



**BRAINERD FIRE DEPARTMENT**  
Fire Inspections  
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## **AUTOMATIC FIRE SPRINKLER SYSTEMS**

### **General Information**

- All sprinkler systems must meet the minimum requirements of the Minnesota State Fire Code (MSFC) and NFPA Standards.
- The entire sprinkler system must be designed and installed per current applicable standards, i.e., 13, 13D, 13R and currently adopted Minnesota State Building Code, Chapter 9.

### **Calculations**

- Sprinkler contractor is responsible for choosing the appropriate density and for the accuracy of hydraulic calculations.
- The remote hydraulic area for a combustibile attic must be increased 30% for dry systems and an additional 30% for roof slope. (2535 square feet)
- Sprinkler systems in buildings used for storage must have a minimum remote area designed for 2000 square feet.
- Sprinkler systems in industrial buildings with an undetermined use must have a minimum sprinkler design of Ordinary Hazard Group 2 over a 3000 square foot design area.
- Sprinkler systems with specialized design criteria (i.e. high pile storage, flammable liquids) must include a code analysis of the proposed design including specific code references.

### **Water Supply**

- Sprinkler systems in multi-tenant buildings must have the riser assembly located in a separate room with an exterior access door or when approved, in an interior room immediately adjacent to an access door. All doors on the interior and exterior of the building providing access to sprinkler system controls must be clearly labeled as such.
- Water flow data may not be more than 3 years old.
- Water lines, when serving both a sprinkler system and hydrant, must be a minimum of 8-inches up to the point of the hydrant. The line to the building can be reduced to 6-inches if this is adequate to supply the system.
- Water lines supplying only a sprinkler system must meet NFPA standards.
- All systems except 13D systems must have a fire supply line separate from the domestic line.
- Existing sprinkler systems with combined domestic and fire system water supply must be retrofitted with a solenoid valve on the domestic side when the building or proven by hydraulic demand system is modified.
- Townhome sprinkler systems with NFPA 13R shall be provided with a separate riser room.

### **Installation Requirements**

- NFPA 13 All areas of a building shall be sprinklered including: attics, electrical rooms, under stairs, under, overhead doors, each landing in stairwell, concealed combustible areas, (elevator mechanical room, elevator shaft in I-1), etc.
- Exterior combustible decks on R-2 apartment buildings shall have sprinkler protection above.
- Where required by the International Mechanical Code, automatic sprinklers shall be provided in ducts conveying hazardous exhaust, flammable or combustible materials.  
**Exception:** Ducts where the largest cross-sectional diameter of the duct is less than 10-inches.

### **System Components and Hardware**

- Fire Department connection shall be a minimum of 15-feet from gas meters and electric transformers.
- The Fire Department connection shall be a minimum of 18 inches above grade, maximum 4-feet above grade.
- All indicating control valves and risers shall have permanent signs identifying the area of the building that is controlled by that valve or riser.
- A zone map is required on all multiple riser systems. The map must be permanently mounted adjacent to sprinkler riser, alarm panel and annunciator panel.
- Power supply breakers for all alarm system components, including exterior sprinkler alarms and air compressors must have approved locking devices to prevent the accidental disconnection of power.

### **Monitoring & Alarm**

- Separate plans and permit are required for all fire alarm systems
- Systems with 20 or more heads must be equipped with central station monitoring service.
- Monitoring systems must comply with NFPA 72 including panel requirement for audible trouble signals and must have two means of signal transmission.
- All components of the system must be UL listed for their application and be compatible.
- The fire alarm control panel or a remote annunciator panel must be located at the main entrance unless otherwise approved.
- The fire alarm control panel must be located in an enclosed room or area, i.e.: mechanical room or main entrance area. Obtain prior approval of FACP location.

- A smoke detector or manual pull station is not required in the room or area of the fire alarm control panel, monitoring panel and dialer.
- All indicating control valves, including WPIV's, must be secured and electronically supervised.
- All sprinkler systems containing air pressure shall have the air pressure electronically monitored.

- Zoning of the sprinkler system shall be approved by a Fire Inspector and shall be annunciated on the alarm panel and at remote annunciator panels.
- Each floor shall be a separate fire alarm zone and be annunciated at the alarm panel.
- Test the flow switch retard setting with inspector's test, 30-60 second retard setting is required.
- Dry valve trip test-water to flow from inspector's test within 60 seconds on systems containing more than 500 gallons. Accelerators and/or exhausters will be required if the 60 second requirement is not met.
- Main drain and primary inspector's test must terminate at the exterior of the building.

### **Inspections Required**

- All underground water supply lines must be properly flushed and hydrostatically tested. Documentation of test must be available. Contact Brainerd Public Utilities 218-829-8726
- 24 hour advance notice to the Fire Inspection Division is required for inspections and witnessing tests.
- Rough-in inspection required if piping or hangers will be concealed.
- 2 hour 200# wet pressure test including the fire department connection.
- 24 hour air pressure test and trip test (for dry systems only)
- Main drain and alarm test.
- Flow switch setting of 35-60 second delay when flowing through the inspector's test.
- Permit, inspection record, and one set of city approved plans for work must be kept at the site or inspections will not be performed.
- System must be 100% tested prior to calling for inspection. If an acceptance test of system fails a re-inspection must be scheduled.