping.
(5) Location of partitions.
(6) Location of fire walls.
(7) Occupancy class of each area or room.
(8) Location and size of concealed spaces, closets, attics, and bathrooms.
(9) Any small enclosures in which no sprinklers are to be installed.
(10) Size of city main in street and whether dead end or circulating; if dead end, direction and distance to nearest circulating main; and city main test results and system elevation relative to test hydrant.
(11) Other sources of water supply, with pressure or elevation.
(12) Make, type, model, and nominal K-factor of sprinklers including sprinkler identification number.
(13) Temperature rating and location of high-temperature sprinklers.
(14) Total area protected by each system on each floor.
(15) Number of sprinklers on each riser per floor.
(16) Total number of sprinklers on each dry pipe system, preaction system, combined dry pipe–preaction system, or deluge system.
(17) Approximate capacity in gallons of each dry pipe system.



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(18) Pipe type and schedule of wall thickness.
(19) Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions). Where typical branch lines prevail, it shall be necessary to size only one typical line.
(20) Location and size of riser nipples.
(21) Type of fittings and joints and location of all welds and bends. The contractor shall specify on drawing any sections to be shop welded and the type of fittings or formations to be used.
(22) Type and locations of hangers, sleeves, braces, and methods of securing sprinklers when applicable.
(23) All control valves, check valves, drain pipes, and test connections.
(24) Make, type, model, and size of alarm or dry pipe valve.
(25) Make, type, model, and size of preaction or deluge valve.
(26) Kind and location of alarm bells.
(27) Size and location of standpipe risers, hose outlets, hand hose, monitor nozzles, and related equipment.
(28) Private fire service main sizes, lengths, locations, weights, materials, point of connection to city main; the sizes, types and locations of valves, valve indicators, regulators, meters, and valve pits; and the depth that the top of the pipe is laid below grade.
(29) Piping provisions for flushing.
(30) Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear.
(31) For hydraulically designed systems, the information on the hydraulic data nameplate.
(32) A graphic representation of the scale used on all plans.
(33) Name and address of contractor.
(34) Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets.
(35) The minimum rate of water application (density or flow or discharge pressure), the design area of water application, in-rack sprinkler demand, and the water required for hose streams both inside and outside.
(36) The total quantity of water and the pressure required noted at a common reference point for each system.
(37) Relative elevations of sprinklers, junction points, and supply or reference points.
(38) If room design method is used, all unprotected wall openings throughout the floor protected.
(39) Calculation of loads for sizing and details of sway bracing.
(40) The setting for pressure-reducing valves.
(41) Information about backflow preventers (manufacturer, size, type).
(42) Information about listed antifreeze solution used (type and amount).
(43) Size and location of hydrants, showing size and number of outlets and if outlets are to be equipped with independent gate valves. Whether hose houses and equipment are to be provided, and by whom, shall be indicated. Static and residual hydrants that were used in flow tests shall be shown.
(44) Size, location, and piping arrangement of fire department connections.
(45) Ceiling/roof heights and slopes not shown in the full height cross section.
(46) Edition year of NFPA 13 to which the sprinkler system is designed.

Water Supply Information: (Extracted from NFPA 13)

(1) Location and elevation of static and residual test gauge with relation to the riser reference point.
(2) Flow location.
(3) Static pressure, psi (bar).
(4) Residual pressure, psi (bar).
(5) Flow, gpm (L/min).
(6) Date
(7) Time
(8) Name of person who conducted the test or supplied the information.
(9) Other sources of water supply, with pressure or elevation.

Hydraulic Calculations Forms: (Extracted from NFPA 13)

Hydraulic Calculations shall be prepared on forms that include a summary sheet, detailed worksheets, and a graph sheet as required and outlined in NFPA 13. At this time The City of Syracuse is not capable of accepting computer-generated hydraulic reports.

Summary Sheet. The summary sheet shall contain the following information, where applicable:

(1) Date
(2) Location
(3) Name of owner and occupant
(4) Building number or other identification
(5) Description of hazard (for storage applications, the commodity classification, storage height, and rack configuration shall be included).
(6) Name and address of contractor or designer



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(7) Name of approving agency
(8) System design requirements, as follows:
    (a) Design area of water application, $ft^2$.
    (b) Minimum rate of water application (density), $gpm/ft^2$. Where sprinklers are listed with minimum water application in gpm (L/min) or pressure in psi (bar), the minimum rate of water application shall be indicated in gpm or pressure, psi (bar).
    (c) Area per sprinkler, $ft^2$.
(9) Total water requirements as calculated, including allowance for inside hose, outside hydrants, and water curtain and exposure sprinklers.
(10) Allowance for in-rack sprinklers, gpm (L/min)
(11) Limitations (dimension, flow, and pressure) on extended coverage or other listed special sprinklers.

Detailed Worksheets. Detailed worksheets or computer printout sheets shall contain the following information:

(1) Sheet number
(2) Sprinkler description and discharge constant (K)
(3) Hydraulic reference points
(4) Flow in gpm (L/min)
(5) Pipe size
(6) Pipe lengths, center-to-center of fittings
(7) Equivalent pipe lengths for fittings and devices
(8) Friction loss in psi/ft (bar/m) of pipe
(9) Total friction loss between reference points
(10) In-rack sprinkler demand balanced to ceiling demand
(11) Elevation head in psi (bar) between reference points
(12) Required pressure in psi (bar) at each reference point
(13) Velocity pressure and normal pressure if included in calculations
(14) Notes to indicate starting points or reference to other sheets or to clarify data shown
(15) Diagram to accompany gridded system calculations to indicate flow quantities and directions for lines with sprinklers operating in the remote area.
(16) Combined K-factor calculations for sprinklers on drops, armovers, or sprigs where calculations do not begin at the sprinkler.

Graph Sheet. A graphic representation of the complete hydraulic calculation shall be plotted on semiexponential graph paper (Q1.85) and shall include the following:

(1) Water supply curve
(2) Sprinkler system demand
(3) Hose allowance (where applicable)
(4) In-rack sprinkler demand (where applicable)

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