FIRE ALARM WORK GROUP MEETING
Meeting Minutes – June 24, 2025

Work Group Representatives
Contacts:
Chair - Crystal Sujeski, OSFM-CDA-Div. Chief, (510) 846-1276, crystal.sujeski@fire.ca.gov
Co-Chair – Travis Tyler, CSU OSF-Dir. of Fire Safety, (562) 900-3639, ttyler@calstate.edu

1. CALL TO ORDER: Sujeski called the meeting to order at 8:05 AM

A. Welcome/Introductions **Tyler**
B. Introductions – All participated
    i. Reviewed how to subscribe for OSFM Work Group notifications and emails.
        1. Workgroups | OSFM
        2. Subscribe to Newsletter | OSFM
C. Agenda & Minutes Review
    i. Please email proposals to Chairs and jena.garcia@fire.ca.gov to be agendized.

2. OLD BUSINESS **Tyler**

A. Review Drafted Charter (Sujeski) – Still drafting
B. Code Comparison Matrix (Tyler) – Presented updates
C. Code Proposals - Revisit
    i. Section 907
        1. Sagiv Weiss-Ishai / Travis Tyler – FA Zoning
            a. 907.6.4 Replace the CFC with IFC since most of the CA amendments are ready included in the NFPA 72-2025 editions.
        2. Sagiv Weiss-Ishai – E Fire Alarm Proposal
            a. 907.2.3 Group E. Recommends carryover FA requirements for Group E with modification to language triggering Voice FA systems and manual FA boxes. Include 2024 IFC Language
                i. Voice FA
                    1. Exempt locations – increase occupant load to 100
                        a. Impacts to I-4?
                ii. Manual FA Boxes
                    1. Exempt locations
            b. Chapter 12.5 Leroy F Greene School Facilities Act of 1998,
            c. California Code, EDU 17074.50
            d. Codes: Cross-Reference
            e. Code Section: Cross Reference: Compare: California Law
        3. David Secoda – E Fire Alarm Proposals

a. 907.5.2.4 Group E Schools. Notification required at exterior buildings in playground areas Ca amendment. Recommends deleting this amendment.
    i. Intent/Origin
    ii. Efficiency - Audible vs Voice
        1. Effectiveness
        2. Outdated. Voice systems are now required in schools, but a horn to be outside of the building.
    iii. Mass Notification needs - Effective
        1. Prevents re-entry in the event a campus evacuation is necessary
        2. Prompts occupants to move to evacuation assembly points.

4. David Secoda – E Fire Alarm Proposals
    a. 907.2.3.6.1 Smoke Detectors and 907.2.3.6.2 Heat Detectors
        i. Intent/Origin – Leroy F Greene School Facilities Act of 1998
            1. Early detection due to fatality fire that prompted Greene Oaks Act.
                a. Required automatic fire sprinkler systems and automatic fire alarm systems
                b. Fire Origin
                    i. 2010-2011 Santa Clara County Civil Grand Jury Report -Trace Elementary School Rising from the Ashes
        ii. Effectiveness of coverage in combustible spaces and ceiling-plenums.

ii. Richard Roberts - CO Detection 915 – Need to further research.

3. NEW BUSINESS **Sujeski**

4. ROUNDTABLE / PUBLIC COMMENT **Tyler**

A. Katrina Chicote (DSS-CCL Division) – “Thank you for bringing up day cares as all of this does affect our facilities. The issue of fire alarms and automatic sprinkler systems has been a cost issue for a lot of our facilities to overcome and has resulted in a lot of facilities to withdraw their applications. Would love to see the various options for exceptions for our facilities so that they can provide much needed care to families. I do think the change from less than 50 to less than a 100 would be helpful as a lot of facilities do fall under the 100 capacity. It's also the issue with age definitions not being consistent with our regulations but that's for the other work group I'm in.”

5. UPCOMING MEETING DATE FOR 2024 **Tyler**

A. Meetings will be held the bi-monthly on Tuesday of each month at 8-10 AM and will remain virtual
    i. Upcoming Meeting – July 8, July 22, August 5, August 9

ii. Please email Jena.Garcia@fire.ca.gov all agenda items and proposals.

7. MEETING ADJOURNED at 10:00 AM **Tyler**

If you would like to watch the recording of this meeting, please visit the link below:

https://youtu.be/gFKIAjlGTD0

Outlook

CSFM Work Group Sagiv Proposals for the 2025 CFC Intervening cycle

From Weiss-Ishai, Sagiv (FIR) <sagiv.weiss-ishai@sfgov.org>
Date Thu 5/29/2025 4:55 PM
To Sujeski, Crystal@CALFIRE <Crystal.Sujeski@fire.ca.gov>; Garcia, Jena@CALFIRE <Jena.Garcia@fire.ca.gov>; Tyler, Travis <ttyler@calstate.edu>
Cc joseph.cervantes@1sae.com <joseph.cervantes@1sae.com>; Weiss-Ishai, Sagiv (FIR) <sagiv.weiss-ishai@sfgov.org>

Hi All
Here are my first proposal for changes for the 2025 CFC Intervening cycle to change the Fire Alarm requirements for E Occupancies

1. Section 907.6.4 – Fire Alarm Zoning as presented by Travis during our first meeting – Match the CFC with the IFC since most of the CA amendments are already included in the NFPA 72-2025 which is adopted

2. Section 907.2.3

This is the CFC -2025 language:

907.2.3 Group E. An automatic fire alarm system that initiates the occupant notification signal utilizing an emergency voice/alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall be installed in Group E occupancies with an occupant load of 50 or more persons or containing more than one classroom or one or more rooms used for Group E or I-4 child-care purposes in accordance with this section. Where automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system. One additional manual fire alarm box shall be located at the administration office or location approved by the AHJ.
Exceptions:
1. For public school state funded construction projects see Section 907.2.29.
2. For public schools see Section 907.2.3.7.
3. For private schools see Section 907.2.3.8

907.2.3 Group E. A*n automatic* fire alarm system that initiates the occupant notification signal utilizing an emergency voice/alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall be installed in Group E occupancies *with an occupant load of 50 or more persons or containing more than one classroom or one or more rooms used for Group E or I-4 child-care purposes in accordance with this section.* Where automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system. *One additional manual fire alarm box shall be located at the administration office or location approved by the AHJ.*

Exceptions:

1. *For public school state funded construction projects see Section 907.2.29.*
2. *For public schools see Section 907.2.3.7.*
3. *For private schools see Section 907.2.3.8.*

This is the 2024 IFC Language

907.2.3: Group E.

A manual *fire alarm system* that initiates the occupant notification signal utilizing an emergency v
the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall be
automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be

Exceptions:

1. A manual *fire alarm system* shall not be required in Group E occupancies with an *occu*
2. Emergency voice/alarm communication systems meeting the requirements of Sectic
with Section 907.6 shall not be required in Group E occupancies with *occupant loads*
the manual *fire alarm system* initiates an *approved* occupant notification signal in accc
3. Manual fire alarm boxes shall not be required in Group E occupancies where all of the
    3.1. Interior *corridors* are protected by smoke detectors.
    3.2. Auditoriums, cafeterias, gymnasiums and similar areas are protected by hea
    devices.
    3.3. Shops and laboratories involving dusts or vapors are protected by *heat*
    devices.
    3.4. Manual activation is provided from a normally occupied location.
4. Manual fire alarm boxes shall not be required in Group E occupancies where all of the
    4.1. The building is equipped throughout with an *approved automatic sprinkle*
    Section 903.3.1.1.
    4.2. The emergency voice/alarm communication system will activate on sprinkler
    4.3. Manual activation is provided from a normally occupied location.

In my opinion, there is no need for a Voice FA system if the occupant load is less than 100. This will have a great reduction in cost impact. My proposal below still requires a FA system for ALL E occupancies in CA but the EVACS will only be triggered for E occupancies with 100 or more persons
I have also included a few exceptions for Automatic Detection (Smoke/Heat detectors and sprinkler systems)

This is my proposal that we could use as a basis

907.2.3 Group E.
A manual fire alarm system that initiates the occupant notification signal meeting the requirements of Section 907.5 shall be installed in Group E occupancies as follows:

1. E Occupancies with an occupant load of 100 or more persons shall utelize an emergency voice/alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6
2. E Occupancies with an occupant load of less than 100 persons shall utelize a notification system in accordance with Section 907.5

Exceptions:
1. For public school state funded construction projects see Section 907.2.29.
2. For public schools see Section 907.2.3.7.
3. For private schools see Section 907.2.3.8
4. Manual fire alarm boxes shall not be required in Group E occupancies where all of the following apply:
   4.1. Interior corridors are protected by smoke detectors.
   4.2. Auditoriums, cafeterias, gymnasiums and similar areas are protected by heat detectors or other approved detection devices.
   4.3. Shops and laboratories involving dusts or vapors are protected by heat detectors or other approved detection devices.
   4.4. Manual activation is provided at the administration office or other location approved by the AHJ.

5. Manual fire alarm boxes shall not be required in Group E occupancies where all of the following apply:
   5.1. The building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1.
   5.2. The notification system will activate upon sprinkler water flow activation.
   5.3. Manual activation is provided at the administration office or other location approved by the AHJ.

Let me know your thoughts or we can discuss this in the next meeting
Sagiv

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Comment submitted by:

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Senior Consultant
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Contact information is shown at the end of the comment.

Item 9
Chapter 9, Fire Protection and Life Safety Systems

The SFM proposes to adopt Chapter 9 and carry forward amendments to Sections…**907.2.3.6.1 and 907.2.3.6.2**…

CBC 907.2.3.6.1 and 907.2.3.6.2 read as follows:

> *907.2.3.6.1 Smoke detectors. Smoke detectors shall be installed at the ceiling of every room and in "ceiling-plenums" utilized for environmental air. Where the ceiling is attached directly to the under-side of the roof structure, smoke detectors shall be installed on the ceiling only.*
>
> > *Exception: Where the environment or ambient conditions exceed smoke detector installation guidelines; heat detectors or fire sprinklers shall be used.*
>
> *907.2.3.6.2 Heat detectors. Heat detectors shall be installed in combustible spaces where sprinklers or smoke detectors are not installed.*

Comment against carrying forward amendments 907.2.3.6.1 and 907.2.3.6.2 as written.

The CBC 907.2.3.6.1 and 907.2.3.6.2 amendments **should not be carried forward as-is** for the following reasons:

1. The amendments **conflict with** other sections of the CBC where automatic detection is required.
2. The cost to the public is **not reasonable**, based on **dubious benefits** derived from the amendment.
3. These amendments were developed by State Agencies and the California State Fire Marshal in response to the Leroy F.Greene School Facilities Act of 1998 and California Senate Bill 575 of 2001.
4. The amendments were likely developed in part by the California State Fire Marshal **with input from the fire alarm industry** (via the CSFM Fire Alarm Advisory Committee). One probable explanation is that fire alarm industry members of the CSFM Fire Alarm Advisory Group may have **misconstrued the intent** of the legislation, or **inferred an unintended purpose** of the legislation. Industry members may have **misunderstood** the legislative intent to mean the NFPA 72 definition of Complete Coverage.

5. **Questionable benefit:** As currently implemented, these amendments result in the installation of automatic fire detection in areas of **little to no risk**, and areas that provide **little to no life/safety benefit.**
    a. In Group E occupancies, automatic heat detection is required and routinely installed in the **crawl spaces** below buildings.
    b. In Group E occupancies, automatic heat detection is required and routinely installed in the **above-ceiling spaces** of Type V, one-story, wood frame relocatable buildings of less than 1,000 square feet in area (relocatable classroom buildings).
6. **Questionable benefit:** There is no record of fires originating in crawl spaces below buildings, or above-ceiling spaces. Reference the National Fire Protection Association Report "Structure Fires in Schools"; Richard Campbell; September 2020.
7. **Conflicts with other sections of the CBC:** The added details regarding installation of smoke detectors "…in ceiling-plenums utilized for environmental air." and "spaces where sprinklers are not installed" is **unlike any other occupancy group** where smoke detection is required.
8. **Conflicts with other sections of the CBC:** In Day-Care occupancies, where children sleep, there is no special consideration given to "ceiling-plenums utilized for environmental air" and "spaces where sprinklers are not installed". Reference CBC 907.2.3.9.2.
9. **Conflicts with other sections of the CBC:** In Residential occupancies, where occupants sleep, there is no special consideration given to "ceiling-plenums utilized for environmental air" and "spaces where sprinklers are not installed". Reference CBC 907.2.11.7.
10. **Conflicts with other sections of the CBC:** In High-Rise buildings, where floor layouts and evacuation may be complex, there is no special consideration given to "ceiling-plenums utilized for environmental air" and "spaces where sprinklers are not installed". Reference CBC 907.2.13.1.
11. **Conflicts with other sections of the CBC:** In Hospital occupancies, where occupants are not be capable of self-preservation, there is not special consideration given to "ceiling-plenums utilized for environmental air" and "spaces where sprinklers are not installed". Reference CBC 907.2.6.2.2.
12. **Conflicts with other sections of the CBC:** In High-piled combustible storage areas, there is no special consideration given to "ceiling-plenums utilized for environmental air" and "spaces where sprinklers are not installed". Reference CBC 907.2.15.
13. **Conflicts with other sections of the CBC:** In Underground Buildings with smoke control systems, there is no special consideration given to "ceiling-plenums utilized for environmental air" and "spaces where sprinklers are not installed". Reference CBC 907.2.18.

14. **Conflicts with other sections of the CBC:** In buildings with an engineered smoke control system, there is no special consideration given to “ceiling-plenums utilized for environmental air” and “spaces where sprinklers are not installed”. Reference CBC 909.20.2.1 and CBC 909.20.7.
15. **Conflicts with other sections of the CBC:** In buildings where Delayed egress is employed, there is no special consideration given to “ceiling-plenums utilized for environmental air” and “spaces where sprinklers are not installed”. Reference CBC 907.3.2.

I am between jobs. My contact information is:
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tion in a manner that is designed to permit easy removal. Also see CCR, Title 24, Part 1, California Administrative Code, Section 4-314 for definition of relocatable building.

2. *A fire alarm system is not required for detached buildings designed and used for non-instructional purposes that meet the applicable requirements for that occupancy. Buildings would include but not be limited to a:*

   Concession Stand
   Press Box
   Restroom Facility
   Shade Structure
   Snack Bar
   Storage Building
   Ticket Booth

907.2.3.8 Private schools. *An automatic fire alarm system shall be provided in new buildings of private schools.*

Exception: *Automatic detection devices are not required where an approved automatic sprinkler system is installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location.*

907.2.3.9 Day-care, Group E.

907.2.3.9.1 *An automatic fire alarm system shall be provided in all buildings used as or containing a Group E day-care.*

Exception: *Automatic detection devices are not required where an approved automatic sprinkler system is installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location.*

907.2.3.9.2 *Smoke detectors shall be installed in every room used for sleeping or napping.*

907.2.3.10 Day-care, Group E or Group I-4 located on a public school campus. *An automatic fire alarm system shall be provided in all buildings used as or containing a Group E or Group I-4 day-care.*

[F] 907.2.4 Group F. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group F occupancies where both of the following conditions exist:

1. The Group F occupancy is two or more stories in height.
2. The Group F occupancy has a combined occupant load of 500 or more above or below the lowest level of exit discharge.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

[F] 907.2.5 Group H. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group H-5 occupancies and in occupancies used for the manufacture of organic coatings. An automatic smoke detection system shall be installed for highly toxic gases, organic peroxides and oxidizers in accordance with Chapters 60, 62 and 63, respectively, of the *California Fire Code*.

907.2.5.1 Group H occupancies located on the 11th story and above. *Manual fire alarm boxes shall be required on each side of the 2-hour fire-smoke barrier and at each exit on the 11th story and above.*

[F] 907.2.6 Group I. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group I occupancies. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be provided in accordance with Sections 907.2.6.1, 907.2.6.2 and 907.2.6.3.3.

Exceptions:

1. *Large family day-care.*
2. Manual fire alarm boxes in sleeping units of Group I-1 and I-2 occupancies shall not be required at exits if located at all care providers' control stations or other constantly attended staff locations, provided that such manual fire alarm boxes are visible and provided with ready access, and the distances of travel required in Section 907.4.2.1 are not exceeded.
3. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is approved by the fire code official and staff evacuation responsibilities are included in the fire safety and evacuation plan required by Section 404 of the *California Fire Code*.

[F] 907.2.6.1 ***Reserved.***

[F] 907.2.6.2 Group I-2 ***and Group I-2.1.*** *A manual and automatic fire alarm system shall be installed in Group I-2 and I-2.1 occupancies. Where automatic fire suppression systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.*

Exception: *Where an entire facility is used for the housing of persons, none of whom are physically or mentally handicapped or nonambulatory, and are between the ages of 18 and 64, the buildings or structures comprising such facility shall be exempt from the provisions of this subsection relating to the installation of an automatic fire alarm system.*

907.2.6.2.1 Notification. *The fire alarm notification system shall be in accordance with Section 907.5.2.5.*

interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

[F] 907.2.11.6 Power source. In new construction, *and in newly classified Group R-3.1 occupancies,*required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system in accordance with Section 2702. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are not required to be equipped with battery backup where they are connected to an emergency electrical system that complies with Section 2702.

[F] 907.2.11.7 Smoke detection system. Smoke detectors listed in accordance with UL 268 and provided as part of the building fire alarm system shall be an acceptable alternative to single- and multiple-station smoke alarms and shall comply with the following:

1. The fire alarm system shall comply with all applicable requirements in Section 907.
2. Activation of a smoke detector in a dwelling unit or sleeping unit shall initiate alarm notification in the dwelling unit or sleeping unit in accordance with Section 907.5.2.
3. Activation of a smoke detector in a dwelling unit or sleeping unit shall not activate alarm notification appliances outside of the dwelling unit or sleeping unit, provided that a supervisory signal is generated and monitored in accordance with Section 907.6.6.

907.2.11.8 Specific location requirements.

Extract from NFPA 72 Section 29.11.3.4 Specific Location Requirements.*

This extract has been provided by NFPA for the Office of the State Fire Marshal adoption by reference as follows:

29.11.3.4 Specific location requirements. *The installation of smoke alarms and smoke detectors shall comply with the following requirements:*

(1) Smoke alarms and smoke detectors shall not be located where ambient conditions, including humidity and temperature, are outside the limits specified by the manufacturer's published instructions.

(2) Smoke alarms and smoke detectors shall not be located within unfinished attics or garages or in other spaces where temperatures can fall below 40ºF (4ºC) or exceed 100ºF (38ºC).

(3) Where the mounting surface could become considerably warmer or cooler than the room, such as a poorly insulated ceiling below an unfinished attic or an exterior wall, smoke alarms and smoke detectors shall be mounted on an inside wall.

(4) Smoke alarms and smoke detectors shall not be installed within an area of exclusion determined by a 10-foot (3.0 m) radial distance along a horizontal flow path from a stationary or fixed cooking appliance, unless listed for installation in close proximity to cooking appliances. Smoke alarms and smoke detectors installed between 10 feet (3.0 m) and 20 feet (6.1 m) along a horizontal flow path from a stationary or fixed appliance shall be equipped with an alarm-silencing means or use photoelectric detection.

(5) Smoke alarms or smoke detectors that use photoelectric detection shall be permitted for installation at a radial distance greater than 6 feet (1.8 m) from any stationary or fixed cooking appliance when both of the following conditions are met:

(a) The kitchen or cooking area and adjacent spaces have no clear partitions or headers.

(b) The 10-foot (3.0 m) area of exclusion would prohibit the placement of a smoke alarm or smoke detector required by other sections of this code.

(6) Effective January 1, 2022, smoke alarms and smoke detectors installed between 6 feet (1.8 m) and 20 feet (6.1 m) along a horizontal flow path from a stationary or fixed cooking appliance shall be listed for resistance to common nuisance sources from cooking.

(7) Smoke alarms and smoke detectors shall not be installed within a 36-inch (910 mm) horizontal path from a door to a bathroom containing a shower or tub unless listed for installation in close proximity to such locations.

(8) Smoke alarms and smoke detectors shall not be installed within a 36-inch (910 mm) horizontal path from the supply registers of a forced air heating or cooling system and shall be installed outside of the direct airflow from those registers.

(9) Smoke alarms and smoke detectors shall not be installed within a 36-inch (910 mm) horizontal path from the tip of the blade of a ceiling-suspended (paddle) fan unless the room configuration restricts meeting this requirement.

(10) Where stairs lead to other occupied levels, a smoke alarm or smoke detector shall be located so that smoke rising in the stairway cannot be prevented from reaching the smoke alarm or smoke detector by an intervening door or obstruction.

(11) For stairways leading up from a basement, smoke alarms or smoke detectors shall be located on the basement ceiling near the entry to the stairs.

(12) For tray-shaped ceilings (coffered ceilings), smoke alarms and smoke detectors shall be installed on the highest portion of the ceiling or on the sloped portion of the ceiling within 12 inches (300 mm) vertically down from the highest point.

(13) Smoke alarms and detectors installed in rooms with joists or beams shall comply with the requirements of 17.7.3.2.4 of NFPA 72.

(14) Heat alarms and detectors installed in rooms with joists or beams shall comply with the requirements of 17.6.3 of NFPA 72.

**For additional requirements or clarification see NFPA 72.*

907.2.11.9 Existing Group R occupancies. *See the California Residential Code for existing Group R-3 occupancies or Chapter 11 of the California Fire Code for all other existing Group R occupancies.*

[F] 907.2.12 Special amusement *areas*. An automatic smoke detection system shall be provided in special amusement *areas and throughout the exit access to the point of exit discharge* in accordance with Sections 907.2.12.1 through 907.2.12.3.

[F] 907.2.12.1 Alarm. Activation of any single smoke detector, the automatic sprinkler system or any other automatic fire detection device shall immediately activate an audible and visible alarm at the building at a constantly attended location from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.12.2.

[F] 907.2.12.2 System response. The activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, the automatic sprinkler system or other approved fire detection device shall automatically do all of the following:

1. Cause illumination of the means of egress with light of not less than 1 footcandle (11 lux) at the walking surface level.
2. Stop any conflicting or confusing sounds and visual distractions.
3. Activate an approved directional exit marking that will become apparent in an emergency.
4. Activate a prerecorded message, audible throughout the special amusement *area and throughout the exit access to the point of exit discharge*, instructing patrons to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound that is distinctive from other sounds used during normal operation.

[F] 907.2.12.3 Emergency voice/alarm communication system. An emergency voice/alarm communication system, which is allowed to serve as a public address system, shall be installed in accordance with Section 907.5.2.2 and be audible throughout the entire special amusement *area and throughout the exit access to the point of exit discharge*.

[F] 907.2.13 High-rise buildings *and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access.* High-rise buildings *and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access* shall be provided with an automatic smoke detection system in accordance with Section 907.2.13.1, a fire department communication system in accordance with Section 907.2.13.2 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2.

Exceptions:

1. Airport traffic control towers in accordance with Sections 412 and 907.2.22.
2. Open parking garages in accordance with Section 406.5.
3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1.
4. Low-hazard special occupancies in accordance with Section 503.1.1.
5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415.
6. In Group I-2, *I-2.1 and R-2.1* occupancies, the alarm shall sound at a constantly attended location and occupant notification shall be broadcast by the emergency voice/alarm communication system.

[F] 907.2.13.1 Automatic smoke detection. Automatic smoke detection in high-rise buildings *and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access* shall be in accordance with Sections 907.2.13.1.1 and 907.2.13.1.2.

[F] 907.2.13.1.1 Area smoke detection. Area smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall activate the emergency voice/alarm communication system in accordance with Section 907.5.2.2. In addition to smoke detectors required by Sections 907.2.1 through 907.2.9, smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room that is not provided with sprinkler protection.
2. In each elevator machine room, machinery space, control room and control space and in elevator lobbies.

907.2.6.2.2 Automatic fire detection. *Smoke detectors shall be provided in accordance with this section.*

1. *In patient and client sleeping rooms. Actuation of such detectors shall cause a visual display on the corridor side of the room in which the detector is located and shall cause an audible and visual alarm at the respective nurse station. A nurse call system listed for this function is an acceptable means of providing the audible and visual alarm at the respective nurse station and corridor room display. Operation of the smoke detector shall not include any alarm verification feature.*

   Exception: *In patient and client rooms equipped with existing automatic door closers having integral smoke detector, the integral detector is allowed to substitute for the room smoke detector, provided it meets all the required alerting functions.*

2. *Group I-2 nurse stations. A minimum of one (1) smoke detector shall be installed at the nurse station and centrally located.*

3. *In waiting areas and corridors onto which they open, in the same smoke compartment, in accordance with Section 407.2.1.*

4. *In areas where patients are restrained, smoke detectors shall be installed at ceilings throughout all occupied areas and mechanical/electrical spaces of smoke compartments and in adjacent smoke compartments where occupants of those compartments utilize the same means of egress.*

[F] 907.2.6.3 Group I-3 occupancies. Group I-3 occupancies shall be equipped with a manual fire alarm system and automatic smoke detection system installed for alerting staff.

Exception: *An automatic smoke detection system is not required within temporary holding cells.*

[F] 907.2.6.3.1 System initiation. Actuation of an automatic fire-extinguishing system, automatic sprinkler system, a manual fire alarm box or a fire detector shall initiate an approved fire alarm signal that automatically notifies staff.

[F] 907.2.6.3.2 Manual fire alarm boxes. Manual fire alarm boxes are not required to be located in accordance with Section 907.4.2 where the fire alarm boxes are provided at staff-attended locations having direct supervision over areas where manual fire alarm boxes have been omitted.

[F] 907.2.6.3.2.1 Manual fire alarm boxes in detainee areas. Manual fire alarm boxes are allowed to be locked in areas occupied by detainees, provided that staff members are present within the subject area and have keys readily available to operate the manual fire alarm boxes.

[F] 907.2.6.3.3 Automatic smoke detection system. An automatic smoke detection system shall be installed throughout resident housing areas, including sleeping units and contiguous day rooms, group activity spaces and other common spaces normally open to *inmates*.

Exceptions:

1. Other approved smoke detection arrangements *may be used to prevent damage or tampering or for other purposes provided the function of detecting any fire is fulfilled and the location of the detectors is such that the speed of detection will be equivalent to that provided by the spacing and location required in accordance with NFPA 72 as referenced in Chapter 35. This may include the location of detectors in return air ducts from cells, behind grilles or in other locations. Spot type, combination duct and open area smoke detectors may be used when located not more than 14 inches (356 mm) from the return air grill. For initiation and annunciation purposes, these detectors may be combined in groups of four. The fire code official having jurisdiction, however, must approve the proposed equivalent performance of the design.*

2. *For detention housing and/or mental health housing area(s), including correctional medical and mental health uses, automatic smoke detection system in sleeping units shall not be required when all of the following conditions are met:*

   2.1. *All rooms, including the inmate cells are provided with an automatic sprinkler system in accordance with Section 903.3.1.1.*

   2.2. *Building is continuously staffed by a correctional officer at all times.*

3. *Smoke detectors are not required to be installed in inmate cells with two or fewer occupants in detention facilities which do not have a correctional medical and mental health use.*

4. *Smoke detectors are not required to be installed in inmate day rooms of detention facilities where 24-hour direct visual supervision is provided by a correctional officer(s) and a manual fire alarm box is located in the control room.*

907.2.6.3.4 System annunciation. *A staff alerting fire alarm shall sound at all staff control stations on the floor of activation and an audible and visual signal shall be indicated on an annunciator at the facility control center upon activation of any automatic extinguishing system, automatic detection system, or any smoke detector or manual actuating*

An approved operations manual describing the complete operations of the smoke control system and functioning of the firefighters smoke control panel shall be maintained at the fire command center.

[F] 909.19 System acceptance. Buildings, or portions thereof, required by this code to comply with this section shall not be issued a certificate of occupancy until such time that the fire code official determines that the provisions of this section have been fully complied with and that the fire department has received satisfactory instruction on the operation, both automatic and manual, of the system and a written maintenance program complying with the requirements of Section 909.20.1 of the *California Fire Code* has been submitted and approved by the fire code official.

Exception: In buildings of phased construction, a temporary certificate of occupancy, as approved by the fire code official, shall be allowed provided that those portions of the building to be occupied meet the requirements of this section and that the remainder does not pose a significant hazard to the safety of the proposed occupants or adjacent buildings.

909.20 Smokeproof enclosures. Where required by Section 1023.12, a smokeproof enclosure shall be constructed in accordance with this section. A smokeproof enclosure shall consist of an interior exit stairway or ramp that is enclosed in accordance with the applicable provisions of Section 1023 and an open exterior balcony, ventilated vestibule or pressurized stair and pressurized entrance vestibule meeting the requirements of this section. Where access to the roof is required by the *California Fire Code*, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required.

909.20.1 Access. Access to the stairway or ramp shall be by way of a vestibule or an open exterior balcony. The minimum dimension of the vestibule shall be not less than the required width of the corridor leading to the vestibule *calculated in accordance with Section 1005.1*, but shall not have a width of less than 44 inches (1118 mm) and shall not have a length of less than 72 inches (1829 mm) in the direction of egress travel.

909.20.2 Construction. The smokeproof enclosure shall be separated from the remainder of the building by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Openings are not permitted other than the required means of egress doors. The vestibule shall be separated from the stairway or ramp by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The open exterior balcony shall be constructed in accordance with the fire-resistance rating requirements for floor assemblies.

909.20.2.1 Door closers. Doors in a smokeproof enclosure shall be self- or automatic closing by actuation of a smoke detector in accordance with Section 716.2.6.6 and shall be installed at the floor-side entrance to the smokeproof enclosure. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the smokeproof enclosure at all levels. Smoke detectors shall be installed in accordance with Section 907.3.

909.20.2.2 Vestibule doors. *Where access to the stairway is by way of a vestibule, the door assembly from the building into the vestibule shall be a 90-minute fire door assembly complying with Section 716.5.5. The door assembly from the vestibule to the stairway shall have not less than a 20-minute fire protection rating and shall comply with the requirements for a smoke door assembly in accordance with Section 716.5.3. The door shall be installed in accordance with NFPA-105.*

909.20.2.3 Standpipes. *Where access to the stairway is by way of a vestibule, Fire department standpipe connections and valves serving the floor shall be within the vestibule unless otherwise approved by the fire code official. Standpipe connections in vestibules shall be located in such a manner so as not to obstruct egress where hose lines are connected and charged.*

909.20.2.4 Pressure differences. *The minimum pressure differences within the vestibule with the doors closed shall be 0.05-inch water gage (12.44 Pa) positive pressure relative to the fire floor and 0.05-inch water gage (12.44 Pa) negative pressure relative to the exit enclosure. No pressure difference is required relative to a nonfire floor.*

909.20.2.5 Relief vent. *A relief vent capable of discharging a minimum of 2,500 cubic feet per minute (1180 L/s) of air at the design pressure difference shall be located in the upper portion of such pressurized exit enclosures.*

Exception: *When approved by the enforcing agency, other engineered design methods capable of discharging a minimum of 2,500 cubic feet per minute (1180 L/s) of air at the design pressure difference shall be permitted.*

909.20.3 Natural ventilation alternative. The provisions of Sections 909.20.3.1 through 909.20.3.3 shall apply to ventilation of smokeproof enclosures by natural means.

909.20.3.1 Balcony doors. Where access to the stairway or ramp is by way of an open exterior balcony, the door assembly into the enclosure shall be a fire door assembly in accordance with Section 716.

909.20.3.2 Vestibule ventilation. *Where access to the stairway is by way of a vestibule,* each vestibule shall have a minimum net area of 16 square feet (1.5 m^2) of opening in a wall facing an outer court, yard or public way that is not less than 20 feet (6096 mm) in width.

909.20.4 Mechanical *pressurization* alternative. The provisions of Sections 909.20.4.1 through 909.20.4.4 shall apply to ventilation of *pressurization* enclosures by mechanical means.

909.20.4.1 Pressure differences. *The pressurization system shall be designed so that the minimum pressure differences provided within the vestibule with the doors closed shall be 0.05-inch water gage (12.44 Pa) positive pressure relative to the fire floor and 0.05-inch water gage (12.44 Pa) negative pressure relative to the exit enclosure. No pressure difference is required relative to a nonfire floor.*

909.20.4.2 Relief vent. *A relief vent capable of discharging a minimum of 2,500 cubic feet per minute (1180 L/s) of air at the design pressure difference shall be located in the upper portion of such pressurized exit stairway or ramp enclosures.*

Exception: *When approved by the enforcing agency, other engineered design methods capable of discharging a minimum of 2,500 cubic feet per minute (1180 L/s) of air at the design pressure difference shall be permitted.*

➡ **909.20.5** ***Reserved.***

909.20.6 Pressurized stair and vestibule alternative. The provisions of Sections 909.20.6.1 through 909.20.6.3 shall apply to smokeproof enclosures using a pressurized stair and pressurized entrance vestibule.

909.20.6.1 Vestibule doors. The door assembly from the building into the vestibule shall be a fire door assembly complying with Section 716.2.2.1. The door assembly from the vestibule to the stairway shall have not less than a 20-minute fire protection rating and meet the requirements for a smoke door assembly in accordance with Section 716.2.2.1. The door shall be installed in accordance with NFPA 105.

909.20.6.2 Pressure difference. The stair enclosure shall be pressurized to not less than 0.05 inch of water gage (12.44 Pa) positive pressure relative to the vestibule with all stairway doors closed under the maximum anticipated stack pressures. The vestibule, with doors closed, shall have not less than 0.05 inch of water gage (12.44 Pa) positive pressure relative to the fire floor. The pressure difference across doors shall not exceed 30 pounds (133-N) maximum force to begin opening the door.

909.20.6.3 Dampered relief opening. A controlled relief vent having the capacity to discharge not less than 2,500 cubic feet per minute (1180 L/s) of air at the design pressure difference shall be located in the upper portion of the pressurized exit enclosure.

909.20.7 ***Pressurization*** **equipment.** The activation of *pressurization* equipment required by the alternatives in Sections 909.20.4, 909.20.5 and 909.20.6 shall be by smoke detectors installed at each floor level at an approved location at the entrance to the smokeproof enclosure *and upon activation of the automatic controls required by Section 909.12.4.* When the closing device for the stairway and ramp shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

909.20.7.1 ***Pressurization*** **systems.** Smokeproof enclosure *pressurization* systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

Exception:

1. Control wiring and power wiring located outside of a 2-hour fire barrier construction shall be protected using any one of the following methods:
   1.1. Cables used for survivability of required critical circuits shall be listed in accordance with UL 2196 and shall have a fire-resistance rating of not less than 2 hours.
   1.2. Where encased with not less than 2 inches (51 mm) of concrete.
   1.3. Electrical circuit protective systems shall have a fire-resistance rating of not less than 2 hours. Electrical circuit protective systems shall be installed in accordance with their listing requirements.

909.20.7.2 Standby power. *Pressurization* and stairway and ramp shaft ventilation systems and automatic fire detection systems shall be provided with standby power in accordance with Section 2702.

[F] 907.2.13.1.2 Duct smoke detection. *Smoke detectors listed for use in air duct systems shall be provided in accordance with this section and the California Mechanical Code. The activation of any detector required by this section shall initiate a visible and audible supervisory signal at a constantly attended location.* Duct smoke detectors complying with Section 907.3.1 shall be located as follows:

1. In the main return air and exhaust air plenum of each air-conditioning system having a capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m^3/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet.
2. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum of an air-conditioning system. In Group R-1 and R-2 occupancies, a smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4 m^3/s) and serving not more than 10 air-inlet openings.

[F] 907.2.13.2 Fire department communication system. Where a wired communication system is approved in lieu of an in-building two-way emergency responder communication coverage system in accordance with Section 510 of the *California Fire Code*, the wired fire department communication system shall be designed and installed in accordance with NFPA 72 and shall operate between a fire command center complying with Section 911, elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside interior exit stairways. The fire department communication device shall be provided at each floor level within the interior exit stairway.

[F] 907.2.13.3 Multiple-channel voice evacuation. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, voice evacuation systems for high-rise buildings shall be multiple-channel systems.

[F] 907.2.14 Atriums connecting more than two stories. A fire alarm system shall be installed in occupancies with an atrium that connects more than two stories, with smoke detection installed in locations required by a rational analysis in Section 909.4 and in accordance with the system operation requirements in Section 909.17. The system shall be activated in accordance with Section 907.5. Such occupancies in Group A, E or M shall be provided with an emergency voice/alarm communication system complying with the requirements of Section 907.5.2.2.

[F] 907.2.15 High-piled combustible storage areas. An automatic smoke detection system shall be installed throughout high-piled combustible storage areas where required by Section 3206.5 of the *California Fire Code*.

[F] 907.2.16 Aerosol storage uses. Aerosol product rooms and general-purpose warehouses containing aerosol products shall be provided with an *approved* manual fire alarm system where required by the *California Fire Code*.

[F] 907.2.17 Lumber, wood structural panel and veneer mills. Lumber, wood structural panel and veneer mills shall be provided with a manual fire alarm system.

[F] 907.2.18 Underground buildings with smoke control systems. Where a smoke control system is installed in an underground building in accordance with this code, automatic smoke detectors shall be provided in accordance with Section 907.2.18.1.

[F] 907.2.18.1 Smoke detectors. Not fewer than one smoke detector listed for the intended purpose shall be installed in all of the following areas:

1. Mechanical equipment, electrical, transformer, telephone equipment, elevator machine or similar rooms.
2. Elevator lobbies.
3. The main return and exhaust air plenum of each air-conditioning system serving more than one story and located in a serviceable area downstream of the last duct inlet.
4. Each connection to a vertical duct or riser serving two or more floors from return air ducts or plenums of heating, ventilating and air-conditioning systems, except that in Group R occupancies, a listed smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cubic feet per minute (2.4 m^3/s) and serving not more than 10 air-inlet openings.

[F] 907.2.18.2 Alarm required. Activation of the smoke control system shall activate an audible alarm at a constantly attended location.

[F] 907.2.19 Deep underground buildings. Where the lowest level of a structure is more than 60 feet (18 288 mm) below the finished floor of the lowest level of exit discharge, the structure shall be equipped throughout with a manual fire alarm system, including an emergency voice/alarm communication system installed in accordance with Section 907.5.2.2.

[F] 907.2.20 Covered and open mall buildings. Where the total floor area exceeds 50,000 square feet (4645 m^2) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. Access to emergency voice/alarm communication systems serving a mall, required or otherwise, shall be provided for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

[F] 907.2.21 Residential aircraft hangars. Not fewer than one single-station smoke alarm shall be installed within a residential aircraft hangar as defined in Chapter 2 and shall be interconnected into the residential smoke alarm or other sounding device to provide an alarm that will be audible in all sleeping areas of the dwelling.

[F] 907.2.22 Airport traffic control towers. An automatic smoke detection system that activates the occupant

[F] 907.3 Fire safety functions. Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building's fire alarm control unit where a fire alarm system is *installed*. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or activate a visible and audible supervisory signal at a constantly attended location. In buildings not equipped with a fire alarm system, the automatic fire detector shall be powered by normal electrical service and, upon actuation, perform the intended function. The detectors shall be located in accordance with NFPA 72.

[F] 907.3.1 Duct smoke detectors. Smoke detectors installed in ducts shall be listed for the air velocity, temperature and humidity present in the duct. Duct smoke detectors shall be connected to the building's fire alarm control unit where a fire alarm system is required by Section 907.2. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal at a constantly attended location and shall perform the intended fire safety function in accordance with this code and the *California Mechanical Code*. In facilities that are required to be monitored by a supervising station, duct smoke detectors shall report only as a supervisory signal and not as a fire alarm. They shall not be used as a substitute for required open area detection.

Exceptions:

1. The supervisory signal at a constantly attended location is not required where duct smoke detectors activate the building's alarm notification appliances.
2. In occupancies not required to be equipped with a fire alarm system, actuation of a smoke detector shall activate a visible and an audible signal in an approved location. Smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble.

[F] 907.3.2 Special locking systems. Where special locking systems are installed on means of egress doors in accordance with Sections 1010.2.13 or 1010.2.14, an automatic *smoke* detection system shall be installed as required by *those* sections *and Sections 907.3.2.1 through 907.3.2.5*.

907.3.2.1 Delayed egress. *In other than Groups I, R-2.1 and R-4 occupancies for single-story building, smoke detectors shall be installed at ceilings throughout all occupied areas and mechanical/electrical spaces. For multiple-story buildings, smoke detectors shall be installed throughout all occupied areas and mechanical/electrical spaces for the story where delayed egress devices are installed. Additional detectors are required on adjacent stories where occupants of those stories utilize the same means of egress.*

Exception: *Refer to Section 907.3.2.4 for Group A courthouse occupancies.*

907.3.2.2 Delayed egress for Group I and R-2.1 occupancies. *Smoke detectors shall be installed at ceilings throughout all occupied areas and mechanical/electrical spaces of smoke-compartments where delayed egress devices are installed. Additional detectors are required in adjacent smoke-compartments where occupants of those compartments utilize the same means of egress.*

907.3.2.3 Delayed egress for Group R-4. *Occupancies licensed as residential care facilities for the elderly, and housing clients with Alzheimer's disease or dementia residential facilities, smoke detectors shall be installed at ceilings throughout all occupiable rooms and areas and mechanical/ electrical rooms and spaces.*

907.3.2.4 Delayed egress for Group A Courthouse occupancies. *An approved automatic smoke detection system shall be installed at ceilings in all occupied corridors and mechanical/electrical spaces of occupancies where delayed egress devices are installed.*

907.3.2.5 Controlled egress doors for Group I-2 occupancies. *Smoke detectors shall be installed at ceilings throughout all occupied areas and mechanical/electrical spaces of smoke-compartments where controlled egress doors are installed.*

[F] 907.3.3 Elevator emergency operation. Automatic fire detectors installed for elevator emergency operation shall be installed in accordance with the provisions of *California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders* and NFPA 72.

[F] 907.3.4 Wiring. The wiring to the auxiliary devices and equipment used to accomplish the fire safety functions shall be monitored for integrity in accordance with NFPA 72.

[F] 907.4 Initiating devices. Where a fire alarm system is required by another section of this code, occupant notification in accordance with Section 907.5 shall be initiated by one or more of the following. Initiating devices shall be installed in accordance with Sections 907.4.1 through 907.4.3.1.

1. Manual fire alarm boxes.
2. Automatic fire detectors.
3. Automatic sprinkler system waterflow devices.
4. Automatic fire-extinguishing systems.

[F] 907.4.1 Protection of fire alarm control unit. In areas that are not continuously occupied, a single smoke detector shall be provided at the location of each fire alarm control unit, notification appliance circuit power extenders, and supervising station transmitting equipment.

Exception: Where ambient conditions prohibit installation of a smoke detector, a heat detector shall be permitted.

[F] 907.4.2 Manual fire alarm boxes. Where a manual fire alarm system is required by another section of this code, it shall be activated by fire alarm boxes installed in accordance with Sections 907.4.2.1 through 907.4.2.6.

[F] 907.4.2.1 Location. Manual fire alarm boxes shall be located not more than 5 feet (1524 mm) from the

NFPA® RESEARCH

Structure Fires in Schools

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Key Findings

- Local fire departments in the United States responded to an estimated average of 3,230 fires in school properties from preschool through grade twelve from 2014 to 2018.
- The fires in these school properties caused an estimated average of one civilian death, 39 civilian injuries, and $37 million in direct property damage per year.
- School property fires accounted for one percent of all US structure fires during this period and less than one percent of the accompanying civilian fatalities, injuries, and direct property damage.
- Three in five school fires were small fire incidents identified as confined fires, meaning they were confined to the cooking equipment, chimneys, fireplaces, boilers or trash in which they ignited.
- Two in five school fires (43%) were intentionally set. Fires with an intentional cause were more prevalent in high school and middle schools (44% of total) than in elementary schools (33%).
- Almost one-third of school fires were caused by cooking equipment (31%) and 10 percent by heating equipment.

High School and Middle School Fires

- In high school and middle school fires, one-third of the property damage (34%) was caused by the small number of fires that occurred between midnight and 4 a.m., when buildings were unlikely to be occupied.
- More than two in five fires (44%) in high schools and middle schools were intentionally set and one in five was caused by playing with a heat source.
- Fires in high schools and middle schools were much more likely to originate in a lavatory or locker room (32%) than any other area.

Elementary School Fires

- Elementary school fires most often began with the ignition of trash or cooking materials.
- Several leading factors contributing to the ignition of elementary school fires had behavioral implications, including playing with a heat source (22%), unclassified misuse of a material or product (8%), abandoned or discarded material or product (7%), and unattended equipment (6%).
- Electrical failures or malfunctions (17%) and mechanical failures or malfunctions (14%) also contributed to a substantial share of fires and they suggest that there might be gaps in the maintenance and repair of school equipment or infrastructure.
- Lighters and matches together provided the heat source in one-quarter of elementary school fires.

Part 1. Structure Fires in Schools

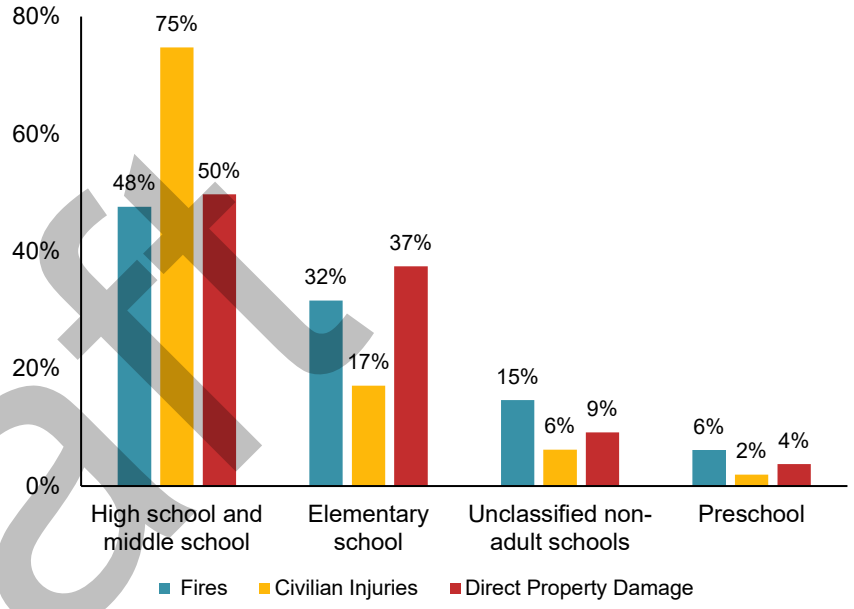
This report presents data on structure fires in school properties for the five-year period from 2014 through 2018. School properties include high school and middle schools, elementary schools (including kindergarten), preschools, and unclassified non-adult schools. Fires in vehicles or non-structure fires on school grounds are not included in this report.

US fire departments responded to an estimated 3,230 structure fires in schools each year from 2014 to 2018. These fires resulted in an average of one civilian death, 39 civilian injuries, and $37 million in direct property damage a year. As indicated in Table 1 in the accompanying tables, the fires in school properties represented one percent of all the structure fires in the US during this period and less than one percent of the civilian deaths, injuries, and direct property damage. Due to the low numbers, civilian deaths are not included in the analysis in this report.

Most school fires occurred in either high schools and middle schools or elementary schools, as shown in Figure 1. Unclassified non-adult schools and preschools accounted for the remaining school fires and had comparatively smaller shares of the civilian injuries and direct property damage. School fire civilian injuries were concentrated in high school and middle school fires, and fires in these schools also accounted for half of the direct property damage in school fires.

In 2014–2018, three in five school fires were small fire incidents identified as confined fires. These fires were confined to the cooking equipment, chimneys, fireplaces, or boilers or trash in which they ignited. Accordingly, the 40 percent of school fires classified as non-confined fires" accounted for the vast majority of the civilian injuries and direct property damage.

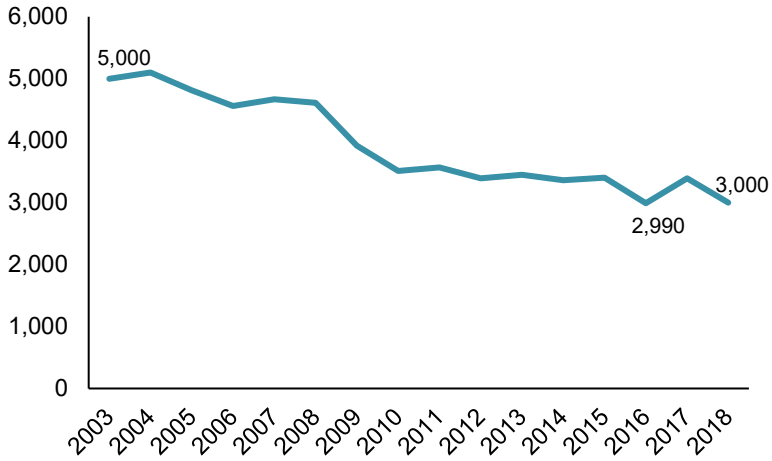
Figure 1. Structure Fires in School Properties by School Type 2014–2018 Annual Averages



School Fires by Year

As shown in Figure 2, the number of structure fires that occur annually in schools has seen a distinct downward trend since 2003, with the sharpest decrease between 2004 and 2010. The annual number of school fires has generally been stable since 2010, although it is encouraging that the estimated 2,990 fires in 2016 and 3,000 fires in 2018 represent the low points for this period. Injuries and direct property damage have shown substantial year-to-year fluctuation, as indicated in Table 3 of the accompanying tables.

Figure 2. Structure Fires in School Properties by Year
2003–2018 Annual Averages



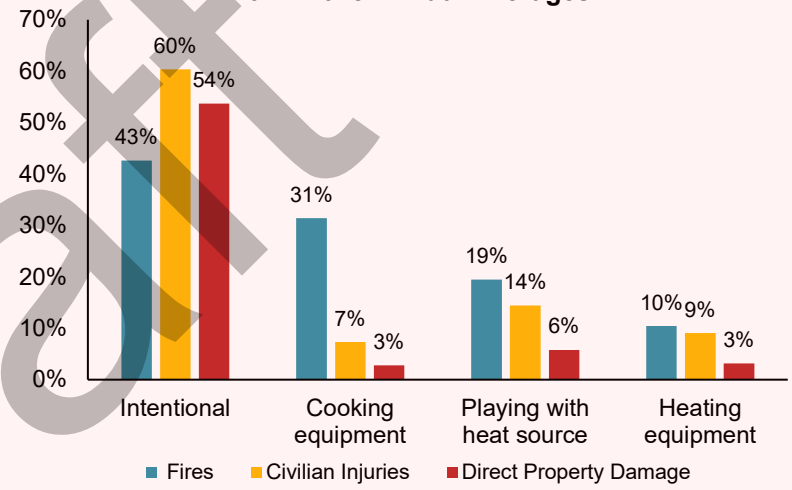
Leading Causes of Structure Fires in Schools

Figure 3 shows the leading causes of fires in school properties. The data in this table comes from several National Fire Incident Reporting System (NFIRS) data elements. Double counting is possible, particularly for playing with a heat source and fires that were intentionally set. For more information see Methodology and Definitions Used in "Leading Causes of Structure Fires".

Fires that were intentionally set were the leading cause of school fires, accounting for over two in five fires, as shown in Figure 3. These fires also caused the majority of the injuries and over half of the property damage from school fires.

Fires that were caused by cooking equipment were the second leading cause of school fires, but these were largely confined fires resulting in little property damage. The ongoing presence of kitchen and other staff in schools is likely to be a factor that differentiates cooking-related fires in schools from those in homes, where cooking fires might be unattended and more likely to cause damage. Fires that involved playing with a heat source were responsible for another one-fifth of the fires, while heating equipment accounted for one in 10 school fires. See Table 4 of the accompanying tables for additional details on the leading causes of fires.

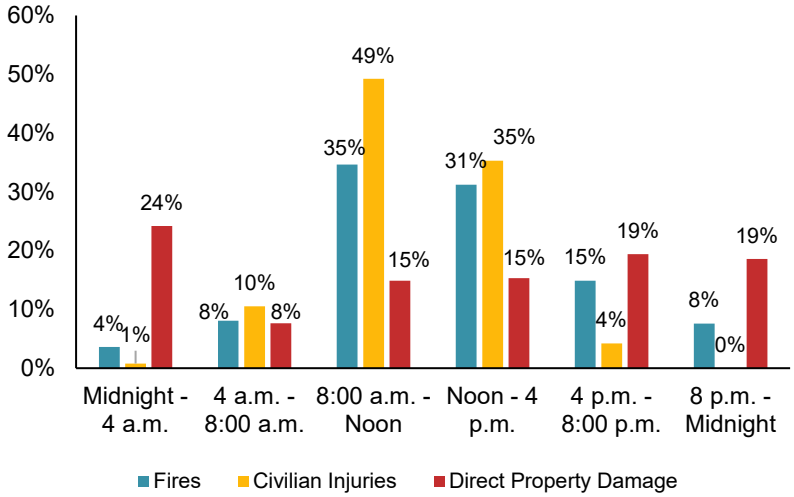
Figure 3. Structure Fires in School Properties by Leading Cause
2014–2018 Annual Averages



Timing of School Fires

School fires were most likely to occur during the daytime hours when the facilities were at their peak occupancy, as shown in Figure 4. Two-thirds of school fires occurred between 8 a.m. and 4 p.m., but these fires accounted for less than one-third of the direct property damage, indicating that many of the fires were detected and extinguished relatively quickly. A comparatively small share of fires occurred in the twelve-hour period between 8 p.m. and 8 a.m., as shown in Figure 3. Significantly, four percent of the fires that occurred between midnight and 4 a.m. accounted for approximately one-quarter (24%) of the direct property damage.

Figure 4. Structure Fire School Properties by Time of Day
2014–2018 Annual Averages



Sprinklers can control a fire until the fire department arrives. A report by Marty Ahrens on the *US Experience with Sprinklers* found that sprinklers were present in only 39 percent of the reported fires in educational properties. A recent *report* from the UK found that sprinkler systems were not present in any of 46 school fires attended by London firefighters in 2019.

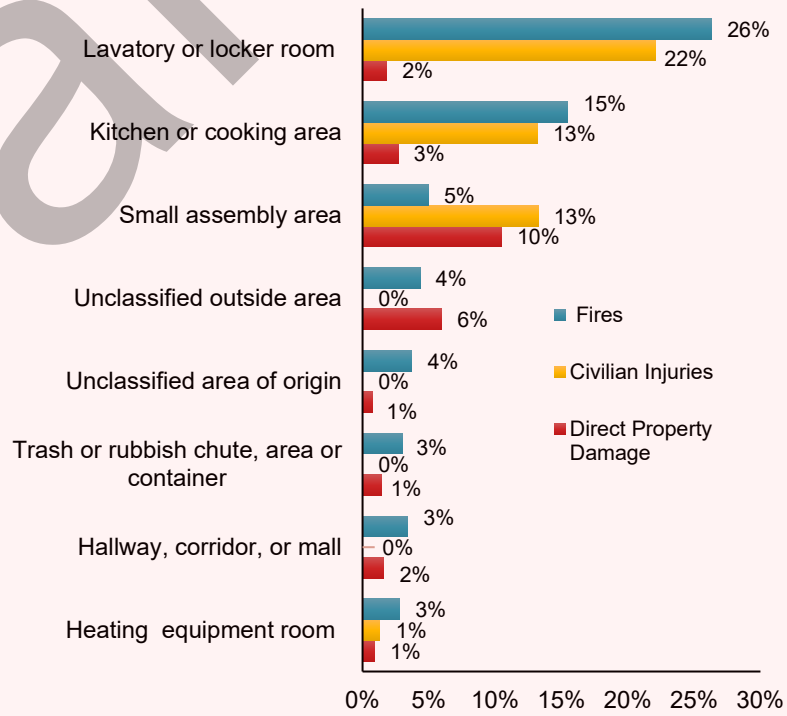
Area of Fire Origin

School fires most often originated in a lavatory or locker room, as shown in Figure 5. This is consistent with the intentional causes of many school fires and suggests that they frequently involved student fire play or arson. The majority of these fires were small confined fires and caused little property damage. However, they were likely to result in injuries (22% of total), underscoring the importance of education and intervention strategies to prevent intentional fire setting.

A kitchen or cooking area was the second leading area of origin for school fires. Confined fires were again predominant, and these fires resulted in little direct property damage. Fires in small assembly areas accounted for five percent of fires, but disproportionately higher shares of injuries and direct property damage.

The remaining fires were distributed among a variety of areas of origin. Just two percent of fires originated on an exterior roof surface, but these accounted for 10 percent of direct property damage. See Table 9 of the supporting tables for additional details.

Figure 5. Structure Fires in School Properties by Area of Origin
2014–2018 Annual Averages



Item First Ignited

Reflecting the predominance of intentionally set fires and cooking fires, the items most often first ignited in school fires were trash and cooking materials. Other leading items of ignition included magazines, newspapers, or writing paper; electrical wire or cable insulation; rolled or wound material; flammable or combustible liquids or gases; and appliance housings or casings.

Factor Contributing to Ignition

Human behavior was involved in two of the leading factors contributing to the ignition of school fires — playing with a heat source and unclassified misuse of materials or products, as shown in Figure 6. Electrical failures or malfunctions and mechanical failures or malfunctions were other leading factors and accounted for the largest share of the direct property damage.

Human behavior also appeared to be involved in a number fires caused by other leading factors, including fires involving abandoned or discarded materials or products, heat sources being too close to combustible materials, unattended equipment, failure to clean equipment, equipment not properly operated, and equipment accidentally turned on or not turned off, suggesting that many school fires could be prevented with enhanced training and education efforts. See Table 11 for additional details.

Heat Source

Figure 7 shows that heat from powered equipment and radiated or conducted heat from operating equipment together served as the heat sources in approximately one-third of school fires, while electrical arcing acted as the heat source in approximately one in 10 fires. Lighters and matches served as the heat source in over one-quarter of school fires, and those fires together accounted for a somewhat higher share of injuries (30%), likely because injury victims were intimate with the heat source. See Table 12 of the accompanying tables for additional details.

Figure 6. Structure Fires in School Properties by Factor Contributing to Ignition, 2014–2018 Annual Averages

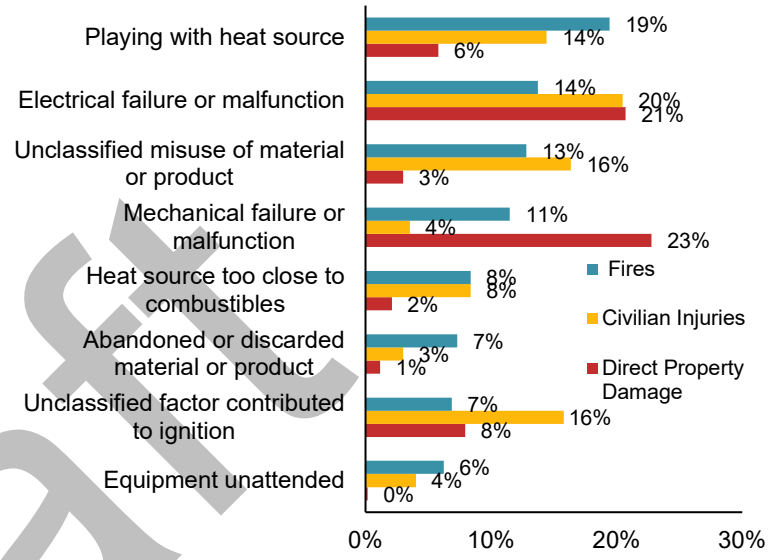
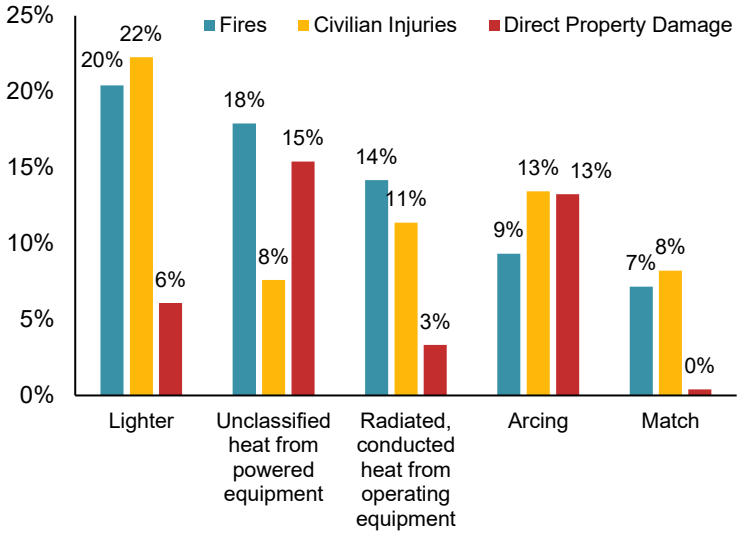


Figure 7. Structure Fires in School Properties by Heat Source, 2014–2018



Part 2: Structure Fires in High Schools and Middle Schools

Because high schools and middle schools include distinctly different student populations than elementary schools, it is useful to analyze the key data elements of these two school groups separately. Note that high schools and middle schools represent a single code in the NFIRS and that data cannot be further disaggregated between the two levels of schooling.

Leading Causes of Structure Fires in High Schools and Middle Schools

Fires with an intentional cause were the leading cause of fires in high schools and middle schools, accounting for more than two in five fires (44%), as shown in Figure 8. Fires caused by cooking equipment and fires caused by playing with a heat source were additional leading causes, followed by fires caused by electrical distribution and lighting equipment and heating equipment.

Although just one in 10 fires were caused by electrical distribution and lighting equipment, these fires were responsible for approximately one-quarter of the injuries (24%). It is likely that the injury victims were workers engaged in electrical work. It is also notable that fires caused by a torch, burner, or soldering iron accounted for just one percent of these fires, but one-fifth of the direct property damage, as indicated by Table 14 in the accompanying tables. Hot work should only be performed by those who have the requisite permits and safety and fire prevention training.

It is worth noting that the prevalence of intentional fires in schools is not a problem unique to the United States. For instance, a *report* from Sweden in 2012 found that 40 percent of fires in Swedish school buildings were caused by arson.

Sprinkler extinguishes fire in high school lab

A fire that started in a high school science laboratory during an experiment involving a Bunsen burner was quickly extinguished by an overhead sprinkler.

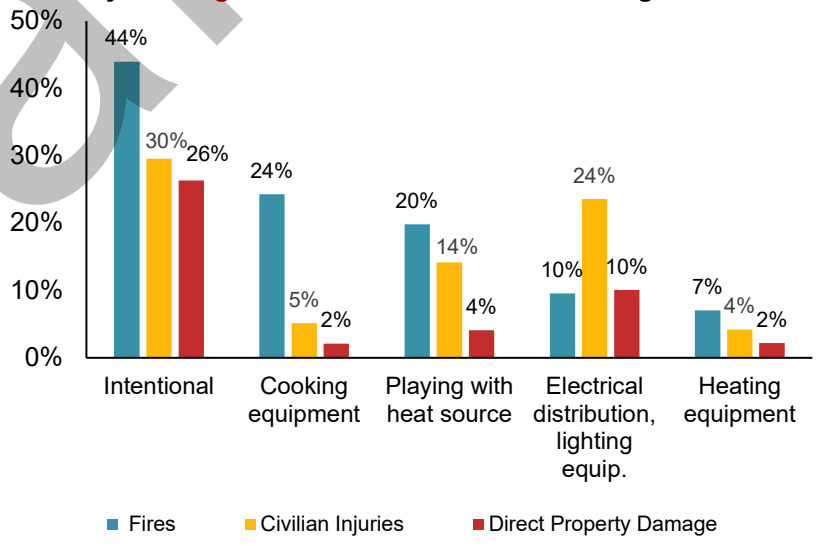
Firefighters were dispatched to the school after a sprinkler head activated and triggered the alarm.

On arrival, crews were advised by school officials that the fire was out, but they proceeded to the lab to confirm extinguishment, remaining on the scene until the alarms were silenced. Investigators determined that the fire was caused by the ignition of fuel inside the Bunsen burner.

The fire caused an estimated $500 in damage to classroom contents.

Source: "Firewatch," *NFPA Journal*. May/June 2017

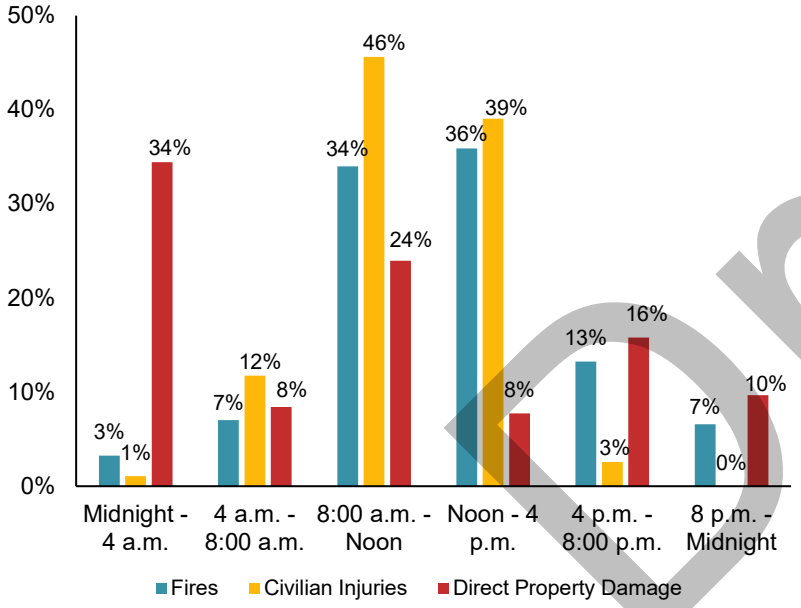
Figure 8. Structure Fires in High Schools and Middle Schools by Leading Cause 2014–2018 Annual Averages



Timing of Fires in High Schools and Middle Schools

The vast majority (70%) of fires in high schools and middle schools occurred during the peak occupancy hours between 8 a.m. and 4 p.m., and these fires also accounted for most of the injuries (85%), as shown in Figure 9. One-third of the property damage (34%) was caused by a small share of fires that occurred between midnight and 4 a.m., when buildings were unlikely to be occupied.

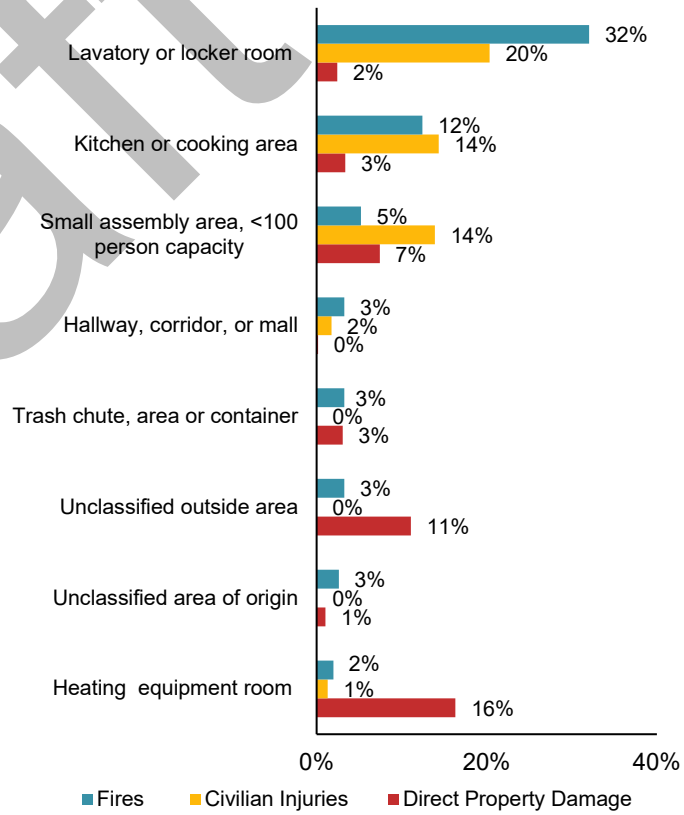
Figure 9. Structure Fires in High Schools and Middle Schools by Time of Day, 2014–2018 Annual Averages



Area of Origin

Fires in high schools and middle schools were substantially more likely to originate in a lavatory or locker room than any other area, serving as the area of origin in approximately one-third of fires. That is more than two and a half times more the number of fires that originated in a kitchen or cooking area, the second leading area of origin. Other leading areas of origin included small assembly areas, hallways, trash chutes, outdoor areas, and heating equipment rooms. Fires originating in a heating equipment room accounted for a disproportionate share of direct property damage, but these losses might have been influenced by a small number of fires.

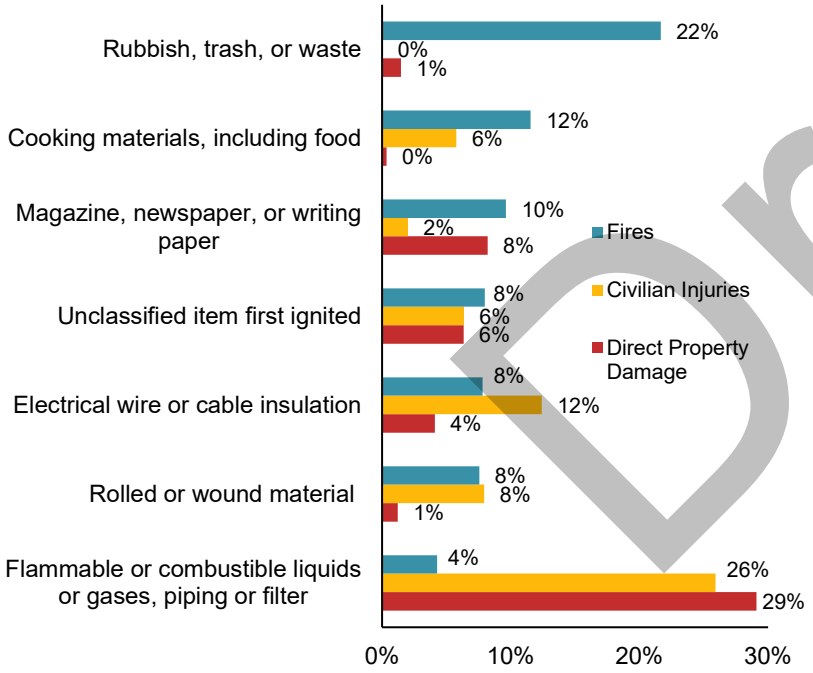
Figure 10. Structure Fires in High Schools and Middle Schools by Area of Origin, 2014–2018 Annual Averages



Item First Ignited

The leading items first ignited in high school and middle school fires were rubbish, trash, or waste; cooking materials; and magazines, newspapers, or writing paper. Many of these items were likely involved in fires that were intentionally set or those caused by cooking equipment. Fires in which flammable or combustible liquids or gases, piping and filters were first ignited —– just four percent of the total — caused one-quarter of the injuries and 29 percent of the property losses.

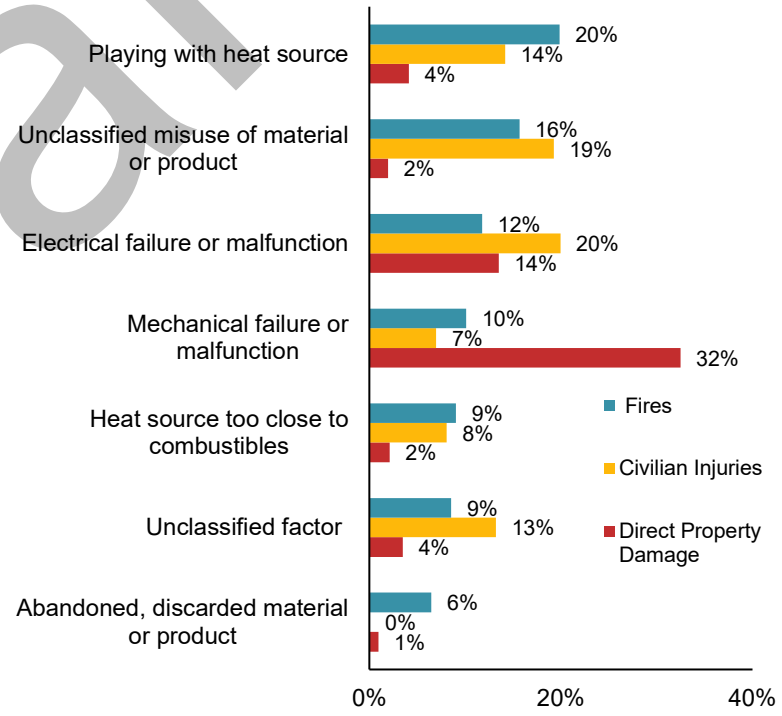
Figure 11. Structure Fires in High Schools and Middle Schools by Item First Ignited, 2014–2018 Annual Averages



Factor Contributing to Ignition

Factors relating to human behavior were the two leading causes of middle and high school fires — playing with a heat source, which contributed to the ignition of one-fifth of the fires, and some form of misuse of a material or product, which contributed to the ignition of another 16 percent of the fires. Electrical and mechanical failures or malfunctions together contributed to the ignition of one in five fires in high schools and middle schools.

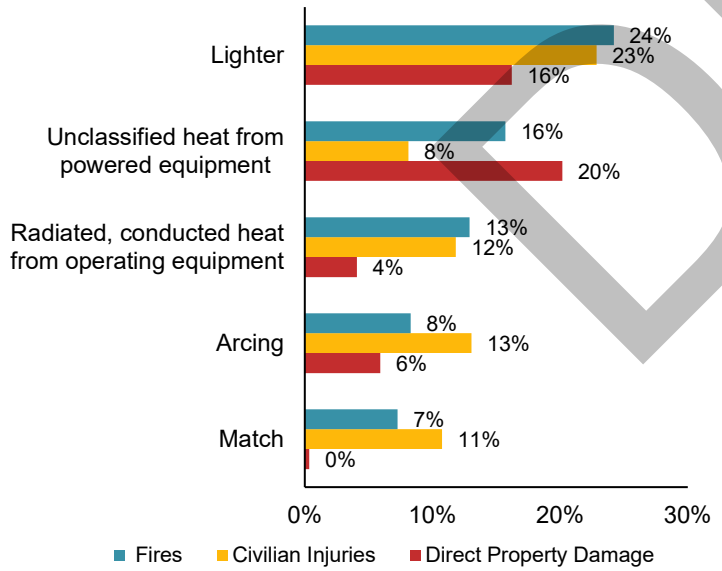
Figure 12. Structure Fires in High Schools and Middle Schools by Factor Contributing to Ignition, 2014–2018 Annual Averages



Heat Source

As shown in Figure 13, almost one-third of the fires in high schools and middle schools were started by a lighter or a match. However, powered equipment and operating equipment together provided the heat for almost three in 10 fires and produced one-quarter of the direct property damage. Arcing also served as a leading heat source in high school and middle school fires, underscoring the need for proper maintenance of electrical equipment and use of power cords, as well as the importance of caution with electrical hazards in schools. Fires started by spontaneous combustion or a chemical reaction contributed to a minor share of the fires but caused the greatest amount of direct property damage (29%), as shown in Table 22. However, a small number of large loss fires could explain this disparity.

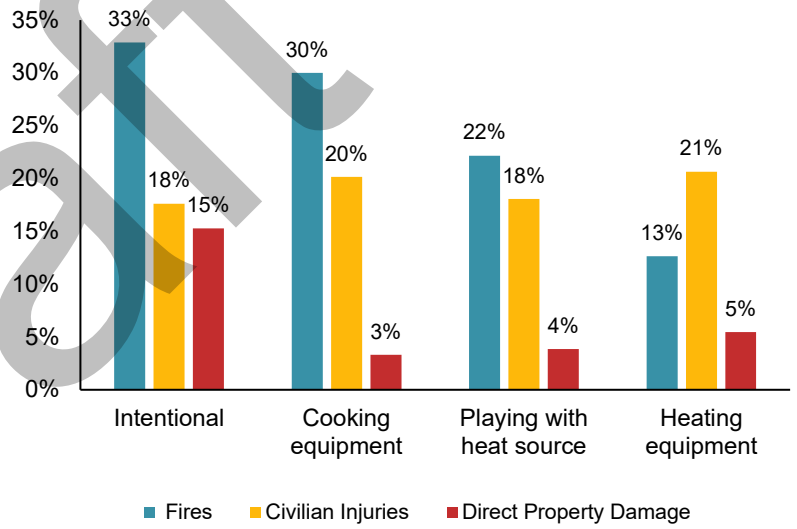
Figure 13. Structure Fires in High Schools and Middle Schools by Heat Source, 2014–2018 Annual Averages



Part 3: Structure Fires in Elementary Schools

As with fires in high schools and middle schools, the leading causes of fires in elementary schools were intentionally set fires, fires caused by cooking equipment, and fires caused by playing with a heat source (Figure 11).

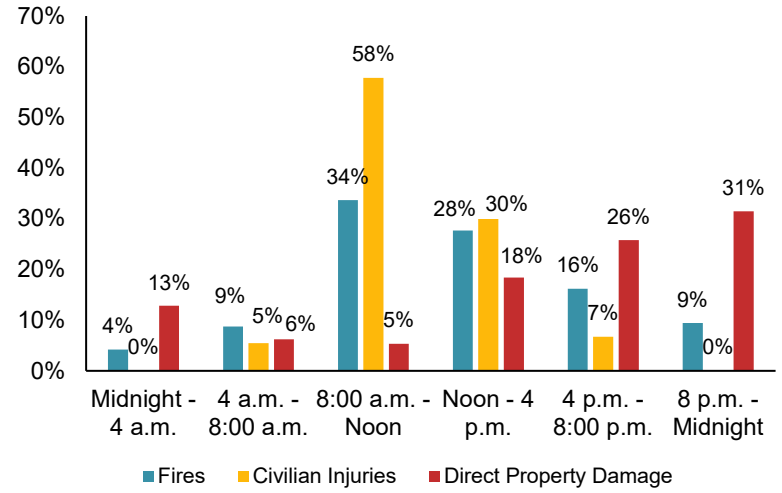
Figure 14. Structure Fires in Elementary Schools by Leading Cause, 2014–2018 Annual Averages



Timing of Fires in Elementary Schools

The peak time period of fires in elementary schools was the eight-hour period between 8 a.m. and 4 p.m., but the share of fires occurring during these school hours was lower than that in high schools. The greatest share of direct property damage was associated with fires occurring between 8 p.m. and midnight (31%), a time interval that accounted for fewer than one in 10 fires.

Figure 15. Structure Fires in Elementary Schools by Time of Day 2014–2018 Annual Averages



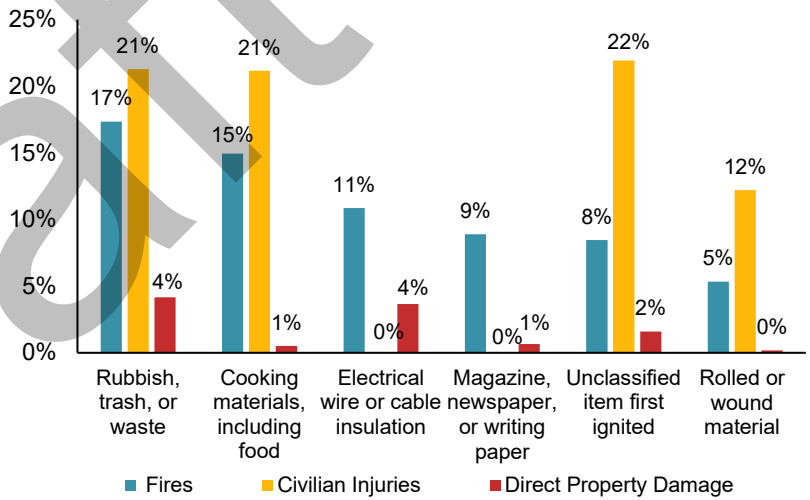
Area of Fire Origin

Fires in elementary schools were most likely to start in the lavatory or locker room or kitchen or cooking area, though the share of lavatory or locker room fires was substantially lower than in high schools, reflecting the lower prevalence of intentional fires at the elementary school level. A small share of fires starting on an exterior roof surface caused nearly one-quarter of the direct property damage, as shown in Table 29. Fires starting in a small assembly area also accounted for a disproportionate share of the direct property damage.

Item First Ignited

Elementary school fires were most often ignited in trash or by cooking materials. Fires ignited in cooking materials were primarily minor fires and did not result in property damage. The ongoing presence of kitchen staff in schools is likely to be a factor that differentiates cooking-related fires in schools from those in homes, where cooking fires might be unattended and are more likely to cause damage. Fires ignited on a roof covering or finish represented a small share of fires but accounted for a disproportionately large share of direct property damage, as indicated in Table 30. It should again be noted that the disparity could be influenced by a small number of fires with larger losses.

Figure 16. Structure Fires in Elementary Schools by Item First Ignited, 2014–2018 Annual Averages

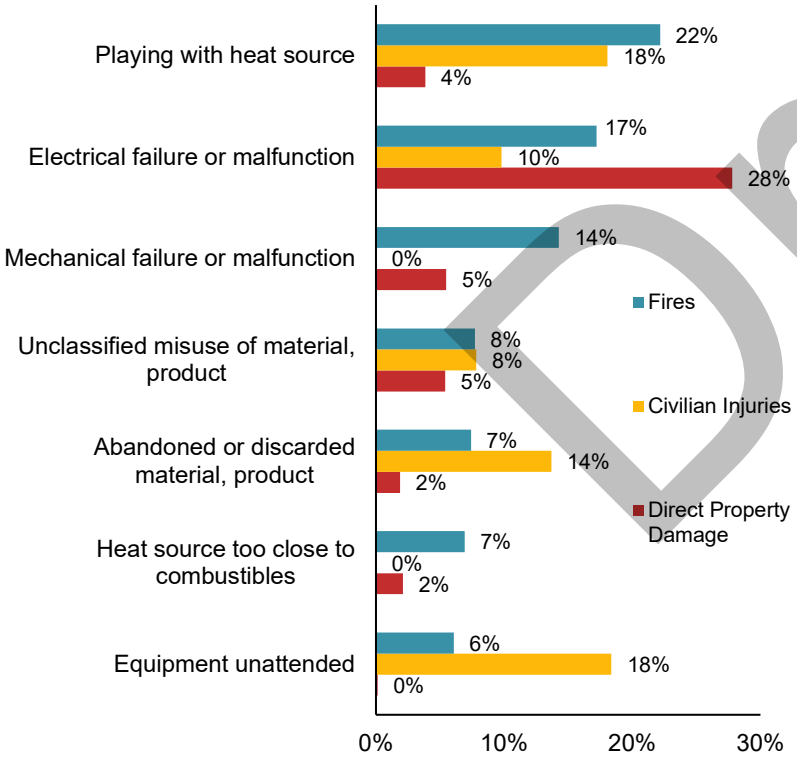


Factor Contributing to Ignition

Several leading factors that contributed to the ignition of fires in elementary schools had behavioral implications, including playing with a heat source, misuse of a material or product, unattended equipment, and abandoned or discarded material or product. Playing with a heat source was a particular issue at the elementary school level, serving as a factor contributing to ignition of just over one-fifth of the fires (22%).

Fires involving electrical and mechanical equipment were also leading causes of fires in elementary schools, suggesting gaps in the maintenance and repair of school equipment or infrastructure. Fires involving electrical failures or malfunctions, which contributed to slightly less than one-fifth of the fires, accounted for the highest share of the direct property damage. While responsible for fewer than one in 10 fires, those involving unattended equipment resulted in a disproportionately large share of injuries (18%), possibly because those attending to the equipment were injured while trying to put the fire out.

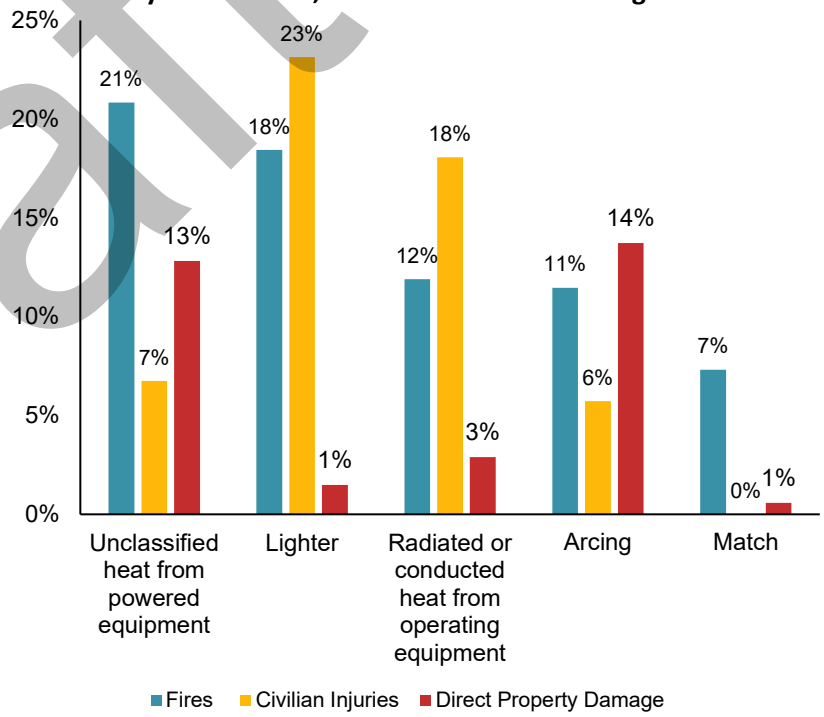
Figure 17. Structure Fires in Elementary Schools by Factor Contributing to Ignition, 2014–2018 Annual Averages



Heat Source

Lighters and matches together provided the heat source in one-quarter of elementary school fires, which is consistent with intentional fires and fires involving fire play (Figure 18). Other leading heat sources of elementary school fires involved equipment or electrical sources, including heat from powered or operating equipment and electrical arcing.

Figure 18. Structure Fires in Elementary Schools by Heat Source, 2014–2018 Annual Averages



Additional Information

See *Structure Fires in Schools: Supporting Tables* by Richard Campbell, September 2020, for more detailed information about the material presented in this report.

Acknowledgments

The National Fire Protection Association® thanks all the fire departments and state fire authorities who participate in the National Fire Incident Reporting System (NFIRS) and the annual NFPA® fire experience survey. These firefighters are the original sources of the detailed data that make this analysis possible. Their contributions allow us to estimate the size of the fire problem. We are also grateful to the US Fire Administration for its work in developing, coordinating, and maintaining NFIRS.

To learn more about research at NFPA, visit nfpa.org/research.

E-mail: research@nfpa.org

NFPA No. PKG14

Comment submitted by:

DAVID SECODA
Senior Consultant
jensenhughes.com
Contact information is shown at the end of the comment.

Item 9
Chapter 9, Fire Protection and Life Safety Systems

The SFM proposes to adopt Chapter 9 and carry forward amendments to Sections…**907.5.2.4**…

CBC 907.5.2.4 reads as follows:

> *907.5.2.4 Group E schools. One audible alarm notification appliance shall be mounted on the exterior of a buildings to alert occupants at each playground area.*

Comment against carrying forward amendment 907.5.2.4.

The CBC 907.5.2.4 amendment **should not be carried forward** for the following reasons:

1. The cost to the public is **not reasonable**, based on questionable benefits derived from the amendment.
2. **The amendment is capricious on the whole:** The amendment is **not performance-based**. For comparison, where audible alarms are specified *indoors*, the code specifies a minimum sound level to be effective (i.e. 15 decibels above average ambient sound.) CBC 907.5.2.4 is frivolous in that it does not prescribe a minimum sound level. The amendment is only a *location-based* requirement.
3. **Questionable** life/safety **benefit**: Occupants at playground areas are not directly threatened by fires occurring within buildings.
4. **Questionable** life/safety **benefit**: Occupants at playground areas may already be at their designated fire emergency assembly area.
5. Exterior-mounted audible alarms are **more costly** than interior alarms.
    a. Exterior-mounted alarms are special-purpose appliances and are required to be "weatherproof". Alarms exposed to weather will deteriorate more quickly than those not exposed to weather.
    b. Mounting appliances on the exterior of a building requires a wire penetration through the exterior wall of a building. Such penetrations are a source for water intrusion into buildings.
    c. The additional **costs impact ALL California K-12 Schools Statewide**.
6. The 2019 California Fire Code Amendments Handbook provides the following limited history for the amendment.

907.5.2.4 Group E schools. *One audible alarm notification appliance shall be mounted on the exterior of a building to alert occupants at each playground area.*

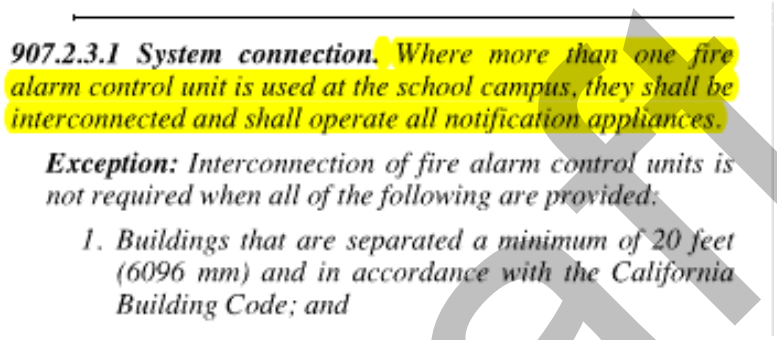
🕮 *2013*

❖ The SFM is proposing modification to the above sections in coordination with the Divisions of State Architect to clarify the specific number of exterior audible alarms for playground area(s) and to clarify that all buildings do not require an exterior audible device or multiple devices.

History:

There have been a large number of projects that have been submitted for plan review where the design professional placed at least one audible device on the exterior of each building fronting a playground with audible devices on each side of the building to notify those who are "around" the area(s). This could include a group of several portable buildings, each having one to three exterior audible devices. The large number of notification devices reportedly can amplify the alarm sound up to five blocks away from the school site, often through residential areas. There have been numerous complaints from residents. The intent of the code is to notify playground occupants that there is a fire and not to enter buildings. A single device will be sufficient.

7. The above history of the amendment is **nonsensical**. It is unlikely that an occupant *outside* a building could *unknowingly* enter a school building involved in a fire. CBC 907.2.3.1 (a separate amendment) requires that **all notification appliances operate on a school campus**.
    a. In effect, this means that **all** notification appliances (both audible and visual) including those installed within all buildings on a school campus operate simultaneously. Where the exception to 907.2.3.1 is applicable, then notification appliances operate only in those buildings involved in a fire alarm event.



907.2.3.1 System connection. *Where more than one fire alarm control unit is used at the school campus, they shall be interconnected and shall operate all notification appliances.*

Exception: *Interconnection of fire alarm control units is not required when all of the following are provided:*

1. Buildings that are separated a minimum of 20 feet (6096 mm) and in accordance with the California Building Code; and

8. Notes on **earlier history** of the amendment:
    a. The amendment likely originated in the early 2000's with the development of the 2007 California Building Code.
    b. The requirement for an exterior audible device first appeared in the 1997 Uniform Building Code (UBC), published by the International Conference of Building Officials (ICBO).
    c. 1997 was the **last** published edition of the UBC (published by the ICBO).
    d. ICBO later merged with other model code publishers to create a new model code making body - The International Code Council (ICC), publisher of the International Building Code (IBC).
    e. The 1997 UBC continued as the basis for the 1998 and 2001 CBC and remained in effect until superseded by the 2007 CBC (based on the 2006 International Building Code).
    f. During this time there was great controversy over the ICC model building code and the National Fire Protection Association (NFPA) model building code (NFPA 5000).
    g. In the process of choosing a new model building code for the State of California, fire protection professionals worked to compare the last (1997) edition of the UBC and the 2006 edition of the IBC.
    h. The requirement for an exterior audible is not found in the 2006 IBC, the successor to the 1997 UBC. The amendment (CBC 907.5.2.4) was most

probably created solely because the requirement existing in the 1998 CBC (based on the 1997 UBC) but did not exist in the 2006 IBC.

9. New Group E buildings require Emergency Voice Alarm Communication (EVAC) type audible notification.
    a. A single speaker is **insufficient** to effectively (intelligibly) notify occupants in large outdoor areas, such as playgrounds.
10. Mass notification is not required for K-12 Group E buildings.
    a. The communication method used to notify groups of people outdoors is included in the category of “Mass Notification”.
    b. Mass notification is not required for any California occupancy type. College and university campuses require a mass notification risk analysis **only** for new buildings. (CBC Section 917).
    c. Based on California Division of the State Architect interpretation 9-1, DSA does not plan review: 1) Risk Analysis reports, 2) Acoustics reports, 3) Acoustically Distinguishable space locations, or 4) Speaker spacing for intelligibility.

I am between jobs. My contact information is:
David Secoda email: david.secoda@outlook.com
Phone: 510-473-2632

All exterior openings in a boiler room or rooms containing central heating equipment, if located below openings in another story or if less than 10 feet (3048 mm) from other doors or windows of the same building, shall be protected by a fire assembly having a three-fourths-hour fire-protection rating. Such fire assemblies shall be fixed, automatic closing or self-closing.

Class I, II or III-A liquids shall not be placed, stored or used in Group E Occupancies, except in approved quantities as necessary in laboratories and classrooms and for operation and maintenance as set forth in the Fire Code.

305.9 Fire Alarm Systems. An approved fire alarm system shall be provided for Group E Occupancies with an occupant load of 50 or more persons. In Group E Occupancies provided with an automatic sprinkler or detection system, the operation of such system shall automatically activate the school fire alarm system, which shall include an alarm mounted on the exterior of the building.

See Chapter 10 for smoke-detection requirements.

For installation requirements, see the Fire Code.

SECTION 306 — REQUIREMENTS FOR GROUP F OCCUPANCIES

306.1 Group F Occupancies Defined. Group F Occupancies shall include the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as Group H Occupancies. Factory and industrial occupancies shall include the following:

Division 1. Moderate-hazard factory and industrial occupancies shall include factory and industrial uses that are not classified as Group F, Division 2 Occupancies, but are not limited to facilities producing the following:

1. Aircraft.
2. Appliances.
3. Athletic equipment.
4. Automobiles and other motor vehicles.
5. Bakeries.
6. Alcoholic beverages.
7. Bicycles.
8. Boats.
9. Brooms and brushes.
10. Business machines.
11. Canvas or similar fabric.
12. Cameras and photo equipment.
13. Carpets and rugs, including cleaning.
14. Clothing.
15. Construction and agricultural machinery.
16. Dry cleaning and dyeing.
17. Electronics assembly.
18. Engines, including rebuilding.
19. Photographic film.
20. Food processing.
21. Furniture.
22. Hemp products.
23. Jute products.
24. Laundries.
25. Leather products.
26. Machinery.
27. Metal.
28. Motion pictures and television filming and videotaping.
29. Musical instruments.
30. Optical goods.
31. Paper mills or products.
32. Plastic products.
33. Printing or publishing.
34. Recreational vehicles.
35. Refuse incineration.
36. Shoes.
37. Soaps and detergents.
38. Tobacco.
39. Trailers.
40. Wood, distillation.
41. Millwork (sash and door).
42. Woodworking, cabinet.

Division 2. Low-hazard factory and industrial occupancies shall include facilities producing noncombustible or nonexplosive materials which, during finishing, packing or processing, do not involve a significant fire hazard, including, but not limited to, the following:

1. Nonalcoholic beverages.
2. Brick and masonry.
3. Ceramic products.
4. Foundries.
5. Glass products.
6. Gypsum.
7. Steel products—fabrication and assembly.

For occupancy separations, see Table 3-B.

306.2 Construction, Height and Allowable Area.

306.2.1 General. Buildings or parts of buildings classed as Group F Occupancies because of the use or character of the occupancies shall be limited to the types of construction set forth in Table 5-B and shall not exceed, in area or height, the limits specified in Sections 504, 505 and 506.

306.2.2 Special provisions, Group F, Division 2 roof framing. In Division 2 Occupancies, the roof-framing system may be of unprotected construction.

306.3 Location on Property. For fire-resistive protection of exterior walls and openings, as determined by location on property, see Section 503.

306.4 Access and Means of Egress Facilities. Means of egress shall be provided as specified in Chapter 10.

Access to, and egress from, buildings required to be accessible shall be provided as specified in Chapter 11.

306.5 Light, Ventilation and Sanitation. In Group F Occupancies, light, ventilation and sanitation shall be as specified in Chapters 12 and 29.

the appropriate Group H Occupancy

See Section 1007 3 for means of egress from laboratories in Group E Occupancies

Equipment in rooms or groups of rooms sharing a common atmosphere where flammable liquids, combustible dust or hazardous materials are used, stored, developed or handled shall conform to the requirements of the Fire Code

305.3 Location on Property. All buildings housing Group E Occupancies shall front directly on a public street or an exit discharge not less than 20 feet (6096 mm) in width The exit discharge to the public street shall be a minimum 20-foot-wide (6096 mm) right-of-way, unobstructed and maintained only as access to the public street. At least one required exit shall be located on the public street or on the exit discharge

For fire-resistive protection of exterior walls and openings, as determined by location on property, see Section 503 and Chapter 6

305.4 Access and Means of Egress Facilities. Means of egress shall be provided as specified in Chapter 10 (For special provisions, see Section 1007 3)

Access to, and egress from, buildings required to be accessible shall be provided as specified in Chapter 11

305.5 Light, Ventilation and Sanitation. All portions of Group E Occupancies customarily occupied by human beings shall be provided with light and ventilation, either natural or artificial, as specified in Chapter 12 See Section 1003 2 9 for required means of egress illumination

The number of urinals and drinking fountains shall be as specified in Section 2902 4

305.6 Shaft and Exit Enclosures. Exits shall be enclosed as specified in Chapter 10 Elevator shafts, vent shafts and other vertical openings shall be enclosed, and the enclosure shall be as specified in Section 711

305.7 Sprinkler and Standpipe Systems. When required by Section 904 2 1 or other provisions of this code, automatic sprinkler systems and standpipes shall be designed and installed as specified in Chapter 9

305.8 Special Hazards. Chimneys and heating apparatus shall conform to the requirements of Chapter 31 of this code and the Mechanical Code

Motion picture machine rooms shall conform to the requirements of Chapter 4

All exterior openings in a boiler room or rooms containing central heating equipment, if located below openings in another story or if less than 10 feet (3048 mm) from other doors or windows of the same building, shall be protected by a fire assembly having a three-fourths-hour fire-protection rating. Such fire assemblies shall be fixed, automatic closing or self-closing

Class I, II or III-A liquids shall not be placed, stored or used in Group E Occupancies, except in approved quantities as necessary in laboratories and classrooms and for operation and maintenance as set forth in the Fire Code

305.9 Fire Alarm Systems. An approved fire alarm system shall be provided for Group E Occupancies with an occupant load of 50 or more persons In Group E Occupancies provided with an automatic sprinkler or detection system, the operation of such system shall automatically activate the school fire alarm system, which shall include an alarm mounted on the exterior of the building

See Chapter 10 for smoke-detection requirements.

For installation requirements, see the Fire Code

Reason: The generic "E" Occupancy contained in the proposed working draft (first draft) treats all schools with 6 or more students just like the Los Angeles Unified School District, the largest single school in California. This is not fair to small school facilities which do not pose the hazard that a large school facility does

Analysis The proposal has references and other correlation issues as the language is from the 1997 edition of the UBC without modifications.

The intent of the drafting process was to develop a draft of a comprehensive building code that is consistent with and inclusive of the scope and context of the existing model codes The proponent should demonstrate how this proposal accomplishes that intent

Public Hearing: Committee: AS AM D
Assembly: ASF DF

305.1

Not part of the 2000. 2003 or 2006 International Building Code.

Proponent: Gene Boecker, Code Consultants, Inc.

1. Revise as follows:

305.1 Educational Group "E". Educational Group "E" includes among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade. Auditoriums, gymnasiums, cafeterias, libraries, and similar assembly-like spaces located within the structures shall be included in the educational classification and shall comply with the requirements of this code for Group E except that the requirements in Section 1011 shall also be applicable to these spaces.

2. Revise as follows:

Notes to Table 302.3.3

1. For occupancies other than H and I-2 buildings equipped with an automatic sprinkler system in accordance with Section 903.3.2. See the exception to Section 302.3.3.
2. Occupancy separation need not be provided for accessory storage areas within Group M if the:
   1. Area is less than 10% of the floor area, or
   2. Area is provided with an automatic fire

structures constructed on or after July 1, 1991, which are intended for public assemblies of 10,000 or more persons, a public address system with an emergency backup power system shall be required.

Existing buildings or structures intended for public assemblies of 10,000 or more persons, which, on or after January 1, 1991, have or subsequently have installed a public address system, shall have an emergency backup power system for the public address system.

[F] 907.2.2 Group B. A manual fire alarm system shall be installed in Group B occupancies having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system and the alarm notification appliances will activate upon sprinkler water flow.

907.2.3 Group E. A manual *and automatic* fire alarm system shall be installed in Group E occupancies *with an occupant load of 50 or more persons or containing more than one classroom or one or more rooms used for day care purposes.* When automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

Exceptions:

1. Manual fire alarm boxes are not required in Group E occupancies where all the following apply:
   1.1. Interior corridors are protected by smoke detectors with alarm verification.
   1.2. Auditoriums, cafeterias, gymnasiums and the like are protected by heat detectors or other approved detection devices.
   1.3. Shops and laboratories involving dusts or vapors are protected by heat detectors or other approved detection devices.
   1.4. Off-premises monitoring is provided.
   1.5. The capability to activate the evacuation signal from a central point is provided.
   1.6. In buildings where normally occupied spaces are provided with a two-way communication system between such spaces and a constantly attended receiving station from where a general evacuation alarm can be sounded, except in locations specifically designated by the fire code official.
2. Manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an approved automatic sprinkler system, the notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location.

[F] 907.2.3.1 System connection. *When more than one fire alarm control unit is used at the school campus, they shall be interconnected and shall operate all notification appliances.*

Exception: *Interconnection of fire alarm control units is not required when:*

1. *Buildings that are separated a minimum of 20 feet (6096 mm) and in accordance with the California Building Code, and*
2. *There is a method of communication between each classroom and the school administrative office approved by the fire authority having jurisdiction.*

[F] 907.2.3.2 School fire alarms. *Except as provided in Section 907.3, every building used for educational purposes, regardless of occupancy classification, shall be provided with an approved fire alarm system. This provision shall apply to, but shall not necessarily be limited to, every elementary school, high school, community college and university.*

Exception: *Privately owned trade or vocational schools or any firm or company that provides educational facilities and instructions for its employees.*

[F] 907.2.3.3 Notification. *The system notification shall be consistent with the requirements for audible and visible notification requirements of Section 907 and NFPA 72 as amended in Chapter 35. Audible notification shall comply with the American National Standards Institute (ANSI) S3.41 Emergency Evacuation Signal. An audible alarm notification appliance shall be mounted on the exterior of buildings to alert occupants in and around the playground area.*

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[F] 907.2.3.4 Annunciation. *Annunciation of the fire alarm system shall comply with the requirements of Section 907.8.*

[F] 907.2.3.5 Supervising station. *Fire alarm systems shall transmit the alarm, supervisory and trouble signals to an approved supervising station in accordance with NFPA 72. The supervising station shall be listed as either UUFX (central station) or UUJS (remote and proprietary) by Underwriters Laboratories Inc. (UL) or shall comply with the requirements of standard, FM 3011.*

[F] 907.2.3.6 Public school—smoke detectors.

[F] 907.2.3.6.1 Automatic detection. *Smoke detectors shall be used as the primary method of automatic alarm initiation except in areas where the environment or ambient conditions exceed smoke detector installation guidelines, another method of automatic detection shall be used. In areas containing sprinklers, heat detectors may be omitted. Smoke detectors shall be designed, installed and maintained in accordance with Section 907 and NFPA 72 as amended in Chapter 35.*

Smoke detectors shall be located at the ceiling of every room and area, and in "ceiling-plenums" utilized for environmental air. In buildings provided with an approved automatic fire sprinkler system where the ceiling creates a "ceiling-plenum" or a space