



1

Description

- This seminar will address the 2018 *International Building Code*® requirements applicable to design and construction of assembly spaces. It will address the differences between the various Group A occupancies and how assembly uses may also fit within the business or educational occupancy classifications.



2

Description

- The seminar will cover the unique aspects of the code related to assembly uses including:
 - Stage and platform requirements of Section 410,
 - ICC 300 *Standard for Bleachers, Folding and Telescopic Seating, and Grandstands*, the special egress provisions of Section 1029,
 - Special amusement building and motion picture projection room requirements from Chapter 4.



3

Goal

- This seminar is designed to familiarize and assist code officials and designers with the applicable design and construction provisions for assembly spaces and applying applicable code requirements 2018 IBC.



4

Objectives

- Upon completion of this seminar, participants will be better able to:
 - Describe the differences between various Group A occupancies.
 - Identify the unique aspects of the code related to assembly uses.
 - List the stage and platform requirements of Section 410.



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Objectives

- Upon completion of this seminar, participants will be better able to:
 - Explain the special egress provisions of Section 1029.
 - Identify the special amusement building and motion picture projection room requirements from Chapter 4.
 - Identify the 2018 *International Fire Code*® provisions related to places of assembly.



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Course Overview

- Classification of Assembly Buildings and Spaces
- IFC Provisions Related to Places of Assembly
- IBC Chapter 4 Special Detailed Requirements Based on Use and Occupancy
- Assembly Spaces



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Course Overview

- ICC 300—Standard for Bleachers, Folding and Telescopic Seating and Grandstands
- Chapter 10 Means of Egress
- Chapter 8 Interior Finishes
- Fire Protection



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Overview

- Group A assembly occupancies cover a number of uses and building types.
 - Theaters
 - Nightclubs
 - Restaurants
 - Art galleries
 - Libraries
 - Airport terminals
 - Places of worship
 - Arenas
 - Stadiums



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Overview

- Largest life-safety losses and building disasters have occurred within assembly occupancies. Some of the most notable losses here in the United States include:
 - Happy Land Social Club (arson fire), Bronx, NY 1990. 87 dead
 - Station nightclub (fire), West Warwick Rhode Island, 2003. 100 dead, over 200 injured
 - E2 nightclub (stampede due to pepper spray), Chicago, 2003. 21 dead, over 50 injured



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Overview

- Puerto Rican Social Club (arson fire), Bronx, NY, 1976. 25 dead
- Beverly Hills supper club (fire), Southgate Kentucky (Cincinnati), 1977. 165 dead, over 200 injured
- The Who concert, (crowd rush), Cincinnati, 1979. 11 dead
- Iroquois Theater (fire), Chicago, 1903. At least 605 dead
- Rhythm nightclub (fire), Natchez, Mississippi, 1940. 207 dead
- Coconut Grove nightclub (fire), Boston, 1942. 492 dead





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Overview

- Most of these fires were found to have several things in common that contributed to the high numbers of people killed:
 - Overcrowding.
 - Locked or blocked exits.
 - Flammable decorations or interior finishes.
 - Lack of or inoperable sprinkler systems.






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Overview

- Most of these fires were found to have several things in common that contributed to the high numbers of people killed:
 - People trying to get out the same way they entered, not using a fire exit.
 - Failure to follow existing fire codes.
 - Failure to exit promptly after the fire started.
 - Using elevators during the fire.






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Classification—302


- Section 302.1 of the IBC requires that all structures or portions of structures be classified into one or more of the occupancy groups listed in Chapter 3 of the code.
- Occupancies are classified according to the structure's purpose and function.

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REFER TO



Section 303.1 thru 303.6
Pages 45-46

Assembly Group A—303

- 303.1 Assembly Group A.
- 303.2 Assembly Group A-1.
- 303.3 Assembly Group A-2.
- 303.4 Assembly Group A-3.
- 303.5 Assembly Group A-4.
- 303.6 Assembly Group A-5.

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REFER TO
ICC
INTERNATIONAL
CODE COUNCIL
CODE BOOK

303.2 Assembly Group A-1

Section
303.2,
Page 41



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REFER TO
ICC
INTERNATIONAL
CODE COUNCIL
CODE BOOK

303.3 Assembly Group A-2

Section
303.3,
Page 41



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REFER TO
ICC
INTERNATIONAL
CODE COUNCIL
CODE BOOK

303.4 Assembly Group A-3

Section
303.4,
Page 41



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REFER TO
ICC
INTERNATIONAL
CODE COUNCIL
CODE BOOK

303.5 Assembly Group A-4

Section
303.5,
Page 42




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FOR EXAMPLE




303.5 Assembly Group A-4

- Swimming pools and tennis courts are included within the Group A-3 and the A-4. occupancy listings.
- Group A-4 occupancy includes spectator seating.
- Group A-3 occupancy is “without spectator seating”.





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FOR EXAMPLE




303.5 Assembly Group A-4

- Tennis courts would also have this same distinction.
- Indoor tennis court without spectator seating would be classified as a Group A-3 occupancy.
- Indoor facility that includes spectator seating, then the Group A-4 classification would be appropriate.





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DISCUSSION




Group A-4 Occupancy

- Given an indoor swimming pool at a hotel with a number of loose tables and chairs are scattered around the pool deck area.
 - Is this type of seating included or must the seating be focused/directed at the pool?
 - How would you determine when a person is a “spectator”?





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DISCUSSION




Group A-4 Occupancy

- An indoor pool in a natatorium of a school has one long built-in bench along one wall of the space.
 - Is this “spectator seating” or simply an area for people to sit and rest or perhaps change prior to entering the pool?
 - What if there were two or more levels of the seating or seating on each wall of the space?
 - Would your opinion differ if the school also had another larger natatorium which clearly was intended for spectator seating during competitive swim meets?

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DISCUSSION

Group A-4 Occupancy

- An indoor hockey rink is used as a practice facility. The walls of the space are only a few feet outside the boards of the rink. In the corner of the facility (where the rink curves in the corners) the parents may stay and watch the practice.
 - Is this considered as "spectator seating"?
 - Does it make a difference if the people watching the practice are standing or seated?
 - Does it matter that this is only a "practice" facility and there is a separate rink elsewhere for games which has clearly defined seating?



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DISCUSSION

Group A-4 Occupancy

- Does the occupant load of 50 from the Sections 303.1.1 or 303.1.2 item 1 have any application to the seating capacity or is that only applicable to the total occupant load of the space (i.e. the hockey players practicing on the ice in #3 above as well as their parents who are waiting for them)?
- Would you allow the swimming pool in item #1, the natatorium in #2 with a single bench, or the hockey rink in #3 to be considered as not having spectator seating if the seating was limited to less than 50 people?
- Would your answer differ if the hockey rink was a professional/regulation sized rink or if the swimming pool was an Olympic sized pool that could have a much larger occupant capacity on the ice or in the water?

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REFER TO



CODE BOOK

Section 303.6, Page 46

303.6 Assembly Group A-5





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REFER TO



CODE BOOK

Section 303.1.1, Page 45


303.1.1 Small buildings and tenant spaces





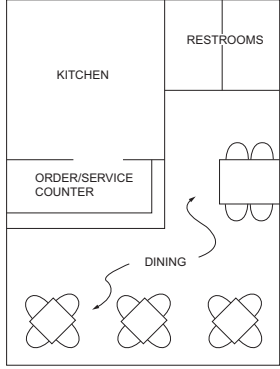
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REFER TO

CODE BOOK

303.1.2 Small assembly spaces.


Section 303.1.2, Page 45



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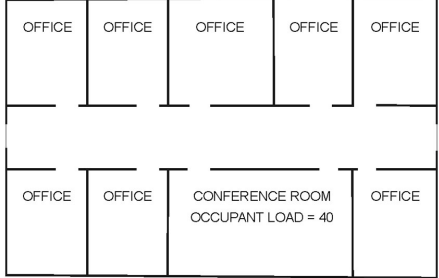
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REFER TO

CODE BOOK

303.1.2 Small assembly spaces.


Section 303.1.2, Page 45



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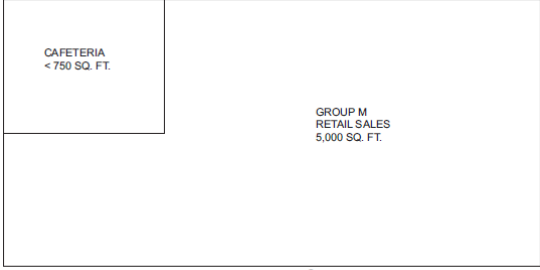
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REFER TO

CODE BOOK

303.1.2 Small assembly spaces.

Section 303.1.2, Page 45



For SI: 1 square foot = 0.093 m².

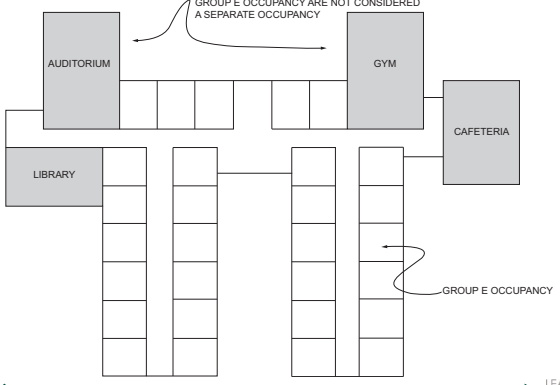
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303.1.3 – Assembly Associated with Group E Occupancies

ASSEMBLY PURPOSES ASSOCIATED WITH GROUP E OCCUPANCY ARE NOT CONSIDERED A SEPARATE OCCUPANCY



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KEY LEARNING

Section 303.1.3

- Section 303.1.3 uses the term “associated” as opposed to the word “accessory” to establish the relationship between the assembly and educational occupancies.
- This revision first occurred in the 2012 IBC with the intention of clarifying that the “accessory occupancy” limitations of Section 508.2 are not applicable in this situation.



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FOR EXAMPLE

Gym

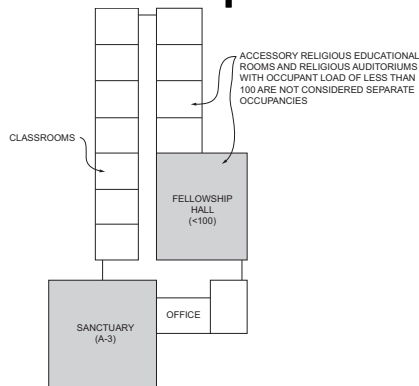
- Gym used for the school’s activities considered an extension of the Group E occupancy.
- Community center gym attached to the school but operates independently would be appropriately classified as a separate assembly occupancy.
- Jurisdiction must determine how this code section is to be applied.

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303.1.4 – Accessory to Places of Religious Worship



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FOR EXAMPLE

303.1.4 – Accessory to Places of Religious Worship

- Religious facility operates a traditional school during the week then a Group E or Group B occupancy classification should be applied.
- Rooms are used for both general education and for religious instruction then Section 302.1 should be applied and the rooms should “comply with all of the requirements that are applicable to each of the purposes for which the room or space will be occupied.”






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Business Group B—304


- Sections 303.1.1 and 303.1.2 allow small assembly spaces to be classified as a Group B occupancy.
- Code official must make decisions regarding the classification of certain uses to determine if they are appropriately classified as a Group B or a Group A-3 occupancy.

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REFER TO





CODE BOOK

2018 IBC
Section
304.1,
Page 46

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:

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DISCUSSION



Group B Occupancy

1. Given that Group B occupancies include “educational occupancies for students above the 12th grade” what is the proper occupancy classification of a college classroom with 55 students?


Are these spaces required to be dealt with as a A-3 occupancy or can they remain as a Group B use?

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DISCUSSION



Group B Occupancy

2. Similar to question #1 above; given that “training and skill development not within a school or academic program” are listed as a Group B use, what is the proper occupancy classification of such use where there are 50 or more persons?

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DISCUSSION

Group B Occupancy

3. Lecture halls are listed under the A-3 occupancy classification. Since the term “lecture hall” is not defined, discuss what features differentiate between a “lecture hall” and a general college classroom.

- Is the occupant load of 50 the only distinction?
- Would the type of seating be a reasonable distinction?



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DISCUSSION

Group B Occupancy

- Would a tiered or sloping floor help to distinguish a lecture hall from a classroom?
- Does a lecture hall have certain features that easily distinguish it from other classrooms?
- The code clearly classifies a “lecture hall” with 50 or more occupants as an A-3 occupancy but is that the correct classification for a traditional classroom?



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DISCUSSION

Group B Occupancy

4. Because the Group B occupancy does not include small restaurants or dining facilities in the list of typical items; what affect does Section 102.1 and Sections 303.1.1 or 303.1.2 have on the proper classification?

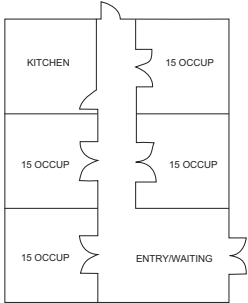


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DISCUSSION

Group B Occupancy

5. Given the small family style restaurant shown in the figure, can Sections 303.1.1 or 303.1.2 be used to classify any, or all of the restaurant as a Group B use or is this facility to be classified as a Group A-2 occupancy?

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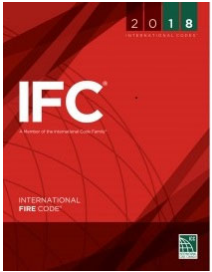


Module 2



IFC Provisions Related to Places of Assembly

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Overview




- Whenever dealing with assembly occupancies it is important to realize that the International Fire Code contains a number of requirements which are applicable and may include requirements that are not addressed within the IBC.

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REFER TO





Permits—IFC 105

CODE BOOK

2018 IFC, Section 105.1.1 and 105.1.2, Page 4

- 105.1.1 Permits required
- 105.1.2 Types of permits






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Permits—IFC 105

- Amusement buildings. (IFC Section 105.6.2)
- Carnivals and fairs. (IFC Section 105.6.4)
- Cellulose nitrate film. (IFC Section 105.6.5)
- Exhibits and trade shows. (IFC Section 105.6.13)
- Liquid- or gas-fueled vehicles or equipment in assembly buildings. (IFC Section 105.6.26)
- Open flames and candles. (IFC Section 105.6.34)
- Outdoor assembly event. (IFC Section 105.6.36)
- Places of assembly. (IFC Section 105.6.37)
- Temporary membrane structures and tents. (IFC Section 105.6.47)

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Permits—IFC 105

- Automatic fire-extinguishing systems. (IFC Section 105.7.1)
- Fire alarm and detection systems and related equipment. (IFC Section 105.7.7)
- Fire pumps and related equipment. (IFC Section 105.7.8)
- Standpipe systems. (IFC Section 105.7.24)
- Temporary special event structures; membrane structures and tents. (IFC Section 105.7.22 and 105.7.25)



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Permits—IFC 105

- IFC Section 105 options and limitations
 - Application (105.2)
 - Conditions of permit (105.3)
 - Construction documents (105.4)



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IFC Chapter 4 Emergency Planning and Preparedness

- Chapter 4 of the IFC addresses the emergency planning and preparedness requirements.
- A number of sections affect the operation and use of assembly spaces (both indoor and outdoor).



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Emergency Preparedness Requirements—403

- Section 403.12.1 grants the code official the authority to require the owner, agent or lessee provide fire watch personnel to be on duty at places of assembly or events where they believe it is essential to the public safety.





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KEY LEARNING



Emergency Preparedness Requirements—403

- The duties of the fire watch personnel are listed in Section 403.12.1.2.
- Crowd managers are required in larger facilities or events where more than 500 people will congregate.






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Fire Safety and Evacuation Plans—403 and 404

- Group A facilities used exclusively for religious worship which have an occupant load of less than 2,000 people are exempt from the fire safety and evacuation plan requirement.
- A plan is also required for any building with an atrium and a Group A occupancy.



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403.2 requires Group A occupancies provide the following:

An approved fire safety and evacuation plan, in accordance with Section 404.

- The plan is required for all assembly occupancies and for any building containing both an atrium and an assembly occupancy.
- Plan is not required where the assembly occupancy is used exclusively for religious worship with an occupant load of less than 2,000.






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Emergency Evacuation Drills—405

- Evacuation drills are to be conducted on a quarterly basis for the employees of a Group A occupancy.

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Employee Training and Response Procedures—406

- Employees in Group A occupancies are to be trained in the fire emergency procedures described in their facilities fire evacuation and fire safety plans.
- Employees are to be trained as part of their new employee orientation and at least annually thereafter.



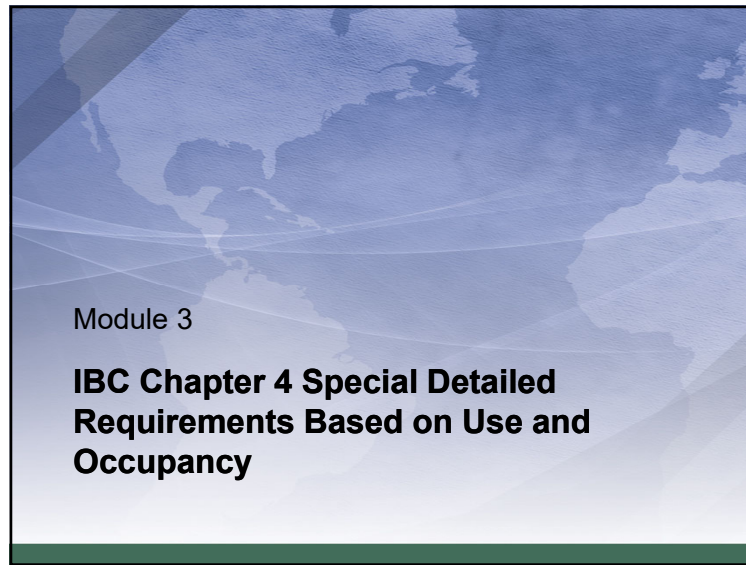
57

Miscellaneous Requirements

- Some of the other IFC provisions to be aware of include the following:
 - **Open flames, Section 308:** This section regulates the use of open flame in several situations affecting assembly occupancies such as during religious ceremonies, preparation of flaming foods or beverages, candles on tables, etc.



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Overview


- Chapter 4
 - Contains a number of provisions which apply in addition to the code's general occupancy and construction requirements.
 - Additional provisions apply to the special uses and occupancies.




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Stages, Platforms and Technical Production Areas—410


- Platform
- Proscenium Wall
- Stage
- Technical Production Area



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410.2.1 – Stage Construction


2018 IBC
Chapter 6,
Page 119

TABLE 601 (partial)
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0

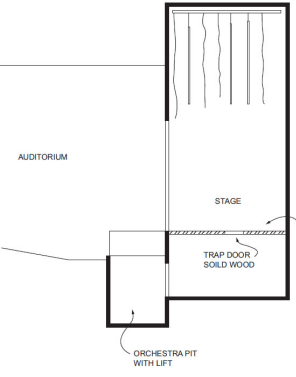


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410.2.1 – Stage Construction



STAGE FLOOR CONSTRUCTION MATCHES BUILDING TYPE OF CONSTRUCTION OR EXCEPTION, ITEMS 1-3 FROM IBC SECTION 410.2.1

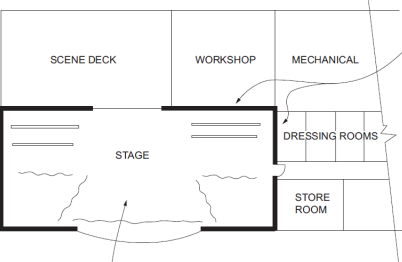


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410.2.1.1 – Stage Height and Area




SEE SECTION 410.4 FOR REQUIRED SEPARATION FROM STAGE

STAGE AREA INCLUDES ENTIRE PERFORMANCE AREA INCLUDING:
• BACKSTAGE SUPPORT AREAS NOT SEPARATED BY FIRE-RESISTANCE-RATED CONSTRUCTION



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410.2.1.1 – Stage Height and Area

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410.2.2 – Technical Production Areas – Construction Requirements

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410.2.3 – Exterior Stage Doors

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410.2.4 – Proscenium Wall

For SI: 1 foot = 304.8 mm.
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410.2.5 – Proscenium Curtain



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410.2.6 – Scenery – Combustible Materials



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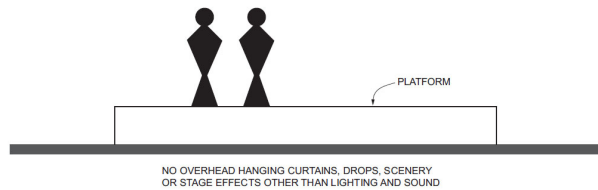
410.3 – Platform Construction

PERMANENT

- USED WITHIN AREA FOR MORE THAN 30 DAYS
- CONSTRUCTED OF MATERIALS AS REQUIRED FOR TYPE OF CONSTRUCTION
- FIRE-RETARDANT-TREATED WOOD IN SPECIFIC CASES
- MINIMUM 1-HOUR FLOOR CONSTRUCTION IF SPACE BELOW IS USED FOR OTHER THAN WIRING, PLUMBING, OR EQUIPMENT

TEMPORARY

- USED WITHIN AREA FOR NOT MORE THAN 30 DAYS
- CONSTRUCTED OF ANY MATERIAL ALLOWED BY CODE
- SPACE BENEATH USED ONLY FOR PLUMBING AND WIRING TO PLATFORM EQUIPMENT



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Permanent Platforms

- Constructed of materials as required for the building's type of construction (Types I and II – noncombustible; Types III, IV and V – combustible).



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Permanent Platforms

- Fire-retardant-treated wood may be used for construction in Types I, II and IV buildings where platform complies with all of the following:
 - Platform is not more than 30 inches (762 mm) above main floor.
 - Area of platform is not more than one-third of room floor area.
 - Area of platform is not more than 3,000 square feet (279 m²).



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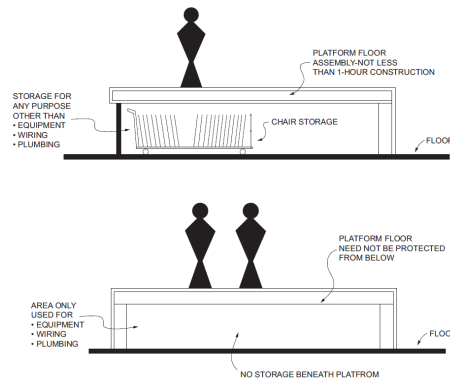
Permanent Platforms

- Floor assembly minimum of 1-hour fire-resistance-rated construction if space beneath is used for storage or any purpose other than equipment, wiring or plumbing.
- Unprotected construction permitted if space beneath is used only for equipment, wiring or plumbing.



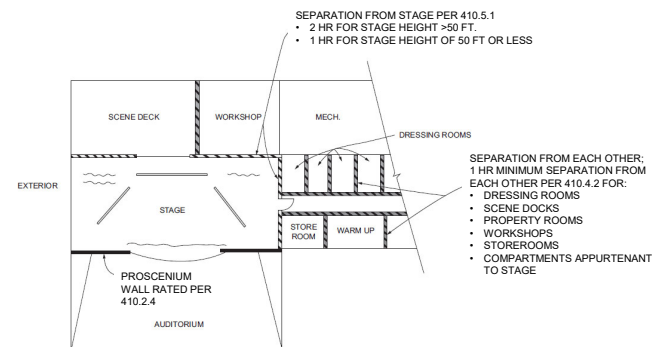
74

Temporary Platforms



75

410.4 – Dressing and Appurtenant Rooms Separation from Stage and from Each Other





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DISCUSSION

Stage, Dressing and Appurtenant Room Discussion

- How are Sections 410.2.4 and 410.4.1 to be coordinated?
 - Does Section 410.4.1 require the stage to be separated from “other parts of the building” include the proscenium wall?



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DISCUSSION

Stage, Dressing and Appurtenant Room Discussion

- How are Sections 410.2.4 and 410.4.1 to be coordinated?
 - While Section 410.2.4 would not impose a separation requirement between the stage and auditorium seating area, if the stage height is 50 feet (15240 mm) or less, it appears that Section 410.4.1 would impose a requirement which would include the proscenium wall on all stages regardless of the stage height.



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DISCUSSION

Stage, Dressing and Appurtenant Room Discussion

- Should Section 410.4.1 be viewed as only applying to the backstage areas and not to the proscenium wall?
What would justify this viewpoint?

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DISCUSSION

Stage, Dressing and Appurtenant Room Discussion

- Does Section 410.4.2 require the dressing rooms, scene docks, property rooms, etc. to be separated from other parts of the building or only from each other?

How does this affect the construction between the listed spaces and spaces which are not “appurtenant” to the stage?

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410.5 and 410.5.1 – Means of Egress and Arrangement

- Code users must recognize that the various sections may apply to any or all of:
 - Stages;
 - Platforms; and
 - Technical production areas.



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FOR EXAMPLE

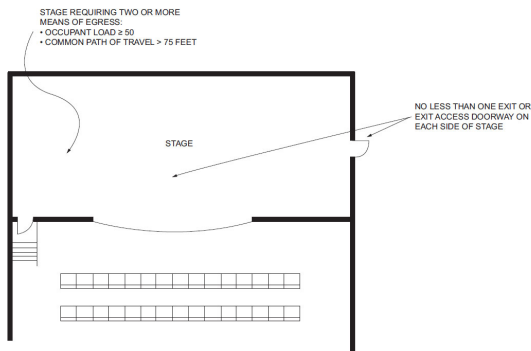
410.5 and 410.5.1 – Means of Egress and Arrangement

- Many sporting arenas may have spaces which could use the technical production area egress provisions or the technical production area may be a stand-alone building element.



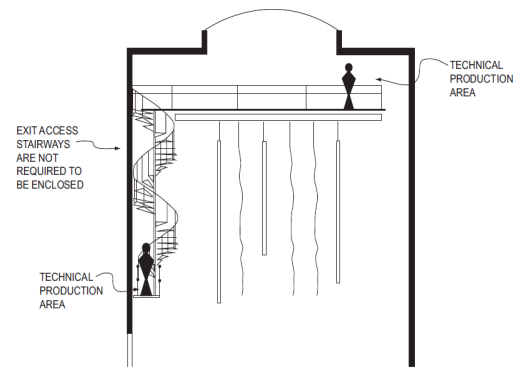
82

410.5 and 410.5.1 – Means of Egress and Arrangement



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410.5.2 – Stairway and Ramp Enclosure



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410.5.2 – Stairway and Ramp Enclosure

STAGE OR PLATFORM

TECHNICAL PRODUCTION AREA

EXIT ACCESS STAIRWAY NOT REQUIRED TO BE ENCLOSED

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410.5.3 – Technical Production Areas – Means of Egress

- This section references both means of egress and means of escape since some components such as ladders would not generally be acceptable for egress and because 410.5.3.3 will allow an escape to the roof.

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410.5.3 – Technical Production Areas – Means of Egress

- The provisions reflect the special allowances for:
 - Minimum number of means of egress;
 - Maximum travel distance;
 - Allowable exit access components; and
 - Minimum travel path width.

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KEY LEARNING

Number of means of egress, Section 410.5.3.1

- Since these spaces are unique and typically occupied by a limited number of people who are familiar with the area, a single means of egress is required and will typically be adequate.

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Exit access travel distance, Travel distance, 410.5.3.2

- Due to the limited occupant load and hazard, and the location of these spaces, the exit access travel distance can be 300 feet (91 440 mm) in buildings without a sprinkler system and 400 feet (121 920 mm) in a building with an automatic sprinkler system.



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Two means of egress, 410.5.3.3

- If two means of egress are required, the maximum length of the common path of travel within the area is limited to 100 feet (30 480 mm).
- This will limit dead ends and limit the travel distance before a choice of paths leading to two means of egress.



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Path of egress travel, 410.5.3.4

- Components allowed to serve as the egress path from these areas include
 - stairways,
 - ramps,
 - spiral stairways,
 - catwalks,
 - alternating tread devices and
 - permanent ladders.



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Width, Section 410.5.3.5

- Egress width for the egress path to be a minimum of 22 inches (559 mm) in width.
- Width would apply to stairways, ramps, catwalks, spiral stairs, and the width adjacent to alternating tread devices and ladders.



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410.6 – Automatic Sprinkler System

SPRINKLERS INSTALLED UNDER

- ROOF
- GRIDIRON
- CATWALKS
- GALLERIES

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410.6 – Automatic Sprinkler System

SPRINKLERS SHALL BE INSTALLED IN:

- DRESSING ROOMS
- PERFORMER LOUNGES
- SHOPS, AND
- STOREROOMS

SCENE DECK WORKSHOP DRESSING ROOMS STORE ROOM STAGE

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410.6 – Automatic Sprinkler System

SPRINKLERS NOT REQUIRED UNDER STAGE

CHAIR STORAGE

SPACE UTILIZED EXCLUSIVELY FOR STORAGE OF TABLES AND CHAIRS

MINIMUM OF 5/8 INCH TYPE X GYPSUM BOARD SEPARATING CONCEALED SPACE FROM ADJACENT SPACES

- Sprinklers are not required under stage areas if:
 - Area less than 4 feet (1219 mm) in clear height
 - Used only for storage of tables and chairs
 - Concealed space is separated from adjacent spaces by minimum 5/8 Type X gypsum board

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410.6 – Automatic Sprinkler System

STAGE HEIGHT ≤ 50 FEET

1,000 SQ. FT. OR LESS IN AREA

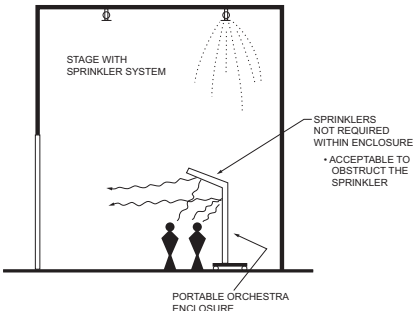
SPRINKLER SYSTEM NOT REQUIRED IF BOTH HEIGHT AND AREA COMPLY

- Sprinklers are not required for stages if $\le 1,000$ sq. ft. (93 m²) in area and ≤ 50 feet (15 240 mm) in height.
- Provided:
 - Curtains, scenery or other combustible hangings are not retractable vertically.
 - Combustible hangings limited to a single main curtain, borders, legs and a single backdrop.

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410.6 – Automatic Sprinkler System



- Sprinklers are not required to be placed within portable orchestra enclosures on stages.
- This overrides general requirement that sprinklers not be obstructed or shielded from being able to protect all areas of the stage.

SPRINKLERS NOT REQUIRED WITHIN ENCLOSURE
• ACCEPTABLE TO OBSTRUCT THE SPRINKLER

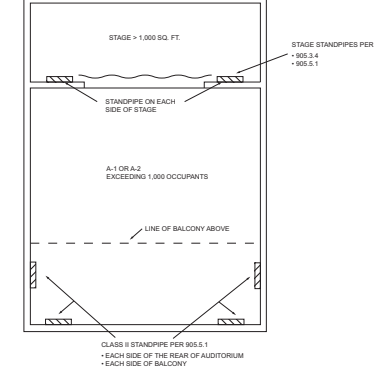
STAGE WITH SPRINKLER SYSTEM

PORTABLE ORCHESTRA ENCLOSURE

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410.7 and 905 – Standpipes for Stages



STAGE > 1,000 SQ. FT.

STAGE STANDPIPES PER
• 905.3.4
• 905.5.1

STANDPIPE ON EACH SIDE OF STAGE

A-1 OR A-2 EXCEEDING 1,000 OCCUPANTS

LINE OF BALCONY ABOVE

CLASS II STANDPIPE PER 905.5.1
• EACH SIDE OF THE REAR OF AUDITORIUM
• EACH SIDE OF BALCONY

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Special Amusement Buildings—Section 411

- The code requirements address many of the issues which made this fire so tragic including:
 - Uncertainty of exit locations and access to them.
 - Dark and confusing exiting system.
 - Confusing or conflicting sounds and visual distractions.
 - Lack of notification and awareness of fire (which led to additional people entering the building after the fire had begun).
 - Flame spread of materials which lead to fire progression and smoke development.

2018 IBC and IFC Assembly Spaces

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Special Amusement Building

REFER TO
2018 IBC
Definitions,
Page 37

- A special amusement building is any temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and that contains a device or system that conveys passengers or provides a walkway along, around or over a course in any direction so arranged that the means of egress path is not readily apparent due to visual or audio distractions or is intentionally confounded or is not readily available because of the nature of the attraction or mode of conveyance through the building or structure.



2018 IBC and IFC Assembly Spaces

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KEY LEARNING

Special Amusement Building

- Note the key features are:
 - The means of egress is not readily available or apparent.
 - The potential for sound or lighting, which can distract or confound the occupants and affect their egress.
 - Buildings can be permanent or temporary.
 - Building could include a passenger conveying system or walkway through it.







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411.1 – Special Amusement Buildings – General

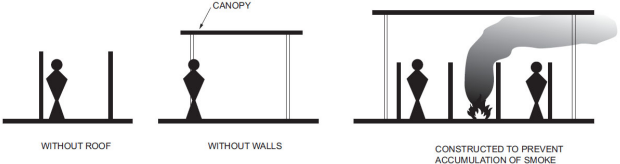


SPECIAL AMUSEMENT BUILDING

2018 IBC and IFC Assembly Spaces

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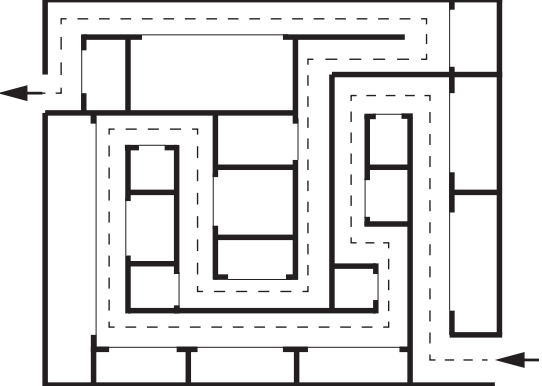


411.1 – Special Amusement Buildings – General

2018 IBC and IFC Assembly Spaces

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411.2 and 411.3 – Special Amusement Building Fire Detection and Sprinkler System

2018 IBC and IFC Assembly Spaces

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411.2 and 411.3 – Special Amusement Building Fire Detection and Sprinkler System

AUTOMATIC FIRE DETECTION SYSTEM REQUIRED

- SEE SECTION 907.2.11 FOR ALARM AND SYSTEM RESPONSE REQUIREMENTS

SPRINKLER SYSTEM INSTALLED THROUGHOUT

- NOT REQUIRED IN TEMPORARY BUILDING <1,000 SQ. FT. AND EXIT ACCESS TRAVEL DISTANCE <50 FT.
- TEMPORARY WATER SUPPLY PERMITTED FOR SPRINKLER SYSTEMS REQUIRED IN TEMPORARY BUILDING

For SI: 1 square foot = 0.093 m², 1 foot = 304.8 mm.

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411.4 and 411.5 – Special Amusement Building – Alarms

ALARM SOUNDED AT LOCATION WHERE EMERGENCY ACTION CAN BE INITIATED.

ALARM SOUNDS AFTER ACTIVATION OF

- SINGLE SMOKE DETECTOR
- SPRINKLER SYSTEM
- OTHER AUTOMATIC FIRE DETECTION DEVICE

CONSTANTLY ATTENDED LOCATION.

EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM REQUIRED THROUGHOUT.

- PERMITTED TO SERVE AS P.A. SYSTEM
- PRERECORDED MESSAGE WITH INSTRUCTIONS

MANUAL INITIATION OF 907.2.11.2 SYSTEM RESPONSE POSSIBLE FROM HERE

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411.6 – Exit Marking

EXIT SIGNS PER 1013 AT EXIT OR EXIT ACCESS DOORWAYS

LOW LEVEL EXIT SIGNS AND DIRECTIONAL PATH MARKINGS REQUIRED WHERE MIRRORS, MAZES OR OTHER DESIGNS DISGUISE EGRESS PATH

- MARKINGS SHALL BECOME VISIBLE IN AN EMERGENCY

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KEY LEARNING 411.6 – Exit Marking

- Exit signage is required as it is generally done for all other buildings.
- Where the egress path is disguised or mirrors or mazes are used, there are additional marking and signage requirements.

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411.7 – Special Amusement Building – Interior Finish

INTERIOR FINISH MATERIALS SHALL HAVE A CLASS "A" FLAME SPREAD INDEX

- DECORATIVE MATERIALS AND OTHER ITEMS PER CHAPTER 8

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KEY LEARNING

Interior Finish

- By definition this includes interior wall and ceiling finish as well as interior floor finish.
- Floor finish materials are typically not regulated by the code unless they are a textile material such as carpeting and in certain occupancies.

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Motion Picture Projection Rooms—409

PROJECTION ROOM REQUIRED IF:

- RIBBON-TYPE CELLULOSE ACETATE OR OTHER "SAFETY FILM" USED WITH
- ELECTRIC ARC, XENON OR OTHER PROJECTION EQUIPMENT DEVELOPING HAZARDOUS GASES DUST OR RADIATION

PROTECTION OF OPENINGS NOT REQUIRED

- GLASS OR OTHER MATERIAL TO CLOSE OPENING (409.2)

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Motion Picture Projection Rooms—409

30" x 30" CLEAR WORKING SPACE ON EACH SIDE AND AT REAR OF:

- PROJECTOR
- FLOODLIGHT
- SPOTLIGHT
- SIMILAR EQUIPMENT

ROOM CONSTRUCTION PER TYPE OF CONSTRUCTION

- UNPROTECTED OPENING PERMITTED

SINGLE WORKING SPACE PERMITTED BETWEEN ADJACENT EQUIPMENT

PROJECTOR FOR SEPARATE THEATER IS PERMITTED

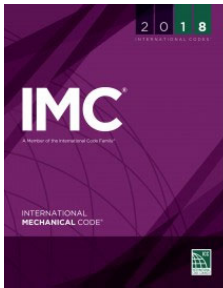
GLASS OR OTHER MATERIAL TO CLOSE OPENING

APPURTENANT ELECTRICAL EQUIPMENT IN PROJECTION ROOM OR ADJACENT ROOM OF EQUIVALENT CONSTRUCTION

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409.3 – Projection Room and Equipment Ventilation



- Section 502.11 of the IMC.
- Requirements depend on the type of projectors and whether the projector is built with an exhaust discharge connection or if the exhaust is taken from the room.



2018 IBC and IFC Assembly Spaces



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409.3 – Projection Room and Equipment Ventilation

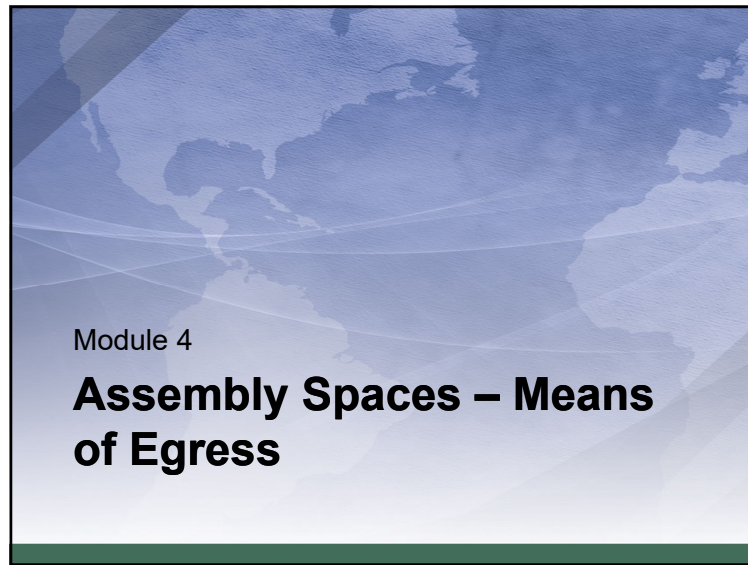
- The ventilation provisions include:
 - Projection room supply air (Section 409.3.1)
 - Projection room exhaust air (Section 409.3.2)
 - Projection machine exhaust system (Section 409.3.3)



2018 IBC and IFC Assembly Spaces

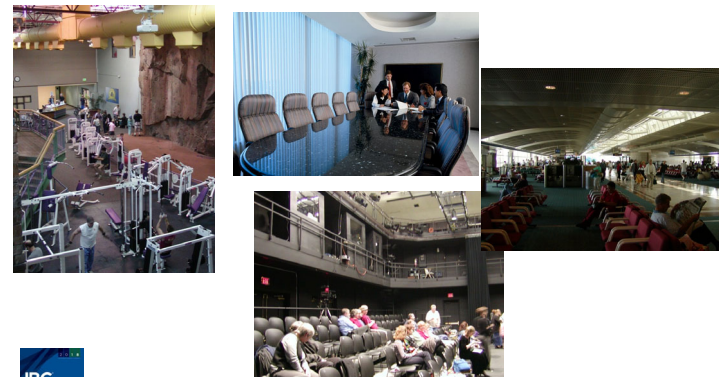


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Assembly Spaces - Section 1029



2018 IBC and IFC Assembly Spaces





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KEY LEARNING

Means of Egress – Assembly—1029

- Requirements should be used in any room “used for assembly purposes which contains seats, tables, displays, equipment or other material” and may be applied in occupancies other than Group A assembly spaces.
- Notice that the wording is “used for assembly purposes” and not limited to assembly occupancies.






2018 IBC and IFC Assembly Spaces

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1004 — Occupant Load

- Determine the occupant load of the assembly space or of the area served by a specific component in the egress system.
- The requirements for assembly spaces are not unique in this aspect, but a quick review of the general code requirements is appropriate.

2018 IBC and IFC Assembly Spaces

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REFER TO



CODE BOOK

2018 IBC
Table
1004.5
Page 259

1004 — Occupant Load

MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT (partial Table showing main assembly uses)	
FUNCTION OF SPACE	OCCUPANT LOAD FACTOR ^a
Airport terminal	
Baggage claim	20 gross
Baggage handling	300 gross
Concourse	100 gross
Waiting areas	15 gross
Assembly	
Gaming floors (keno, slots, etc.)	11 gross
Exhibit Gallery and Museum	30 net
Assembly with fixed seats	See Section 1004.4
Assembly without fixed seats	
Concentrated (chairs only-not fixed)	7 net
Standing space	5 net
Unconcentrated (tables and chairs)	15 net
Bowling centers, allow 5 persons for each lane including 15 feet of runways, and for additional areas	7 net
Courtrooms—other than fixed seating areas	40 net
Exercise rooms	50 gross
Library	
Reading rooms	50 net
Stack area	100 gross
Skating rinks, swimming pools	
Rink and pool	50 gross
Decks	15 gross
Stages and platforms	15 net

For SI: 1 square foot = 0.093 m².
^aFloor area in square feet per occupant.






2018 IBC and IFC Assembly Spaces

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For areas with fixed seating (1004.6)

- Occupant load is determined by counting the number of fixed seats.
- If the seating does not have dividing arms, the occupant load is determined as follows:
 - One person for each 18 inches (457 mm) of seating length (general requirement).
 - One person for each 24 inches (610 mm) of booth seat length where seating is in a booth.





2018 IBC and IFC Assembly Spaces

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For areas with fixed seating (1004.6)


- Remember that general egress provisions of Section 1004 also address:
 - Cumulative occupant loads
 - Where egressing through intervening rooms, areas or spaces
 - Where egressing from adjacent levels such as mezzanines or stories
 - Allowing increased occupant loads
 - Outdoor areas
 - Multiple occupancies or use of space for multiple uses



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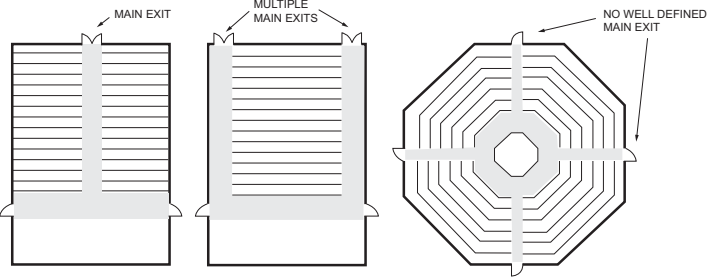

1029.2 – Assembly Main Exit

- Main Exit:
 - Has sufficient capacity to accommodate not less than one-half of occupant load.
 - Accommodates not less than the total required capacity of all means of egress leading to the exit.
 - Front onto a street or an unoccupied space that adjoins a street or public way if the building is classified as a Group A occupancy. Minimum width of space is not less than 10 feet (3048 mm).



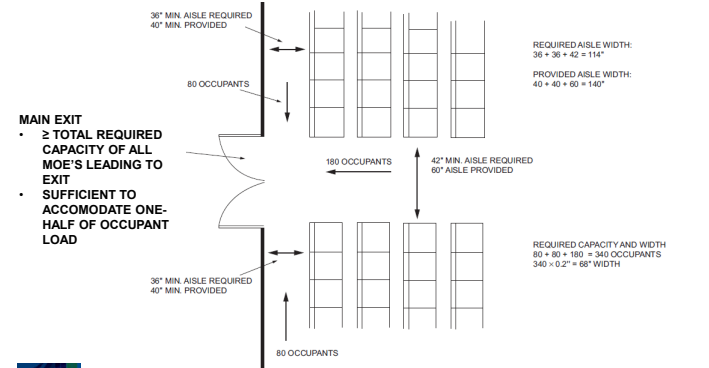
122

1029.2 – Assembly Main Exit

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1029.2 – Assembly Main Exit



MAIN EXIT

- ≥ TOTAL REQUIRED CAPACITY OF ALL MOE'S LEADING TO EXIT
- SUFFICIENT TO ACCOMMODATE ONE-HALF OF OCCUPANT LOAD

36" MIN. AISLE REQUIRED
40" MIN. PROVIDED

80 OCCUPANTS

160 OCCUPANTS

42" MIN. AISLE REQUIRED
60" AISLE PROVIDED


80 OCCUPANTS

36" MIN. AISLE REQUIRED
40" MIN. PROVIDED

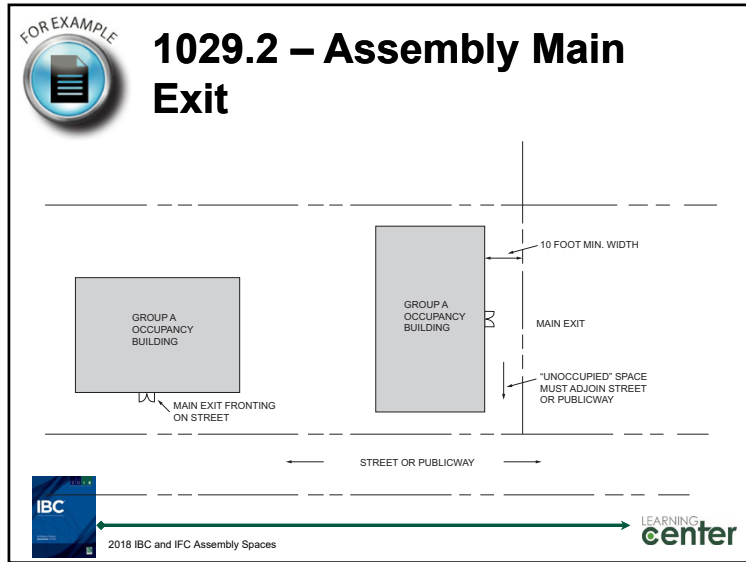
REQUIRED AISLE WIDTH:
36 + 36 + 42 = 114"

PROVIDED AISLE WIDTH:
40 + 40 + 60 = 140"

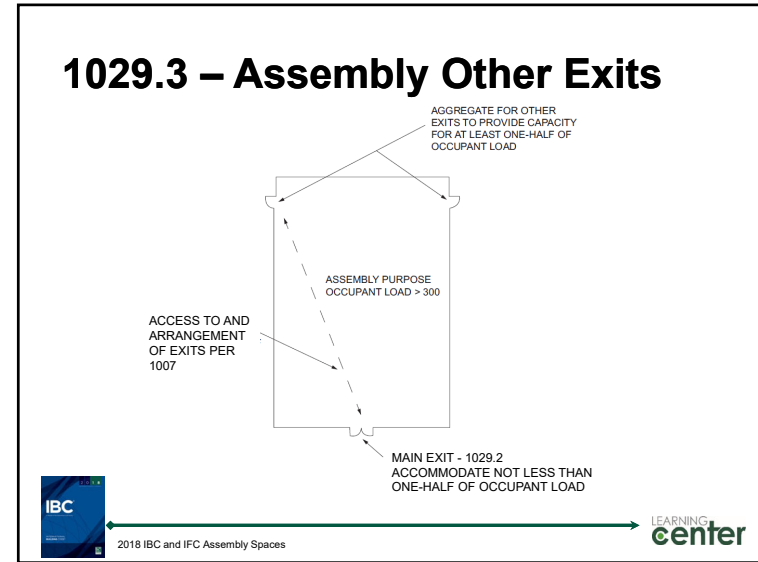
REQUIRED CAPACITY AND WIDTH
80 + 80 + 160 = 360 OCCUPANTS
360 ÷ 3.2' = 65' WIDTH



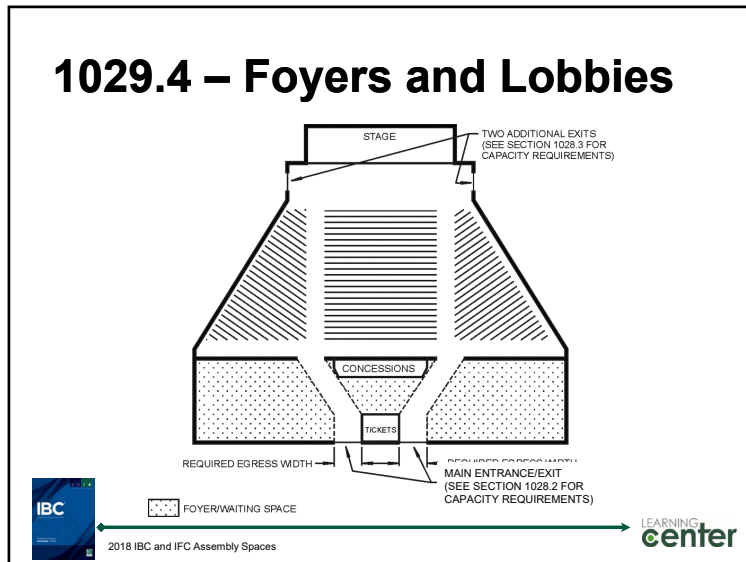
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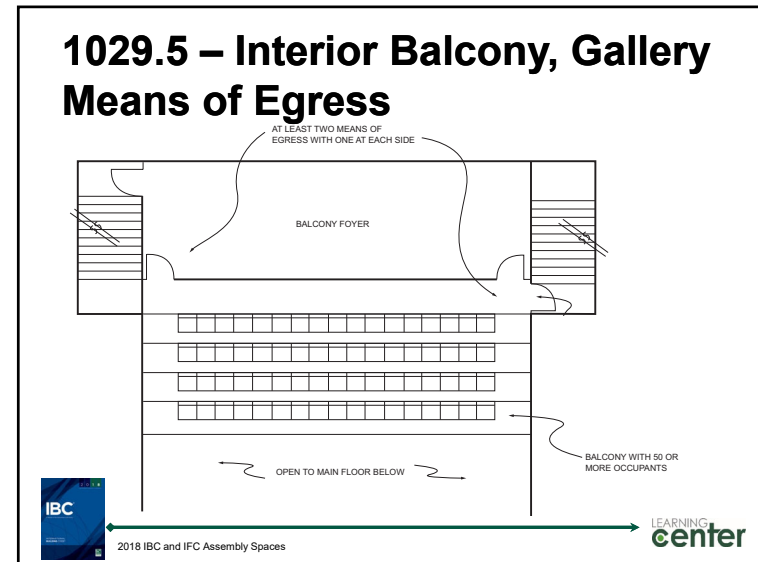
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1029.6 – Capacity of Aisle for Assembly

- Required width and egress capacity is determined by multiplying the occupant load served by the appropriate egress width factor.
- This section therefore sizes the means of egress based upon the occupant load using the system.
- These capacity requirements may then require an increase in the minimum component width.
- Egress width factors for the various elements will depend on whether the assembly space has smoke-protected seating or not, or is open-air.

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REFER TO



2018 IBC Definitions, Page 37

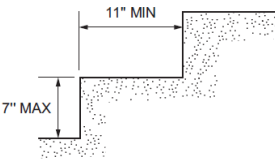
Smoke-protected Assembly Seating

- Seating served by means of egress that is not subject to smoke accumulation within or under a structure for a specified design time by means of passive design or by mechanical ventilation.






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1029.6.1 – Capacity of Aisle – Without Smoke Protection




Element	Width requirement per occupant served	Limitations
Stepped aisle	0.3 inch	Riser height 7 inches or less Tread depth 11 inches or greater






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1029.6.1 – Minimum Egress Width – Without Smoke Protection

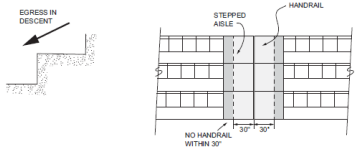


Element	Width requirement per occupant served	Limitations
Stepped aisle (additional Capacity factor for riser height greater than 7 inches)	0.005 inch additional capacity (see limitations)	0.005 inch of additional width is required for each occupant for each 0.10 inch of riser height above 7 inches

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1029.6.1 – Minimum Egress Width – Without Smoke Protection




Element	Width requirement per occupant served	Limitations
Stepped aisle (egress in descent)	0.075 inch additional capacity (see limitations)	0.075 inch of additional width is required for each occupant on stairs not having a handrail within a 30 inch horizontal distance

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1029.6.1 – Minimum Egress Width – Without Smoke Protection



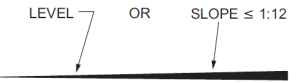
MAXIMUM SLOPE OF 1:8 PER 1029.14.1. STEPS REQUIRED IF SLOPE > 1:8

Element	Width requirement per occupant served	Limitations
Ramped (Slope >1:12)	0.22 inch	For slopes steeper than one unit vertical in 12 units horizontal (>1:12, >8%). Maximum slope of 1:8 per 1029.14.1. Stepped aisle required if >1:8.

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1029.6.1 – Minimum Egress Width – Without Smoke Protection



Element	Width requirement per occupant served	Limitations
Level or Ramped (Slope ≤ 1:12)	0.2 inch	For slopes not steeper than one unit vertical in 12 units horizontal (≤1:12, ≤8%)

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REFER TO IBC INTERNATIONAL CODE COUNCIL CODE BOOK 2018 IBC Definitions Page 37

1029.6.2 – Smoke-Protected Seating

- Smoke-protected Assembly Seating
 - Seating served by means of egress that is not subject to smoke accumulation within or under a structure for a specified design time by means of passive design or by mechanical ventilation.

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REFER TO

CODE BOOK



1029.6.2 – Smoke-Protected Seating

2018 IBC
 Table
 1029.6.2
 Page 296

**TABLE 1029.6.2
 CAPACITY FOR AISLES FOR SMOKE-PROTECTED ASSEMBLY**


TOTAL NUMBER OF SEATS IN THE SMOKE-PROTECTED ASSEMBLY SEATING	INCHES OF CAPACITY PER SEAT SERVED			
	Stepped aisles with handrails within 30 inches	Stepped aisles without handrails within 30 inches	Level aisles or ramped aisles not steeper than 1 in 10 in slope	Ramped aisles steeper than 1 in 10 in slope
Equal to or less than 5,000	0.200	0.250	0.150	0.165
10,000	0.130	0.163	0.100	0.110
15,000	0.096	0.120	0.070	0.077
20,000	0.076	0.095	0.056	0.062
Equal to or greater than 25,000	0.060	0.075	0.044	0.048

For SF: 1 inch = 25.4 mm.



2018 IBC and IFC Assembly Spaces

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KEY LEARNING



Life-Safety Evaluation Complying with NFPA 101

- The Life-Safety Code (NFPA 101) defines a life safety evaluation as “A written review dealing with the adequacy of life safety features relative to fire, storm, collapse, crowd behavior, and other related safety considerations.” (NFPA 101 2018 edition, Section 3.3.166)



2018 IBC and IFC Assembly Spaces

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KEY LEARNING



Life-Safety Evaluation Complying with NFPA 101

- The life safety evaluation is to:
 - Be performed by a person acceptable to the Building Official (NFPA 101, Section 12.4.1.1).
 - Shall include assessments of both building systems and management features upon which reliance is placed for the safety of facility occupants (NFPA 101, Section 12.4.1.3).



2018 IBC and IFC Assembly Spaces

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KEY LEARNING


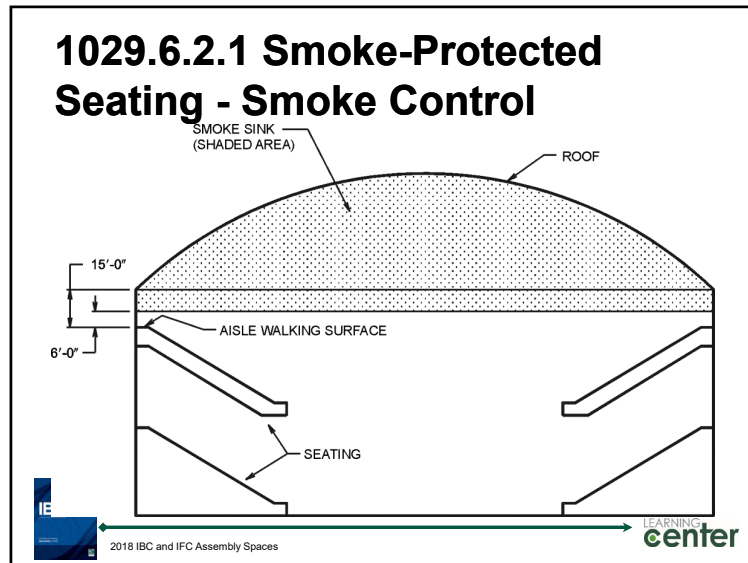
Life-Safety Evaluation Complying with NFPA 101

- The life safety evaluation is to:
 - Shall consider scenarios appropriate to the facility (NFPA 101, Section 12.4.1.3).
 - Shall be approved annually by the Building or Fire Code Official and shall be updated for special or unusual conditions (NFPA 101, Section 12.4.1.1).
 - Shall include a written assessment of all of the following conditions and appropriate safety measures (NFPA 101, Section 12.4.1.2).

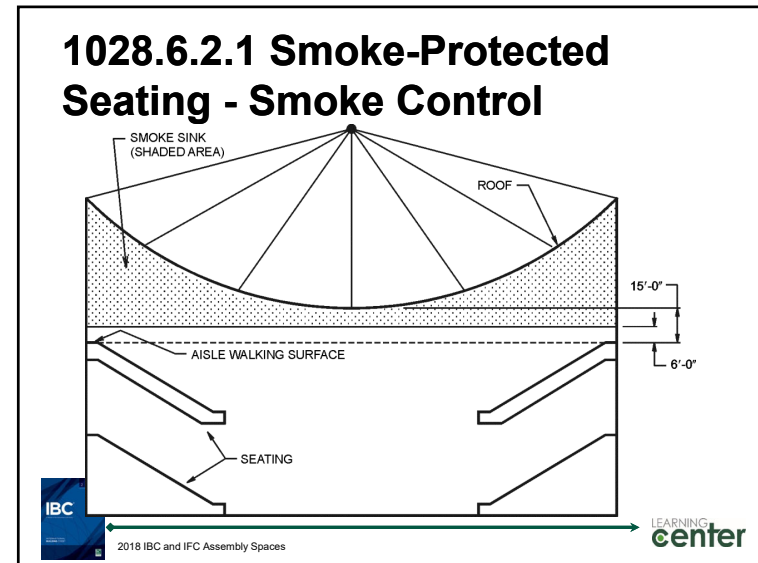
 

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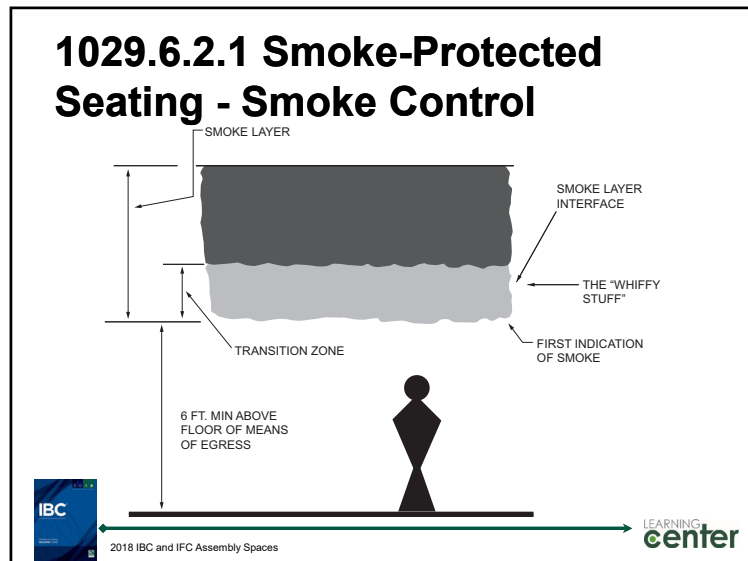
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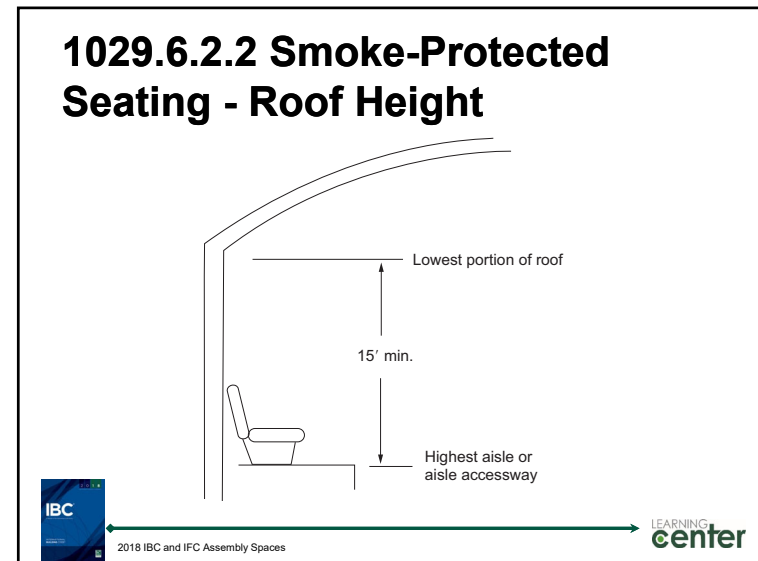
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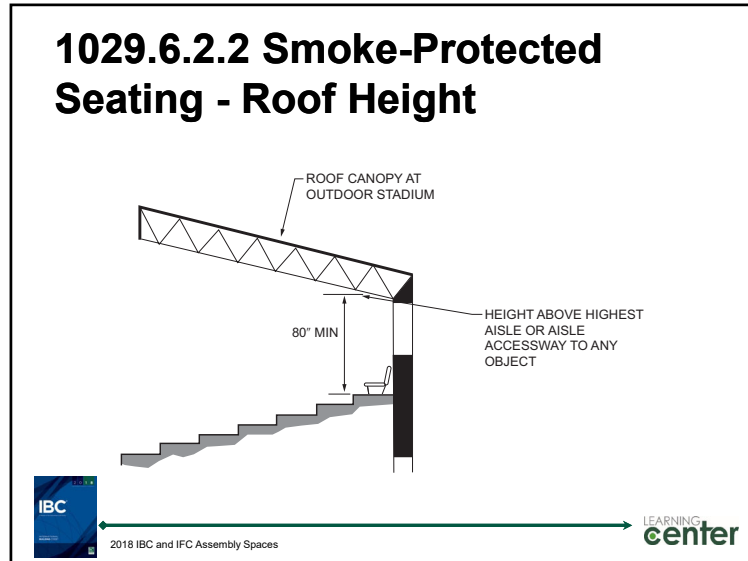
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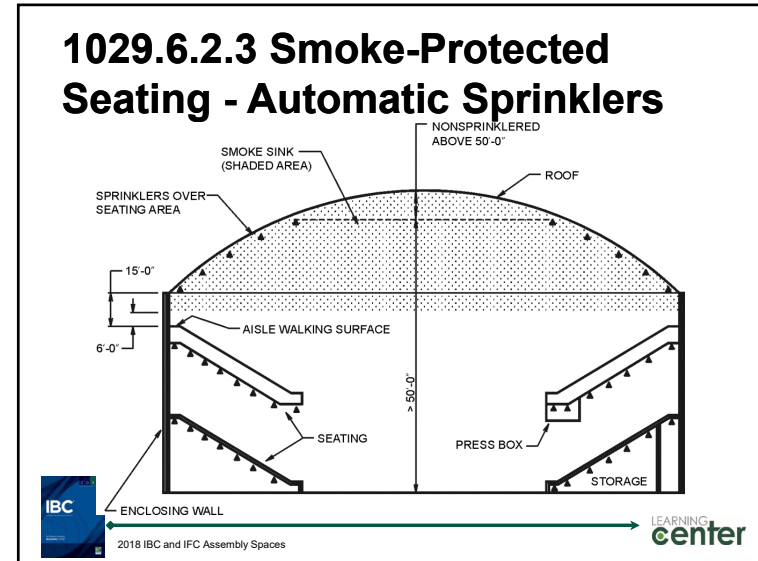
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1029.6.2.3 Smoke-Protected Seating - Automatic Sprinklers

- Three exceptions :
 1. Over the floor area used for contests, performances or entertainment; provided the roof construction is more than 50 feet (15 240 mm) above the floor and the area is limited to low fire hazard uses.
 2. Press boxes and storage facilities that are less than 1,000 square feet (93 m²) in area are also exempted from the sprinkler requirement even though they may be enclosed.

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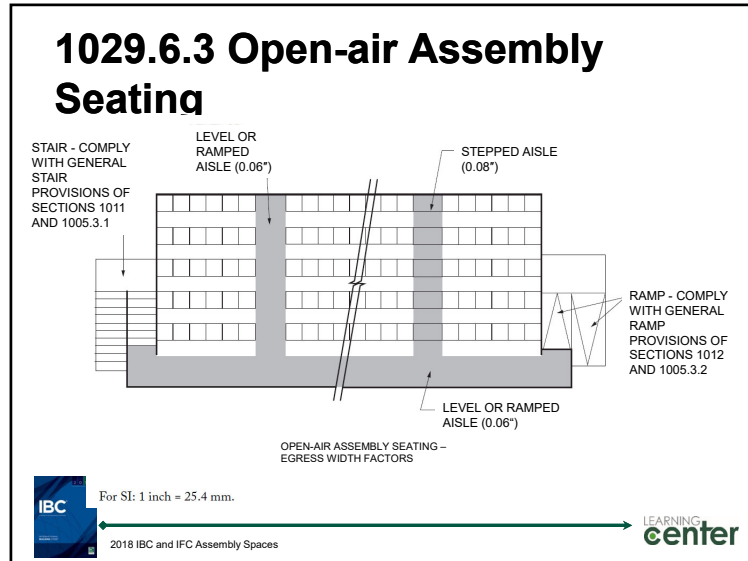
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1029.6.2.3 Smoke-Protected Seating - Automatic Sprinklers

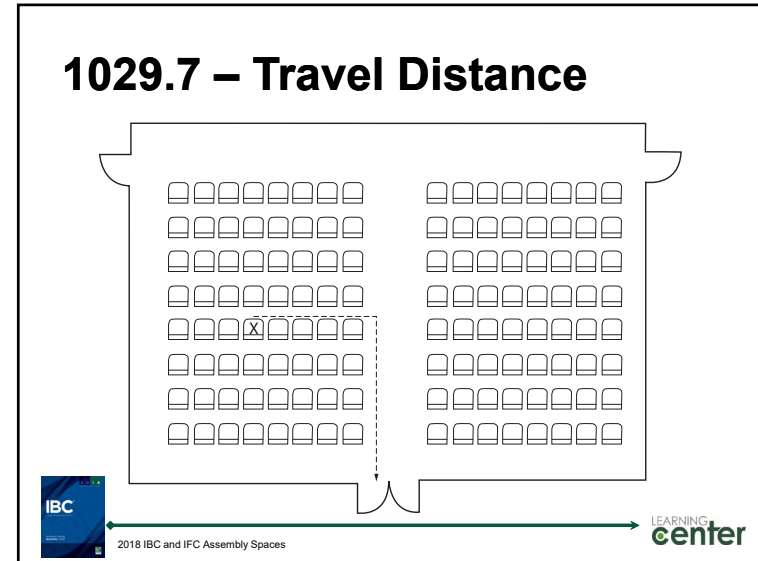
- Three exceptions :
 3. An outdoor seating facility is not required to have sprinklers installed in the enclosed areas where the seating and the means of egress within the seating area are “essentially open to the outside.”

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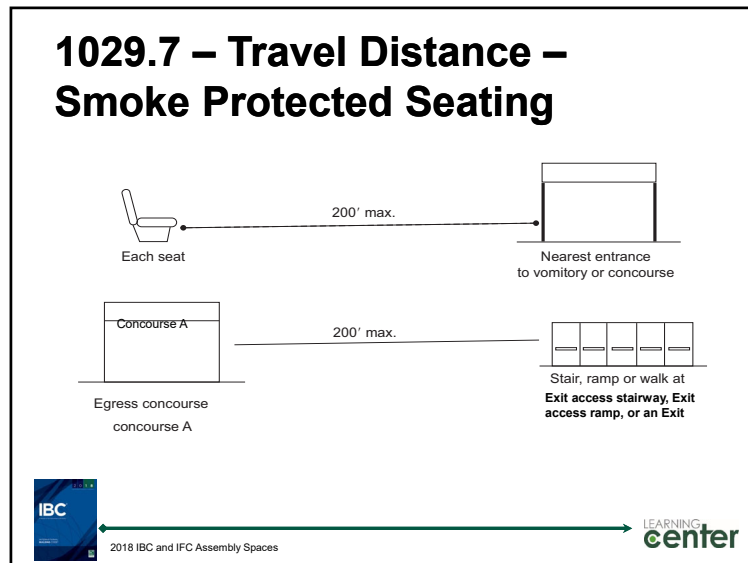
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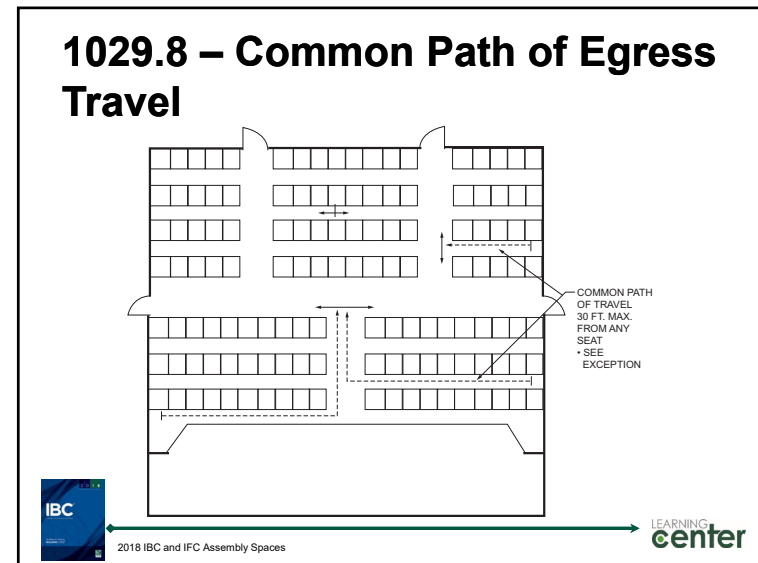
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REFER TO

 CODE BOOK
 2018 IBC
 Definitions,
 Page 18

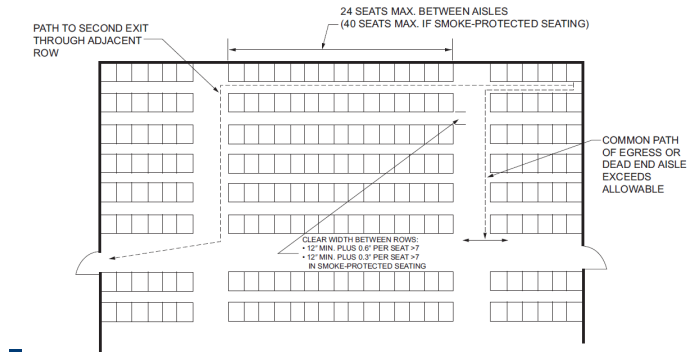
Common Path Of Egress Travel



- **COMMON PATH OF EGRESS TRAVEL.** That portion of the exit access travel distance measured from the most remote point of each room, area or space to that point where the occupants have separate and distinct access to two exits or exit access doorways.



 2018 IBC and IFC Assembly Spaces

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1029.8.1 Path Through Adjacent Row







 2018 IBC and IFC Assembly Spaces

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1029.8.1 Path Through Adjacent Row



- Maximum number of seats between the adjacent aisles when traversing through the aisle accessway:
 - 24 seats (general requirement)
 - 40 seats if smoke-protected or open-air assembly seating



 2018 IBC and IFC Assembly Spaces

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1029.8.1 Path Through Adjacent Row

- Clear width between adjacent rows when traversing through the aisle accessway:
 - 12 inches plus 0.6 inch (304.8 plus 15.2 mm) for each seat greater than seven in the row between the aisles (general requirement)
 - 12 inches plus 0.3 inch (304.8 plus 7.6 mm) for each seat greater than seven in the row between the aisles if smoke-protected or open-air assembly seating





 2018 IBC and IFC Assembly Spaces

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FOR EXAMPLE

Example for row width

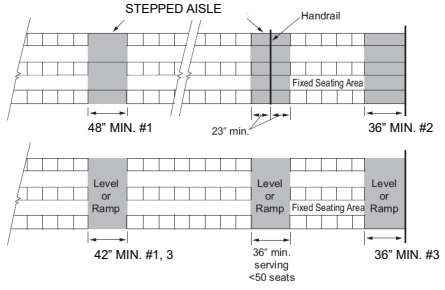
- In an section with 20 seats between the aisle, the row spacing would be determined as follows:
 $12" + 0.6"(20-7) = 12" + 0.6"(13) = 12" + 7.8" = 19.8"$
 (For SI: 1 inch = 25.4 mm)

2018 IBC and IFC Assembly Spaces



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1028.9.1 and 1028.9.2 Minimum Aisle Width



EXCEPTIONS

- 36" WHERE AISLE SERVES LESS THAN 50 SEATS
- 23" BETWEEN HANDRAIL AND SEATING WHERE SERVING FIVE ROWS OR LESS
- 30" WHERE AISLE SERVES 14 SEATS OR LESS AND NOT ACCESSIBLE ROUTE



2018 IBC and IFC Assembly Spaces

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FOR EXAMPLE

1029.9.1 and 1029.9.2 Minimum Aisle Width

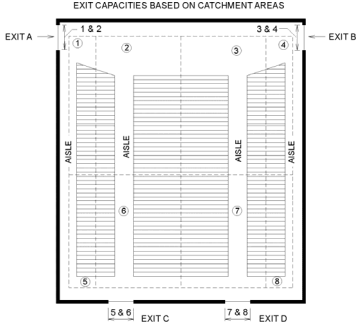
- Minimum clear width required for a stepped aisle serving seating on both sides is 48 inches (1219 mm).
- In an area without smoke-protection a stepped aisle is required to provide at least 0.3 inch (7.6 mm) of egress capacity for each occupant served (Section 1029.6.1, item 1).
- Assuming the aisle serves 180 people, the minimum width to provide sufficient egress capacity for the number of people accommodated is 54 inches (180 x 0.3" = 54") (1372 mm).
- Therefore the aisle must be 54 inches (1372 mm) in width and cannot use the 48 inch (1219 mm) minimum specified in Section 1029.9.1, Item 1.

2018 IBC and IFC Assembly Spaces



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Section 1029.9.2 – Aisle Width



NOTE: FOR MINIMUM AISLE WIDTHS, SEE SECTION 1029.9.1
 EXIT A IS DESIGNED FOR OCCUPANTS IN CATCHMENT AREAS #1 AND #2.

○ INDICATES A CATCHMENT AREA

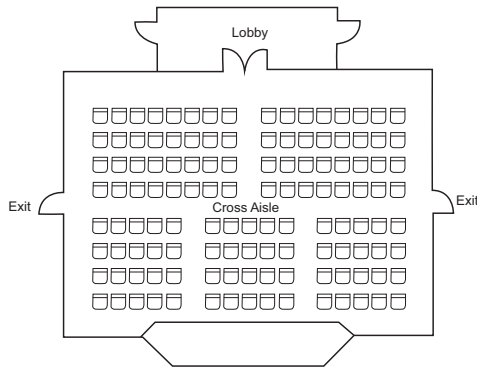



2018 IBC and IFC Assembly Spaces

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Aisle Width



2018 IBC and IFC Assembly Spaces



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Aisle Width

1. Does the type of assembly space affect what assumptions are appropriate?
 - For example in a motion picture theater with stadium seating where everyone enters from the front at the ground level, is it reasonable to assume that half will go up to an exit at the top/back of the auditorium? If the space was a performing arts theater and people enter from the rear of the auditorium will that change or influence whether people would exit towards the stage and doors or aisle that may be available at the front?



2018 IBC and IFC Assembly Spaces



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Aisle Width

2. Referring to the figure, how will the following situations be addressed:
 - a. How are things like the 3 way (T) intersection handled where the main aisle in the back intersects the cross aisle? Will people in the cross aisle stay in the cross aisle or will they turn and try to head up to the lobby even though people in the back area may be trying to move forward toward the cross aisle?



2018 IBC and IFC Assembly Spaces



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Aisle Width

2. Referring to the figure, how will the following situations be addressed:
 - b. Will the people coming up out of the front aisles really split 50/50? Consider the fact they may not just split left or right into the cross aisle but whether a different percentage would split off towards the main lobby or if proportionally more would simply turn and head to the closest side exit.



2018 IBC and IFC Assembly Spaces





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DISCUSSION

Aisle Width

2. Referring to the figure, how will the following situations be addressed:
 - c. Would people from the front aisles be affected by how much of an offset there is to the main aisle in the back? (Notice there is only a short offset like this plan shows versus having more of an equal distance to the side aisle/exit and the main aisle.)



2018 IBC and IFC Assembly Spaces

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DISCUSSION

Aisle Width

2. Referring to the figure, how will the following situations be addressed:
 - d. How would an aisle across the front of the auditorium affect the plan? What would be the impact if the front aisle only occurred in front of the side sections as opposed to extending across the entire seating area?



2018 IBC and IFC Assembly Spaces

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DISCUSSION

Aisle Width

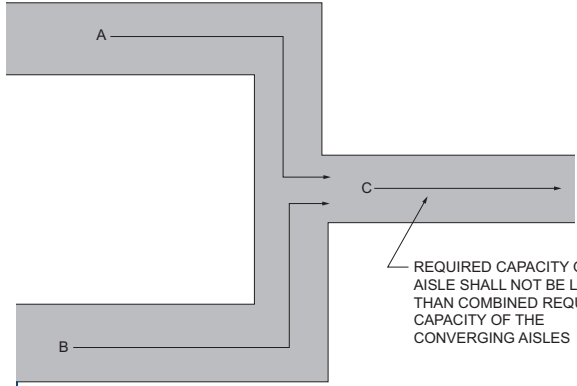


3. Assuming a plan with a main aisle running from the front to the back of the auditorium but goes past a cross aisle or two. Since we size the main exit for 50 percent of the occupants and know that most people will tend to head that direction, is it really safe to assume people will keep moving that direction and will walk past cross aisles or other routes (especially if they are more open and available)?

2018 IBC and IFC Assembly Spaces

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1029.9.3 – Converging Aisles



2018 IBC and IFC Assembly Spaces

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FOR EXAMPLE

1029.9.3 – Converging Aisles

1. Aisle “A” and “B” each serve 100 people. Aisle “A” and “B” are each a minimum of 42 inches in width (Section 1029.9.1, Item 4). Aisle “C” is required to be a minimum of 42 inches in width (Sections 1029.9.3 and 1029.9.1, Item 4).






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FOR EXAMPLE

1029.9.3 – Converging Aisles

2. Aisle “A” and “B” each serve 150 people. Aisle “A” and “B” are each a minimum of 42 inches in width Section 1029.9.1, Item 4). Aisle “C” is required to be a minimum of 60 inches in width (Sections 1029.9.3 and 1029.6.1, Item 4). [$300 \times 0.2 = 60$ ”]






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FOR EXAMPLE

1029.9.3 – Converging Aisles

3. Aisle “A” and “B” each serve 250 people. Aisle “A” and “B” are each a minimum of 50 inches in width Section 1029.6.1, Item 4) [$250 \times 0.2 = 50$ ”]. Aisle “C” is required to be a minimum of 100 inches in width (Sections 1029.9.3 and 1029.6.1, Item 4) to serve the 500 occupant capacity. [$500 \times 0.2 = 100$ ”]






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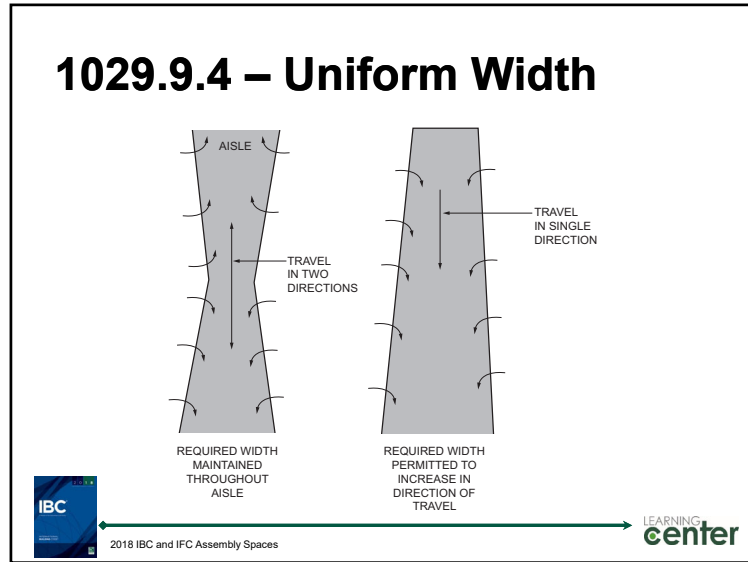
FOR EXAMPLE

1029.9.3 – Converging Aisles

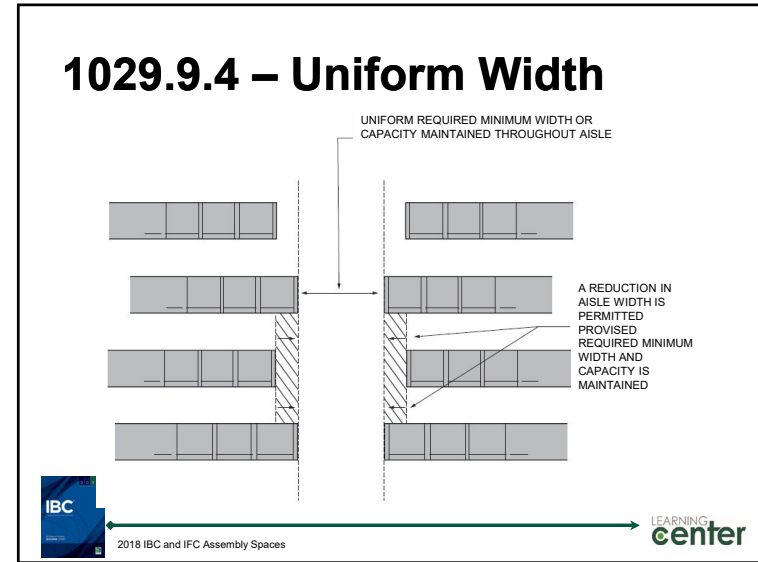
4. For this example assume that aisles “A” and “B” are level travel but aisle “C” is a stepped aisle with a 7 inch riser height. Aisle “a” and “b” each serve 150 people. Aisle “A” and “B” are each a minimum of 42 inches in width (Section 1029.9.1, Item 4) [$150 \times 0.2 = 30$ ” but 1029.9.1, Item 4 requires a minimum 42 inch width]. Aisle “C” is required to be a minimum of 90 inches in width (Sections 1029.9.3 and 1029.6.1, Item 1). [$300 \times 0.3 = 90$ ”]

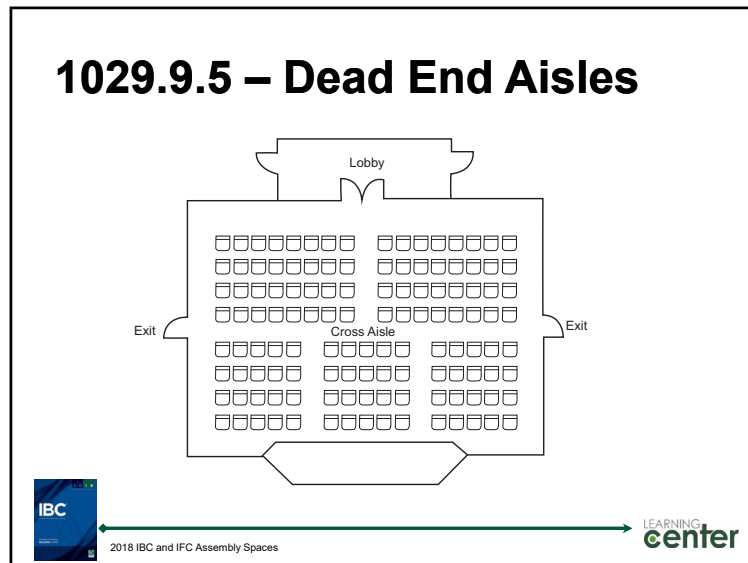
172



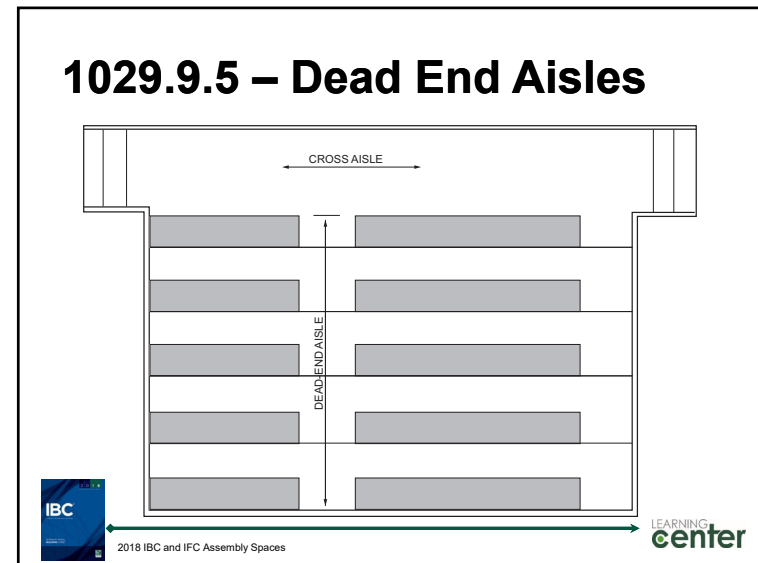
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1029.9.5 – Exceptions 2 and 4 Dead-End Aisles – Permitted Increases

24 SEATS MAX. BETWEEN AISLES
40 SEATS MAX. IF SMOKE-PROTECTED SEATING

DEAD END AISLE

Dead ends typically limited to:
- 20 ft. (General)
- 21 rows (smoke protected)

See Section 1029.9.5 Exceptions 2 and 4 for increased dead end requirements

Clear width between rows: 12" min. plus add extra:

- 0.6" per seat
 - Beyond 7 if seats have backrests
 - Beyond 10 if seats without backrests
- 0.3" per seat in smoke-protected or open-air seating
 - Beyond 7 if seats have backrests
 - Beyond 10 if seats without backrests

Increased row spacing applies to rows beyond:

- 16th row (General)
- 21st row (Smoke-protected seating)

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1029.9.5 – Exceptions 2 and 4 Dead-End Aisles - Permitted Increases

- Maximum number of seats between the adjacent aisles when traversing through the aisle accessway:
 - 24 seats (general requirement)
 - 40 seats if smoke-protected assembly seating

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1029.9.5 – Exceptions 2 and 4 Dead-End Aisles - Permitted Increases

Clear width between adjacent rows when traversing through the aisle accessway:

- 12 inches plus 0.6 inch (304.8 mm plus 15.2 mm) for each seat greater than seven in the row between the aisles where the seats have backrests (general requirement).
- 12 inches plus 0.3 inch (304.8 mm plus 7.6 mm) in smoke-protected assembly seating for each seat greater than seven in the row between the aisles where the seats have backrests.
- In both cases:** Where the seats are without backrests, the increase width applies to seats beyond the 10th seat.

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FOR EXAMPLE

1029.9.5 – Exceptions 2 and 4 Dead-End Aisles - Permitted Increases

- Row Width:
 - In an section with 20 seats with backrests between the aisle, the row spacing would be determined as follows: $12" + 0.6"(20-7) = 12" + 0.6"(13) = 12" + 7.8" = 19.8"$

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Section 1029.9.6 – Aisle measurement

The clear width for aisles shall be measured to:

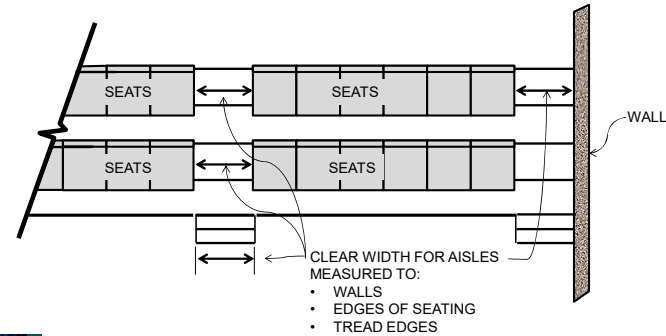
- Walls,
- Edges of seating
- Tread edges

Where the aisles serve seating at tables, such as in a dining area, the exception references Section 1029.13.1 which will be covered shortly.



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Section 1029.9.6 – Aisle measurement



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1029.13 – Aisle Accessways

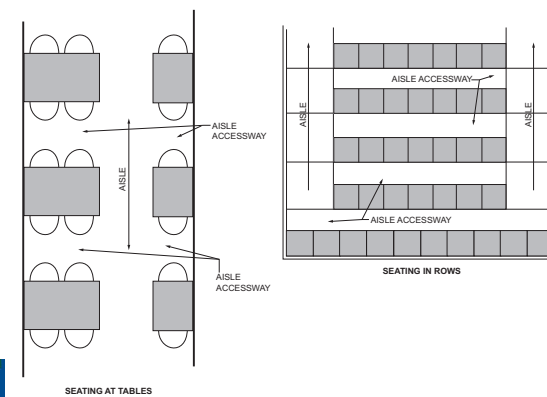
- Defined as: “That portion of an exit access that leads to an aisle.”

Therefore the aisle accessway is generally the starting point that the occupant must get through in order to reach the aisle and then ultimately to leave the room and reach an exit.

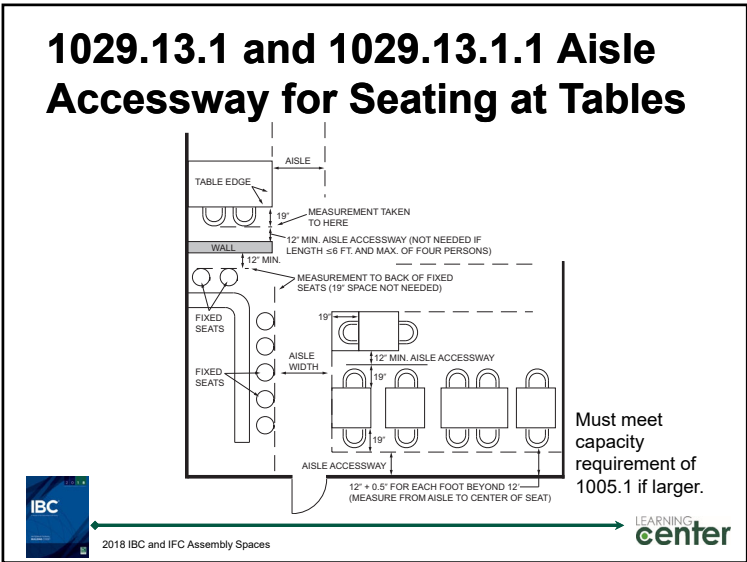


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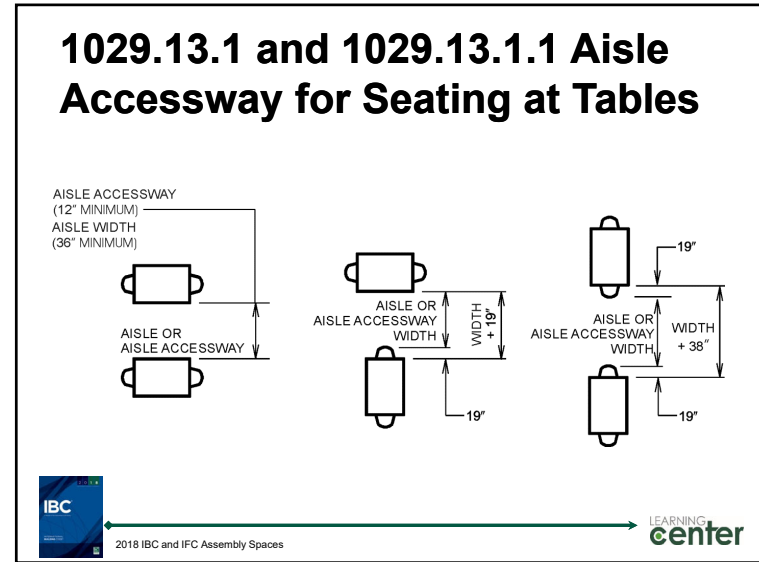
1029.13 – Aisle Accessways



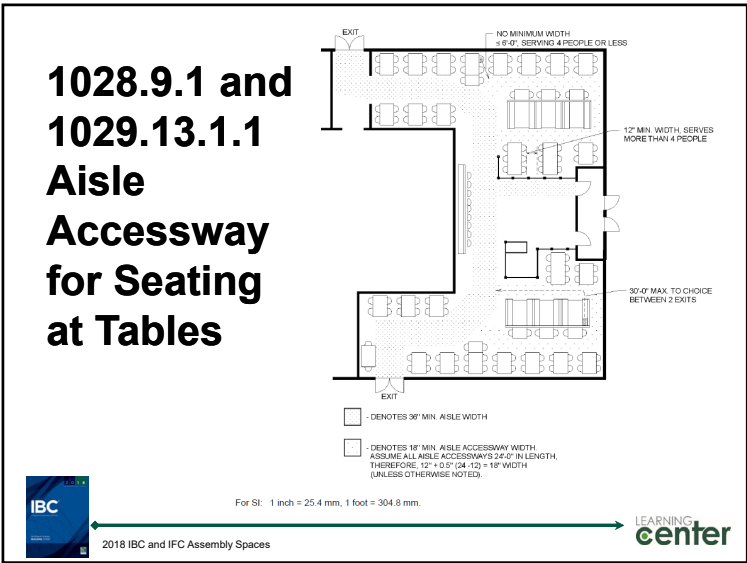
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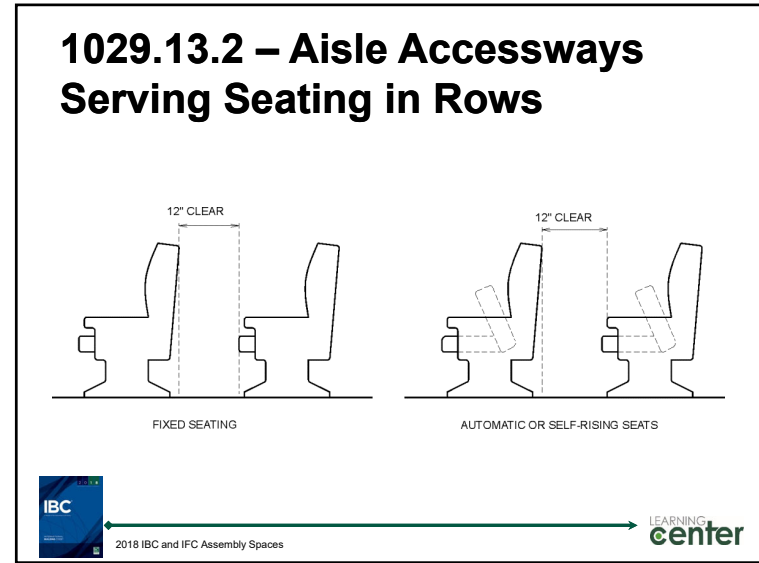
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1029.13.2 – Aisle Accessways Serving Seating in Rows

SEATS IN THIS ROW	ACCESSWAY WIDTH AT EACH ROW
14	12"
18	13.2"
24	15"
30	16.8"
36	18.6"
42	20.4"
48	22"
54	22"

60 SEATS EACH ROW, CENTER SECTION
22" MIN. DISTANCE BETWEEN ROWS

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1029.13.2 – Aisle Accessways Serving Seating in Rows

22" MAX. 18.0 17.4 16.8 16.2 15.6 15.0 14.4 13.8 13.2 12.6 12" min.

30'-0" MAX. FOR SINGLE ACCESS

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REFER TO IBC INTERNATIONAL CODE BOOK

1029.13.2.1 Aisle Accessways Serving Seating in Rows - Smoke Protected

2018 IBC Table 1029.13.2.1 Page 300

TOTAL NUMBER OF SEATS IN THE SMOKE-PROTECTED OR OPEN-AIR ASSEMBLY SEATING	MAXIMUM NUMBER OF SEATS PER ROW PERMITTED TO HAVE A MINIMUM 12-INCH CLEAR WIDTH AISLE ACCESSWAY			
	Aisle or doorway at both ends of row		Aisle or doorway at one end of row only	
	Seats with backrests	Seats without backrests	Seats with backrests	Seats without backrests
Less than 4,000	14	21	7	10
4,000	15	22	7	10
7,000	16	23	8	11
10,000	17	24	8	11
13,000	18	25	9	12
16,000	19	26	9	12
19,000	20	27	10	13
22,000 and greater	21	28	11	14

For SI: 1 inch = 25.4 mm.

2018 IBC and IFC Assembly Spaces

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1029.12 and 1029.14 – Construction & Walking Surface

RAMPED AISLES ARE PERMITTED

WHEN SLOPE IS 1:8 OR LESS

NO STEPS

STEPED AISLES ARE REQUIRED

WHEN SLOPE IS STEEPER THAN 1:8

STEPS

2018 IBC and IFC Assembly Spaces

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Section 1029.14.1 – Ramped Aisles

Sloped aisles (those sloped one unit vertical in 20 units horizontal or less), or level aisles must comply with the general aisle requirements such as:

- Capacity requirements of Section 1029.6
- General aisle requirements of Section 1029.9
- Construction requirements of Section 1029.12



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Section 1029.14.1 – Ramped Aisles

Aisles that slope more than one unit vertical in 20 units horizontal (5-percent slope) shall be considered as a ramped aisle and shall also comply with the “ramped aisle” provisions of Section 1029.14.1.

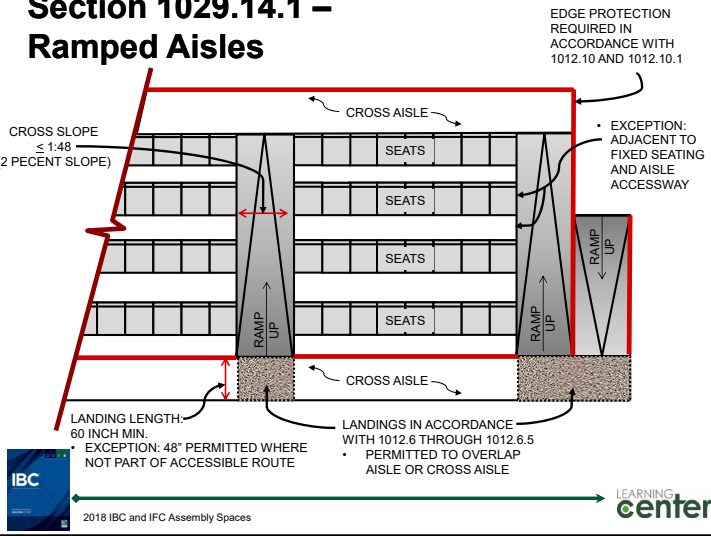
These provisions regulate:

- Cross slope
- Landings
- Edge protection



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Section 1029.14.1 – Ramped Aisles



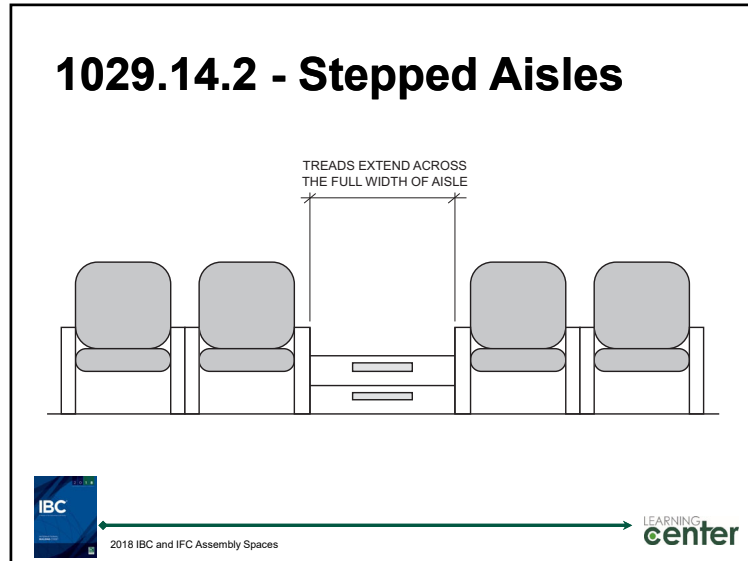
195

1029.14.2 - Stepped Aisles

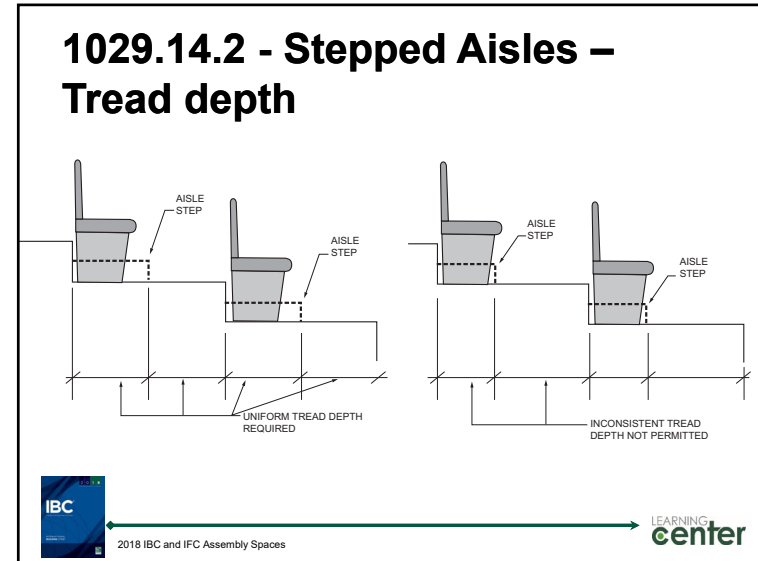
KEY LEARNING

- Ensure a tread run of not less than 11 inches (279 mm).
- Mandate a uniform and consistent tread depth throughout the aisle. [See Section 1029.14.2.1, Exception, allowing a maximum 3/16-inch (4.8 mm) construction tolerance].
- Establish a minimum riser height of 4 inches (102 mm) and limit the risers to an 8 inch height. [See Section 1029.14.2.2, Exception 2, allowing a 9 inch (229 mm) riser where necessitated by the sightlines]
- Mandate a uniform and consistent riser height throughout each flight in the aisle. [See Section 1029.14.2.2, Exceptions 1 & 2, allowing riser heights to vary where necessitated by the sightlines].
- Extend tread across the full width of the aisle (Section 1029.14.2).
- Identify nosing or leading edge of each tread.

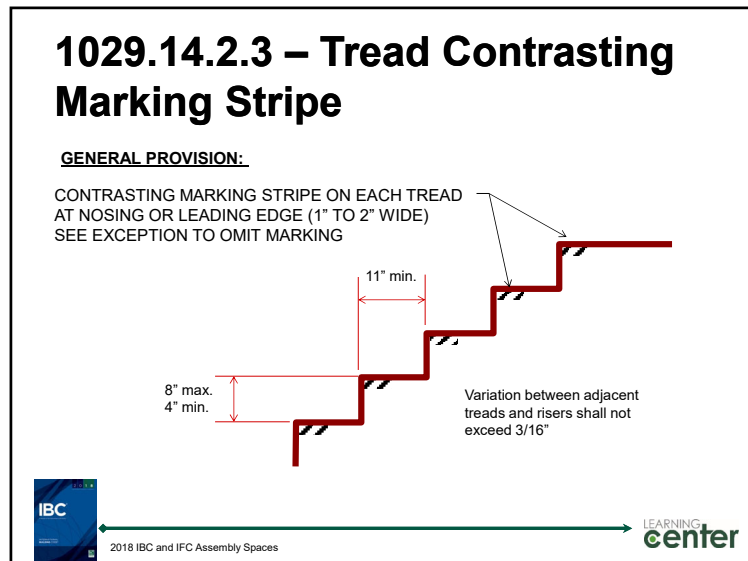
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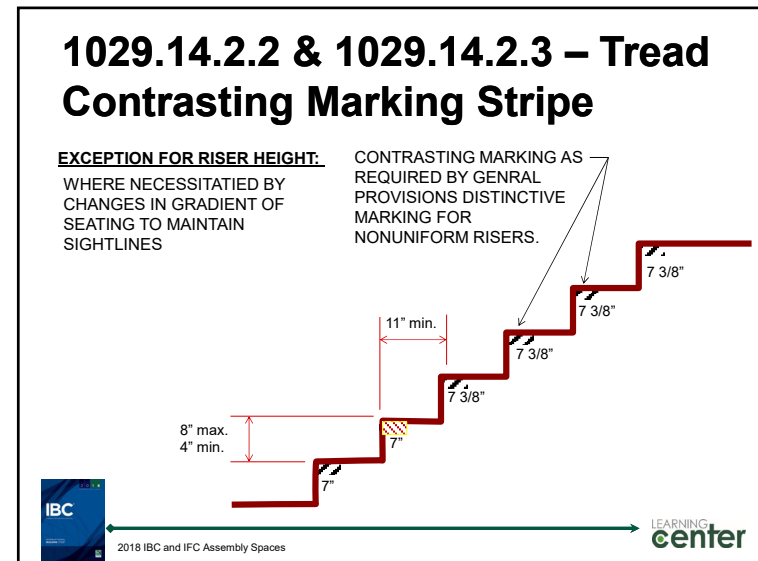
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FOR EXAMPLE



1029.6.1 & 1029.14.2 – Assembly Aisle Treads and Risers

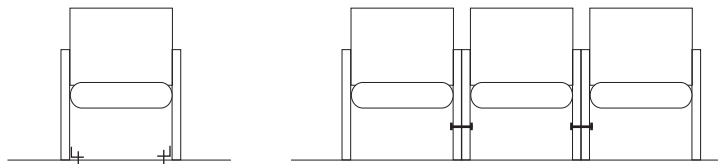
- 0.3 inch width per occupant for 7" riser, 0.35 inch factor for 8" riser, and 0.4 inch factor for 9" riser) (179 mm, 8.9 mm, 203 mm and 10 mm for 229 mm)

2018 IBC and IFC Assembly Spaces



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1029.15 – Seat Stability



SEAT SECURELY FASTENED TO GROUND

SEATS FASTENED TOGETHER IN GROUP OF 3 OR MORE






2018 IBC and IFC Assembly Spaces

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1029.15 – Seat Stability-Exceptions

- Spaces without ramped or tiered floors having 200 or less seats.
- Spaces without ramped or tiered floors where the seating is at tables.
- Spaces without ramped or tiered floors where the seats are fastened together in groups of 3 or more.
- Spaces with tiered seating where flexibility of the seating arrangement is an integral part of the design and function of the space are allowed to have a maximum of 200 seats that are not fastened.
 - A seating plan must be submitted for approval.






2018 IBC and IFC Assembly Spaces

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1029.15 – Seat Stability-Exceptions

- Areas such as “box seats” may have up to 14 seats within them and are not fastened to the floor provided the area is separated from other seating areas by railings, guards, partial height walls or similar barriers.
- Seats intended for musicians or performers are not required to be fastened to the floor provided the area is separated from other seating areas by railings, guards, partial height walls or similar barriers.

2018 IBC and IFC Assembly Spaces

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1029.16 – Aisle Handrails

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1029.16 – Aisle Handrails

Three exceptions eliminate or modify the handrail requirements:

- Ramped aisles with seating on both sides do not require a handrail.
- Where the side of an aisle is protected by a guard that complies with the handrail graspability requirements of Section 1014.3, a separate handrail is not required.
- Handrail extensions are not required beyond the top or bottom of a stepped aisle or ramped aisle.

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1029.16.1 and 1029.16.2 Discontinuous Mid-Aisle Handrails and Intermediate Rails

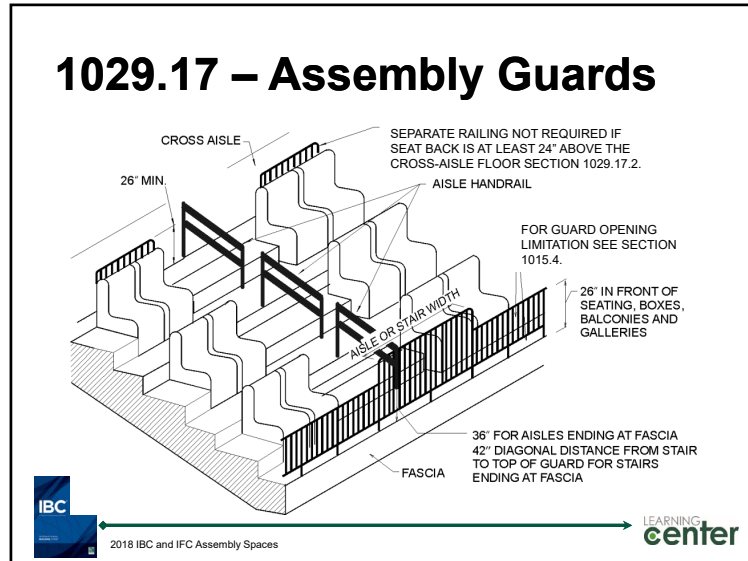
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1028.16.1 and 1028.13.4 Discontinuous Handrails and Intermediate Rail

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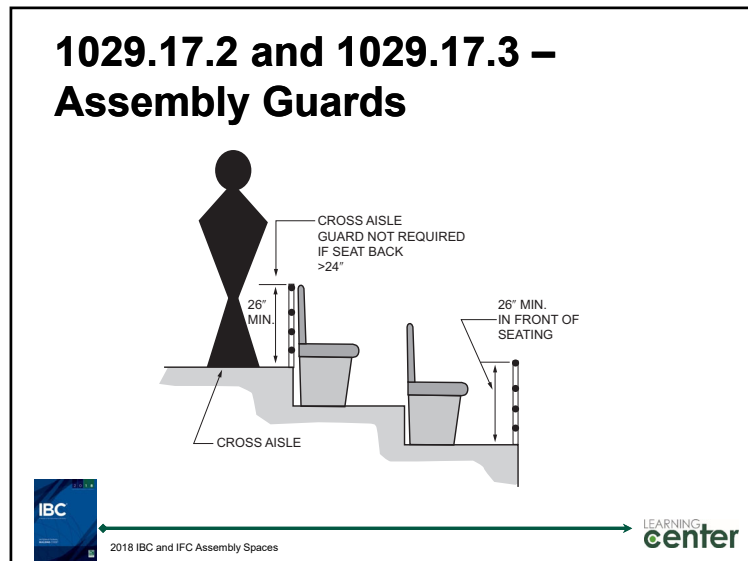
209

Section 1029.17.1 - Perimeter Guards

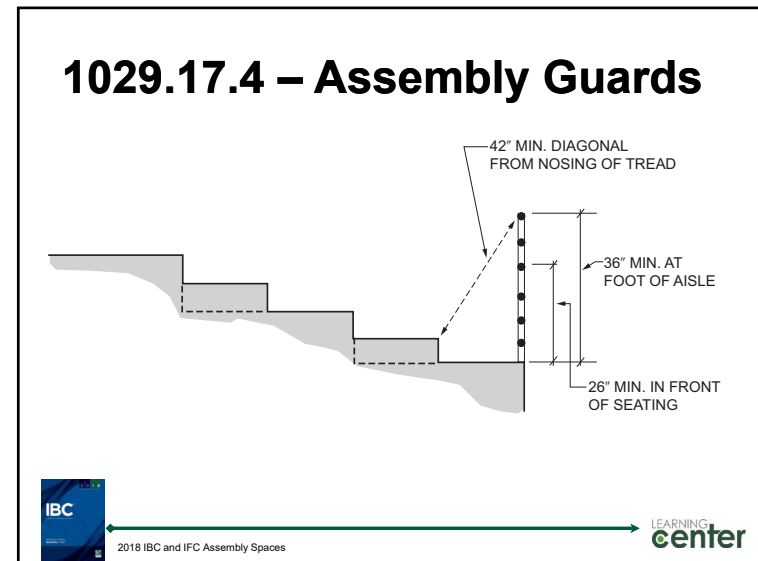
- Required where footboards or walking surface of seating area is more than 30 inches (762 mm) above floor or ground below.
- Minimum guard height of 42 inches (1067 mm)
 - Measured from seatboard when seatboard is adjacent to perimeter
 - Measured from floor surface when seats are self-rising
 - Height can be reduced to 26 inches where guard would interfere with sightlines of adjacent seating

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Guards at cross aisles (Section 1029.17.2)

- Required to comply with Section 1015 where the drop-off from the aisle is more than 30 inches (762 mm).
- Permitted to be 26 inches (660 mm) minimum in height where the drop-off from the aisle is 30 inches or less.
- Permitted by the exception to use seat backs not less than 24 inches (610 mm) in height on the front of the cross aisle.



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Sightline-constrained guard heights (Section 1029.17.3)

- Permitted to be 26 inches (660 mm) minimum in height where guard would interfere with sightlines of “immediately adjacent seating”.
- Specifically states 30” drop-off measurement is from the floor or footboard level.
- Applies to any guard immediately adjacent to the seating which would affect sightlines, not just those in front of seats. May affect guards at side of seating, perimeter guards, or at vomitories.



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Guards at the end of aisles (Section 1029.17.4)

- Due to increased tripping hazard in the aisle, a 36 inch minimum height is required at the foot of an elevated aisle.
- Increase in the 26 inch (660 mm) minimum height typically allowed by Section 1029.17.3.



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Guards at the end of aisles (Section 1029.17.4)

- Additional requirement for a 42 inch (1069 mm) minimum guard height where measured diagonally from nosing of nearest tread.
- Unique opening limitations in Section 1015.4, Exception 5, uses 4 inch sphere limitation up to a height of 26 inches (660 mm) and then 8 inch (203 mm) sphere from 26 inch (660 mm) height up to 42 inch (1069 mm) height.



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1029.1.1 and ICC 300 – Assembly Seating - Bleachers

- ICC-300 standard - Standard on Bleachers, Folding and Telescopic Seating and Grandstands which is adopted by reference in Section 1029.
- Scope of the standard deals with both temporary and permanent bleachers, folding and telescopic seating, and grandstands which are supported on their own dedicated structural system and are not constructed as part of the building



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FOR EXAMPLE

1029.1.1 and ICC 300 – Assembly Seating - Bleachers

- A temporary wooden bleacher seating section is constructed within a building.
- The bleacher system is constructed and resting directly on the existing building floor system. This system is regulated by the standard.

2018 IBC and IFC Assembly Spaces

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FOR EXAMPLE

1029.1.1 and ICC 300 – Assembly Seating - Bleachers

- A metal bleacher seating system is erected outdoors for viewing a soccer match.
- The seating is erected on metal pads/skids so that the seating may be relocated to the baseball field when needed there. This system is regulated by the standard.

2018 IBC and IFC Assembly Spaces

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FOR EXAMPLE

1029.1.1 and ICC 300 – Assembly Seating - Bleachers

- A metal bleacher seating system is erected outdoors for viewing a soccer match.
- The seating is erected on metal columns and beams which are bolted onto cast concrete piers extending 5 feet (1524 mm) in depth into the ground. This system is regulated by the standard.



2018 IBC and IFC Assembly Spaces

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FOR EXAMPLE

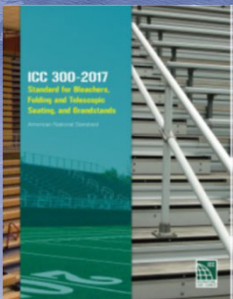
1029.1.1 and ICC 300 – Assembly Seating - Bleachers

- A permanent bleacher seating system is constructed as a part of a basketball arena.
- The main beams and supports for the seating connect back to the building's columns and foundation. This system is regulated by the IBC and not by the standard.

2018 IBC and IFC Assembly Spaces

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Module 5 ICC 300—Standard for Bleachers, Folding and Telescopic Seating and Grandstands

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ICC 300

- The applicability of the standard is as follows:
 - Provisions apply to both temporary and permanent installations. Temporary installations are those that are erected for less than 180 days in a calendar year.
 - New bleachers, folding and telescopic seating and grandstands must comply with Chapters 1 through 4 of the standard.
 - Existing installations must comply with Chapters 1, 2 and 5 of the standard.






2018 IBC and IFC Assembly Spaces

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ICC 300

- The primary requirements of the standard are found within Chapters 3 and 4 which regulate the construction and means of egress requirements for the seating systems.

2018 IBC and IFC Assembly Spaces

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ICC 300

- The main topics include:
 - Location on lot for outdoor installations
 - Structural design and support for interior installations
 - Spaces beneath the seating system
 - Clear height for the egress system and above seating area if a smoke-protected seating or open-air installation with a roof canopy
 - Fire alarm system requirements
 - Accessibility for tiered seating areas
 - Open spaces between footboards and seatboards
 - Means of egress requirements

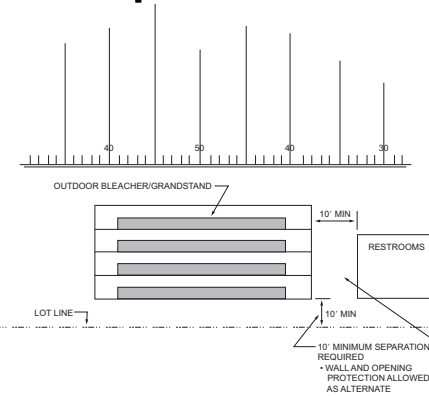


2018 IBC and IFC Assembly Spaces



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Construction Requirements— ICC 300 Chapter 3



2018 IBC and IFC Assembly Spaces



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Construction Requirements— ICC 300 Chapter 3

- Systems regulated by the ICC 300 standard are permitted to be constructed of combustible or non-combustible materials.
- IBC Section 1029.1.1 are not “building elements” and therefore are not limited or regulated by the building's type of construction. They are also not to be considered as a part of the “interior finish” even when located within a building.



2018 IBC and IFC Assembly Spaces



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Construction Requirements— ICC 300 Chapter 3



2018 IBC and IFC Assembly Spaces



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Spaces Beneath Seats—ICC 300 Sections 305 and 311

OPENING TO BELOW

OPEN SPACES

SPACES BENEATH SEATING STRUCTURE COMPLY WITH IBC AND IFC

SEE IBC 1029.1.1 FOR REQUIREMENT AND EXCEPTIONS

2018 IBC and IFC Assembly Spaces

LEARNING center

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FOR EXAMPLE

Spaces Beneath Seats—ICC 300 Sections 305 and 311

- Removal of combustible waste, or other materials. (IFC 304.1)
- Use of space for ticket booths < 100 sq.ft.; toilet rooms; or other accessory areas < 1,000 sq.ft.
- Sprinkler requirement for “other accessory areas” if rated separation eliminated due to <1,000 sq.ft. size limitation
- Any other applicable section.

2018 IBC and IFC Assembly Spaces

LEARNING center

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Minimum Number of Means of Egress—ICC 300 Section 404

SEATING SERVING <250

SEATING SERVING 251 TO 750

ONE REQUIRED MEANS OF EGRESS

TWO REQUIRED MEANS OF EGRESS

SEATING SERVING 751 TO 2,500

> 2,500 OCCUPANTS REQUIRES 4 MEANS OF EGRESS

THREE REQUIRED MEANS OF EGRESS

2018 IBC and IFC Assembly Spaces

LEARNING center

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REFER TO

ICC INTERNATIONAL CODE COUNCIL

CODE BOOK

Minimum Number of Means of Egress—ICC 300 Section 404

OCCUPANT LOAD	REQUIRED MEANS OF EGRESS
0–250	1
251–750	2
751–2,500	3
Over 2,500	4

ICC 300 Table 404.1, Page 9

2018 IBC and IFC Assembly Spaces

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ICC 300 – Sections 401.1 & 404.3 – Exterior Installations – Means of Egress

WHERE MEANS OF EGRESS CONVERGE, A MINIMUM OF TWO EGRESS PATHS SHALL BE PROVIDED.

EGRESS PATH SIZED FOR OCCUPANT LOAD SERVED

EXTERIOR SEATING

FENCE ENCLOSURE

GATE 'A'

GATE 'B'

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ICC 300 – Section 404.3 Exception – Exterior Installations

- In situations where the path of travel to the public way is not safe or achievable due to site constraints, security concerns or other reasons, this exception allows the occupants of the seating facility to move to a safe dispersal area where they would be a safe distance away from the seating area and could safely wait until the exits are available or until the hazard is resolved.

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ICC 300 – Section 405.1 – Aisles

MAY EXCEED 28" ROW SPACING WHEN SEAT BOARD AND FOOT BOARD ARE AT SAME ELEVATION

SEATBOARDS ARE CONTINUOUS FLAT SURFACES

SEATS HAVE NO BACKRESTS

11" MIN.

28" MAX.

6" MAX.

12" MAX.

16 ROWS MAX.

EGRESS FROM SEATING IS NOT RESTRICTED BY RAILS, GUARDS OR OTHER OBSTRUCTIONS

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ICC 300 – Section 405.6 – Dead End Aisles

CROSS AISLE

DEAD-END AISLE

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ICC 300 – Section 405.6 – Exceptions 1 and 2 Dead-End Aisles - Permitted Increases

24 SEATS MAX. BETWEEN AISLES
40 SEATS MAX. IF SMOKE-PROTECTED OR OPEN-AIR SEATING

CLEAR WIDTH BETWEEN ROWS:
 • 12" MIN. PLUS 0.6" PER SEAT >7
 • 12" MIN. PLUS 0.3" PER SEAT >7 IN SMOKE-PROTECTED SEATING
 • 12" MIN. PLUS 0.6" PER SEAT >10 WITHOUT BACKRESTS
 • 12" MIN. PLUS 0.3" PER SEAT >10 WITHOUT BACKRESTS IN SMOKE-PROTECTED SEATING

OR OPEN-AIR

OR OPEN-AIR

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KEY LEARNING

ICC 300 – Section 405.6 – Exceptions 1 and 2 Dead-End Aisles - Permitted Increases

- Under the ICC 300 the increased aisle accessway requirements only apply to the rows beyond the generally permitted dead end length of 16 rows for general seating and 21 rows for smoke-protected or open-air seating.
- Therefore the aisle accessways in the back of the seating section may be required to be wider than those in the same seating section which are close to an exit or cross aisle.

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ICC 300 – Sections 406.3 and 406.4 – Aisle Stairs - Tread and Riser Construction

0.50 INCH MAXIMUM GAP

WHAT IS MAXIMUM PERMITTED GAP?

TREAD CONSTRUCTED OF "MORE THAN TWO ELEMENTS"

TREAD CONSTRUCTED OF TWO ELEMENTS

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ICC 300 – Sections 406.7 – Riser Construction

GENERAL REQUIREMENT

MAXIMUM OPENING ALLOWED IN RISER



MAXIMUM OPENING ALLOWED BY 311.1

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ICC 300 – Section 407.3 Rows served by aisles or doorways at both ends (Dual access)



- 100 seats maximum between aisles.
- Clear width increased by 0.3 inch (7.6 mm) for each seat beyond 14 where seats have backrests.
- Clear width increased by 0.3 inch (7.6 mm) for each seat beyond 21 where seats do not have backrests.
- Maximum required clear width of 22 inches (559 mm).
- Exception for smoke-protected assembly seating - 12 inch (304.8 mm) minimum for longer rows in large occupancies. (See Table 407.5)

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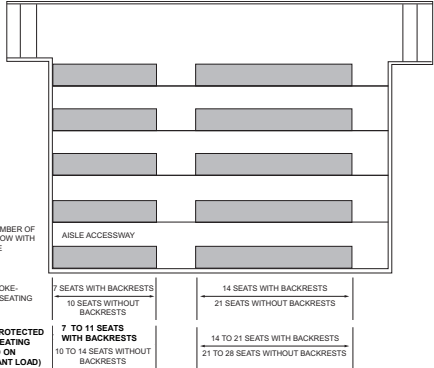
ICC 300 – Section 407.4 Rows served by aisle or doorway at one end only (Single access)

- Clear width increased by 0.6 inch (15.2 mm) for each seat beyond 7 where seats have backrests.
- Clear width increased by 0.6 inch (15.2 mm) for each seat beyond 10 where seats do not have backrests.
- Maximum required clear width of 22 inches (559 mm).
- 30 foot (9144 mm) maximum common path of travel distance (Section 407.4.1).
- Exception for smoke-protected assembly seating - 12 inch (304.8 mm) minimum for longer rows in large occupancies. (See Table 407.5)

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ICC 300 – Section 407.3 and 407.4 Dual and Single Access Aisle Accessways



MAXIMUM NUMBER OF SEATS PER ROW WITH 12" MIN. AISLE ACCESSWAY

Configuration	7 SEATS WITH BACKRESTS 10 SEATS WITHOUT BACKRESTS	14 SEATS WITH BACKRESTS 21 SEATS WITHOUT BACKRESTS
WITHOUT SMOKE-PROTECTED SEATING	7 TO 11 SEATS WITH BACKRESTS 10 TO 14 SEATS WITHOUT BACKRESTS	14 TO 21 SEATS WITH BACKRESTS 21 TO 28 SEATS WITHOUT BACKRESTS
WITH SMOKE-PROTECTED OR OPEN-AIR SEATING (VARIES BASED ON TOTAL OCCUPANT LOAD)		



SINGLE ACCESS DUAL ACCESS

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KEY LEARNING Comparison of ICC 300 to IBC Requirement – AISLES

Topic	ICC 300 Section	IBC Section	Comparison comments
Minimum aisle widths	405.2	1029.9.1	SAME
Aisle width/capacity	405.3	1029.9.2	SAME
Converging aisles	405.4	1029.9.3	SAME
Uniform width	405.5	1029.9.4	Similar intent. IBC states "uniform in minimum width or required capacity"
Dead ends	405.6	1029.9.5	Mostly similar. IBC general limit is 20 feet while standard uses 16 rows. Exceptions in IBC match standard and help coordination for longer dead ends.





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KEY LEARNING

Comparison of ICC 300 to IBC Requirement – AISLE STAIRS

Topic	ICC 300 Section	IBC Section	Comparison comments
Treads and risers	406.1	1029.14 and 1029.14.2	Similar intent. IBC specifies a 1:8 slope at which point steps must be used.
Tread depth	406.3	1029.14.2.1	SAME (Errata in standard for metric on tolerance. Should be 4.8 mm)
Tread construction	406.4	NONE	Compare to IBC 1029.12 and 1011.7.
Riser height	406.6	1029.14.2.2	Similar IBC exception addresses nonuniformity, which is covered by Section 406.8 in the standard.
Riser construction	406.7	No direct equivalent.	Compare to 1011.5.5.3 and 1029.12. Similar base requirement. Exceptions differ. IBC allows up to 4-inch gap while standard specifies 0.5-inch opening limit.



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KEY LEARNING

Comparison of ICC 300 to IBC Requirement – AISLE STAIRS

Topic	ICC 300 Section	IBC Section	Comparison comments
Dimensional uniformity	406.8	1029.14.2.1, 1029.14.2.2 and 1011.5.4	Similar. Section 1029.14.2.2.1 provides additional details which depend on tread depth and if risers are designed to vary.
Tread and riser nonuniformity Permitted	406.8.1	1011.5.4, Exception 1 & 3, 1029.10, 1029.14.2.2 and 1029.14.2.2.1	Compare to IBC sections listed with 406.8. Addresses mid-aisle handrail at transition areas. IBC distinction between stepped aisle in seating area and transition stairs at other locations.



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KEY LEARNING

Comparison of ICC 300 to IBC Requirement – AISLE ACCESSWAYS

Topic	ICC 300 Section	IBC Section	Comparison comments
Required aisle accessways	407.1	1029.13 and 1015.2	Standard requires above first row of seating. Minimum seat depth specified in standard.
Minimum width	407.2	1029.13.2	SAME
Dual access	407.3	1029.13.2.1	SAME
Single access	407.4	1029.13.2.2	SAME
Path of egress travel	407.4.1	1029.8	SAME
Path through adjacent rows	407.4.2	1029.8.1	Mostly similar. IBC provides 7 seat limit for 12-inch aisle accessway. Standard uses 7 seat limit if seats have backrests and 10 seats without backrests.
Smoke-protected aisle accessways	407.5	Table 1029.13.2.1	SAME



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KEY LEARNING

Comparison of ICC 300 to IBC Requirement – GUARDS

Topic	ICC 300 Section	IBC Section	Comparison comments
Required guards	408.1	1029.17 plus subsections and 1015	SAME
Opening limitations	408.2	1029.17 and 1015.4	Similar. Standard allows 8-inch sphere above 34 inches while IBC limits to 4-3/8 for heights above 36 inches. 8-inch limit for upper portions of guards at the ends of aisles is consistent.
Guard design	408.3	1607.8	Same since the standard references the IBC.



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KEY LEARNING

Comparison of ICC 300 to IBC Requirement – HANDRAILS

Topic	ICC 300 Section	IBC Section	Comparison comments
Required handrails	409.1	1029.16 and 1014	Similar intent
Mid-aisle handrails	409.1.1	1029.16.1 and 1029.16.4	Same. Standard specifically exempts intermediate (lower rail) from grasping requirements. IBC has same intent by calling it a "rail" and not a handrail.
Height	409.2	1014.2	Same
Graspability	409.3	1014.3, 1014.3.1	Same. 2.25" maximum width for non circular in standard, 2.75" "above" finger recess in code.
Continuity	409.4	1014.4 and 1029.16	Same
Handrail termination	409.5	1029.16.2 1029.16.3	Same



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KEY LEARNING

Comparison of ICC 300 to IBC Requirement – HANDRAILS

Topic	ICC 300 Section	IBC Section	Comparison comments
Mid-aisle handrail termination	409.5.1	1014.6 and 1029.16.3	Same
Clearance	409.1	1014.7	Same
Projections	409.7	1014.8	Similar intent. IBC includes added information where a pair of intermediate handrails is used (more common on stairways).
Handrail design	409.8	1607.8	Same since standard references IBC.



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Module 6


Chapter 10 Means of Egress

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FOR EXAMPLE

Section 1004.3 – Calculating and Posting of Occupant Load

- Multipurpose assembly room will be used without seats, for classroom and for dining, it is appropriate to show each of those occupant loads on the sign. This establishes the appropriate occupant load for each use and helps prevent overcrowding.



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1004.3 and 1004.9 – Posting of Occupant Load

SIGN POSTED NEAR MAIN DOORWAY FROM SPACE IN CONSPICUOUS PLACE

ASSEMBLY OCCUPANCY (OCCUPANT LOAD ≥ 50)

MAXIMUM OCCUPANT LOAD

- STANDING - NO CHAIRS: 240
- CHAIRS ONLY: 171
- DINING - TABLES AND CHAIRS: 80
- CLASSROOM: 60

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Means of Egress Illumination— Section 1008

Lobby

Exit

Exit

Cross Aisle

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Means of Egress Illumination— Section 1008

- Exceptions for assembly uses permit the following:
 - Aisle accessways are not required to be illuminated.
 - In auditoriums, theaters, concert or opera halls and similar assembly spaces are permitted to reduce the lighting to 0.2 footcandles (2.15 lux) during performances provided the illumination automatically returns to the 1 footcandle level when the fire alarm system is activated.

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1010.1 – Door Hardware - Lock and Latch Requirements

- Section 1010.1.9.4: Key operated locking device is permitted on main door or doors provided:
 - Device is distinguishable as being locked
 - Sign posted adjacent to door “Door to remain unlocked when this space is occupied”
 - Use of device is revocable by building official




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1010.1 – Door Hardware - Lock and Latch Requirements

- Section 1010.1.9.10: Electromagnetically locked egress doors are permitted if equipped with a listed locking system with a switch that does the following:
 - Obvious method of operation under all lighting conditions
 - Capable of being operated with one hand
 - Operation interrupts power to lock and immediately unlocks the door
 - Loss of power automatically unlocks the door
 - Operation of the listed panic or fire exit hardware also releases electromagnetic lock

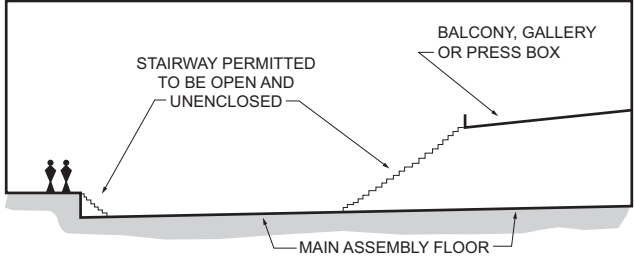


Locking system is listed in accordance with UL 294

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1019.3– Exit Access Stairways







2018 IBC and IFC Assembly Spaces

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1019.3 – Exit Access Stairways

- Item 7:** Allows open and unenclosed stairways to serve smoke-protected or open-air seating if exit access travel distances are met.






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1009.3 – Exit Access Stairways

- Item 8:** Allows stairways between the main assembly floor and any balcony, gallery or press box to be open in assembly uses such as theaters, places of religious worship, auditoriums and sports facilities.

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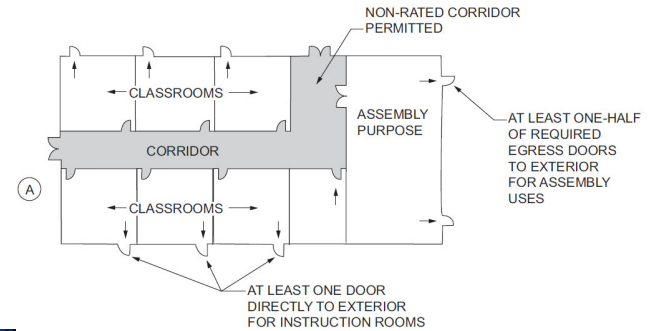
1019.3 – Exit Access Stairways

- Section 1019.3, Item 8 does allow the stair between the balcony and other spaces to be open to the main floor, code users should remember the requirements of other code sections and how they may affect the design. Section 1029.5 requires balconies, galleries or press boxes with a seating capacity of 50 or more to have:
 - A minimum of two means of egress,
 - One egress path from each side of the space.



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1020.1 – Exception 1 Corridor Construction



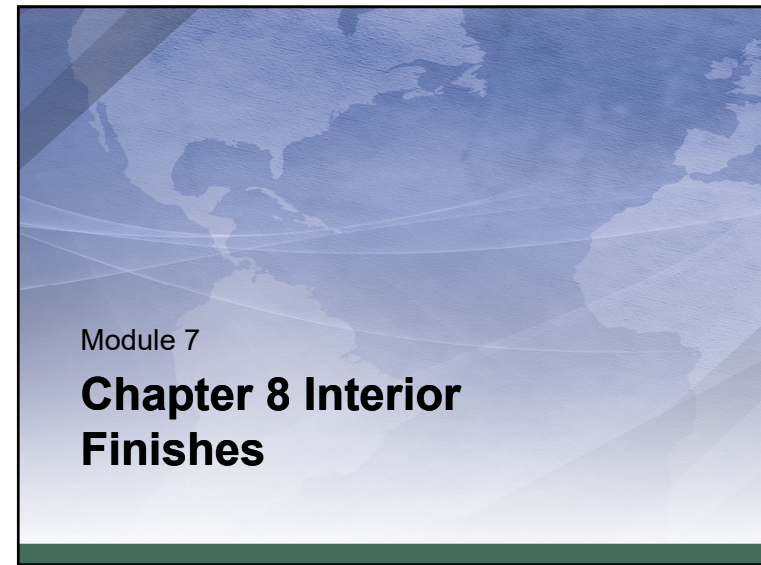
262

1020.1 – Exception 1 Corridor Construction

- Exception 1 in Section 1020.1 allows for the fire resistance rating of a corridor to be eliminated where:
 - Each room used for instruction has at least one door opening directly to the exterior.
 - Each room used for assembly purposes has at least one-half of the required means of egress doors opening directly to the exterior.



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Mitigating Hazards and Fire Protection Systems

- Assembly occupancies follow the general interior finish requirements of the code and that users recognize some of the special provisions which are applicable to Group A occupancies assembly occupancies typically will require a greater limit on the flame spread of materials used for interior wall and ceiling finishes.



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2018 IBC
Table 803.13
Page 213

GROUP	SPRINKLERED†			NONSPRINKLERED		
	Interior exit stairways and ramps and exit passageways††	Corridors and enclosures for exit access stairways and ramps	Rooms and enclosed spaces†	Interior exit stairways and ramps and exit passageways†	Corridors and enclosures for exit access stairways and ramps	Rooms and enclosed spaces†
A-1 & A-2	B	B	C	A	A ¹	B ¹
A-3, A-4, A-5	B	B	C	A	A ¹	C
R, E, M, R-1	B	C ¹	C	A	B	C
R-4	B	C	C	A	B	B
F	C	C	C	B	C	C
H	B	B	C ¹	A	A	B
I-1	B	C	C	A	B	B
I-2	B	B	B ¹	A	A	B
I-3	A	A ¹	C	A	A	B
I-4	B	B	B ¹	A	A	B
R-2	C	C	C	B	B	C
R-3	C	C	C	C	C	C
S	C	C	C	B	B	C
U	No restrictions			No restrictions		

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m².

a. Class C interior finish materials shall be permitted for wainscoting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fireblocked as required by Section 803.15.1.

b. In other than Group I-3 occupancies in buildings less than three stories above grade plane, Class B interior finish for nonsprinklered buildings and Class C interior finish for sprinklered buildings shall be permitted in interior exit stairways and ramps.

c. Requirements for rooms and enclosed spaces shall be based on spaces enclosed by partitions. Where a fire resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered to be enclosing spaces and the rooms or spaces on both sides shall be considered to be one room or space. In determining the applicable requirements for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor regardless of the group classification of the building or structure.

d. Lobby areas in Group A-1, A-2 and A-3 occupancies shall be not less than Class B materials.

e. Class C interior finish materials shall be permitted in places of assembly with an occupant load of 300 persons or less.

f. For places of religious worship, wood used for ornamental purposes, trusses, purling or chancel furnishings shall be permitted.

g. Class B material is required where the building exceeds two stories.

h. Class C interior finish materials shall be permitted in administrative spaces.

i. Class C interior finish materials shall be permitted in rooms with a capacity of four persons or less.

j. Class B materials shall be permitted as wainscoting extending not more than 48 inches above the finished floor in corridors and exit access stairways and ramps.

k. Finish materials as provided for in other sections of this code.

l. Applies when protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

m. Corridors in ambulatory care facilities shall be provided with Class A or B materials.



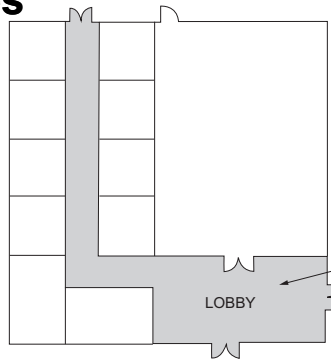
2018 IBC and IFC Assembly Spaces



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803.13 and 806.6 – Interior Finishes

CORRIDOR AND ENCLOSURE FOR EXIT ACCESS STAIRWAYS AND RAMPS
• CLASS 'A' FLAME SPREAD AS GENERAL REQUIREMENT



NONSPRINKLERED A-1, A-2, A-3 LOBBY AREA NOT LESS THAN CLASS B



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806 and 806.2 – Decorative Materials and Trim



2018 IBC and IFC Assembly Spaces



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806.1 and 806.2 – Decorative Materials and Trim



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Module 8

Fire Protection

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Overview

- The fire protection systems are intended to:
 - Detect a fire
 - Alert the occupants or fire department of a fire emergency
 - To control smoke
 - To control or extinguish the fire



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Overview

- Though not specific to assembly spaces, code users should be aware:
 - Fire protection systems are required to be installed, repaired, operated and maintained in accordance with the code.
 - Any fire protection system for which an exception or reduction in code provisions has been taken shall be considered as a required system.
 - Fire protection systems shall not be removed or modified without approval of the code official (includes any existing system even if that system is not required).
 - It is unlawful to occupy portions of a structure until the fire protection systems have been tested and approved.



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903.2.1 Automatic Sprinkler System Required - Group A

- Where an automatic sprinkler system is required for a Group A-1, A-2, A-3 or A-4 occupancy, the code will require the system to be provided:
 - Throughout the story where the assembly occupancy is located, and
 - On all stories from the Group A occupancy to, and including the level of exit discharge serving the Group A occupancy (Note that this could be above or below the assembly occupancy).



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903.2.1 Automatic Sprinkler System Required - Group A

- Sprinkler requirement is tied to the “fire area” which by definition is tied to “floor area...” and that when dealing with assembly uses such as picnic shelters and pavilions that it does include buildings or portions of buildings that are not surrounded with exterior walls.
- As defined in the code the term floor area includes the usable area under the horizontal projection of the roof or floor above if there are no surrounding exterior walls.



2018 IBC and IFC Assembly Spaces



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903.2.1 Automatic Sprinkler System Required - Group A

- For Group A-1, A-3 and A-4, the following three items all apply and will determine whether an automatic sprinkler system is required.
 - The fire area exceeds 12,000 square feet (1115 m²).
 - The fire area has an occupant load of 300 or more.
 - The fire area with the assembly occupancy is located on a floor other than the level of exit discharge.



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903.2.1 Automatic Sprinkler System Required - Group A


- Requirements are tied to the “fire area” it is important for code users to review the code requirements of Sections 707.3.10 and 901.7 .
 - Where the spaces are adequately separated by fire barriers or horizontal assemblies then they may be considered as separate fire areas.
 - Where the spaces are not properly separated, they are considered as being a part of the same fire area.
 - If not properly separated, the floor area and occupant load of other occupancies would be combined with the assembly occupancy and therefore could exceed the limitations specified.



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REFER TO

CODE BOOK

2018 IBC
 Table
 707.3.10,
 Page 133


903.2.1 Automatic Sprinkler System Required - Group A

**TABLE 707.3.10
 FIRE-RESISTANCE RATING REQUIREMENTS FOR
 FIRE BARRIERS, FIRE WALLS OR HORIZONTAL
 ASSEMBLIES BETWEEN FIRE AREAS**

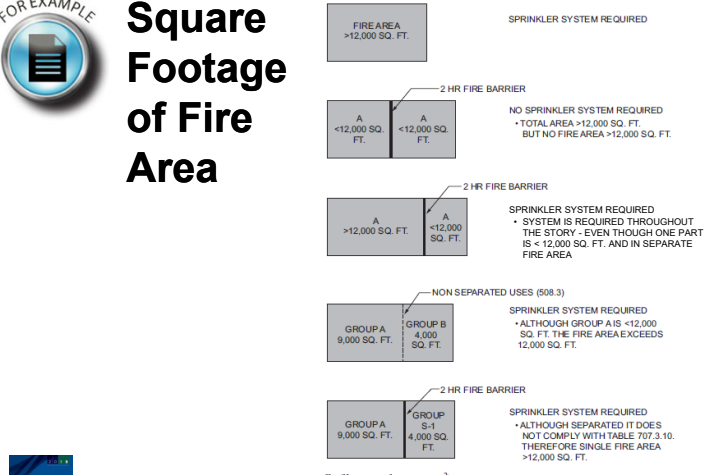
OCCUPANCY GROUP	FIRE-RESISTANCE RATING (hours)
H-1, H-2	4
F-1, H-3, S-1	3
A, B, E, F-2, H-4, H-5, I, M, R, S-2	2
U	1

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FOR EXAMPLE



Square Footage of Fire Area



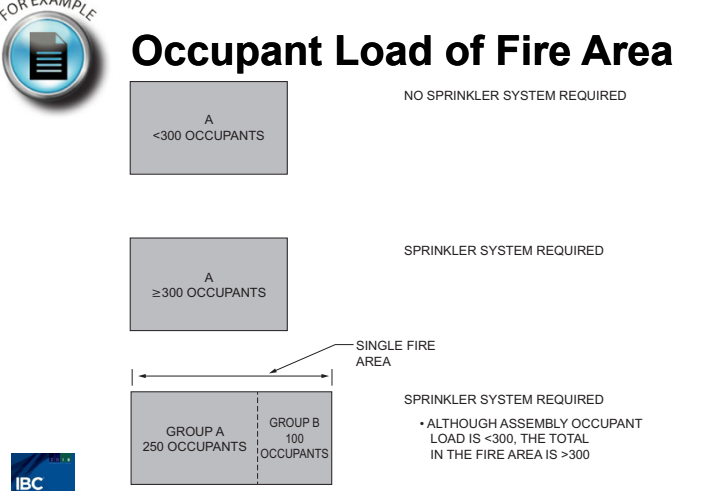
For SI: 1 square foot = 0.093 m²



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FOR EXAMPLE


Occupant Load of Fire Area

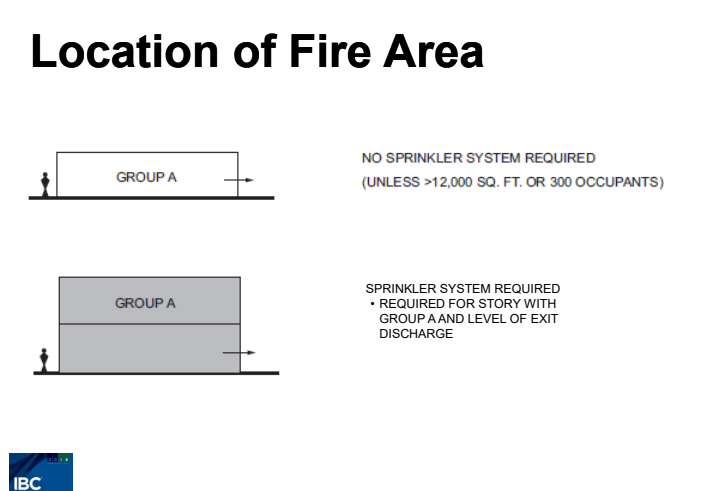




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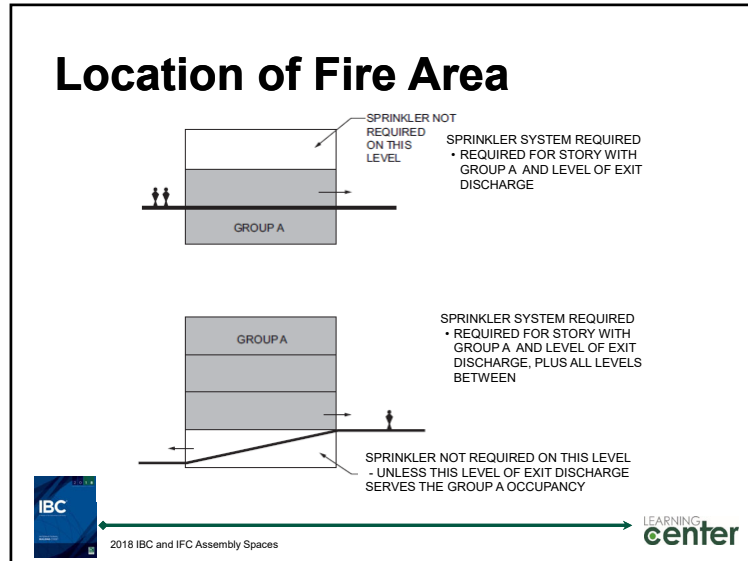
FOR EXAMPLE


Location of Fire Area

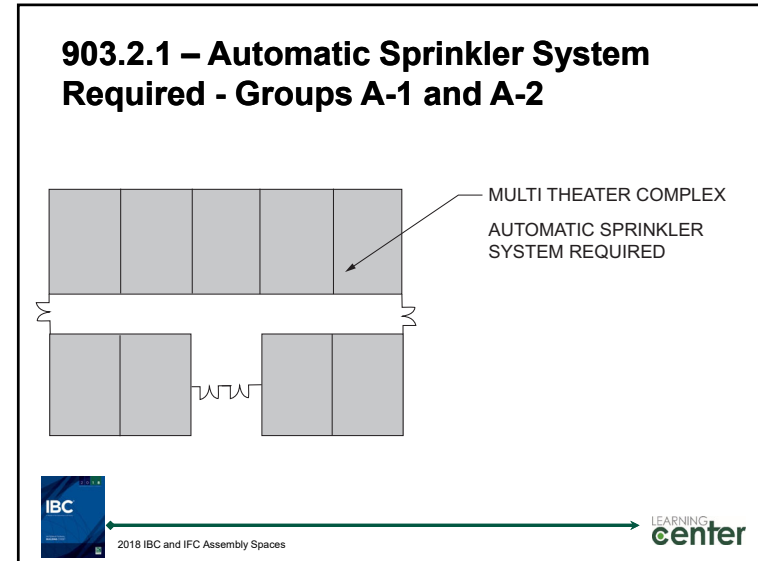


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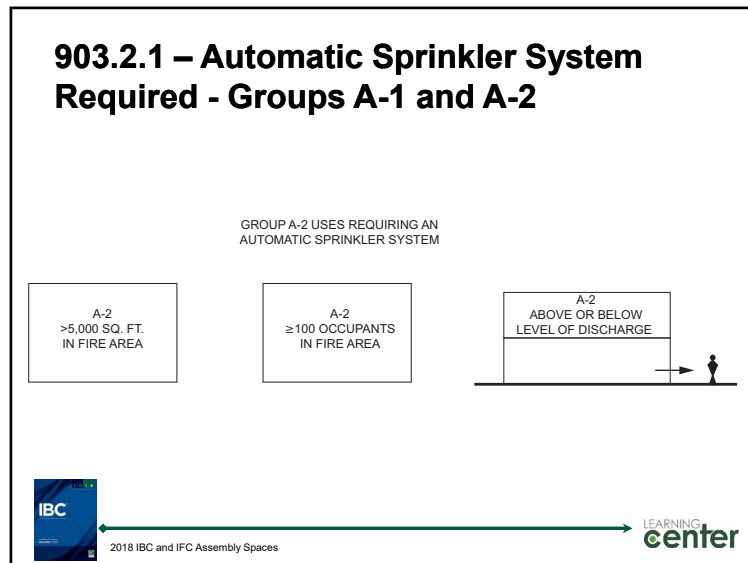
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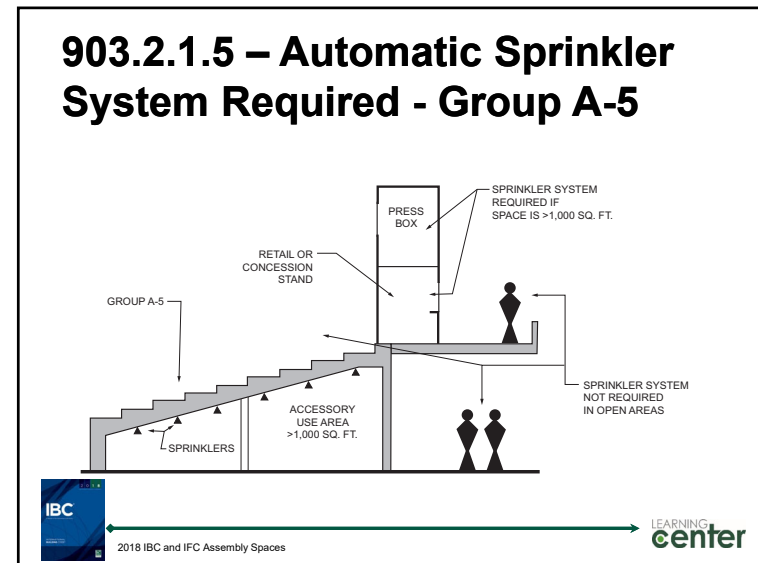
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FOR EXAMPLE

903.2.1.5 – Automatic Sprinkler System Required - Group A-5

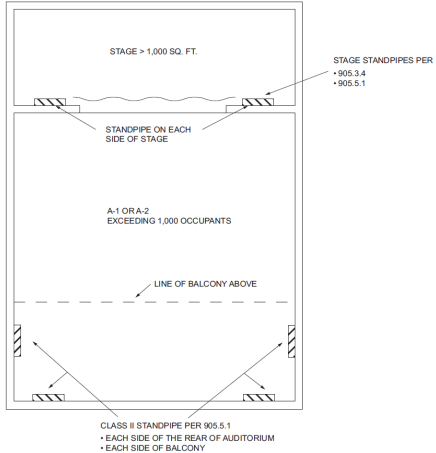


- Facility had 20 concession stands but each of them individually was less than 1,000 sq. ft. (93 m²) in area, then none of the concession stands would require an automatic sprinkler system if rated separation provided.
- This option to subdivide or compartment the spaces would also be applicable to all of the other items such as retail areas, press boxes or accessory use areas such as storage spaces.

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905.3.2 and 905.5.1 – Standpipe Systems - Group A







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905.3.2 and 905.5.1 – Standpipe Systems - Group A

- Section 905.3.2 which requires a Class I automatic wet standpipe and is applicable to nonsprinklered buildings with occupant load >1,000
 - Exception exempts open-air seating spaces without enclosed space.
 - Exception allows automatic dry, semiautomatic dry standpipes or manual wet standpipes in buildings that are not a high-rise.






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905.3.2 and 905.5.1 – Standpipe Systems - Group A

- Section 905.5.1 which requires Class II standpipe hose connections and is applicable to A-1 and A-2 uses with occupant load >1,000.
- Provision was addressed previously with Section 410.7 and requires connections at:
 - Each side of any stage
 - Each side at the rear of the auditorium
 - Each side of the balcony
 - Each tier of dressing rooms





2018 IBC and IFC Assembly Spaces


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907.2.1 Fire Alarm Requirement - Group A

- Alarm system required if occupant load is ≥ 300 ; or ≥ 100 above or below the level of exit discharge.
- Only the occupants of the Group A assembly use is counted towards the occupant limits.
- Multiple Group A uses are added together unless they are separated into separate fire areas in accordance with Section 707.3.10.
- Areas occupied for assembly purposes that are a part of a Group E occupancy shall be provided with an alarm system as required for the Group E occupancy.




2018 IBC and IFC Assembly Spaces



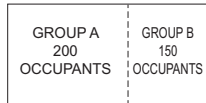
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FOR EXAMPLE

907.2.1 Fire Alarm Requirement - Group A




FIRE ALARM SYSTEM REQUIRED




NO FIRE ALARM REQUIRED
• ONLY THE OCCUPANT LOAD DUE TO ASSEMBLY OCCUPANCY IS INCLUDED.

Requirement:
Only the occupants of the Group A assembly use is counted towards the 300 occupant limit



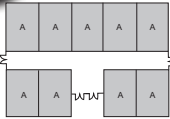
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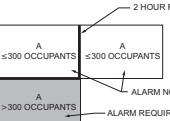
FOR EXAMPLE

907.2.1 Fire Alarm Requirement - Group A




AGGREGATE OCCUPANT LOAD OF GROUP A OCCUPANCIES IF USES ARE NOT SEPARATED
• MINIMUM OF 2 HOUR FIRE BARRIER OR HORIZONTAL ASSEMBLY TO SEPARATE FIRE AREAS


Occupants in multiple Group A uses are added together unless the spaces are separated into separate fire areas in accordance with Section 707.3.10.

2 HOUR FIRE BARRIER
WHERE SEPARATED PER SECTION 707.3.10 GROUP A USES CONSIDERED AS SEPARATE USES FOR ALARM PROVISIONS
ALARM NOT REQUIRED
ALARM REQUIRED



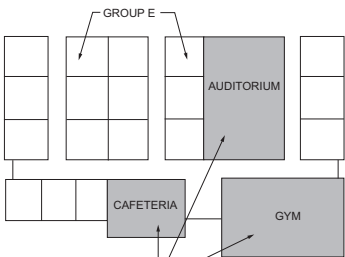
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FOR EXAMPLE


907.2.1 Fire Alarm Requirement - Group A




GROUP E
AUDITORIUM
CAFETERIA
GYM

Areas occupied for assembly purposes that are a part of a Group E occupancy shall be provided with an alarm system as required for the Group E occupancy

ALARMS AS REQUIRED FOR GROUP E OCCUPANCY



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907.2.1.1 and 907.5.2.2 – Emergency Voice/Alarm Communication System



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907.2.1.1 and 907.5.2.2 – Emergency Voice/Alarm Communication System



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907.2.1.1 and 907.5.2.2 – Emergency Voice/Alarm Communication System

- Activation of the alarm system must commence automatically upon the operation of any:
 - Automatic fire detector,
 - Sprinkler waterflow device, or
 - Manual fire alarm box



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EV/ACS Exceptions for Outdoor Seating—ICC 300 Section 309



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EV/ACS Exceptions for Outdoor Seating—ICC 300 Section 309

1. EV/AC system not required for outdoor bleacher-type seating complying with all of the following:
 - Occupant load is less than 15,000
 - Public address system is provided and equipped with standby power
 - Attached or adjacent enclosed spaces are 10% or less of overall area or 1,000 sq. ft. (93 m²) maximum (must use smallest of the two)
 - Spaces under the seating is in accordance with IBC Section 1029.1.1.1 (*The section referenced is the 2018 IBC section based on the reference within Chapter 6 of the ICC 300 standard*). Requires spaces used for other than ticket booths less than 100 sq. ft. (9.3 m²) in area or as restrooms to be separated from seating by not less than one hour fire barrier

All means of egress must be open to the outside






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EV/ACS Exceptions for Outdoor Seating—ICC 300 Section 309


2. Outdoor bleacher-type seating with an occupant load of less than 300. (Since IBC Section 907.2.1 only applies with occupant loads greater than 300)
3. Temporary outdoor bleacher-type seating complying with all of the following:
 - No enclosed spaces under or attached to seating
 - Seating is erected for less than 180 days
 - Fire safety plan includes evacuation of the seating area

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Summary/Q&A





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FINAL REFLECTION

Final Reflection

- **What?** What happened and what was observed in the training?
- **So what?** What did you learn? What difference did this training make?
- **Now what?** How will you do things differently back on the job as a result of this training?

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