



Automatic Fire Sprinkler Submittal Requirements

All commercial and industrial buildings with a total floor area of 5000 sq. ft. shall have an approved automatic sprinkler system installed. The Windsor-Severance Fire Protection District will allow an approved installation of a 2 hour fire wall to break up the total floor area below 5000 sq. ft. Floor areas shall be defined as printed in the 2003 IFC, Chapter 10. Fire walls shall be defined by Chapter 7 of the 2003 IBC.

Fire sprinkler systems, when required, shall meet the criteria of the IFC Chapter 9, and all applicable provisions of NFPA 13, NFPA 13-R, and NFPA 13-D. It is required that you obtain a permit from the Windsor-Severance Fire Protection District for any project located within the district boundaries. A full submittal packet, in accordance with NFPA Standards, shall be required for all sprinkler system installations. Inspection requests must be made a week in advance.

Working Plans

Working plans shall be submitted for approval to the authority having jurisdiction, before any equipment is installed or remodeled. Deviation from the approved plans shall require permission of the Windsor-Severance Fire Protection District. Working plans shall be drawn on sheets with a maximum size of 24" x 36" (ANSI C) and a minimum of 1/8" = 1'0", with a plan of each floor, and shall show those items from the following list that pertain to the design of the system. A minimum of two sets of drawings are required to be submitted to the Fire District Prevention Office located at 100 7th Street, Windsor, CO 80550 and shall include, but are not limited to the following items:

- (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 (see A-9-2.1).
- (11) Other sources of water supply, with pressure or elevation.
- (12) Make, type, model, and nominal K-factor of sprinklers.
- (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.
- (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, joints and location of all welds and bends. The contractor shall specify on the 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 which corresponds with comparable reference points on the hydraulic calculation sheets.
- (35) The minimum rate of water application (density), 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 should be 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 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.

The working plan submittal shall include the manufacturer's installation instructions for any specially listed equipment; including descriptions, applications, and limitations for any sprinklers, devices, piping, or fittings.

Working Plans for Automatic Sprinkler Systems with Non-Fire Protection Connections

Special symbols shall be used and explained for auxiliary piping, pumps, heat exchangers, valves, strainers, and the like; clearly distinguishing these devices and piping runs from those of the sprinkler system. Model number, type, and manufacturer's name shall be identified for each piece of auxiliary equipment.

Water Supply Information.

Water Supply Capacity Information.

The following information shall be included:

- (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) Test conducted by or information supplied by
- (9) Other sources of water supply, with pressure or elevation

Hydraulic Calculation Forms

Hydraulic calculations shall be prepared on form sheets which include: a summary sheet, detailed worksheets, and a graph sheet.

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
- (6) Name and address of contractor or designer
- (7) Name of approving agency
- (8) System design requirements, as follows:
 - a. Design area of water application, ft² (m²)
 - b. Minimum rate of water application (density), gpm/ft² (mm/min)
 - c. Area per sprinkler, ft² (m²)

- (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 demand (where applicable)
- (4) In-rack sprinkler demand (where applicable)

General

Shelving units and shelves shall be constructed so as not to provide storage closer than two feet below any ceiling; and no closer than eighteen inches below the horizontal plane of any sprinkler head deflector.

Automatic sprinkler systems shall be supervised by an approved outside monitoring agency at all times, except for:

1. Twenty heads or less in a group I, Division I occupancy
2. When NFPA 13-R systems cover less than 3600 square feet.

Sprinkler piping and hangars shall not be covered (and/or concealed) by any means prior to being approved by the Fire District Prevention Office. **THIS INCLUDES DROP GRID STYLE CEILINGS.**

Sprinklers, which require a 200-pound hydrostatic test procedure, shall have the test witnessed and approved by the Fire District Prevention personnel. Written certification shall be provided to the fire department, prior to system acceptance and approval.

Flow/Tamper

Automatic fire extinguishing systems shall be provided with flow switches; zoned per floor, in multi-story buildings with a minimum of one flow switch, per floor, required. Additional flow switches may be required on individual floors; as deemed necessary due to special building characteristics, large floor areas, different occupancy types or uses, or any special concern on the part of the Fire District, which would warrant their installation. Any of these special considerations could initiate a requirement for a fire alarm system to be centrally monitored by an approved central, proprietary U.L. approved monitoring agency.

Any floor or area of the building, which is required to have flow switches (as outlined above), shall have installed an isolation valve with a corresponding tamper switch. Tamper switches shall be wired such that it would send in a trouble signal on the same zone as the corresponding zone flow alarm. Tamper switches shall be provided on all automatic sprinkler systems (which have flow switches), and isolation valves installed are required to be centrally monitored per International Fire Code, Chapter 10.

Valves

Sprinkler valves shall be secured per the provisions of NFPA 13/13-R/13-D. In sprinklered buildings that are protected with fire alarm detection systems, valves shall be tied directly into a supervisory alarm circuit and shall be monitored through the fire alarm system. In buildings that are not protected by fire detection devices, the sprinkler control valves shall be secured by one of the following methods: locked in the open position with chain and or padlock; locked in a room designated for that purpose and identified on the door accordingly; or locked in a cage or other approved area, which can be adequately supervised and secured.

Suitable signage must be provided on the door of the enclosure in which any sprinkler system valves/controls are located; stating "Fire Sprinkler Control Valves" in two-inch high block letters, with a stroke of not less than ½" and of a color contrasting with its background. Valves or switches which are located within the building elements must also be identified in an approved, suitable and easy identifiable method or manner; at the point/location within the building. Elements must also be identified in an approved suitable, and easily identifiable method or manner; at the point/location giving access to said valve component.

Fire Department Connections

All standpipe and automatic fire sprinkler system fire department connections and valves shall be properly identified; so as to indicate clearly what component and each piece of equipment it serves.

A Fire District approved exterior horn and light unit shall be installed within twenty feet of the exterior fire department connection. Proper signage shall be installed, per Fire District requirements, when applicable. Where there may be additional requirements for fire department connections on residential sprinkler systems; refer to NFPA 13D and NFPA 13R, for standards and specifications.

Fire department connections shall be immediately discernable and the fire department shall not, in any way, be deterred or hindered from gaining immediate access to such connections. All fire department connections are to be installed at locations approved by the Prevention Office. (Facing the street, from which the building is addressed, is the preferred location whenever possible). A fire hydrant capable of supplementing the system shall be within a maximum of 150 feet from the fire department connection. If special building conditions (and/or restrictions) exist and the fire department connection cannot be located per this standard, approval by the Windsor-Severance Fire Protection District (for an alternate location) shall be obtained.

High Piled Combustible Stock

In buildings used for high-piled combustible storage, fire protection shall meet the criteria of the International Fire Code Chapter 23, the applicable provisions of NFPA13, NFPA 230.

Rack Storage

In buildings where rack storage is utilized, fire protection requirements shall meet the criteria of the 2003 International Fire Code, Chapter 23, Section 2308; any applicable provisions of NFPA 13, NFPA 231-C, 1998 Edition.