



State of Connecticut
Department of Administrative Services
Division of Construction Services
Office of Education and Data Management

Office of Education and Data Management
Fall 2017 Career Development Series

**Inspecting Existing
Assembly Occupancies**

Presented by
Joseph Versteeg, Building and Fire Code
Consultant

Joe Versteeg
Versteeg Associates, LLC

Code Compliance & Fire Safety Consultants

86 University Drive, Torrington, CT

860-480-3951

josephversteeg@gmail.com

www.versteeg-associates.com



Overview

This presentation will focus on requirements governing existing assembly occupancies.

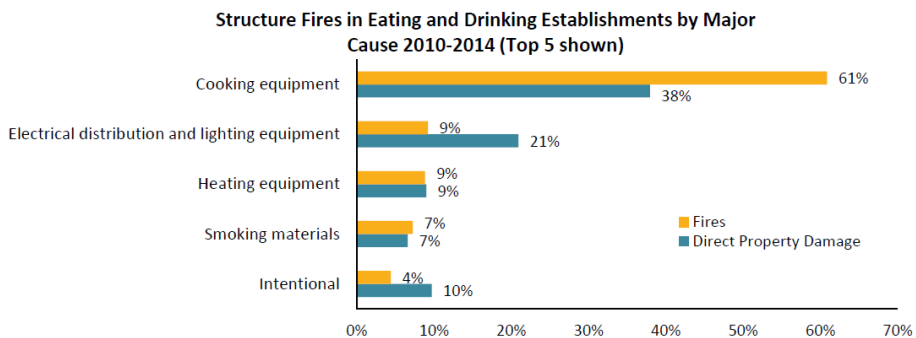
Topics include egress, seating arrangements, fire protection systems, fire drills, and crowd managers.



Inspecting Existing Assembly Occupancies

Stats

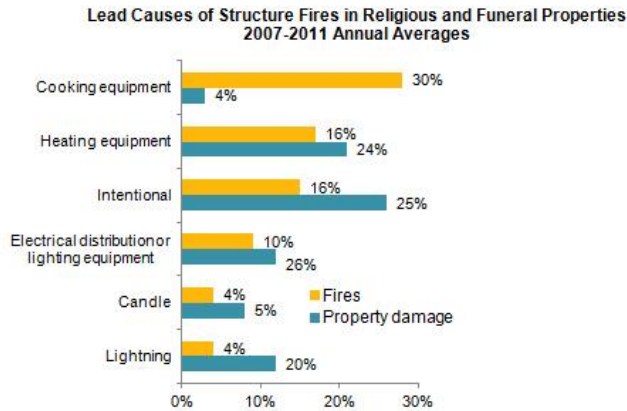
Report: NFPA's "[U.S. Structure Fires in Eating and Drinking Establishments](#)"
Author: Richard Campbell
Issued: February 2017



Inspecting Existing Assembly Occupancies

Stats

Report: NFPA's "[U.S. Structure Fires in Religious and Funeral Properties](#)"
 Author: Richard Campbell
 Issued: June 2013



Inspecting Existing Assembly Occupancies

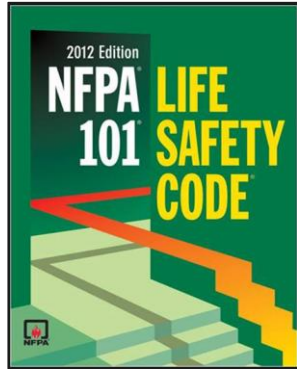
10 Deadliest Fires

Iroquois Theater, Chicago, IL December 30, 1903. Deaths: 602	Ringling Brothers circus, Hartford, CT July 6, 1944 Deaths: 168
Coconut Grove nightclub, Boston, MA November 28, 1942 Deaths: 492	Beverly Hills Supper Club, Southgate, KY May 28, 1977 Deaths: 165
Conway's Theater, Brooklyn, NY December 5, 1876 Deaths: 285	The Station nightclub, W. Warwick, RI February 20, 2003 Deaths: 100
Rhythm Club dance hall, Natchez, MS April 23, 1940 Deaths: 207	Happy Land Social Club, Bronx, NY March 25, 1990 Deaths: 87
Rhoads Opera House, Boyertown, PA January 13, 1908 Deaths: 170	Richmond Theater, Richmond, VA December 26, 1811 Deaths: 72

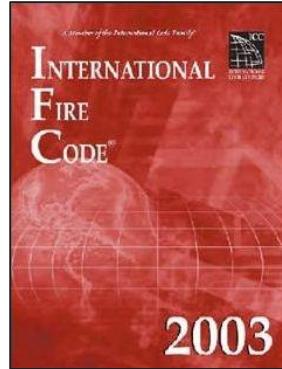


Inspecting Existing Assembly Occupancies

Regulatory Documents



Prior to
 December 31, 2005



December 31, 2005
 to
 September 30, 2016

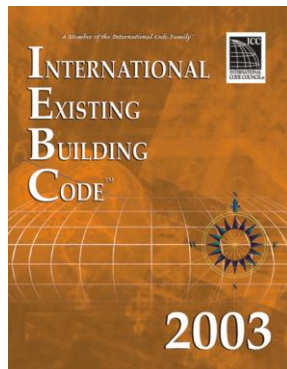


Inspecting Existing Assembly Occupancies

Regulatory Documents



Why conditions may differ from the Code.



State of Connecticut, Department of Public Safety Chief of Police, Department of Building Inspection Office of State Fire Marshal			
Application for Review for Modification or Replacement of a State Resource subject to review by the Connecticut General Services			
Reference:			
Facility Name			
Facility Address	City	State	Zip
Facility Owner	Telephone		
Owner's Address	City	State	Zip
Applicant's Name	Telephone		
Applicant's Address	City	State	Zip
Contact Person	Telephone		
Type of Facility:			
<input type="checkbox"/> New <input type="checkbox"/> Existing <input type="checkbox"/> Replacement Date of Construction: _____ Date of Present Use: _____ Previous modification to this facility: <input type="checkbox"/> None <input type="checkbox"/> Yes, Modification Number: _____			
<input type="checkbox"/> Check if Modification Request to the State Building Code is being submitted to the Office of State Building Inspector			
<input type="checkbox"/> If the above named applicant, being a duly agent of the owner, request modification from a replacement of the CT:			
<input type="checkbox"/> International Building Code pursuant to C.G.S. § 29-290		<input type="checkbox"/> State Building Code pursuant to C.G.S. § 29-290	
<input type="checkbox"/> International Fire Code pursuant to C.G.S. § 29-290		<input type="checkbox"/> International Existing Building Code pursuant to C.G.S. § 29-290	
<input type="checkbox"/> International Life Safety Code pursuant to C.G.S. § 29-290		<input type="checkbox"/> International Chemical Code pursuant to C.G.S. § 29-290	
<input type="checkbox"/> International Mechanical Code pursuant to C.G.S. § 29-290		<input type="checkbox"/> International Electrical Code pursuant to C.G.S. § 29-290	
For the replacement as presented by: _____			
Registration Number	Application Number	Revision Number	Date
_____	_____	_____	_____
Request this modification/draft due to the following reasons:			
<input type="checkbox"/> Replacement Alternative <input type="checkbox"/> Practical Difficulty <input type="checkbox"/> Requirements Unavailable			

<input type="checkbox"/> Deleted from History			



Inspecting Existing Assembly Occupancies

Regulatory Documents



Applies to All
General Safety Requirements
Occupancy Requirements
Commercial Cooking Equipment
ITM



Inspecting Existing Assembly Occupancies

Definition



Existing

Buildings, facilities, or conditions already in existence, constructed, or officially authorized prior to the adoption of this Code,



Inspecting Existing Assembly Occupancies

Occupancy Classification



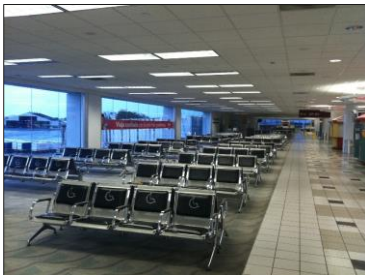
Building or portion thereof used for a gathering of 50 or more persons for:

- deliberation,
- civic, social or religious functions,
- recreation,
- food or drink consumption
- worship, entertainment, amusement,
- awaiting transportation, or
- similar uses



Inspecting Existing Assembly Occupancies

Occupancy Classification



Inspecting Existing Assembly Occupancies

Occupancy Classification



Special Amusement Buildings



Inspecting Existing Assembly Occupancies

Occupancy Classification



Exceptions to the rule:

Where incidental to another occupancy, areas used as follows shall be permitted to be considered part of the predominant occupancy and shall be subject to the provisions of the *Code* that apply to the predominant occupancy:

- (2) Nonresidential use with an occupant load fewer than that established by Section 6.1 for the occupancy threshold.



Inspecting Existing Assembly Occupancies

Occupancy Classification



Exceptions to the rule:

A room or space used for assembly purposes by less than 50 persons and accessory to another occupancy shall be included as a part of that occupancy.



Occupancy Classification



Occupancy Classification



Exceptions to the rule:

Assembly areas with less than 750 square feet and which are accessory to another occupancy according to Section 302.2.1 of the *Building Code* are not assembly occupancies.



Occupancy Classification



Exceptions to the rule:



≤ 750 SF and

Accessory to another
occupancy



Occupancy Classification



Exceptions to the rule:

Assembly occupancies which are accessory to Group E in accordance with Section 302.2 of the *International Building Code* are not considered assembly occupancies.



Occupancy Classification



Exceptions to the rule:



Assembly occupancies *SOLEY* accessory to an Group E occupancy



Occupancy Classification



Exceptions to the rule:

Religious educational rooms and religious auditoriums which are accessory to churches in accordance with Section 302.2 of the *International Building Code* and which have occupant loads of less than 100 shall be classified as A-3.



Occupancy Classification



Exceptions to the rule:



Occupancy Classification



Exceptions to the rule:



- Assembly use
- OL <50

Classification?



Inspecting Existing Assembly Occupancies

Occupant Load

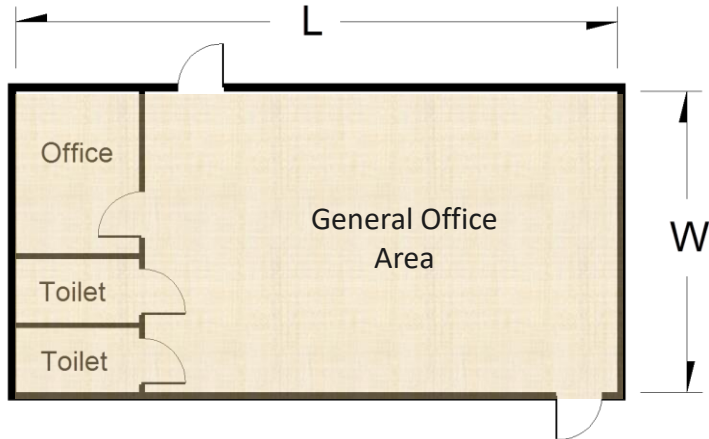
Use	ft ² /person
Concentrated use, w/o fixed seating	7 net
Standing Space	5 net
Less concentrated use, w/o fixed seating	15 net
Bench-type seating	1 person/18"
Kitchens	200
Library stack areas/reading rooms	100/50 net
Swimming pools – water/deck	50/30
Exercise rooms	50
Skating rinks	50



Inspecting Existing Assembly Occupancies

Occupant Load

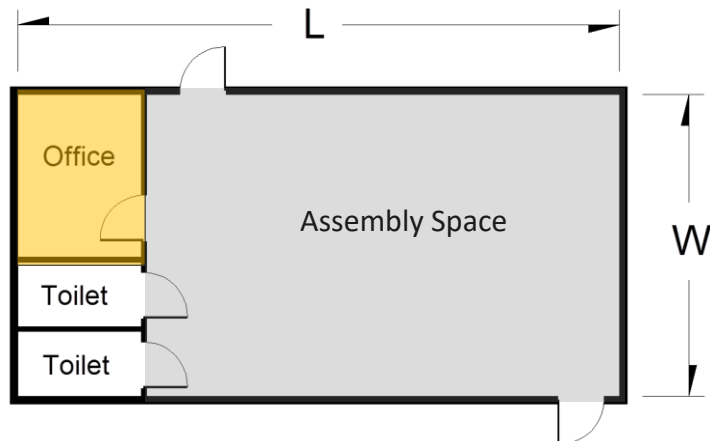
Floor Area, *gross*



Inspecting Existing Assembly Occupancies

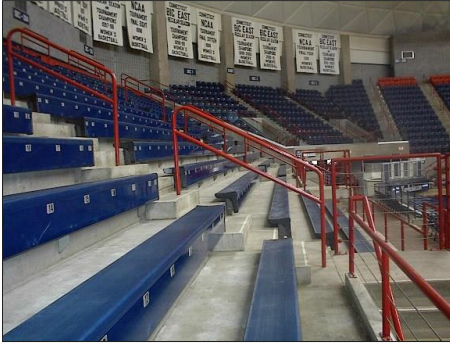
Occupant Load

Floor Area, *net*



Inspecting Existing Assembly Occupancies

Occupant Load



1 person per 18
linear inches



Inspecting Existing Assembly Occupancies

Egress

Number of



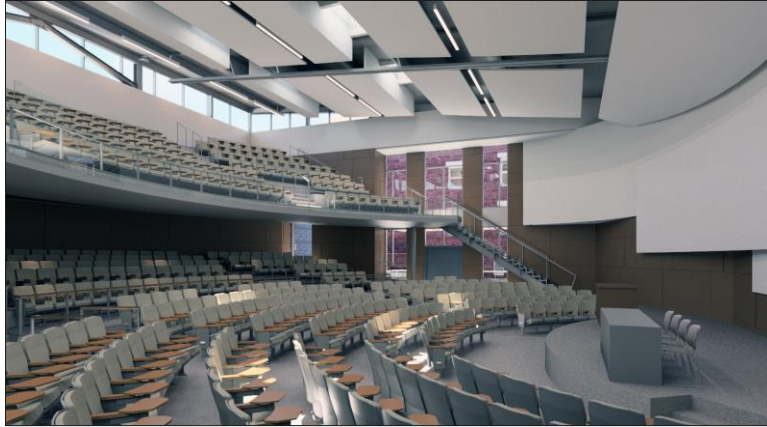
Number Required	Occupant Load	
	2	< 600
3	601 – 1,000	501 – 1,000
4	>1,000	> 1,000



Inspecting Existing Assembly Occupancies

Egress

Balconies



Inspecting Existing Assembly Occupancies

Egress

Catwalks



Inspecting Existing Assembly Occupancies

Egress

Rooftops



Inspecting Existing Assembly Occupancies

Egress

Outdoor Dining



Inspecting Existing Assembly Occupancies

Exits & Egress Capacity



Inspecting Existing Assembly Occupancies

Exits & Egress Capacity



Inspecting Existing Assembly Occupancies

Exits & Egress Capacity



Inspecting Existing Assembly Occupancies

Exits & Egress Capacity



Inspecting Existing Assembly Occupancies

Egress Capacity



$$(R-1) \div R = C$$
$$(3-1) \div 3 = 2/3$$



Main Entrance exception



Egress Capacity

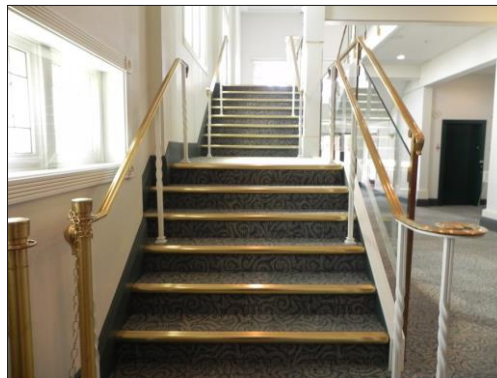


Inspecting Existing Assembly Occupancies

Egress Capacity



0.2"



0.3"



Inspecting Existing Assembly Occupancies

Egress Capacity

Sloped Aisles



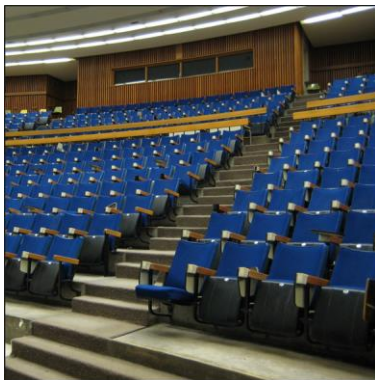
- 0.22"
- 0.22C - Steeper than 1:10 used in accent
C = 1.10



Inspecting Existing Assembly Occupancies

Egress Capacity

Stepped Aisles



- 0.3"AB
- $A = 1 + \left[\frac{\text{riser height} - 7}{5} \right]$
- B = 1.25



Inspecting Existing Assembly Occupancies

Catchment Area



Inspecting Existing Assembly Occupancies

Egress Capacity

Seating in Rows



- $\geq 12''$ – 1st 14 seats
- 0.3'' – ea. Seat > 14
- Never more than 22''



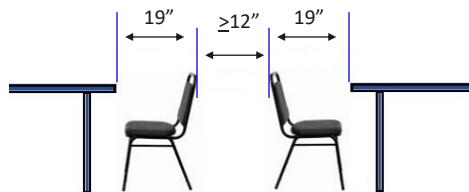
Inspecting Existing Assembly Occupancies

Egress Capacity

Seating at Tables



- $\geq 12''$ – 1st 12' of table
- 0.6" – ea. 1' of table



Inspecting Existing Assembly Occupancies

Key-Operated



OL < 600



OL < 300
&
churches



Inspecting Existing Assembly Occupancies

Panic/Fire Exit Hardware



Inspecting Existing Assembly Occupancies

Delayed Egress



YES



NO



Inspecting Existing Assembly Occupancies

Alarmed Egress



Inspecting Existing Assembly Occupancies

Access Controlled



Entrance doors only



Inspecting Existing Assembly Occupancies

Reliability



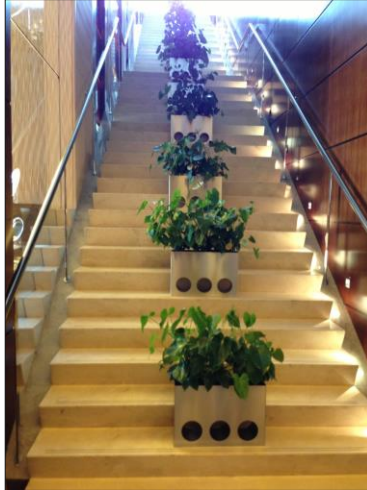
Inspecting Existing Assembly Occupancies

Impediments



Inspecting Existing Assembly Occupancies

Impediments



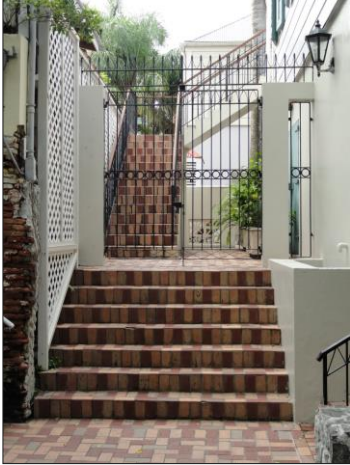
Inspecting Existing Assembly Occupancies

Impediments



Inspecting Existing Assembly Occupancies

Impediments



Inspecting Existing Assembly Occupancies

Impediments

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection



Sprinklers [13.3.5.1]

Buildings with occupant loads greater than 300 for which a building permit for new occupancy was issued on or after April 15, 1987, shall be protected by an approved supervised automatic sprinkler system in accordance with Section 9.7.1 as follows:



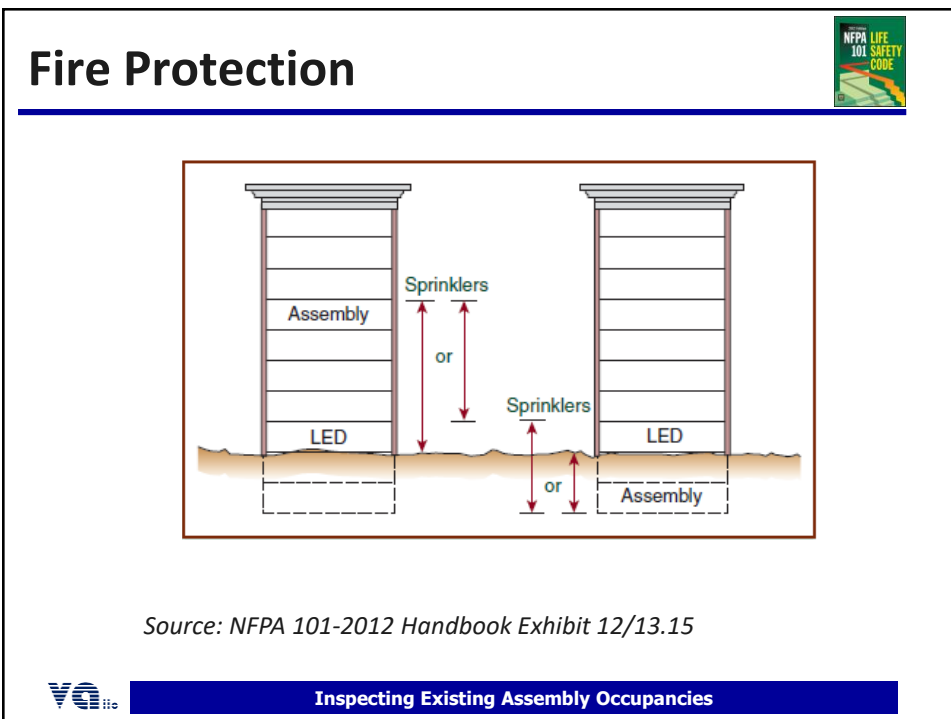
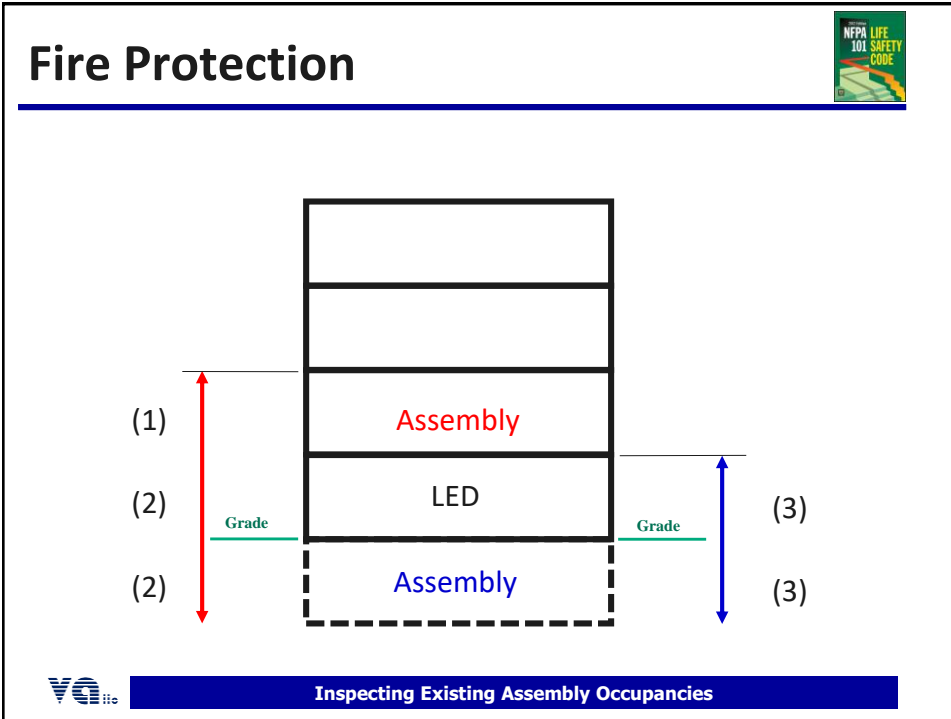
Fire Protection



Sprinklers [13.3.5.1]

- (1) Throughout the story containing the assembly occupancy.
- (2) Throughout any story below the story containing the assembly occupancy.
- (3) In the case of an assembly occupancy located below the level of exit discharge, throughout any story intervening between this story and the level of exit discharge, including the level of exit discharge.





Fire Protection



Sprinklers [13.3.5.2]

Any assembly occupancy used or capable of being used for exhibition or display purposes shall be protected throughout by an approved automatic sprinkler system in accordance with Section 9.7 where the exhibition or display area exceeds 15,000 ft².



Fire Protection



Fire Protection

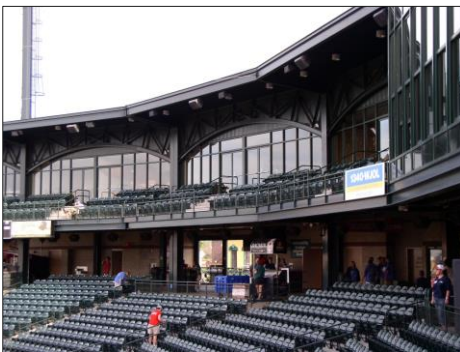


Inspecting Existing Assembly Occupancies

Fire Protection



Exceptions to the rule:



Unenclosed stadia/arenas

- Press boxes < 1,000 ft²
- Storage facilities < 1,000 ft² & 1-hr FRR
- Enclosed areas under grandstands if free of combustibles



Inspecting Existing Assembly Occupancies

Fire Protection



Exceptions to the rule:



Assembly occupancies used primarily for worship with fixed seating.



Inspecting Existing Assembly Occupancies

Fire Protection



Exceptions to the rule:



Single multi-purpose room less than 12,000 SF and not used for exhibition or display.



Inspecting Existing Assembly Occupancies

Fire Protection



Exceptions to the rule:



Gymnasiums, skating rinks, swimming pools used exclusively for participant sport with no audience facilities for more than 300.



Fire Protection



Sprinklers

13.3.5.6 Automatic sprinkler protection shall also be provided as required by Section 9.7.1.5.

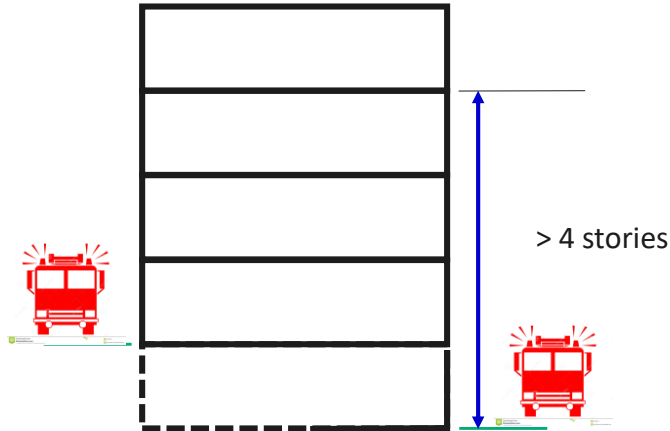
An automatic fire sprinkler system shall be installed per the **high-rise provisions** of section 29-315 of the CGS in effect on October 1, 1973. For the purpose of this section, building height shall be measured from the lowest level of fire department vehicle access to the floor of the highest occupiable story. The provisions of Section 9.7.3.1 shall not apply to these systems.



Fire Protection



29-315 C.G.S.



Inspecting Existing Assembly Occupancies

Fire Protection



Supervision



Inspecting Existing Assembly Occupancies

Fire Protection



Sprinklers [13.3.5.1]

For Group A-1, A-2, A-3, and A-4 occupancies, the automatic sprinkler system shall be provided throughout the floor area where the Group A-1, A-2, A-3 or A-4 occupancy is located, and in all floors between the Group A occupancy and the level of exit discharge.



Fire Protection



Sprinklers

Group A-1. Shall be provided where one of the following conditions exists:

- The fire area exceeds 12,000 square feet;
- The fire area has an occupant load of 300 or more;
- The fire area is located on a floor other than the level of exit discharge; or
- The fire area contains a multi-theater complex.



Fire Protection



Sprinklers

Group A-2. Shall be provided where one of the following conditions exists:

- The fire area exceeds 5,000 square feet;
- The fire area has an occupant load of 300 or more;
- The fire area is located on a floor other than the level of exit discharge.



Fire Protection



Sprinklers

Groups A-3 & A-4. Shall be provided where one of the following conditions exists:

- The fire area exceeds 12,000 square feet;
- The fire area has an occupant load of 300 or more;
- The fire area is located on a floor other than the level of exit discharge.

Except participant sports at the LED



Fire Protection



Stories and basements without openings



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS

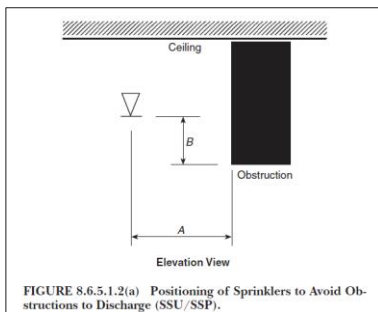


FIGURE 8.6.5.1.2(a) Positioning of Sprinklers to Avoid Obstructions to Discharge (SSU/SSP).

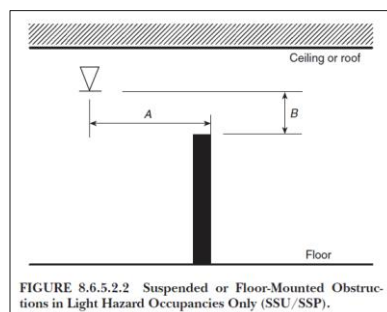


FIGURE 8.6.5.2.2 Suspended or Floor-Mounted Obstructions in Light Hazard Occupancies Only (SSU/SSP).

Source: NFPA 13 - 2010



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

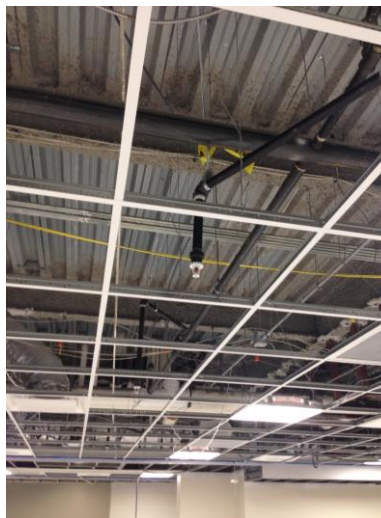
OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

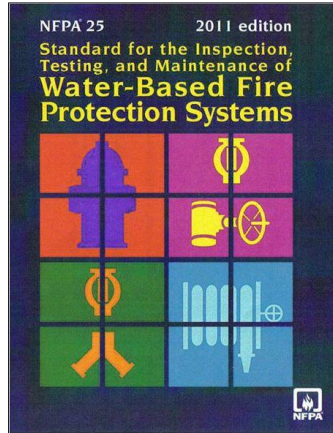
OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

ITM



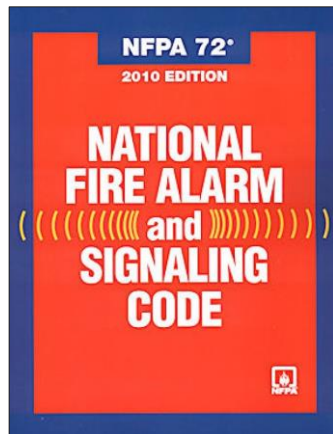
... minimum requirements for the periodic inspection, testing, and maintenance of water-based fire protection systems ...



Inspecting Existing Assembly Occupancies

Fire Protection

ITM



- Table 14.3.1.1 Visual Inspection Frequencies
- Table 4.5 Test Frequencies
- Table 4.2.2 Test Methods



Inspecting Existing Assembly Occupancies

Fire Protection

Table 14.4.2.2 *Continued*

Test Method

Device	Method
15. Alarm notification appliances (<i>continued</i>) (c) Visible	Test shall be performed in accordance with the manufacturer's published instructions. Appliance locations shall be verified to be per approved layout, and it shall be confirmed that no floor plan changes affect the approved layout. It shall be verified that the candela rating marking agrees with the approved drawing. It shall be confirmed that each appliance flashes.

Table 14.4.5 *Continued*

Test Frequency

Component	Initial/ Reacceptance	Monthly	Quarterly	Semiannually	Annually	Table 14.4.2.2 Reference
18. Interface equipment and emergency control functions	X	—	—	—	X	22, 23
19. Special hazard equipment	X	—	—	—	X	17
20. Alarm notification appliances						15
(a) Audible devices	X	—	—	—	X	—
(b) Audible textual notification appliances	X	—	—	—	X	—
(c) Visible devices	X	—	—	—	X	—



Fire Protection

OOPS



Fire Protection

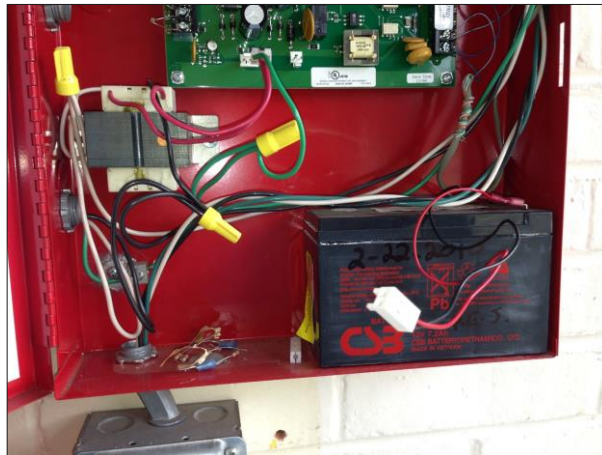
OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Fire Protection

OOPS



Inspecting Existing Assembly Occupancies

Occupancy Requirements



Door Inspections



Building owner or agent shall inspect the means of egress to ensure it is maintained free of obstructions, and correct any deficiencies found, prior to each opening of the building to the public.



Inspecting Existing Assembly Occupancies

Occupancy Requirements



OOPS



Inspecting Existing Assembly Occupancies

Occupancy Requirements



Food Service Operations



Inspecting Existing Assembly Occupancies

Occupancy Requirements



OOPS



Inspecting Existing Assembly Occupancies

Occupancy Requirements



Open Flame Devices



Permitted in the following situations, provided precautions satisfactory to the AHJ are taken to prevent ignition of any combustible material or injury to occupants:

- ceremonial or religious purposes
- stages and platforms where part of a performance
- Where candles on tables are securely supported



Inspecting Existing Assembly Occupancies

Occupancy Requirements



Furnishings & Decorations



Combustible scenery of cloth, film, vegetation (dry), and similar materials

- NFPA 701
- NFPA 289

Foamed plastics

- NFPA 289
- AHJ approval



Inspecting Existing Assembly Occupancies

Occupancy Requirements



Exposition Facilities



- Materials not on display
- Exhibit booth construction
- Heat release rate limitations
- Sprinklers w/in roofed exhibits
- Cooking/food warming
- Vehicles
- Prohibited materials



Inspecting Existing Assembly Occupancies

Occupancy Requirements



Exposition Facilities



Inspecting Existing Assembly Occupancies

Occupancy Requirements



Crowd Managers



“approved training
in crowd management
techniques”

At least 1 required
1 per 250 occupants*

NA churches OL <2,000

* *Lower ratios if AS and event
conditions warrant*



Inspecting Existing Assembly Occupancies

Occupancy Requirements



Drills



employees or attendants trained & drilled in the duties they are to perform in case of fire, panic, or other emergency to effect orderly exiting.

Fire extinguishers & manual fire suppression equipment



Inspecting Existing Assembly Occupancies

Occupancy Requirements



Announcement of Exits



Audible announcement or a projected image prior to the start of each program that notifies occupants of the location of the exits

- Theaters
- Motion picture theaters
- Auditoriums
- Non-continuous programs OL > 100



Inspecting Existing Assembly Occupancies

Occupancy Requirements



Stages

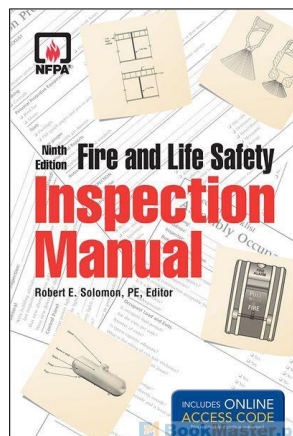


Building owner or agent shall inspect the means of egress to ensure it is maintained free of obstructions, and correct any deficiencies found, prior to each opening of the building to the public.



Inspecting Existing Assembly Occupancies

Resource



Inspection Checklist Assembly Occupancies		
Building: _____		
Address: _____		
Inspector: _____		Date: _____
Date of Last Inspection: _____	Outstanding Violations:	<input type="checkbox"/> Yes <input type="checkbox"/> No
General		
When alterations/modifications made since last inspection?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Is building related occupancy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
What other occupancies? _____		
Is building construction acceptable for height and occupancy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Is it a high-rise?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Is it enclosed?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Is it underground?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Occupant Load and Exits		
Is occupant load posted?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are the exits per code?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Number of exits?	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 or more	
Is egress capacity adequate?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
What is the rating of exit door enclosure?	<input type="checkbox"/> 1 hr <input type="checkbox"/> 2 hr	
What is the rating of exit stair door?	<input type="checkbox"/> 1 hr <input type="checkbox"/> 1.5 hr	
Are they self-closing?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are they self-latching?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are exit enclosures free of storage?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do 100% of exit discharge directly outside?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
If not, do 250% discharge outside and to level of discharge opening?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Is exit stair memory per code?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Doors		
Are doors blocked?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are they locked?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Is it in the sense required to release lock?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do doors swing in direction of travel per code?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Is there panic hardware per code?	<input type="checkbox"/> Yes <input type="checkbox"/> No	

616



Inspecting Existing Assembly Occupancies

Questions or Comments

Thank You & Goodbye



Inspecting Existing Assembly Occupancies