

Minnesota Department of Public Safety State Fire Marshal Division

Fire Alarms for Educational Occupancies

Educational occupancies are defined as preschools, K-12 schools and day care centers. Fire alarms are required in the 2020 Minnesota State Fire Code (MSFC) for educational occupancies having 50 or more people. The number of people is based on an occupant load factor.

Building sizes where fire alarm systems are typically required:

- Day care centers – 35 sq. ft. per person times 50 people = 1,750 sq. ft.
- Schools – 20 sq. ft. per person times 50 people = 1,000 sq. ft.

Initiation Devices in New and Existing Educational Occupancies

Manual Initiation Devices

Fire alarm pull boxes are required as a way to manually initiate an alarm signal. (See MSFC Section 907.4.2 and MSFC 1103.7.2.2)

Building Protection Provided	Where Required
No fire sprinkler system or automatic smoke detection throughout the corridor system	Within 5 feet of all exits Within 200 feet of travel in the building
Fire alarm system with automatic smoke detection throughout the corridor system	Main office In a custodial area
Fire sprinkler system throughout the building	Main office In a custodial area

- **Specific manual pull box requirements**

- Mounting height: 42-48 inches above the floor (measured at the pull handle).
- Red in color.
- Where the fire alarm system is not monitored off-site by a supervising station, a permanent sign must be mounted near each pull station reading "When alarm sounds, call fire department."

Automatic Initiation Devices

Automatic fire detectors are required throughout the building to continually monitor ambient conditions for smoke or heat.

Location or Area	Device Required – No Fire Sprinkler System	Device Required – Fire Sprinkler System
Laundry rooms	Heat or smoke detection	None required
Boiler and furnace rooms	Heat or smoke detection	None required
Mechanical and electrical rooms	Heat or smoke detection	None required
Shops	Heat or smoke detection	None required
Laboratories	Heat or smoke detection	None required



Minnesota Department of Public Safety State Fire Marshal Division

Kitchens	Heat or smoke detection	None required
Locker rooms	Heat or smoke detection	None required
Trash-collection rooms	Heat or smoke detection	None required
Custodial closets	Heat or smoke detection	None required
Storage rooms	Heat or smoke detection	None required
Lounges	Heat or smoke detection	None required
Similar normally unoccupied rooms or areas	Heat or smoke detection	None required
Single exit rooms having 11 or more people that must egress through an intervening room	Smoke detection	None required
Above fire alarm control panels	Smoke detection	Smoke detection
Near fire alarm power supplies	Smoke detection	Smoke detection
Air-handling units (AHU)	Smoke detection (supervisory signal, not general evacuation)	Smoke detection (supervisory signal, not general evacuation)
Elevator control (lobbies and machine rooms) – see note below	Smoke detection (supervisory signal, not general evacuation)	Smoke detection (supervisory signal, not general evacuation)

- Automatic smoke detectors installed to control or recall elevators or to control doors for elevators, elevator lobbies, or elevator shafts must initiate a supervisory signal, and shall not initiate an alarm signal. Elevator recall and firefighters emergency operation for elevators must only be controlled by the designated elevator smoke detectors and should not be initiated by other building fire detectors or alarm signals (See MSFC Section 907.3.2).

Notification Appliances in New Educational Occupancies *New 2020 MSFC Requirement*

Fire alarms in educational occupancies must include an audible and visual evacuation signal. The 2020 MSFC (effective on March 31, 2020) also requires emergency voice/alarm communications when there are more than 100 occupants.

- The emergency voice/alarm communication system must be:
 - Designed and installed in accordance with NFPA 72 (MSFC Section 907.5.2.2)
 - Initiated by any automatic fire detector, sprinkler waterflow or manual pull box.
 - Sound an alert tone, followed by voice instructions giving approved information and directions for a general or staged evacuation in accordance with the building's fire safety and evacuation plans (See MSFC Section 404),
- The emergency voice/alarm communication system is allowed to be used for other (common) announcements, provided that during an emergency the fire alarm system takes precedence over any other use.

Notification in Existing Educational Occupancies

- Activation of the fire alarm system or automatic sprinkler system shall initiate a general audible evacuation signal (See MSFC Section 1103.7.2.4). Visible notification may also be provided depending on the standard in effect at the time of installation.



Minnesota Department of Public Safety State Fire Marshal Division

Portable Classrooms and Permanent Modular Classroom Buildings

A fire alarm system is required for buildings:

- 1,000 square feet or more or
- Located within 20 feet from another building. (MSFC Section 1103.7.2.1).

Fire Alarm Panel/Notification Installation, Upgrade or Replacement in New and Existing Educational Occupancies With Occupant Loads Exceeding 100

When installing or replacing a fire alarm control panel:

- The panel must be voice/alarm communication capable.
- Existing notification appliances may remain in service provided:
 - They are fully compatible with the new fire alarm control panel and software.
 - They meet the required sound pressure levels.
 - There is a pronounced and defined audible separation between the existing notification appliances and any new or replaced voice/alarm communication devices so that the voice/alarm is not acoustically obscured by existing notification appliances.
 - Any existing non-compatible notification appliances must be replaced with voice/alarm capable devices.

When Installing or Replacing Notification Appliances

- Any new or replaced notification appliances must be voice/alarm capable.

Buildings Undergoing a Level III Alteration

- For buildings undergoing a Level III alteration as defined by the Minnesota Conservation Code for Existing Buildings, Section 904.2, (where the work area is 50 percent or more of the building area), the fire alarm system must have voice/alarm notification as required for new construction.

Monitoring

Where sprinkler systems are provided, valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures and waterflow switches on all sprinkler systems shall be electrically supervised by a listed fire alarm control unit and monitored by an approved supervising station service (See MSFC Section 903.4):

- In new buildings with more than six limited area sprinklers.
- In existing buildings when the number of sprinklers is 100 or more.



Minnesota Department of Public Safety State Fire Marshal Division

Nuisance Alarms

Fire alarm equipment consists of precise sensors and other sensitive electronics. To limit nuisance alarms, fire alarm panels and devices should be selected and installed to provide the proper fire protection without compromising the integrity of the equipment. Fire alarm equipment should only be installed in locations where:

- Ambient conditions do not exceed the voltage, temperature, and humidity limits specified by the product manufacturer or product listing.
 - Vibration or jarring does not exist.
 - Devices are not subject to high air movement.
 - There is no electrical or radio frequency (RF) interference.
 - Devices are not subject to normal ambient smoke such as in kitchens or garages.
 - Devices are not subject to normal ambient humidity such as in bathrooms with showers.
- Where ambient conditions prohibit installation of an automatic smoke detector, an automatic heat detector shall be permitted (See MSFC 907.4.3).

Questions

Contact the SFMD 651-201-7221 or by email at fire.code@state.mn.us

