



## Building Inspections

# Sprinkler Permit Applications

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### **REQUIREMENTS FOR NFPA 13 SYSTEM**

A complete application for a Sprinkler Permit will comply with the requirements of Chapter 8 of NFPA 13.

- **Hydraulic calculations shall include a summary, detailed work and graph sheet**
  1. **Summary sheet to include:**
    - name of owner, date and location
    - hazard classification
    - name and address of contractor, designer
    - approving engineer
    - density, flow and pressure data
  2. **Work Sheets:**
    - sheet number
    - sprinkler description and discharge constant (“K” factor)
    - hydraulic reference points, flow (gpm), pipe size, pipe lengths
    - equivalent pipe lengths, friction loss per foot of pipe, total friction
    - loss, elevation head between reference points, required
    - pressure at each reference point, notes to indicate starting point
  3. **Graph Sheet:**
    - water supply curve
    - sprinkler system demand
    - hose demand (where applicable)
    - in-rack sprinkler demand (where applicable)
  
- **Additional information required**
  1. **System Design Requirements:**
    - rate of water application (density)
    - area covered by each sprinkler
    - design area clearly identified on drawings
    - total water requirements as calculated, including allowance for inside hose, outside hydrants, water curtains and exposure sprinkler
    - allowance for in-rack sprinklers
    - limitations (dimension, flow and pressure) on extended coverage or other listed special sprinklers
  2. **Water Supply Information:**
    - location and elevation of static and residual test
    - flow location, static pressure, residual pressure, flow, date
    - specify if test conducted or is information supplied by others

## **REQUIREMENTS FOR NFPA 13R SYSTEM**

### **NFPA 13R:**

- Residential up to and including four-storey apartments
- Lodging and rooming houses
- Board and care facilities (16 or fewer slow-evacuation and prompt-evacuation types)
- Hotels, motels and dormitories

### **NFPA 13R Requirements:**

- 1. Working plans are to be submitted to the authority having jurisdiction before any equipment is installed or remodelled and shall not be deviated from without the approval of the authority having jurisdiction.**
- 2. Working plans will show the following information:**
  - name of owner and occupant
  - street address of the project
  - the ceiling construction
  - location of partitions and fire walls
  - occupancy of each area or room
  - location and size of concealed spaces, attics, closets and bathrooms
  - any small enclosure to which no sprinklers are to be installed
  - size, pressure and city main test results
  - make, manufacturer, type, heat-response element, temperature rating and nominal orifice size of the sprinkler
  - temperature rating and location of high temperature sprinklers
  - number of sprinklers on each riser per floor
  - type and location of alarm bells
  - type of pipe and fittings
  - type of protection for non-metallic pipe
  - nominal pipe size with lengths shown to scale
  - location and size of riser nipples
  - types of fittings and joints and the locations of all welds and bends
  - types and locations of hangers, sleeves, and braces and methods of securing sprinklers, where applicable
  - all control valves, check valves, drain pipes, test connections and FDC location
  - underground pipe size, length, location, weight, material, and point of connection to the city main: type of valves, meters, and valve pits, and the depth at which the top of the pipe is laid below grade
  - material to be included on the hydraulic data nameplate

The installer shall perform all required acceptance tests, complete the Contractor's Material and Test Certificate(s) and forward the certificate(s) to the authority having jurisdiction prior to asking for approval of the installation.

## **REQUIREMENTS FOR NFPA 13D SYSTEM**

### **NFPA 13D:**

- A minimum standard for single family dwellings, duplexes and mobiles homes.
- Sprinklers are not required in garages, open attached porches, carports and similar structures.
- Sprinklers are not required in attics, crawl spaces and other concealed spaces that are not intended for living or storage.
- Sprinklers are not required in clothes closets, linen closets and pantries where the floor area does not exceed 24 square feet and the least dimension does not exceed 3 feet.
- Limited Area Design method can be used for single story buildings and manufactured homes if not more than 2,000 square feet.

### **NFPA 13D Requirements:**

- 1. Working drawings are to be submitted to the authority having jurisdiction before any equipment is installed or remodelled and shall not be deviated from without the approval of the authority having jurisdiction. Design and drawings for this type of system may be undertaken by licensed sprinkler installers acceptable to the authority having jurisdiction.**
- 2. Working drawings will show, but not limited to, the following information:**
  - the name of owner and occupant
  - the street address of the project
  - the ceiling construction
  - the location of rooms and partitions (compartments)
  - identify the compartment and number of sprinklers involved for the design
  - identify areas where no sprinklers are to be installed
  - show location of water flow alarm (exempt if building equipped with smoke detectors in accordance with NFPA 72)
  - dimension sprinkler head spacing and floor area coverage
  - dimension size of piping
  - location and layout of valve station
- 3. Calculation sheet will provide the following minimum information:**
  - the minimum sprinkler head pressure and flow (gpm) at the most remote head
  - the minimum flow to each head in a multiple head design
  - number of sprinkler heads in design compartment
  - verify water demand requirements (# of heads x calculated discharge per head)
  - list the city water pressure and flow at street
  - provide calculations for pressure losses for meter, elevation differences, underground piping, piping within the building to the farthest sprinkler head and all fittings from the control valve to the farthest sprinkler
  - verification that the supply pressure exceeds the required pressure for the design sprinklers

## **REQUIREMENTS FOR ALTERATIONS TO EXISTING SPRINKLER SYSTEMS WITHIN EXISTING SPACES**

### **Minor alterations include:**

- Work not affecting branch pipe sizes, in hydraulically calculated systems (*no alterations allowed in a hydraulic design area*).
- Additions of a maximum of 8 heads (outside the *design area* only), or relocation of a maximum of 20 heads (*including the 8 maximum sprinkler heads to be added*).
- Turning heads up or down to accommodate a new ceiling, including additional heads in a newly created concealed space above the ceiling.
- Areas where there is no change in use or hazard classification.

### **Permit requirements for minor alterations (Note that plans may be designed by a qualified sprinkler installer):**

- Floor plan of area affected by alteration.
- Number and location of heads to be installed or relocated.
- Number and location of heads to be raised, lowered, removed or replaced, including type of heads to be installed.
- Changes to pipe sizes in pipe schedule system as per table 6-5.2.3 NFPA13, name, phone number and trade qualification number installer.

### **Major alterations include:**

- Work including changes to branch pipe sizes in a hydraulically calculated system, work on the valve station.
- Additions or relocation of more than 8 heads excluding additions of heads to sprinkler concealed spaces created by adding a ceiling.
- Additions of any head inside the design area.

### **Permit requirements for major alterations:**

- Floor plan of area affected by alteration, number and location of heads to be installed or relocated.
- Number and location of heads to be raised, lowered, removed or replaced, including type of heads.
- Changes to pipe sizes.
- Hydraulic calculation where changes are inside *design area*.
- Schedule B, provided by a mechanical engineer.

### **Note that:**

- **No work is permitted until the building/sprinkler permit is issued.**
- **Verification of annual testing and/or a mechanical engineer's review of the overall system may be required.**
- **The Building Section reserves the right to determine whether a project is a major or a minor alteration.**
- **As-built drawings are required for installations not conforming to approved drawings.**

## **REQUIREMENTS FOR DESIGN/BUILD SPRINKLER INSTALLATIONS**

The “design/build” option is intended for large projects. Large projects are defined as projects that are required to be of non-combustible construction by the Building Code. This should be discussed with the City Building Inspection Section well in advance of permit issuance.

### **1. APPLICATION – Step 1**

- Schedule B from mechanical engineer
- Proof of water supply (provide hydraulic graph)
- Fire line sizing and material
- Design summary (building size, occupancy classification, density)
- Civil design to include hydrant, FDC, meter chamber locations and underground piping
- Sprinkler fee on Building Permit

### **2. BUILDING PERMIT ISSUED – Step 2**

- No sprinkler installation or frame inspection until working drawings and design approved
- Fire line installation may be inspected

### **3. DESIGN BUILD DRAWING SUBMITTED – Step 3**

- A minimum of ten working days is required for plan review and approval
- Approved set of plans must be on site for sprinkler inspection

### **4. ROUGH IN AND FINAL INSPECTIONS – Step 4**

## **MAJOR SPRINKLER COMPONENTS TO BE INSPECTED**

### **Included, but not limited to:**

#### **1. Fireline Inspection (Underground)**

- underground certificate
- witness flushing
- witness 200 lb. test
- rodding and thrusting blocks
- pipe materials
- bedding materials
- depth of cover
- verify appropriate certification of materials (UL/ULC)

#### **2. Rough In (Sprinkler)**

- conformity to approved plans (must be on site)
- above ground certificate complete with trades qualification
- valve station configuration
- hangers
- seismic restraint
- obstructions
- drains
- fire department connection
- location of hydrant

#### **3. Final Inspection (Sprinkler System)**

- alarm verification
- bucket test (13D only)
- securing valves
- trim completion
- obstruction
- operating manuals (inclusive of shop drawings, cut sheet of devices, recommended maintenance schedule and name, phone number and address of installer) and/or fire safety plan
- Schedule "C-B" from design professional