

EDWARDS

EST 1872
150
YEAR ANNIVERSARY

EDWARDS

Carrier



About Me: James C. Martzall



- Edwards: 4.5 year
- HyperSpike: 7 years
 - Design both indoor and outdoor ECS/MNS systems
 - Traveled the world
 - Hundreds of demos completed
 - Jim Beam
 - NASA
 - Facebook
- Certifications:
 - NICET Level II Fire Alarm Systems: 150831
 - GROL Certified: FRN: 0032353443
 - General Radiotelephone Operators License
 - Elements One, Three, & Eight with Radar Endorsement
 - Purdue MBA Candidate 2024



#4 Aug. 2023

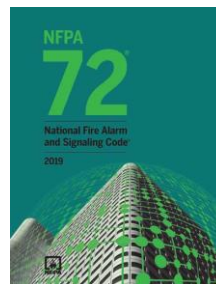
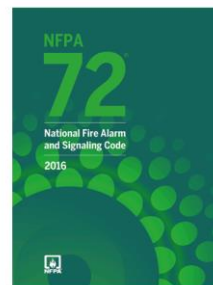
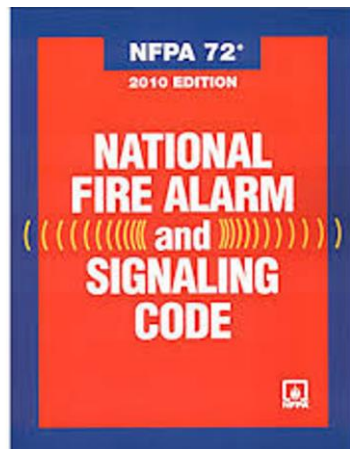


Knowing is half the battle

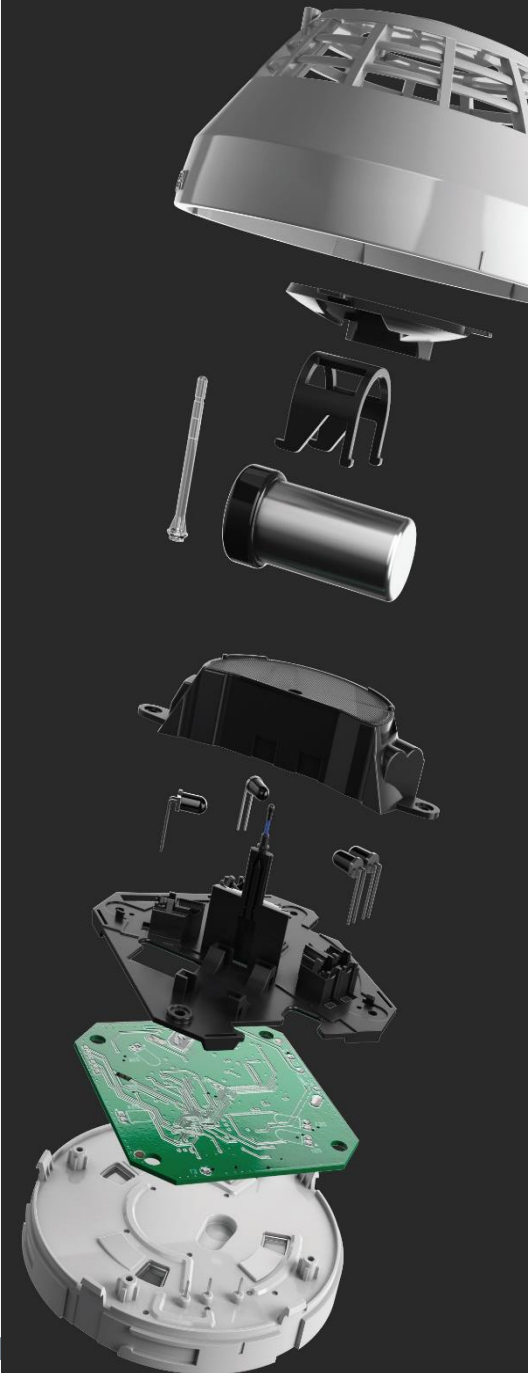
A large, stylized graphic on a black background. The word "KNOWING" is written in a bold, italicized, white sans-serif font. A blue five-pointed star is positioned above the letter 'I'. To the right of "KNOWING" are three horizontal bars: a red bar on top, a white bar in the middle, and a blue bar on the bottom. Below "KNOWING" is the phrase "IS HALF THE BATTLE" in a smaller, italicized, white sans-serif font.



Indiana NFPA 72 and IBC Updates

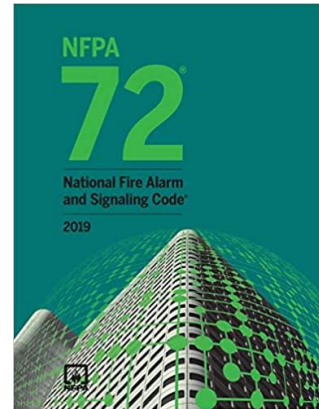
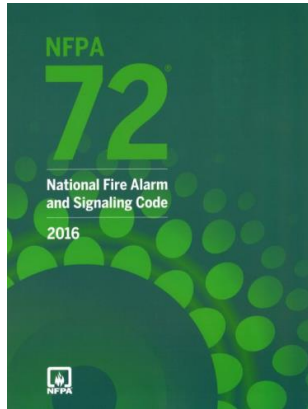
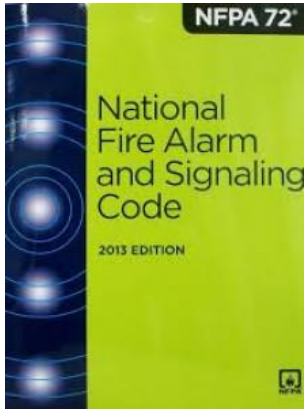


Proprietary and Confidential

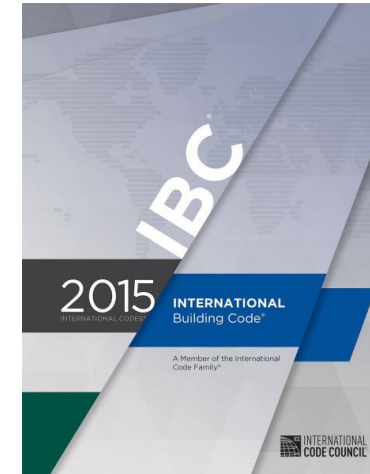


Indiana:

- NFPA 72 2010 – A lot taken out.....
- NFPA 72 2019/2022 Coming soon!



- Indiana Building Code 2012
 - Based on 2014 Edits as well
- Quick References for Fire
 - Chapter 2
 - Chapter 3
 - Chapter 9
 - 903 – Sprinkler
 - 907 – Fire Alarm

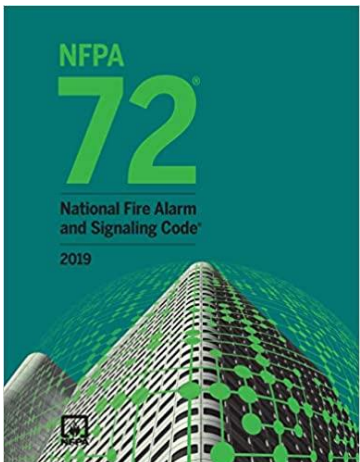


2024 in the works



Indiana building code tells us WHAT is needed in the building.

The provisions of this code shall apply to the construction, alteration, relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.



NFPA 72 tell us HOW to put the system in a building.

1.1.1 NPFA 72 cover the application, installation, location, performance, inspection, testing, and maintenance of fire alarm systems, supervising station alarm systems, public emergency alarm reporting systems, fire warning equipment and emergency communications systems (ECS), and their components.

Up Codes:

<https://up.codes/codes/michigan>

ICC Digital codes

https://codes.iccsafe.org/content/MIBC2015P1/chapter-9-fire-protection-systems#MIBC2015P1_Ch09_Sec907

It shows the differences from code cycle to code cycle or changes from International codes.

HIGH-RISE BUILDING. A building with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

HIGH-RISE BUILDING. "High-rise building" means a building with an occupied floor located more than 55 feet (16 764 mm) above the lowest level of fire department vehicle access.

R 408.30415a

Michigan 2015 Amendments

[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. 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 such stations are visible and *continuously accessible and that the distances of travel required in Section 907.4.2.1 are not exceeded.*
2. 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 International Fire Code.*

REVISION SYMBOLS IDENTIFYING CHANGES FROM THE PREVIOUS EDITION

Text revisions are indicated by a shaded background. When a chapter, section, or table is deleted and a new one is added, one or more sections, figures, or tables are deleted. Note that the text in this cheat sheet is for informational purposes only, but users can refer to the NFPA Technical Manual for more information.

N 17.7.3.6.3 Installation and Spacing.

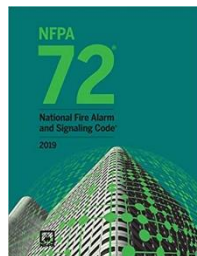
17.7.3.6.3.1* Air sampling pipe network fittings shall be installed air-tight and permanently affixed.

•
N 17.7.3.6.3.2 Sampled air shall be exhausted to a lessor or equal pressure zone. The pressure differential between the sampled air and detector exhaust shall not exceed the manufacturer's published instructions.

N 17.7.3.6.3.3* Supports for sampling pipe shall be in accordance with the air sampling-type smoke detector manufacturer's published instructions.

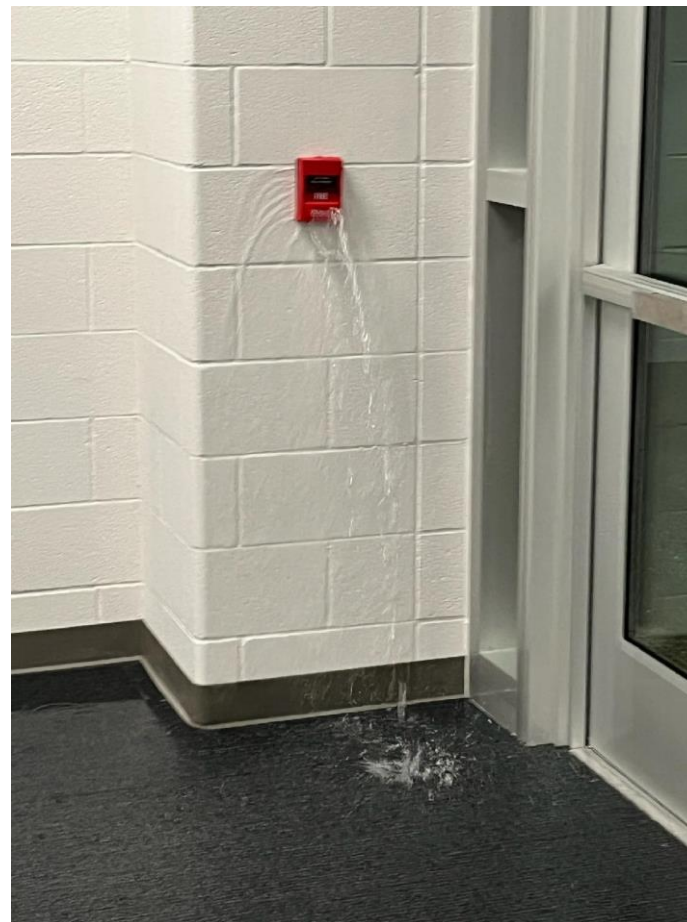
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Shaded text = Revisions. **Δ** = Text deletions and figure/table revisions. **•** = Section deletions, **N** = New material, **Δ** = Deleted material.

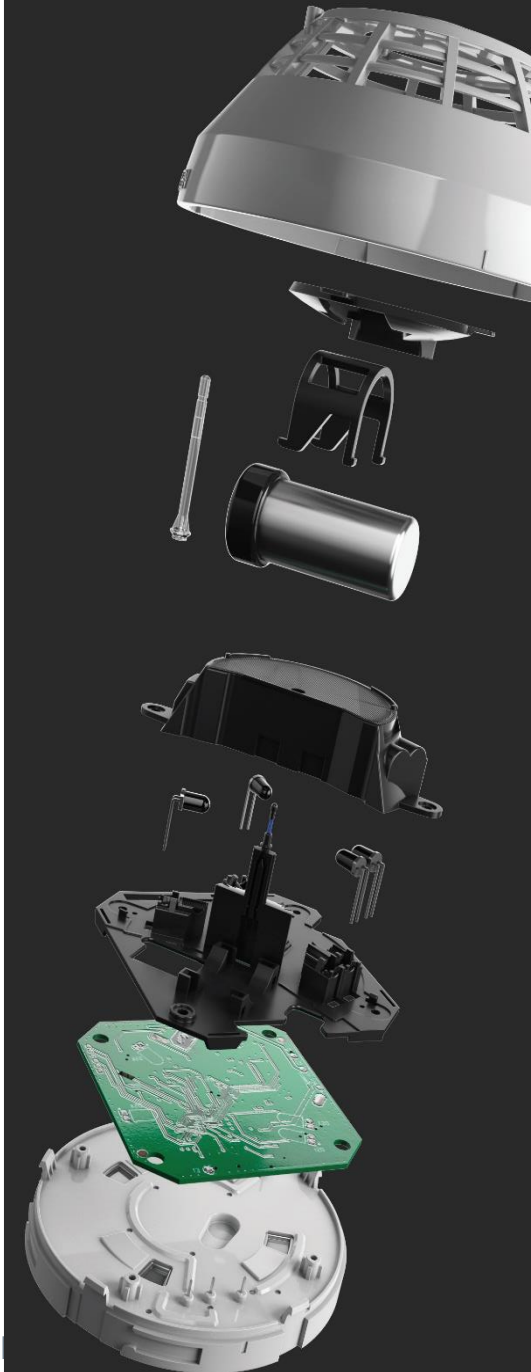




Quiz Time!



Who do you call? FA vendor or plumber?



Question:

NFPA 72 1.2.3: This Code establishes _____ required levels of performance, extent of redundancy, and quality of installation but does not establish the only methods by which these requirements are to be achieved.

Answer:

- A) Maximum
- B) Minimum
- C) Necessary
- D) Crucial

Question: Shall vs. Should

3.2.6

Shall - Indicates a _____ requirement.

Answer:

A) Mandatory

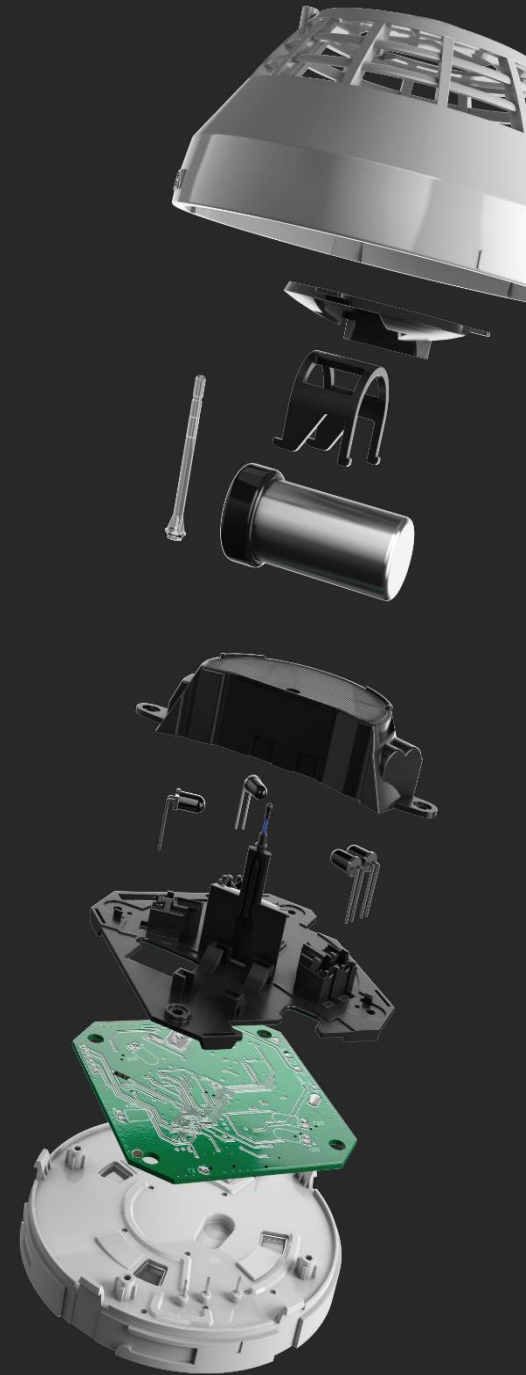
B) Recommended

3.2.7

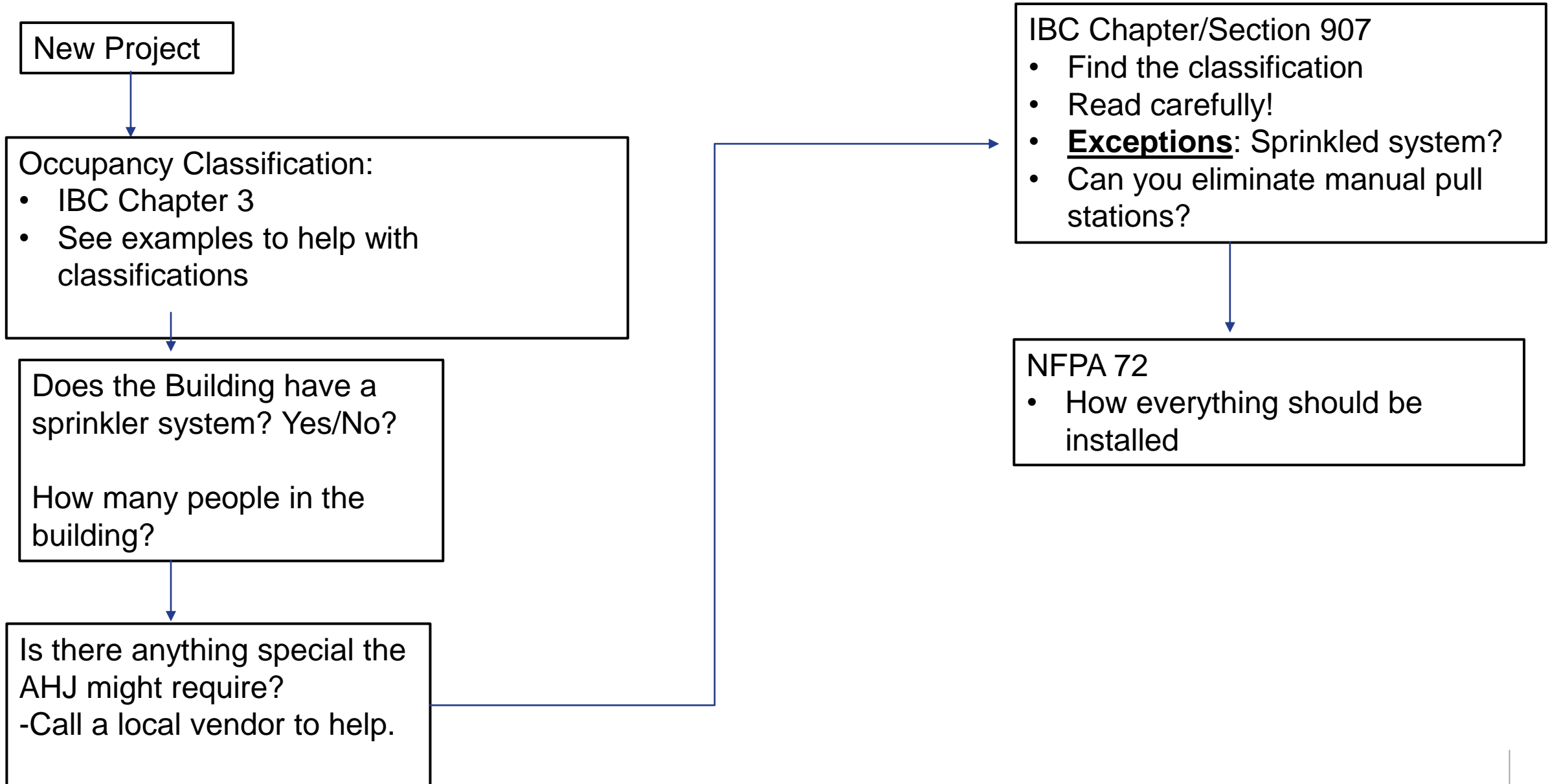
Should – Indicates a recommendation or that which is advised but not required.



What is needed and
how do I know?



A Simple Diagram



302.1 General

Structures or portions of structures shall be classified with respect to occupancy in one or more of the groups listed in this section. A room or space that is intended to be occupied at different times for different purposes shall comply with all of the requirements that are applicable to each of the purposes for which the room or space will be occupied. Structures with multiple occupancies or uses shall comply with Section 508. Where a structure is proposed for a purpose that is not specifically provided for in this code, such structure shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard involved.

1. Assembly (see Section 303): Groups A-1, A-2, A-3, A-4 and A-5.
2. Business (see Section 304): Group B.
3. Educational (see Section 305): Group E.
4. Factory and Industrial (see Section 306): Groups F-1 and F-2.
5. High Hazard (see Section 307): Groups H-1, H-2, H-3, H-4 and H-5.
6. Institutional (see Section 308): Groups I-1, I-2, I-3 and I-4.
7. Mercantile (see Section 309): Group M.
8. Residential (see Section 310): Groups R-1, R-2, R-3 and R-4.
9. Storage (see Section 311): Groups S-1 and S-2.
10. Utility and Miscellaneous (see Section 312): Group U.

304.1 Business Group B

Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

- Airport traffic control towers
- Ambulatory care facilities
- Animal hospitals, kennels and pounds
- Banks
- Barber and beauty shops
- Car wash
- Civic administration
- Clinic, outpatient
- Dry cleaning and laundries: pick-up and delivery stations and self-service
- Educational occupancies for students above the 12th grade
- Electronic data processing
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m²) in area.
- Laboratories: testing and research
- Motor vehicle showrooms
- Post offices
- Print shops
- Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
- Radio and television stations
- Telephone exchanges

907.2.2 Group B

A manual fire alarm system shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B occupant load of all floors is 500 or more.
2. The Group B occupant load is more than 100 persons above or below the lowest level of exit discharge.
3. The fire area contains an ambulatory care facility.

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.

907.2.1 Group A - 2015

A manual fire alarm system that **activates the occupant notification system** in accordance with Section 907.5 shall be installed in Group A occupancies where the occupant load due to the assembly occupancy is 300 or more. Group A occupancies not separated from one another in accordance with Section 707.3.10 shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

907.2.2 Group B - 2015

A manual fire alarm system shall be installed in Group B occupancies where one of the following conditions exists:



2021: Spelled out a lot better.

[F] 907.2.2 Group B.

A manual fire alarm system, which activates the occupant notification system in accordance with Section 907.5, shall be installed in Group B occupancies where one of the following conditions exists:

[F] 907.2.7 Group M

A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group M occupancies where one of the following conditions exists:

1. The combined *Group M occupant load* of all floors is 500 or more persons.
2. The *Group M occupant load* is more than 100 persons above or below the lowest level of exit discharge.

Exceptions:

1. A manual fire alarm system is not required in *covered or open mall buildings* complying with Section 402.
2. 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 automatically activate throughout the notification zones upon sprinkler water flow.

[F] 907.2.7.1 Occupant Notification

During times that the building is occupied, the initiation of a signal from a manual fire alarm box or from a waterflow switch shall not be required to activate the alarm notification appliances when an alarm signal is activated at a *constantly attended location* from which evacuation instructions shall be initiated over an emergency voice/ alarm communication system installed in accordance with Section 907.5.2.2.

Example Project

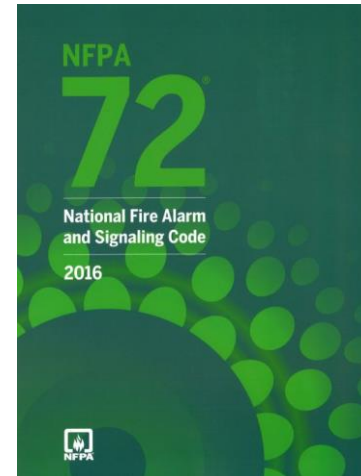
Type of building:	New Flea Market
Size of the building:	45,000 square feet
Number of floors:	Single story, no steps required for entry
Occupant Load:	750 persons
Codes Being Enforced:	NFPA 72, NFPA 70, IBC
IBC Classification:	Group M (Mercantile)

Quiz time

1. According to the IBC, when is a fire alarm system required for a Flea Market?
 - a. If the building is 2 or more stories above exit discharge
 - b. If the occupant load is greater than 300
 - c. If the bldg. is subject to more than 100 persons above or below exit discharge
 - d. All buildings of this type require a fire alarm system

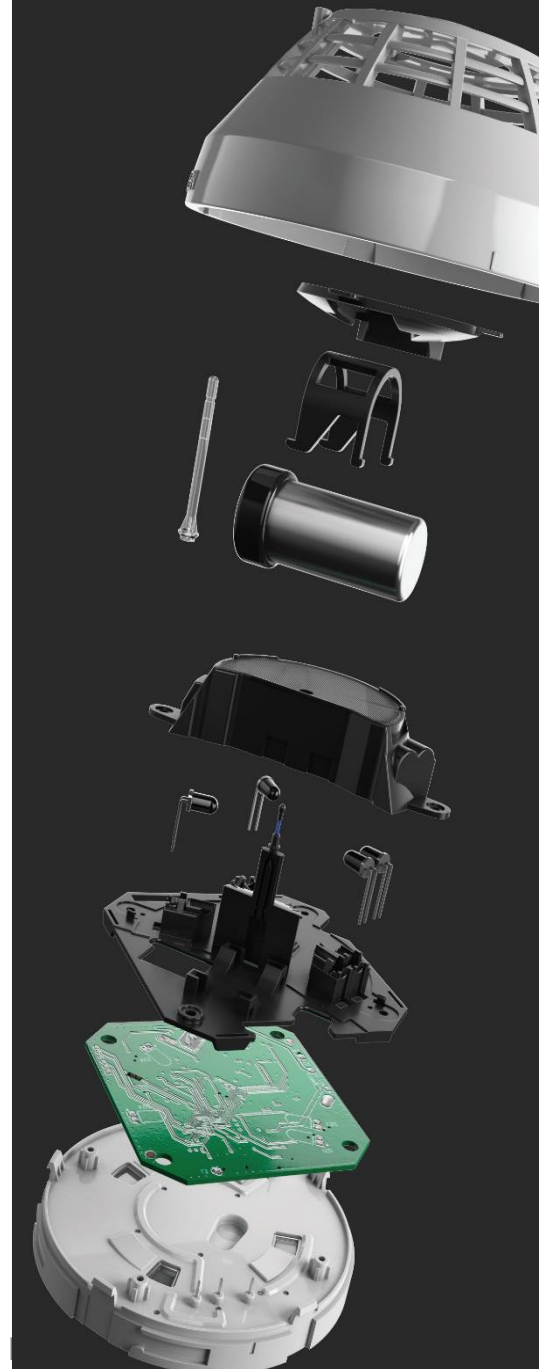
2. According to the IBC, what are the fire alarm initiation requirements for a Flea Market?
 - a. A manual fire alarm system
 - b. A manual system not required for covered mall buildings complying with section 402
 - c. Manual fire alarm boxes not required when building is equipped with an automatic sprinkler system
 - d. All of the above

Any questions on the codes?





IBC Code Updates and Changes



Voice Systems for K-12 Schools Started in 2012



907.2.3 Group E.

A manual 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. When *automatic sprinkler systems* or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

Exceptions:

1. A manual fire alarm system is not required in Group E occupancies with an *occupant load* of 30 or less.
2. Manual fire alarm boxes are not required in Group E occupancies where all of the following apply:
 - 2.1. Interior *corridors* are protected by smoke detectors.
 - 2.2. Auditoriums, cafeterias, gymnasiums and similar areas are protected by *heat detectors* or other *approved* detection devices.
 - 2.3. Shops and laboratories involving dusts or vapors are protected by *heat detectors* or other *approved* detection devices.
3. Manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1, the emergency voice/alarm communication system will activate on sprinkler water flow and manual activation is provided from a normally occupied location.

2012 IBC

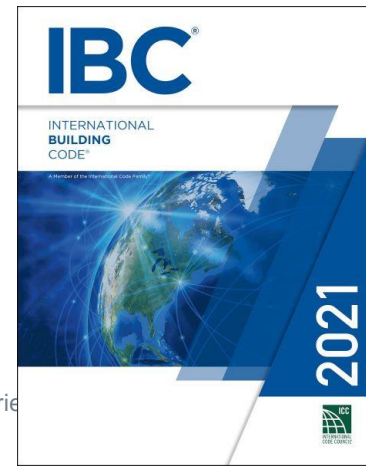


[F] 907.2.3 Group E.

A manual 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. Where *automatic sprinkler systems* or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

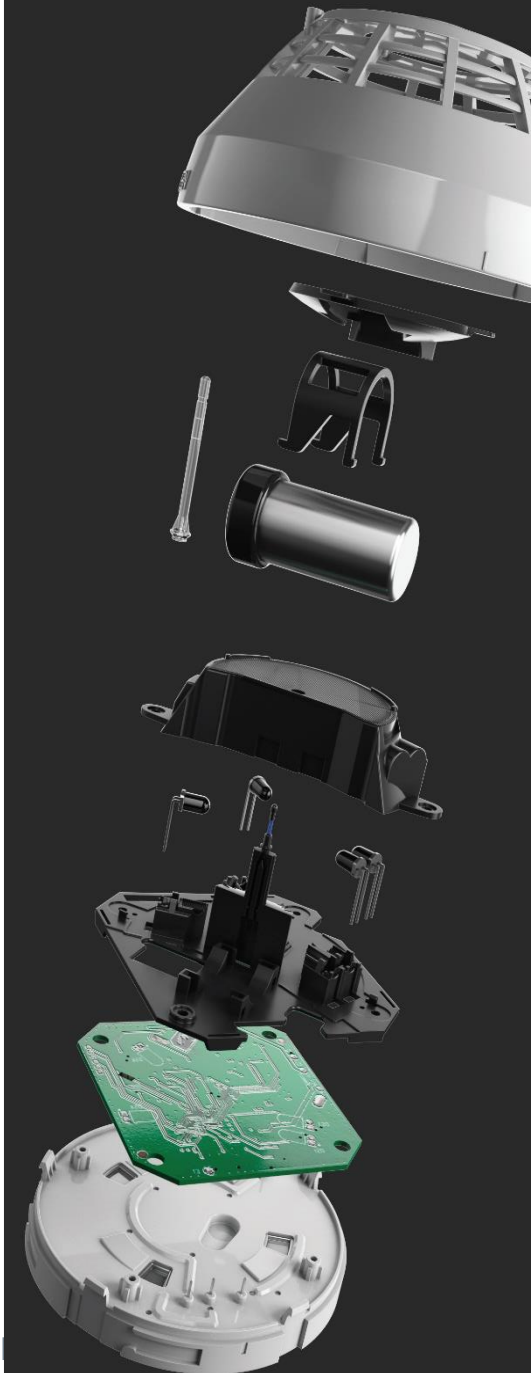
Exceptions:

1. A manual fire alarm system shall not be required in Group E occupancies with an occupant load of 50 or less.
2. Emergency voice/alarm communication systems meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall not be required in Group E occupancies with occupant loads of 100 or less, provided that activation of the manual fire alarm system initiates an approved occupant notification signal in accordance with Section 907.5.
3. Manual fire alarm boxes shall not be required in Group E occupancies where all of the following apply:
 - 3.1. Interior corridors are protected by smoke detectors.
 - 3.2. Auditoriums, cafeterias, gymnasiums and similar areas are protected by heat detectors or other approved detection devices.
 - 3.3. Shops and laboratories involving dusts or vapors are protected by heat detectors or other approved detection 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 following apply:
 - 4.1. The building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1.
 - 4.2. The emergency voice/alarm communication system will activate on sprinkler waterflow.
 - 4.3. Manual activation is provided from a normally occupied location.





Quiz Time!



Proprietary and Confidential

Questions

- What happens if there is a threat that did that on purpose?
- What if I need a different message to be played?
- How can I keep kids safer?



Cheat Sheet Based on 2015 Codes

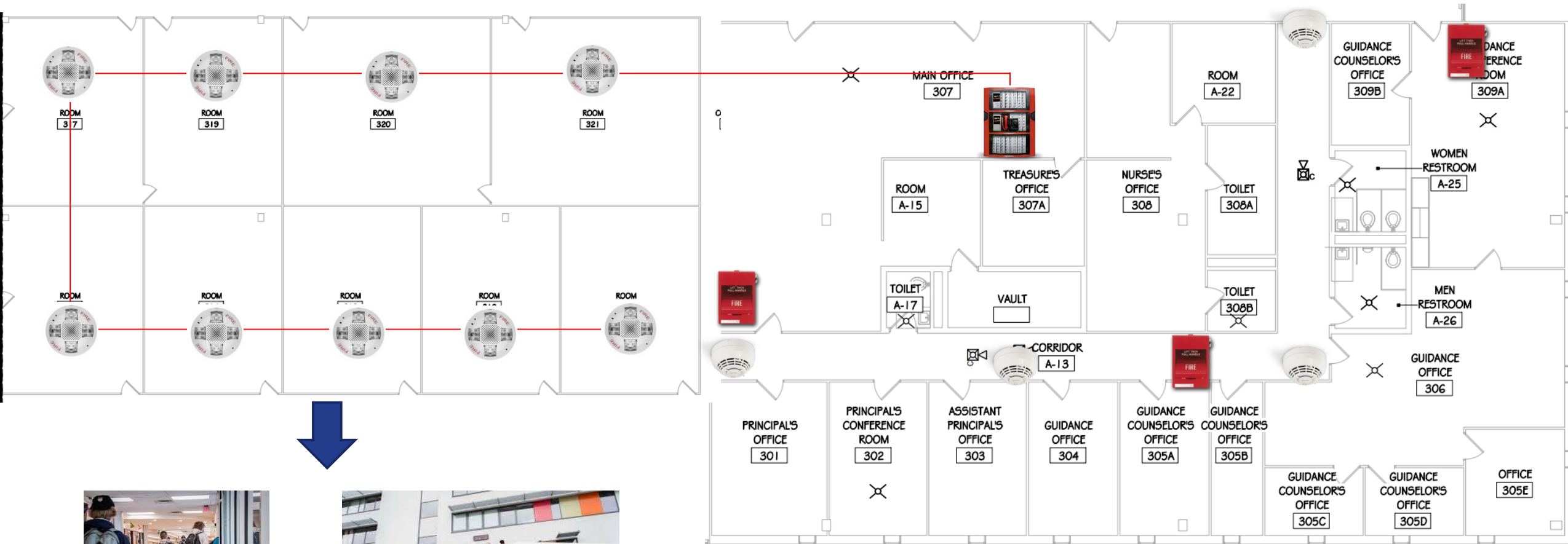


New and Existing School, College, and University Fire Safety State of Michigan	
Questions to Start with K-12	
6+ persons attending a K-12 Grade?	Group E (305.1) - See: Fire Alarm and Detection Section
Religious Facility: Accessory w/ < 100 per room/space	Group A-3
Day Cares w/in Group E:	Group E (305.2) Check below, then See Fire Alarm and Detection
<ul style="list-style-type: none"> Children > 2.5 old, cared for < 24 hr. 	
<ul style="list-style-type: none"> W/ In Religious Facilities: During worship 	Not Group E, Possible Group A-1,2,3, or 4
<ul style="list-style-type: none"> <= 5 Children Facility 	Check Primary Occupancy Group
<ul style="list-style-type: none"> <=5 child in Dwelling Unit 	Group R-3 (International Residential Code)
<ul style="list-style-type: none"> Does the area >= 1,000 sq. ft? 	No Fire System Needed
<ul style="list-style-type: none"> Contains a single classroom? 	No Fire System Needed
Located <= 10 feet from another building	
Fire Alarm and Detection (Excluding CO Detection) K-12	
Questions to Start with:	
Occupant Load <=50?	<u>No</u> Manual Fire Alarm System needed
Occupant Load > 50 <=100?	Manual Fire Alarm system needed, Horn Strobes Only
Occupant Load >100?	Manual Fire Alarm needed; Speaker Strobe system required
Does the Building have an elevator? - If yes: is the building sprinkled?	If <u>Yes</u> , Will need additional detection
Required Fire Alarm Equipment	
Fire Alarm Panel	Addressable panel all devices shall be listed with the control panel

Pull Stations	<ul style="list-style-type: none"> Within 60 in. of each exit doorway Grouped Opening > 40 ft in width, Pull Station on both sides Needed even if not an exit door that leads outside Additional needed when >200 ft horizontal distance
Notification Appliances	<p>>100 Students Speakers and Strobes >50 <100 Horn and Strobes</p> <p>Visible Signal in New Schools <u>DO NOT</u> need them in:</p> <ol style="list-style-type: none"> Exit stair enclosures. Offices less than 200 square feet. Closets and coat rooms. Electrical closets. Mechanical pipe chases. Crawl spaces. Small bathrooms in classrooms. Janitor closets. Storage rooms less than 200 square feet. Unoccupied spaces. <p>Sleeping areas for Children</p> <ul style="list-style-type: none"> Low frequency (LF) required (can use system detection w/ LF base)
Smoke Detection	<p>Required:</p> <ul style="list-style-type: none"> At FACP Locations NAC Extenders/Booster Panels Remote Annunciators <p>Elevators: - Harsh environment allow to use other means</p> <ul style="list-style-type: none"> w/ in 21ft of centerline of each elevator door machine room/Control Room If Bldg. is Sprinkled: Required in elevator elevator-recall Required for smoke relief <p>Optional:</p> <ul style="list-style-type: none"> Other areas of concern that may need smoke detection

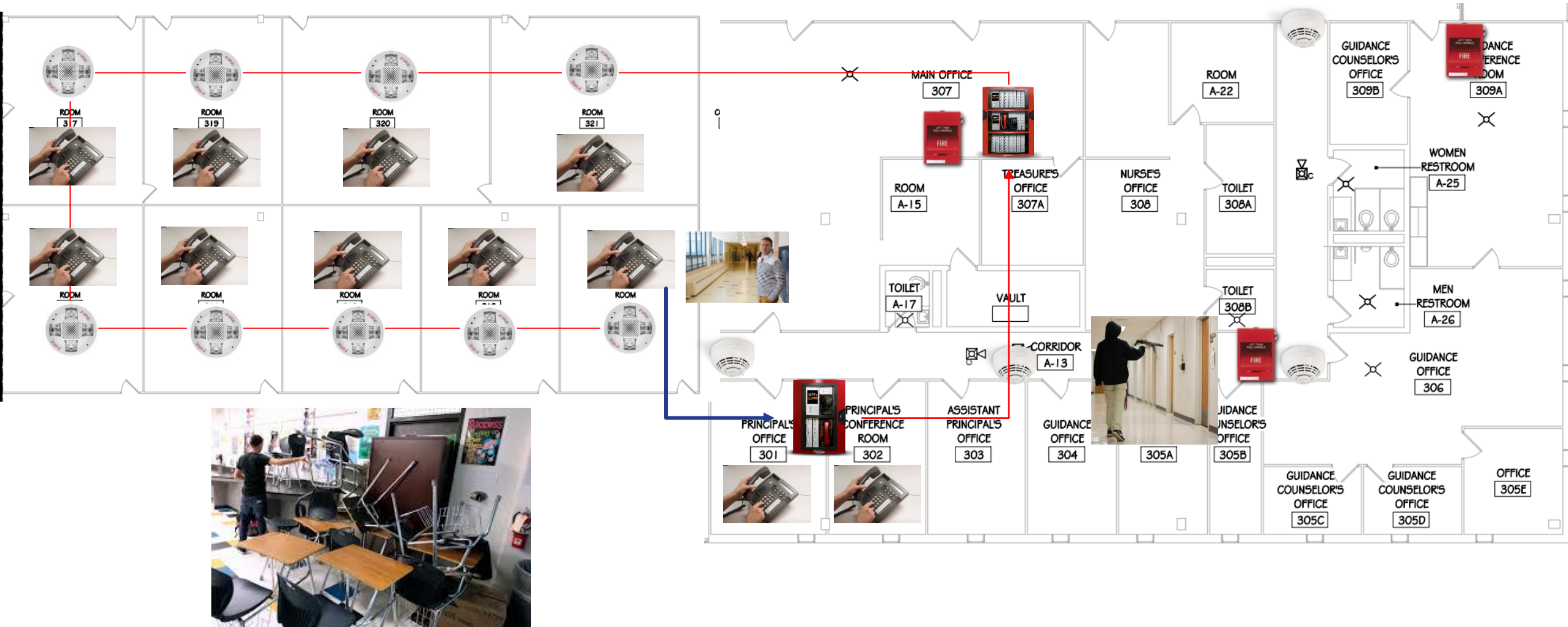
Typical Installation

Fire Evacuation



Using the FACP for More

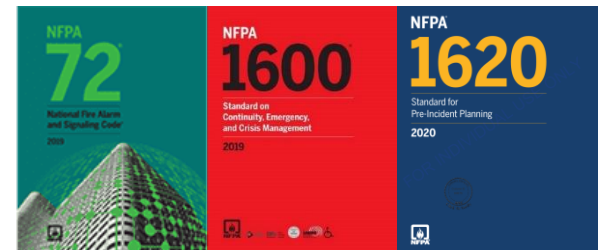
Active Threat!



- **3.3.243 – Risk Analysis:** A process to characterize the likelihood, vulnerability, and magnitude of incidents associated with natural, technological, and manmade disasters and other emergencies that **address scenarios of concern**, their probability and their potential consequences.
- **24.1.2*** - The requirements of this chapter **shall** apply to emergency communications systems **within buildings** and outdoor areas.
- **24.3.11*** Risk Analysis for Mass Notification systems.
 - Designer shall consider both fire and non-fire emergencies...
 - Risk analysis shall consider the number of persons, type of occupancy, and perceived peril to occupants.
 - Risk analysis shall consider characteristics of the buildings, areas, spaces, campuses, or regions, equipment, and operations that are not inherent in the design specifications.
- 24.5.2.1* Who are the designated authorized personnel ?
- **24.4.7.2 – Priority** of mass notification messages **over fire** alarm evacuation **shall** be permitted when evaluated by the **stakeholders** through a risk analysis in accordance with **24.3.11**.



- **3.3.97 Emergency Response Plan:** A documented set of actions to address the planning for, management of, and response to natural, technological, and man-made disasters.
- **24.3.13* Emergency Response Plan Elements.** A well-defined emergency response plan shall be developed in accordance with NFPA 1600 and NFPA 1620 as part of the design and implementation of a mass notification system.
 - NFPA 1600 – Standard on Continuity, Emergency, and Crisis Management (97 page book).
 - NFPA 1620 – Standard for Pre-Incident Planning (53 page book).



Smoke Alarms and Detectors

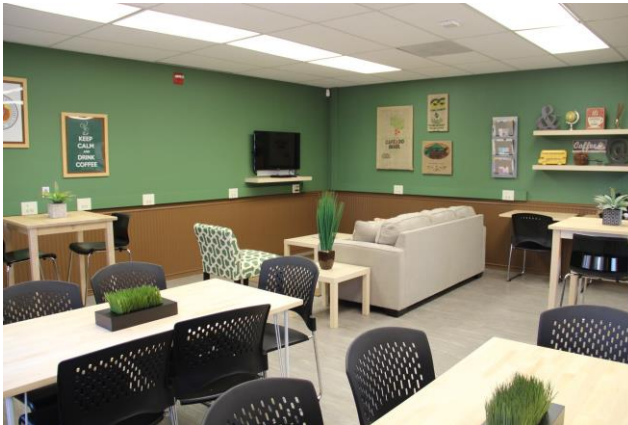
[F] 907.2.11.3 Installation near cooking appliances.

Smoke alarms shall not be installed in the following locations unless this would prevent placement of a smoke alarm in a location required by Section 907.2.11.1 or 907.2.11.2:

1. Ionization smoke alarms shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking appliance.
2. Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.
3. Photoelectric smoke alarms shall not be installed less than 6 feet (1829 mm) horizontally from a permanently installed cooking appliance.

[F] 907.2.11.4 Installation near bathrooms.

Smoke alarms shall be installed not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by Section 907.2.11.1 or 907.2.11.2.



Question:

Does the date May 2020 mean anything to anyone?

Answer:

- A) My wedding anniversary is that month.
- B) I should start planning something for my wedding anniversary.
- C) That is usually when the snow stops in the Midwest.
- D) That's when UL 268 7th Edition for smoke detectors **should** have taken effect.

Video Link



Delayed Delayed Delayed

- Was June 2019
- Was June 2020
- Was June 2021
- Now June 2022
- Now June 2023
- **Now June 2024**



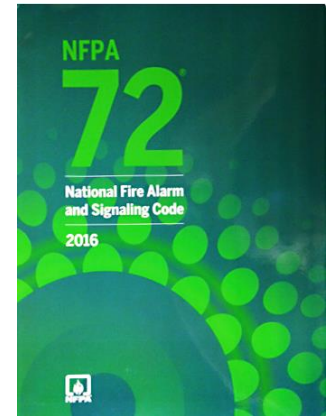
New 7th Edition
Device Label



7th Edition UL 268 & 8th Edition UL 217

Effective June 30th 2024 – Fourth time this date has been pushed back

- UL 268 – Fire Alarm System Smoke Detectors
- UL 217 – 120VAC or Battery powered Smoke Alarms
- New Two Polyurethane Foam Fires
- New Cooking **Nuisance** Alarm Test (Detectors Can't **ALARM**)
- Manufactured units after June 2024 **MUST** Comply!!!!



See Steam vs. Smoke video

Prior 7th Edition Device Label

New 7th Edition Device Label



[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.



Smoke Detector

Vs.



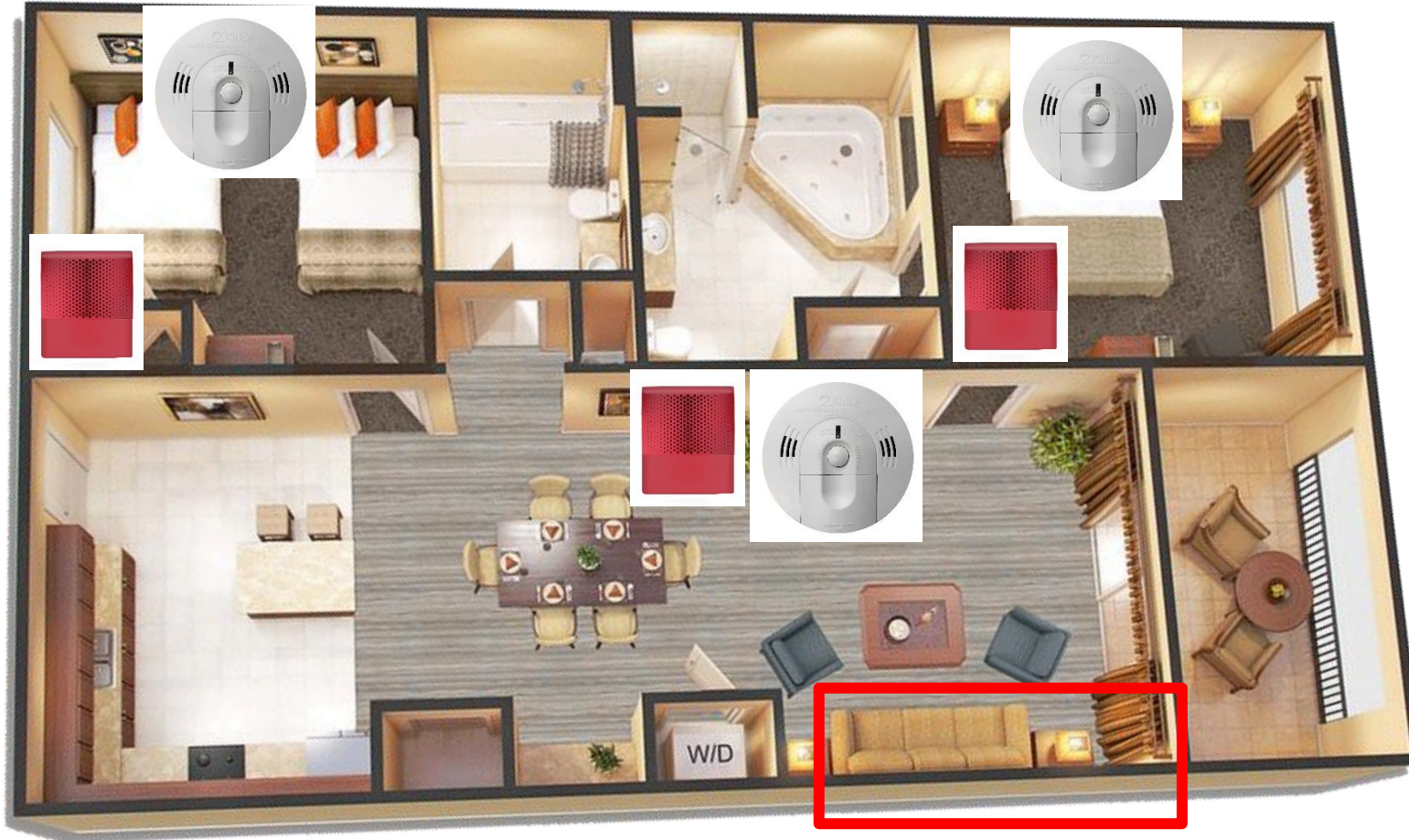
Smoke Alarm

R1 – Occupancy (Hotel)



75 dB required. Code says doors must be closed in testing. No time to guess on a design build project.

R2 Occupancy 120V smokes



What do we do for general alarm?

520 Hz horn? Maybe strobe?

What about Audio?

Use Group R – Sleeping area issues

[F] 907.5.2.1.3 Audible signal frequency in Group R-1 and R-2 sleeping rooms. CDP

Audible signal frequency in Group R-1 and R-2 occupancies shall be in accordance with Sections 907.5.2.1.3.1 and 907.5.2.1.3.2.

[F] 907.5.2.1.3.1 Fire alarm system signal. CDP

In sleeping rooms of Group R-1 and R-2 occupancies, the audible alarm activated by a fire alarm system shall be a 520-Hz low-frequency signal complying with NFPA 72.

[F] 907.5.2.1.3.2 Smoke alarm signal in sleeping rooms. CDP

In sleeping rooms of Group R-1 and R-2 occupancies that are required by Section 907.2.8 or 907.2.9 to have a fire alarm system, the audible *alarm signal* activated by single- or multiple-station smoke alarms in the *dwelling unit* or *sleeping unit* shall be a 520-Hz signal complying with NFPA 72. Where a sleeping room smoke alarm is unable to produce a 520-Hz signal, the 520-Hz *alarm signal* shall be provided by a *listed* notification appliance or a smoke detector with an integral 520-Hz sounder.



Not 520 Hz Listed

- No Smoke Alarm on the market can produce a 520-Hz tone at this time.
- A separate system would need to be added or have a new system installed with addressable smoke detectors.



520 Hz



520 Hz

Use Group A – Assembly

[F] 907.2.1 Group A. P

A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the occupant load due to the assembly occupancy is 300 or more, or where the Group A occupant load is more than 100 persons above or below the lowest level of exit discharge. Group A occupancies not separated from one another in accordance with Section 707.3.10 shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

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] 907.2.1.1 System initiation in Group A occupancies with an occupant load of 1,000 or more.

Activation of the fire alarm in Group A occupancies with an *occupant load* of 1,000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with Section 907.5.2.2.

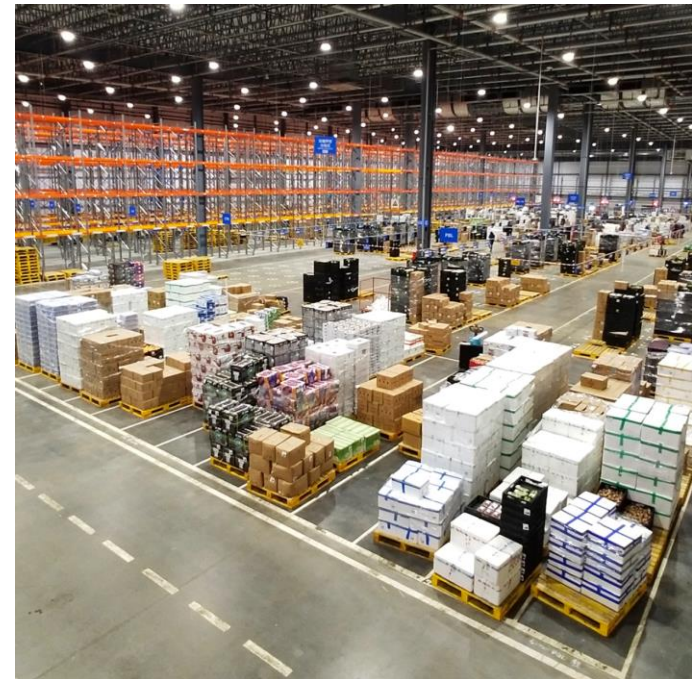
Exception: Where *approved*, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed 3 minutes, for the sole purpose of allowing a live voice announcement from an *approved, constantly attended location*.



>100 persons above or below was adding 2018
Watch out for basements and 2nd story buildings

Group S – Storage

- Growing concerns with high rack storage and smoke detection
Example: Amazon and Walmart Distribution centers.
- What are they classified as?
 - **Storage Group S.** Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as hazardous occupancy.
 - Moderate Hazard Storage, Group S-1
 - Low-hazard storage, Group S-2
- IBC 2015
 - 903 (Sprinkler) – Group S shown
 - 907 (Fire Alarms) – **Group S NOT SHOWN**
 - *Is fire detection desired by the AHJ?*



Group S – Storage 2021

NEW

[F] 907.2.10 Group S. CDP

A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group S public-and self-storage occupancies three stories or greater in height for interior corridors and interior common areas. Visible notification appliances are not required within storage units.

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.

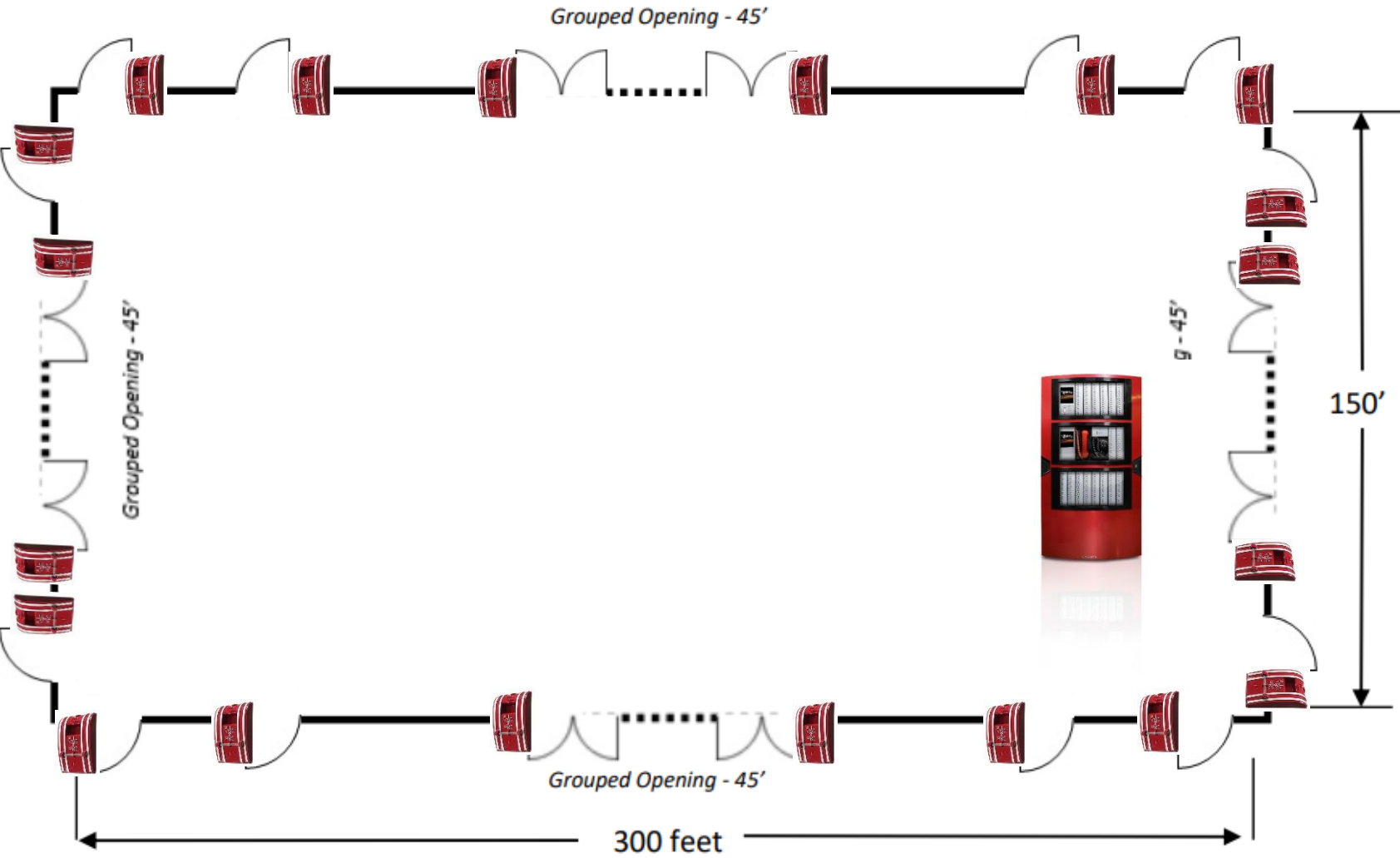


Large distribution companies' insurance provider might require them.

I would want them added



Quiz Time: How many Pull Stations?



[F] 907.2.12.3 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.

HIGH-RISE BUILDING. A building with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

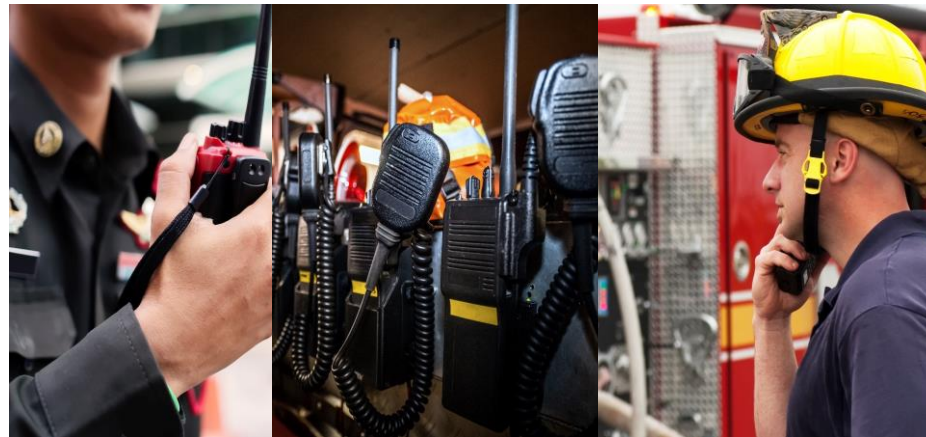
Personal Thoughts:

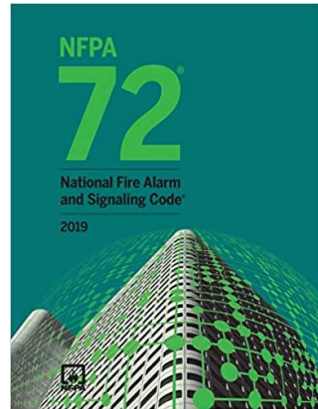
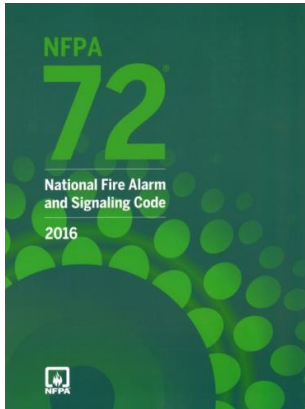
- Aid in paging audio per floor, with multi-channel audio this will aid firefighters.
- Help evacuating the building. For Example: Detroit has a lot of high-rise that are general alarm for evacuating because of the limited sq ft.



[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 *International 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*.





N 17.7.3.6.3 Installation and Spacing.

17.7.3.6.3.1* Air sampling pipe network fittings shall be installed air-tight and permanently affixed.

N 17.7.3.6.3.2 Sampled air shall be exhausted to a lessor or equal pressure zone. The pressure differential between the sampled air and detector exhaust shall not exceed the manufacturer's published instructions.

N 17.7.3.6.3.3* Supports for sampling pipe shall be in accordance with the air sampling-type smoke detector manufacturer's published instructions.

26.6.3.3 Single Communications Path. Unless prohibited by the enforcing authority, governing laws, codes, or standards, a single transmission path shall be permitted, and the path shall be supervised at an interval of not more than 60 minutes. A failure of the path shall be annunciated at the supervising station within not more than 60 minutes. The failure to complete a signal transmission shall be annunciated at the protected premises in accordance with Section 10.14.

Δ 26.6.3.3 Single Communications Path. Unless prohibited by the enforcing authority, governing laws, codes, or standards, where a single communications path is used, the following requirements shall be met:

- (1) The path shall be supervised at an interval of not more than 60 minutes.
- (2) A failure of the path shall be annunciated at the supervising station within not more than 60 minutes.
- (3) The failure to complete a signal transmission shall be annunciated at the protected premises in accordance with Section 10.15.

26.6.4.1.4 Transmission Channels.

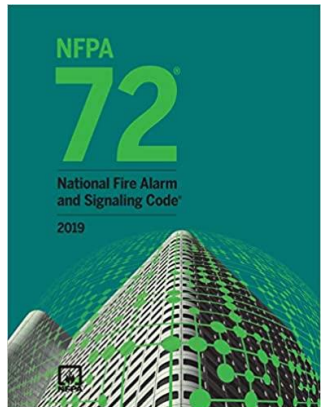
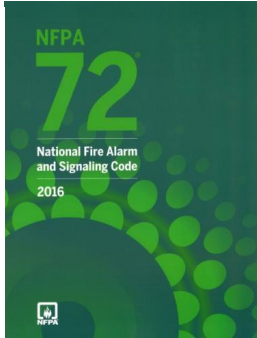
(A) A system employing a DACT shall employ one telephone line (number). In addition, one of the following transmission means shall be employed:

- (1) One-way private radio alarm system
- (2) Two-way RF multiplex system
- (3) Transmission means complying with 26.6.3

26.6.4.1.4 Transmission Channels.

Δ (A) A system employing a DACT shall employ a single telephone line (number) and one of the following transmission means:

- (1) One-way private radio alarm system
- (2) Two-way RF multiplex system
- (3) Transmission means complying with 26.6.3
- (4) A second telephone line (number), where all of the following are met:
 - (a) Access to one of the technologies in (1), (2), or (3) is not available at the protected premises.
 - (b) The authority having jurisdiction approves the arrangement.
 - (c) The DACT is programmed to call a second DACR line (number) when the signal transmission sequence to the first called line (number) is unsuccessful.



Single vs Dual Path DACT



Δ **26.6.3.3 Single Communications Path.** Unless prohibited by the enforcing authority, governing laws, codes, or standards, where a single communications path is used, the following requirements shall be met:

- (1) The path shall be supervised at an interval of not more than 60 minutes.
- (2) A failure of the path shall be annunciated at the supervising station within not more than 60 minutes.
- (3) The failure to complete a signal transmission shall be annunciated at the protected premises in accordance with Section 10.15.

No Change from 2019 to 2022

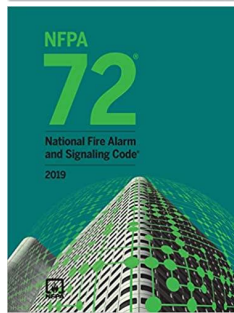


Three main issues come to mind:

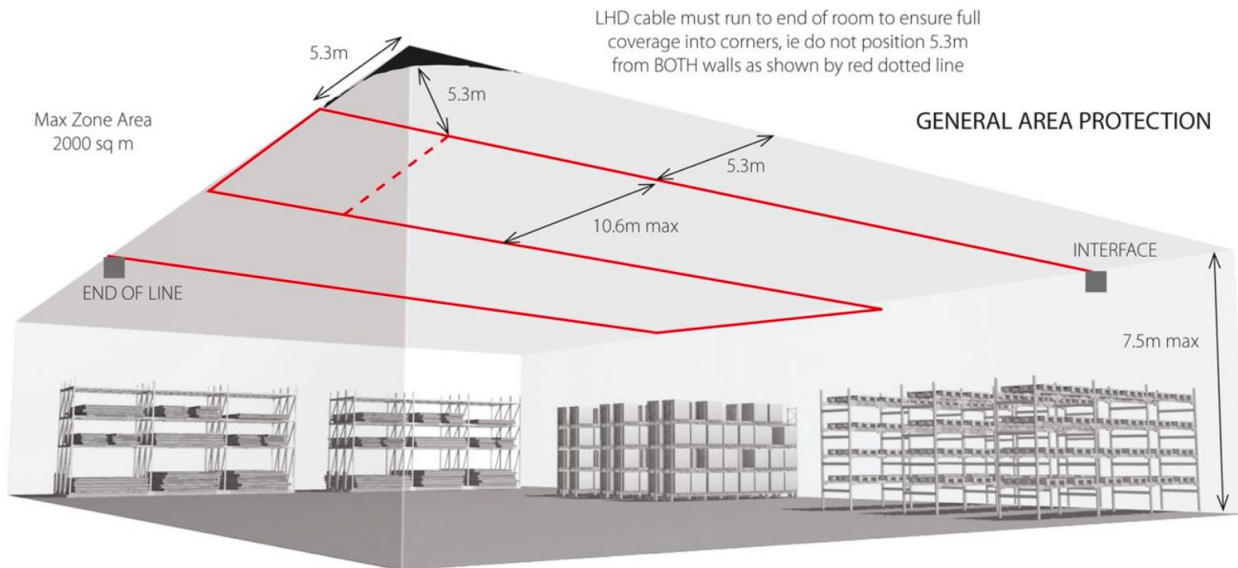
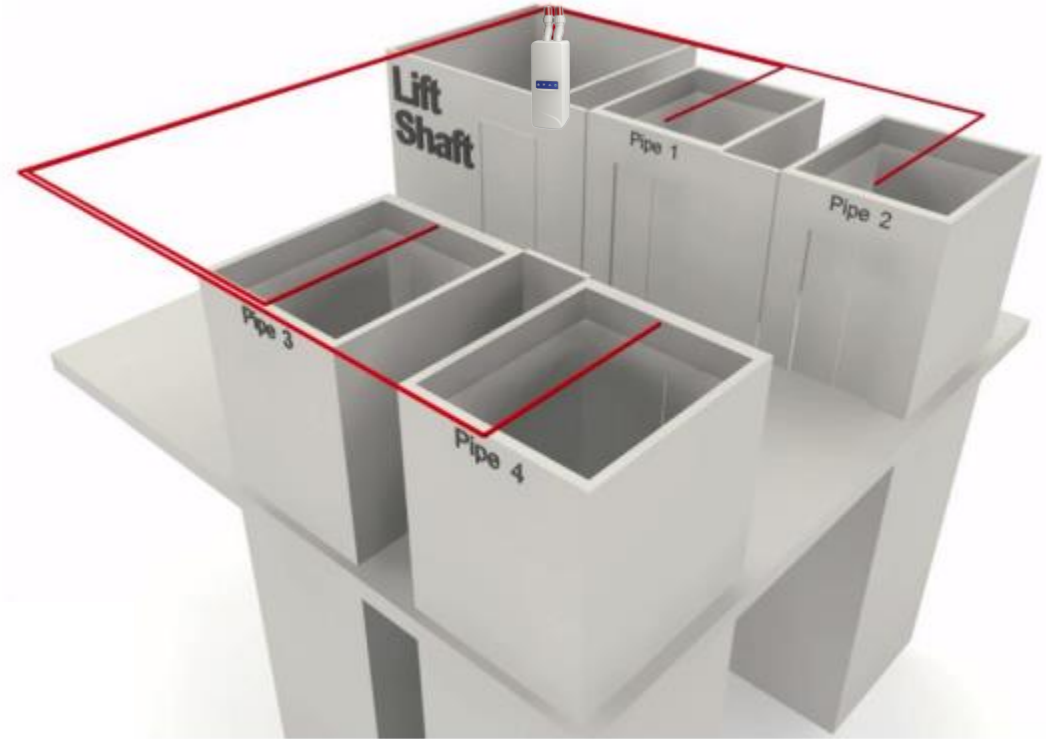
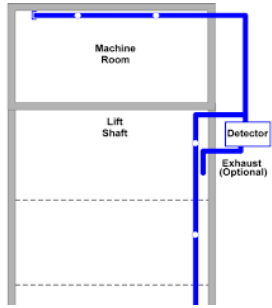
1. What tech wants to climb into the shaft? Maintenance personnel may forgo climbing into the elevator shaft because it's a hassle. Easier maybe to skip cleaning/maintaining that detector and get to it on the next test and inspection date.
2. Gaining access to the detector may require contacting the owner's elevator contractor and they may even be required to be on site during maintenance.
 1. How much are customers spending just to get elevator contractors on site for 1-2 smoke/heat detectors? Look at that cost over 5 years.
3. Elevator cab movement can bring dirt and dust to the detector in the shaft, causing it to get contaminated faster than normal.

Are there ways around this?

- Yes NFPA 72 2019 is addressing this issue.
- **21.3.7*** Fire Alarm Initiating Device(s) Inside Elevator Hoistways. Fire alarm initiating device(s) required to be installed inside an elevator hoistway by other sections of this Code or by other governing laws, codes, or standards shall be required to be accessible for service, testing, and maintenance from outside the elevator hoistway.
- **A.21.3.7** Since it is permitted by ASME A17.1/CSA B44, Safety Code for Elevators and Escalators, to have access for fire alarm initiating devices installed inside elevator hoistways, the following are examples for proposed methods for providing such access (other methods could be acceptable if approved by the authority having jurisdiction):
 - (1) Provide an access hatch door and associated protective guard for a spot type fire detector, where the fire detector is installed within the protective guard.
 - **(2) Provide an air sampling-type detector as specified in 17.7.3.6 installed outside the hoistway with its sampling tube installed to sample the air within the hoistway.**
 - (3) If heat detection is required, linear heat detectors with connection points located outside the hoistway or spot type heat detectors installed in accordance with A.21.3.7(1) are acceptable.



Elevator Example



Smoke and Heat Detection Requirements:

- **Elevator Machine Room:** Smoke Detector **required**. It's a good practice to label with a subscript "E" or "EL" to designate it's for the elevator and elevator recall. Heat detector **within 2 ft.** of the sprinkler head for shunt trip if the room is sprinklered. You **only need a heat detector** if it's sprinklered.
- **Elevator Hoistway top:** Smoke Detector **required** for smoke ventilation **and also** required for all **hoistways that are sprinklered**. Heat detector **within 2 ft.** of the sprinkler head for shunt trip if the shaft is sprinklered. You only need a heat detector if it's sprinklered.
- **Elevator Lobby(s):** System Smoke detector (s) **within 21 ft.** of the elevator centerline. Larger elevator lobbies may require additional detectors, simply make sure the furthest one has a smoke detector within 21 ft.
- **Elevator Pit:** No smoke detection. And typically, no heat detection. A heat detector is required for shunt trip if the sprinkler head is more than 2 ft. above the pit floor (NFPA 13 does not allow it to be more than 2 ft off the floor).
 - *Notes: Although smoke detection in the pit seems appropriate due to the possibility of combustibles, it will be an issue due to dirt, dust maintenance and falling debris. Also, note some local jurisdictions wanted them years ago ... possibly due to people smoking in elevator lobbies. If you're not sure, make a call to the local fire inspector.*

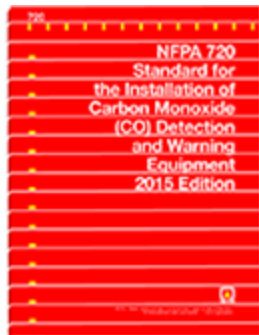
Addressable Control Relay Modules for connection to the elevator controller.

- Three Addressable Control Relay Modules for connection to the elevator controller. An optional 4th may be required (see below).
 - **Relay #1** - Activated by a smoke detector at the designated level.
 - **Relay #2** - Activated by a smoke detector at elevator lobbies other than the designated level.
 - **Relay #3** - Activated by a shunt trip heat detector in the machine room or hoistway.
 - For shunt trip systems, a monitor module is required to monitor that there is power at the shunt trip breaker.
 - **Relay #4** - Activated by the smoke detector at the top of the shaft or elevator equipment room. This relay causes the firefighters hat symbol in the elevator cab to **flash** to let firefighters using the elevator know that there is a fire in the shaft or equipment room and there is a possibility of power disconnect (shunt trip).
 - **Note:** Hat is on **solid** when firefighters put the elevator in manual mode.

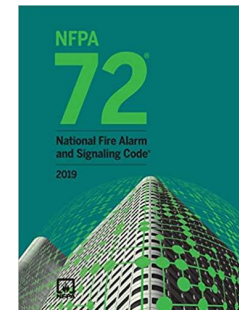
Cheat Sheet available upon request.

N 10.6.7.2.4 Where carbon monoxide detection is monitored by a supervising station, the secondary power supply shall have sufficient capacity to operate the carbon monoxide detection system under quiescent load (system operating in a nonalarm condition) for a minimum of 24 hours and, at the end of that period, shall be capable of operating the carbon monoxide detection system and all notification appliances for 5 minutes.

N 10.13 Carbon Monoxide (CO) Notification Appliance Deactivation. A CO initiating device with an integral sounder shall be permitted to be silenced locally if the CO alarm or supervisory status continues to be displayed at the control unit.



Added the one key code requirement needed out of NFPA 720



N 17.12.2 Carbon monoxide detectors shall meet the following requirements:

- (1) Carbon monoxide detectors shall be listed in accordance with applicable standards, such as ANSI/UL 2075, *Gas and Vapor Detectors and Sensors*.
- (2) Carbon monoxide detectors shall be set to respond to the sensitivity limits specified in ANSI/UL 2034, *Standard for Single and Multiple Station Carbon Monoxide Alarms*.

N 17.12.3 All carbon monoxide detectors shall be located and mounted so that accidental operation will not be caused by jarring or vibration.

N 17.12.4 The location of carbon monoxide detectors shall be based on an evaluation of potential ambient sources and flows of carbon monoxide, moisture, temperature, dust, or fumes and of electrical or mechanical influences to minimize nuisance alarms.

N 17.12.5 The selection and placement of carbon monoxide detectors shall take into account both the performance characteristics of the detector and the areas into which the detectors

N 18.4.3 Distinctive Carbon Monoxide Audible Alarm Signal.

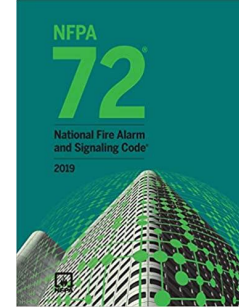
N 18.4.3.1 Where a carbon monoxide detector or alarm is required by other codes or standards or by the authority having jurisdiction and where an audible signal is required, a distinctive signal pattern shall be required that is different from a fire evacuation signal.

N 18.4.3.2 Where an audible signal is required, the carbon monoxide signal shall be a four-pulse temporal pattern and comply with the following:

- (1) Signals shall be a pattern consisting of four cycles of 100 milliseconds \pm 10 percent “on” and 100 milliseconds \pm 10 percent “off,” followed by 5 seconds \pm 10 percent “off,” as demonstrated in Figure 18.4.3.2.

Same standards for placement as smoke detectors

10.6.7.2.1.1* Battery calculations shall include a minimum 20 percent safety margin above the calculated amp-hour capacity required.



10.6.7.2.14* As a minimum, battery calculations shall apply a correction factor of 1.25 for aging to ensure the battery can meet its current demand at the end of service life.

25 percent safety margin



Air sampling Detection (ASD)

17.7.3.6 Air Sampling-Type Smoke Detector.

N 17.7.3.6.1 General.

N 17.7.3.6.1.1* In the absence of specific performance-based design criteria, each sampling port of an air sampling-type smoke detector shall be treated as a spot-type smoke detector for the purpose of location and spacing in accordance with 17.7.3.



specified range.
N 17.7.3.6.1.3 If provided, atmospheric contaminant filtration shall be listed for use with the detector and installed and maintained in accordance with the air sampling-type smoke detector manufacturer's published instructions.

N 17.7.3.6.2 Pipe Network.

N 17.7.3.6.2.1 Maximum air sample transport time from the farthest sampling port to the detector shall not exceed 120 seconds.

N 17.7.3.6.2.2 Sampling pipe networks shall be designed on the basis of, and shall be supported by, computer-based fluid dynamics design calculations to ensure required performance.

N 17.7.3.6.2.3 The sampling pipe network design calculations shall include pressure, volumetric flow, and alarm sensitivity at each sampling port.

N 17.7.3.6.2.4 Software applications for the design of pipe networks shall be listed for use with the manufacturer's equipment.

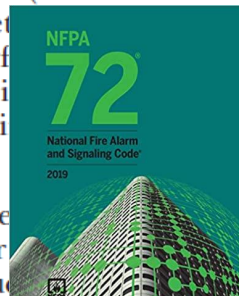
N 17.7.3.6.2.5 Sampling system piping shall be conspicuously identified as "SMOKE DETECTOR SAMPLING TUBE — DO NOT DISTURB," as follows:

- (1) At changes in direction or branches of piping
- (2) At each side of penetrations of walls, floors, or other barriers
- (3) At intervals on piping that provide visibility within the space, but no greater than 20 ft (6.1 m)

N 17.7.3.6.2.6* Sampling ports shall be identified as such.

N 17.7.3.6.2.7* If provided, test ports at the end (most remote location) of a pipe run installed in the pipe network for the purpose of validating consistency in performance (referred to as benchmark test points) shall be included in design calculations and allowed, but not required, in accordance with the requirements of 17.7.3.6.2.

N 17.7.3.6.2.8 If the piping and fittings are painted, the painting shall be performed in accordance with the air sampling-type smoke detector manufacturer's published instructions.

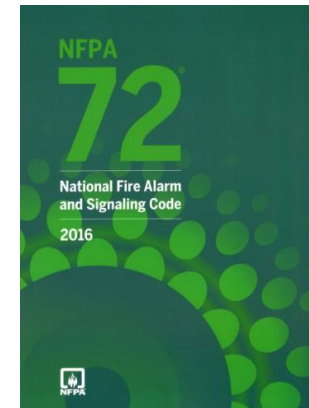
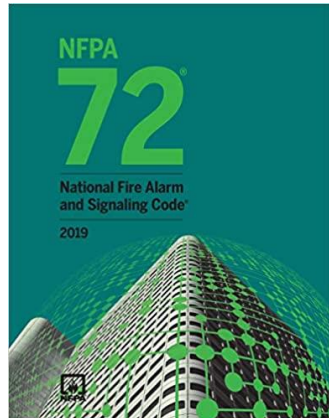


Δ 18.5.5.2 Where low ceiling heights do not permit wall mounting at a minimum of 80 in. (2.03 m), wall mounted visual notification appliances shall be mounted within 6 in. (150 mm) of the ceiling.

N 18.5.5.3 Where low ceiling heights do not permit wall mounting at a minimum of 80 in. (2.03 m), the room size covered by a visual notification appliance of a given value shall be reduced by twice the difference between the minimum mounting height of 80 in. (2.03 m) and the actual lower mounting height.

18.5.5.2 Where low ceiling heights do not permit wall mounting at a minimum of 80 in. (2.03 m), wall mounted visible appliances shall be mounted within 6 in. (150 mm) of the ceiling. The room size covered by a strobe of a given value shall be reduced by twice the difference between the minimum mounting height of 80 in. (2.03 m) and the actual lower mounting height.

18.5.5.3* Visible appliances listed for mounting parallel to the floor shall be permitted to be located on the ceiling or suspended below the ceiling.



•
N 3.3.34 Building System Information Unit (BSIU). A computer-based electronic device that is intended to display building information and execute system control functions, including fire system information display and control.

N 23.8.4.2 Building System Information Unit (BSIU).

N 23.8.4.2.1* A building system information unit (BSIU) shall be listed to product safety standard ANSI/UL 60950, *Information Technology Equipment — Part 1: General Requirements*, or ANSI/UL 62368-1 *Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements*, or equivalent.



N 23.8.4.2.2 Where a BSIU provides control of the fire alarm system, the requirements in 23.8.4.2.2.1 through 23.8.4.2.2.4 shall also apply.

N 23.8.4.2.2.1 A fire alarm control unit (FACU) controlling the fire alarm system shall be located within the same room as the BSIU.

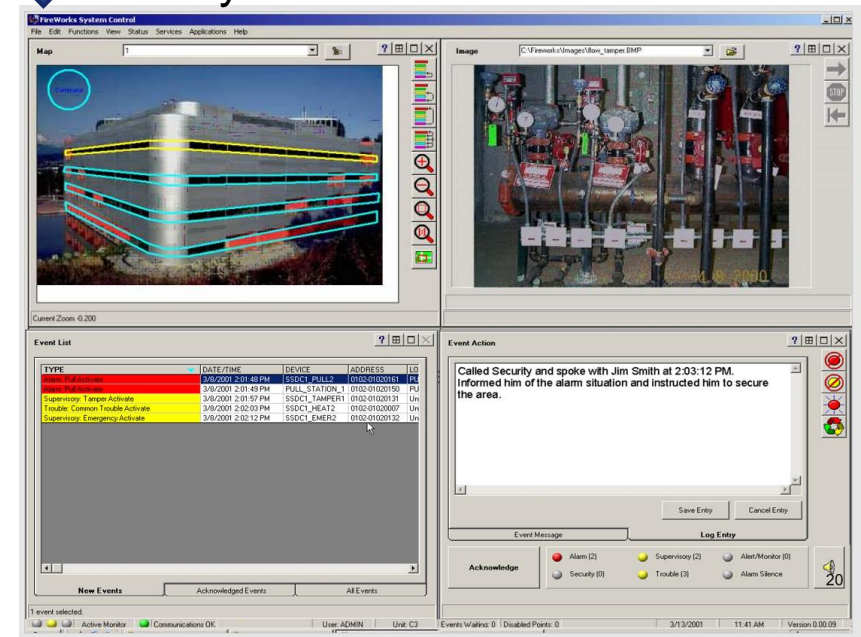
N 23.8.4.2.2.2* The BSIU shall not be permitted to perform fire alarm system control features that cannot be accomplished by the FACU within the room.

N 23.8.4.2.2.3 The communication path from the FACU and the BSIU shall meet the requirements of 23.8.4.4.1 through 23.8.4.4.3.

N 23.8.4.2.2.4 The application software for the BSIU shall be listed to ANSI/UL 864, *Control Units and Accessories for Fire Alarm Systems*.



Only Software needs to be Listed

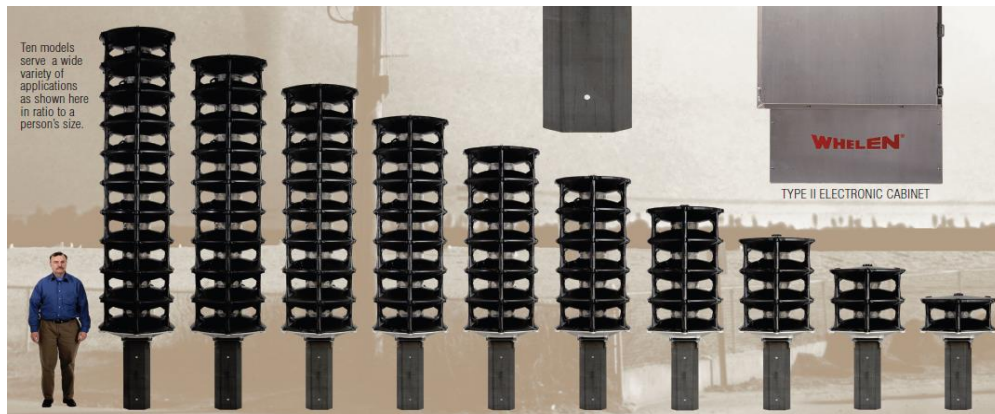


High Power Loudspeaker Array (HPLA)

24.6.5* High Power Loudspeaker Array (HPLA). When required by the risk analysis, high power loudspeaker arrays (HPLAs) shall be provided, installed, and maintained.

24.6.5.1 The HPLA shall be arranged in such a manner to provide intelligible voice and audible tone communications.

(A) When multiple HPLAs are used, they shall be arranged in physical or virtual notification zones so that each notification zone can be individually controlled by the emergency command center.



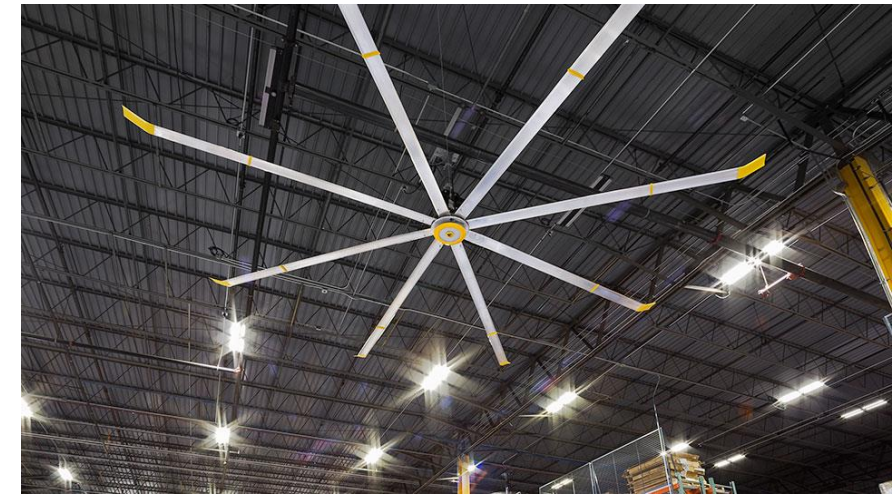
Chapter 11 Cybersecurity

11.1* Cybersecurity. Where required by governing laws, codes, or standards, or other parts of this Code, cybersecurity **shall** be provided for equipment, software, firmware, tools, installation methods, physical security of and access to equipment, data pathways, testing and maintenance.



N 3.3.132 High Volume Low Speed (HVLS) Fan. A ceiling fan that is approximately 6 ft (1.8 m) to 24 ft (7.3 m) in diameter with a rotational speed of approximately 30 to 70 revolutions per minute. [13, 2016] (SIG-PRO)

N 21.8 High Volume Low Speed (HVLS) Fans. Where required by NFPA 13, all HVLS fans shall be interlocked to shut down upon actuation of a sprinkler waterflow switch that indicates waterflow in the area served by the fans.



- Starting Fall 2022!
- More information to come
- Let the SFPE President know if your interested!





Please contact me for a **discounts** and more information.

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