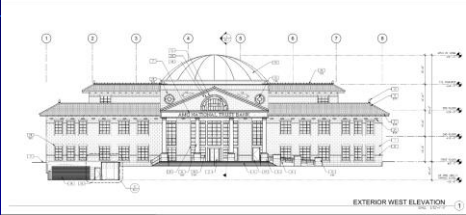



Introduction to Plan Review



INTERNATIONAL CODE COUNCIL PREFERRED PROVIDER

Shums Coda Associate, Inc.



1

Bill Clayton, CBO Shums Coda Associates

- Over 30 years in Building Code Enforcement and Administration
- Combination Building Inspector since 1992
- Plans Examiner since 1996
- Recovering CBO, 10 years
- Code consultant, inspector, plans examiner, instructor with CCC & Shums Coda Associates 9 + years
- Past member ICC IEBC Committee 2009 & 2012 cycle
- Past member ICC IBC General Committee 2015 cycle
- Author of ICC Resource book "Fire Stopping, Joint Systems and Dampers" based on the 2024 I codes

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2

Class Summary

- Plan Review Techniques
 - Personal Preparation
 - Tools/Equipment
- Based on small commercial project
- 2021 IBC/IFC
- Applicable to small or large department
- Not a code introductory class



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Professionalism



- Professional manner
- Courteous
- Prompt
- Good frame of mind
- Refrain from criticism
- Work to limit complaints



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Develop a Reputation

- Tough
- Knowledgeable
- Fair
- Reasonable
- Understands construction


- A jerk
- Hard to work with
- Unreasonable
- Arrogant
- **Doesn't know the code**
- #&*@\$@&#%



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Paperwork




- Keep good records
- Keep work up to date
- Be consistent with paperwork
- Streamline forms

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Records

- Follow basic criteria for developing reports, letters, field cards, notes
 - Keep legal action in mind
- Set up efficient file system
- Destroy old files when permitted





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Time Management

- Plan Reviews
 - Number per day
 - Difficult projects
 - Dealing /unskilled persons
- Phone calls, messages
 - Set time of day
- Report writing
 - Completeness
 - Quality information
- Meetings
 - Staff, designers, contractors

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Public Relations

- Resolve differences without argument
 - Maintain professionalism
 - **Don't raise your voice**
 - Leave if your safety is in question
 - Notify your superior



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Public Relations


- Unskilled people
 - Be patient
 - Expect to spend more time
 - Use opportunity to educate person about codes



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Tools/Equipment (Paper Review)



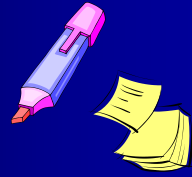
- Drafting Table
- Calculator
- Architect/Engineer Scale
- Red Pen

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Tools/Equipment (Paper Review)

- Miscellaneous
 - Highlighters
 - Sticky Notes
 - Straight edge
 - Rolling scale

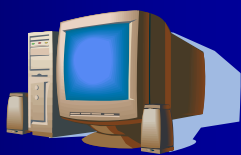


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Tools/Equipment (Electronic Review)

- Computer
 - Electronic Review
 - Internet
 - Digital Codes
 - Bluebeam



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Tools/Equipment

- Code Book!



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Tools/Equipment


- Code References



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Submittal Documents 107.1




- Submittal documents consisting of construction documents, statement of special inspections, geotechnical report and other data shall be submitted in two or more sets, or in a digital format where allowed by the building official, with each permit application.

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Submittal Documents 107.1




- The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

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Submittal Documents 107.1




- Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.

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Submittal Documents 107.1



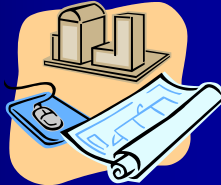
- Exception: The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that review of construction documents is not necessary to obtain compliance with this code.

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Information On Construction Documents – 107.2.1

- Construction documents shall be dimensioned and drawn upon suitable material.
- Electronic media documents are permitted to be submitted where approved by the building official.

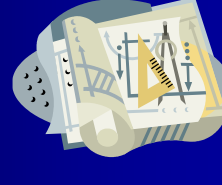


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Information On Construction Documents – 107.2.1


- Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official.



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Fire Protection System Shop Drawings – 107.2.2



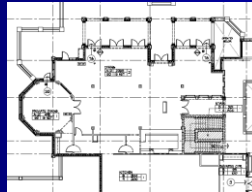
- Shop drawings for the fire protection system(s) shall be submitted to indicate conformance with this code and the construction documents and shall be approved prior to the start of system installation.
- Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9.

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Means Of Egress 107.2.3

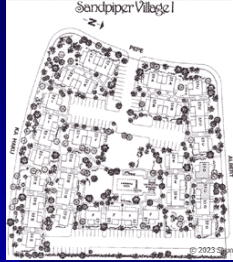
- The construction documents shall show in sufficient detail the location, construction, size and character of all portions of the means of egress in compliance with the provisions of this code. In other than occupancies in Groups R-2, R-3, as applicable in Section 101.2, and I-1, the construction documents shall designate the number of occupants to be accommodated on every floor, and in all rooms and spaces.



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Site Plan 107.2.6



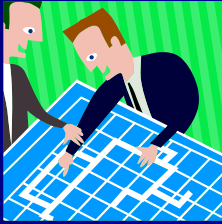
- The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and design flood elevations; and it shall be drawn in accordance with an accurate boundary line survey.

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Examination of documents 107.3

- The building official shall examine or cause to be examined the accompanying submittal documents and shall ascertain by such examinations whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.




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Approval Of Construction Documents - 107.3.1

Reviewed for Compliance

- When the building official issues a permit, the construction documents shall be approved, in writing or by stamp, as "Reviewed for Code Compliance."




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Approval Of Construction Documents - 107.3.1

- One set of construction documents so reviewed shall be retained by the building official.
- The other set shall be returned to the applicant, shall be kept at the site of work and shall be open to inspection by the building official or a duly authorized representative.



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Design Professional In Responsible Charge - 107.3.4

The registered design professional in responsible charge shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.



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Deferred Submittals 107.3.4.1

Deferral of any submittal items shall have the prior approval of the building official. The registered design professional in responsible charge shall list the deferred submittals on the construction documents for review by the building official.

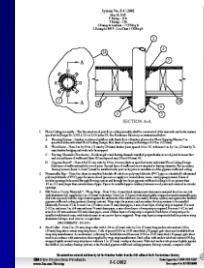


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Deferred Submittals 107.3.4.1



Documents for deferred submittal items shall be submitted to the registered design professional in responsible charge who shall review them and forward them to the building official with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the design and submittal documents have been approved by the building official.

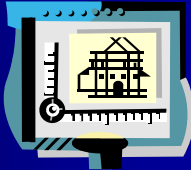
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Amended Construction Documents 107.4

- Work shall be installed in accordance with the approved construction documents, and any changes made during construction that are not in compliance with the approved construction documents shall be resubmitted for approval as an amended set of construction documents.




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Retention of construction documents - 107.5

- One set of approved construction documents shall be retained by the building official for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws.

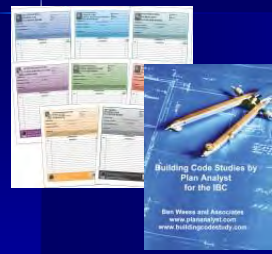


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Plan Review Process

- Develop personal/department style
 - Checklist
 - Page by page
 - Computer Programs
 - Other styles?

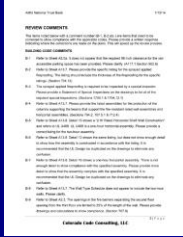


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The Plan Review Report

- Be specific
- Reference the code
- Reference sheet with problem
- Proofread the report
- Be sure of your comments



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Example Comments

- Arch. Dwg. A501 Review Comments: Specify the width/ riser / treads for the new stair to the Mech. Room. Specify a guardrail at the floor opening. Address the incidental use separation at the Mech equipment (furnace) per IBC, Table 508.2.5.
- Confirm / document that fire alarms shall be provided per IBC, Section 907.2.9.1 and address the 1-Hour firestopping at the plumb penetrations at the 1-hour F-C assembly (Specify applicable UL assemblies or equivalent) per IBC, Section 713.4.1.1.2 and electrical membrane penetrations per IBC, Section 713.4.1.2.

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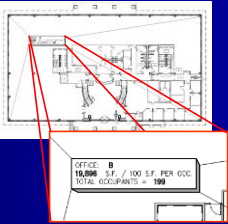
Example Comments

- Refer to Sheet A13.7. Please provide the specific listing for the sprayed applied fireproofing. The listing should include the thickness of the fireproofing for the specific ratings. (Section 704.1.3)
- Refer to Sheet E1. Please provide exit signs above the exit doors in the training rooms and the door from corridor 142 to corridor 138. The total combined occupant load in the training rooms exceeds 49 and two exits are required. (Section 1013.1)

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Classifying the Building

- Calculate Building Area
 - The area included within surrounding exterior walls (or exterior walls and firewalls) exclusive of vent shafts and courts
 - Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above.




OFFICE - B
19,000 S.F. / 100 S.F. PER OCC
TOTAL OCCUPANTS = 190

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Classifying the Building

- Occupancy Classification
 - A Assembly
 - B Business
 - E Educational
 - F Factory/Industrial
 - H Hazardous
 - I Institutional
 - M Mercantile
 - R Residential
 - S Storage
 - U Utility/Misc.




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Business Group B 304


- The use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts.



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Residential Group R 310




- R-2
 - Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature

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Storage Group S 311

- The use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.
- S-1 – Moderate-Hazard
- S-2 – Low-Hazard



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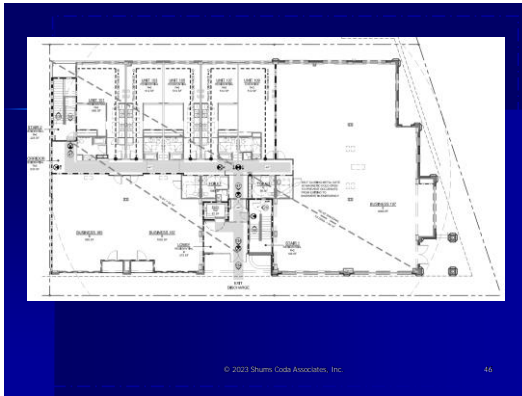
311.1.1 Accessory storage spaces

- A room or space used for storage purposes that is accessory to another occupancy may be classified as part of that occupancy.



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Classifying the Building

- Type of Construction
 - Building Materials
 - Noncombustible Materials
 - Combustible Materials



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Classifying the Building

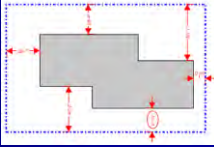
- Type of Construction
 - Fire Resistance of Building Elements

BUILDING ELEMENT	TABLE 601 FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)												
	TYPE I			TYPE II			TYPE III			TYPE V			
	A	B	1 ^{1/2}	A	B	1 ^{1/2}	A	B	1 ^{1/2}	HT	A	B	
Primary structural frame ^a (see Section 202)	3 ^{1/2}	2 ^{1/2}	1 ^{1/2}	0	0	0	3 ^{1/2}	2 ^{1/2}	1 ^{1/2}	0	HT	1 ^{1/2}	0
Bearing walls	3	2	1	0	2	2	3	2	2	2	1	0	0
Exterior ^b	3 ^{1/2}	2 ^{1/2}	1	0	1	0	3	2	2	1/RT	1	0	0
Interior	See Table 705.5												
Nonbearing walls and partitions	See Table 705.5												
Exterior	See Table 705.5												
Nonbearing walls and partitions	See Section 204.11.2												
Interior ^c	0	0	0	0	0	0	0	0	0	0	0	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0	0
Roof construction and associated secondary structural members (see Section 202)	1 1/2	1 ^{1/2}	1 ^{1/2}	0 ^d	1 ^{1/2}	0	1 1/2	1	1	HT	1 ^{1/2}	0	0

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506.3.2 Minimum frontage distance

- The frontage increase shall be based on the smallest public way or open space that is 20 feet or greater, and the percentage of building perimeter having a minimum 20 feet public way or open space.



Perimeter with > 20' yard = 364'
Total Perimeter = 406'
364/406 = 90%
Smallest Yard = 21' 3"

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506.3.3 Amount of increase

- The area factor increase based on frontage shall be determined in accordance with Table 506.3.3.

PERCENTAGE OF BUILDING PERIMETER	OPEN SPACE (ftwd)			
	0 to less than 20	20 to less than 25	25 to less than 30	30 or greater
0 to less than 25	0	0	0	0
25 to less than 50	0	0.17	0.21	0.25
50 to less than 75	0	0.33	0.42	0.50
75 to 100	0	0.50	0.63	0.75

90% Building Perimeter
Yard Dimension = 21' 3"
Frontage Increase = 50%

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506.3.3.1 Section 507 buildings

- Where a building meets the requirements of Section 507, as applicable, except for compliance with the minimum 60-foot public way or yard requirement, the area factor increase based on frontage shall be determined in accordance with Table 506.3.3.1.

PERCENTAGE OF BUILDING PERIMETER	OPEN SPACE (ftwd)					
	30 to less than 35	35 to less than 40	40 to less than 45	45 to less than 50	50 to less than 55	55 to less than 60
0 to less than 25	0	0	0	0	0	0
25 to less than 50	0.29	0.33	0.38	0.42	0.46	0.50
50 to less than 75	0.58	0.67	0.75	0.83	0.92	1.00
75 to 100	0.88	1.00	1.13	1.25	1.38	1.50

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PERCENTAGE OF BUILDING PERIMETER	20 to less than 25	25 to less than 35	35 to less than 45	45 to less than 50	50 to less than 55	55 to less than 60
0 to less than 25	0	0	0	0	0	0
25 to less than 50	0.29	0.33	0.38	0.42	0.46	0.50
50 to less than 75	0.58	0.67	0.75	0.83	0.92	1.00
75 to 100	0.88	1.00	1.13	1.25	1.38	1.50

Perimeter with > 20' yard = 911'
 Total Perimeter = 1,018'
 911/1,018 = 90%
 Smallest Yard = 53' 1"

90% Building Perimeter
 Yard Dimension = 53' 1"
 Frontage Increase = 138%

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506.2.1 Single-occupancy, one-story buildings

90% Building Perimeter
 Yard Dimension = 21' 3"
 Frontage Increase = 50%

- Group B, Type IIB
- Sprinklered, 1 story
- $A_B = A_1 + (NS \times I_r)$
- $A_B = 92,000 + (23,000 \times 0.5)$
- $A_B = 92,000 + 11,500$
- $A_B = 103,500$ SF

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506.2.1 Single-occupancy buildings

- The total allowable area of a single-occupancy building more than three stories above grade plane shall be determined in accordance with Equation 5-2.

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506.2.1 Single-occupancy, multistory buildings -

- Equation 5-2
- $A_a = [A_f + (NS \times I_f)] \times S_a$

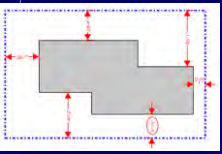
The actual area of any individual floor shall not exceed the allowable area per Equation 5-1.

- A_a = Allowable area (square feet).
- A_f = Tabular allowable area factor in accordance with Table 506.2.
- NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building.
- I_f = Area factor increase due to frontage as calculated in accordance with Section 506.3.
- S_a = 3 where the actual number of stories above grade plane exceeds three, or
- S_a = 4 where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

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506.2.1 Single-occupancy, multistory buildings -



- Group B, Type IIB
- Sprinklered, 4 story
- $A_a = [A_f + (NS \times I_f)] \times S_a$
- $A_a = 69,000 + (23,000 \times 0.5) \times 3$
- $A_a = [69,000 + 11,500] \times 3$
- $A_a = 80,500 \times 3$
- $A_a = 241,500$ SF
- No single story can exceed 80,500 SF


90% Building Perimeter
Yard Dimension = 21' 3"
Frontage Increase = 50%

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Mixed-occupancy, one-story buildings - 506.2.2


- The allowable area of each story of a mixed-occupancy building shall be determined in accordance with the applicable provisions of, Section 508.3.2 for nonseparated occupancies and Section 508.4.2 for separated occupancies.



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508.3.2 - Allowable building area, height and number of stories



- The allowable building area, height and number of stories of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with [Section 503.1](#).

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Nonseparated Occupancy Example

One-story
Office, Warehouse
Parking Garage
Type IIB Construction
Fully Sprinklered
80,000 sq. ft.
40' + yards around building

- Occupancy Classifications
 - Office = Group B
 - Warehouse = S -1
 - Auto Storage = S-2
- Tabular Areas/Max. Ht.
 - Group B = 92,000/4
 - Group S-1 = 70,000/3
 - Group S-2 = 104,000/4
- Most Restrictive = Group S-1
- Area calculation based on S-1
 - $A_n = A_1 + [NS \times I]$
 - $A_n = 70,000 + [17,500 \times 0.75]$
 - $A_n = 70,000 + 13,125$
 - $A_n = 83,125$ sq. ft.

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Multi-story Example

- Given:
 - Shell Building – Retail Center as shown
- Determine:
 - Total Allowable Building Area
- Possible Occupancies?
- Most Restrictive?

40' Yards all sides

Shell Building – Retail Center
Two-Story
Fully sprinklered
Type IIIB
Construction
35,000 sq. ft. per story

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Multi-story Example

- A-2 most restrictive
 - $A_b = 28,500 + [9,500 \times 0.75]$
 - $A_b = 28,500 + 7,125$
 - $A_b = 35,625$ sq. ft. per story

40' Yards all sides


Shell Building – Retail Center
Two-story
Fully sprinklered
Type IIIB Construction
35,000 sq. ft.

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Mixed-occupancy, one-story buildings - 506.2.2

- The allowable area of each story of a mixed-occupancy building shall be determined in accordance with the applicable provisions of Section 508.3.2 for nonseparated occupancies and Section 508.4.2 for separated occupancies.



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Allowable Building Area 508.4.2

- In each story, the building area shall be such that the sum of the ratios of the actual building area of each separated occupancy divided by the allowable building area of each separated occupancy shall not exceed 1.

Apartments
10,500 sq. ft.

One-story
Mixed Use
Type VB Const.
Fully Sprinklered

Offices
8,500 sq. ft.

Parking
Garage
14,500 sq. ft.

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Separated Occupancy Example

Occ.	Actual Area	A ₁	Ratio
R-2	10,500	28,000	0.38
B	8,500	36,000	0.24
S-2	14,500	54,000	0.27
Total	33,500		0.89 < 1

Apartments
10,500 sq. ft.

One-story
Mixed Use
Type VB Const.
Fully Sprinklered

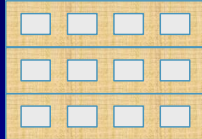
Offices
8,500 sq. ft.

Parking
Garage
14,500 sq. ft.

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Multi-Story Mixed Occupancies Example

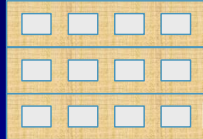


- Given
 - 3 story building as shown
 - 30,000 sq. ft. per story
 - Type VA Construction
 - NFPA 13 Sprinklers
 - No yard increase
- Solution
 - A_a (M) = 42,000
 - A_a (B) = 54,000 sq. ft.
 - A_a (R-2) = 36,000 sq. ft.

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Multi-Story Mixed Occupancies Example



- Given
 - 3 story building as shown
 - 30,000 sq. ft. per story
 - Type VA Construction
 - NFPA 13 Sprinklers
 - No yard increase
- Solution
 - M = 20,000/42,000 = 0.48
 - A-2 = 10,000/34,500 = 0.29
 - Total 1st Story = 0.77 < 1
 - B = 30,000/54,000 = 0.56 < 1
 - R-2 = 30,000/36,000 = 0.83 < 1

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506.2.2 - Mixed-occupancy, multistory buildings

Group R-2	
Group R-2	
Group B	Group A-2
Group M	Group B

- For buildings with more than three stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories, determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed three.
- Equation 5-3
- $A_{1i} = A_i + (NS \times I_i)$

Type VA Construction, sprinklered, Nonseparated Occ.

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Mixed-occupancy, multistory buildings 506.2.2

Floor	Occupancy	Actual Area	Allowable Area	Ratio
First	M	10,000	42,000	0.24
	B	15,000	54,000	0.27
	Total Ratio this floor			0.51
Second	A-2	10,000	35,400	0.28
	B	15,000	54,000	0.27
	Total Ratio this floor			0.55
Third	R-2	25,000	36,000	0.69
Fourth	R-2	20,000	36,000	0.69
0.51 + 0.55 + 0.69 + 0.69 = 2.44 < 3 =OK				


No yard increase used

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Classifying the Building

- Location on Property



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Accessory Occupancies 508.2

- Ancillary to the main occupancy of the building or portion thereof.
- Individually classified as to occupancy
- Code requirements shall apply to each portion based on the occupancy classification

Area	Occupancy	Floor Area	Floor Load
CLUB ROOM	R-2	700	4
STRESS ROOM	R-2	131	4
SWIM	R-2	480	4
POOL	A-3	100	10
POOL DECK	A-3	100	10

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Accessory Use Area and Height - 508.2.3

- The allowable building area and height of the building shall be based on the allowable building area and height for the main occupancy in accordance with Section 503.1.
- Must be less than 10% of the building area of the story in which it is located, (508.2.1).

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Separation of Accessory Occupancies - 508.2.4

- No separation is required between accessory occupancies and the main occupancy.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Incidental accessory occupancies required to be separated or protected by Section 508.2.5.
3. Group I-1, R-1, R-2 and R-3 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from accessory occupancies contiguous to them in accordance with the requirements of Section 420.

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Nonseparated Occupancies 508.3



- Nonseparated occupancies shall be individually classified
- Code requirements shall apply to each portion of the building based on the occupancy classification of that space
- Most restrictive provision of 403 and Chapter 9 shall apply to entire building
- No Separation required between occupancies
 - Exceptions for H & R Occupancies

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Separated Uses 508.4.1



- Separated occupancies shall be individually classified.
- Each fire area shall comply based on the occupancy classification of that portion of the building.

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Required Separation Table 508.4


OCCUPANCY	TABLE 508.4 REQUIRED SEPARATION OF OCCUPANCIES (HOURS) ¹																			
	A, E	I-1, I-3, I-4		I-2	R ²	F-2, S-2 ³ , U			B ⁴ , F-1, M, S-1		H-1	H-2		H-3, H-4		H-5				
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS				
A, E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3	2	NP
I-1, I-3, I-4	1	2	N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	2	NP	2	NP	N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
R ²	1	2	1	NP	2	NP	N	N	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2 ³ , U	N	1	1	2	2	NP	1	2	N	N	1	2	NP	NP	3	4	2	3	2	NP
B ⁴ , F-1, M, S-1	1	2	1	2	2	NP	1	2	1	2	N	N	NP	NP	2	3	1	2	1	NP
H-1	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	N	NP	NP	NP	NP	NP	NP	NP	NP	NP
H-2	3	4	3	NP	3	NP	3	NP	3	4	2	3	NP	NP	N	NP	1	NP	1	NP
H-3, H-4	2	3	2	NP	2	NP	2	NP	2	3	1	2	NP	NP	1	NP	1 ⁵	NP	1	NP
H-5	2	NP	2	NP	2	NP	2	NP	2	NP	1	NP	NP	NP	1	NP	1	NP	N	NP

1. See Section 507.2.
 2. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but not to less than 1 hour.
 3. See Sections 405.1.2 and 405.1.4.
 4. Separation is not required between occupancies of the same classification.
 5. See Section 502.2 for ambulatory care facilities.
 6. Occupancy separations that serve to define fire area limits established in Chapter 9 for requiring the protection systems shall also comply with Sections 707.3.10 and Table 707.3.10 in accordance with Section 501.7.

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Special Detailed Requirements Based On Use And Occupancy Chapter 4



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Atriums 404

- ✓ Automatic sprinklers
- ✓ Fire alarm system
- ✓ Smoke control
- ✓ Atrium Enclosure
 - ✓ Exceptions
- ✓ Standby power
- ✓ Interior Finishes
- ✓ Travel Distance



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Motor-Vehicle-Related Occupancies 406




- Private garages/carports
- Parking structures
- Open parking garages
- Enclosed parking garages
- Automotive motor fuel-dispensing facility
- Repair garages

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Motor-Vehicle-Related Occupancies 406

- Area and height increases
- Separation
- Ventilation
- Canopies



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Chapter 4

- 407 Group I-2
- 408 Group I-3
- 409 Motion Picture Projection Rooms
- 410 Stages & Platforms
- 411 Special Amusement Buildings
- 412 Aircraft Related Occupancies
- 413 Combustible Storage
- 414 Hazardous Materials
- 415 Groups H-1, H-2, H-3, H-4, & H-5
- 416 Application of Flammable Finishes
- 417 Drying Rooms
- 418 Organic Coatings

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Effective Use of the Code

- Classify the building
- Review occupancy requirements
- Review type of construction requirements
- Review means of egress requirements
- Review detailed code requirements
- Review structural & material requirements

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Common Path of Egress Travel 202

- That portion of 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.

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1006.3.3 Egress based on occupant load

- Each story and occupied roof shall have the minimum number of separate and distinct exits, or access to exits, as specified in Table 1006.3.3.
- A single exit or access to a single exit shall be permitted in accordance with Section 1006.3.4.
- The required number of exits, or exit access stairways or ramps providing access to exits, from any story or occupied roof shall be maintained until arrival at the exit discharge or a public way.

OCCUPANT LOAD PER STORY	MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS FROM STORY
1-500	2
501-1,000	3
More than 1,000	4

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OVERALL 3RD FLOOR PLAN

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Continuity and Components 1009.2

- Continuous to public way
- consist of one or more components
 - Accessible routes
 - Interior exit stairways
 - Exit access stairways
 - Exterior exit stairways
 - Elevators
 - Platform lifts
 - Horizontal exits
 - Ramps
 - Areas of refuge
 - Exterior areas of assisted rescue




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Doors 1010.1

- Size of Doors
- Side-hinged swinging
- Swing in direction of egress travel > 50 occupants or hazardous occupancies
- Special doors
- Floor elevation



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Door Operations 1010.1.9

- Hardware Schedule?
- Type of locks/latches
- Bolt locks
- Special latches
- Panic & fire exit hardware



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Stairway Width 1011.2




- Minimum 44"
- Calculated Width (Occupant load)
- Exceptions:
 - occupant load 50 or less - 36" permitted
 - spiral stairways
 - aisle stairs
 - stairway lift in dwelling units

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Headroom 1011.3



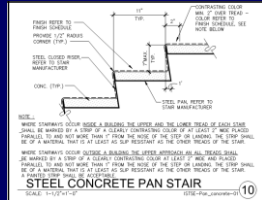
- Stairways shall have a minimum headroom clearance of 80 inches measured vertically from a line connecting the edge of the nosings.
 - spiral stairways may have 78" headroom

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Stair Treads & Risers 1011.5

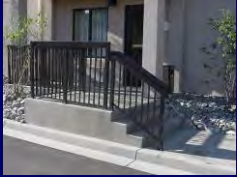

- Riser heights
 - 7 inches maximum and 4 inches minimum.
- Tread depths
 - 11 inches minimum.
- Profile



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Stairway Landings 1011.6



- Floor or landing at the top and bottom of each stairway
- Width not less than stairway served
- Length same as width of stairway
- Straight runs need not exceed 48' max.
- Doors shall not reduce width more than 1/2 required width nor project more than 7" when fully open

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Vertical Rise 1011.8



- A flight of stairs shall not have a vertical rise greater than 12 feet between floor levels or landings

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Handrails 1014



- Handrail both sides of stair
- 34" - 38" above nose of tread
- Graspability
- Continuity
- Handrail extensions
- Intermediate handrails

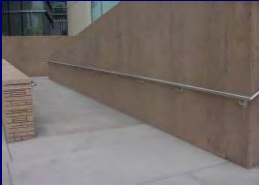


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Ramp Landings 1012.6

- Located at top, bottom, points of turning, entrance, exit and doors
 - maximum slope 1:48
 - width same as ramp
 - minimum length 60"
 - 60" X 60" at change of direction
 - Doors per ANSI A117.1



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Exit Signs 1013.1

- Readily visible from any direction
- In cases where the exit or path of egress travel is not immediately visible to the occupants
- Place so no point in exit access corridor is more than 100 feet from nearest sign or the listed viewing distance

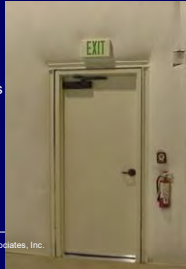


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Illumination/Power Source 1013.5/1013.6

- Internally Illuminated
 - Listed/labeled
 - Installed per manufacturers instructions
- Externally illuminated
 - 5 foot-candles
- Illuminated at all times
- 90 minute standby




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Guards 1015

- Open sided walking surfaces more than 30 inches above floor or grade below
- Includes screened porches
- Mechanical equipment within 10 ft. of roof edge




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Guard Height 1015.3

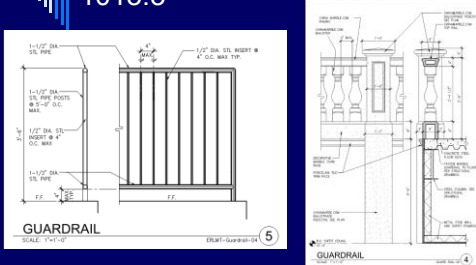
- Required guards shall be not less than 42 inches high, measured vertically above the adjacent walking surfaces, or the line connecting the leading edges of the treads.



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Guard Opening Limitations 1013.3



GUARDRAIL
SCALE: 1/4"=1'-0"

GUARDRAIL
SCALE: 1/4"=1'-0"

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Exit Access Components

- Aisles
- Corridors
- Egress Balconies




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Aisles 1018

- Aisles shall be provided from all occupied portions of the exit access which contain seats, tables, furnishings, displays, and similar fixtures or equipment.
- Aisles serving assembly areas, other than seating at tables, shall comply with Section 1028




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Egress Balconies 1021

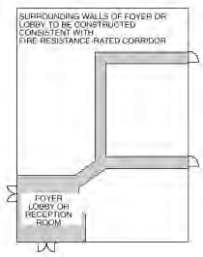
- Balconies used for egress purposes shall conform to the same requirements as corridors for width, headroom, dead ends and projections.



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Corridor Continuity 1020.7




- Fire-resistance-rated corridors shall be continuous from the point of entry to an exit. Fire-resistance-rated corridors shall not be interrupted by intervening rooms.
 - Foyers, lobbies, reception rooms constructed as required for corridors shall not be construed as intervening rooms

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Exits 1022.1



- Exits shall comply with Sections 1022 through 1027 and the applicable requirements of Sections 1003 through 1015.
- An exit shall not be used for any purpose that interferes with its function as a means of egress.
- Once a given level of exit protection is achieved, such level of protection shall not be reduced until arrival at the exit discharge.
- Exits shall be continuous from the point of entry into the exit to the exit discharge.

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Interior Exit Stairways 1023

- Interior exit stairways and ramps shall be enclosed
 - 4+ stories - 2 hr. fire rated
 - < 4 stories - 1 hr. fire rated
 - all floor levels used to compute stories, including basements
 - excluding mezzanines

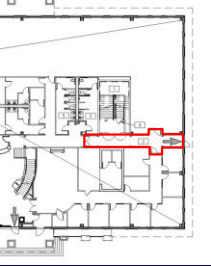


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Exit Passageway 1024

- Width per Section 1005.1, minimum 44 inches
 - Occupant load <50 – 36"
- Walls, floors & ceilings 1-hour fire-resistance rated, and not less than exit enclosure rating
- Openings & penetrations restricted

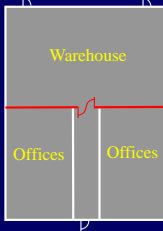


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Horizontal Exits 1026

- A path of egress travel from one building to an area in another building on approximately the same level, or a path of egress travel through or around a wall or partition to an area on approximately the same level in the same building, which affords safety from fire and smoke from the area of incidence and areas communicating therewith.



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Exterior Exit Ramps & Stairways 1027

- Not permitted to be used in I-2
- Open on at least one side
 - Minimum 35 sq. ft., 42" above floor level
 - open areas yards, courts, public ways
- Separated per 1019.1




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Exit Discharge 1028

- Exits shall discharge directly to the exterior of the building.
- The exit discharge shall be at grade or shall provide direct access to grade.
- The exit discharge shall not re-enter a building.



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Effective Use of the Code


- Classify the building
- Review occupancy requirements
- Review type of construction requirements
- Review means of egress requirements
- Review detailed code requirements chapter 4
- Review structural & material requirements

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International Building Code Accessibility

- Chapter 11
 - Accessibility
- Chapter 10
 - Means of Egress
- International Existing Building Code
 - Existing Buildings



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1101.1 Accessibility Scope


- The provisions of this chapter shall control the design and construction of facilities for accessibility for individuals with disabilities.



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2021 IBC - Design



- 1101.2 Design:
- THIS CODE and
- ICC/ANSI A117.1-2017.

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IBC – Where is accessibility required?????

- Everywhere!!!
- Temporary or permanent buildings and structures and associated sites and facilities.


There are always Exceptions to the rule!

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1104.1 Site arrival points

- At least one accessible route within the site shall be provided from public transportation stops, accessible parking, accessible passenger loading zones, and public streets or sidewalks to the accessible building entrance served.




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1104.2 Within a site

- At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements and accessible spaces that are on the same site.



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1104.3 Connected spaces

- Where a building or portion of a building is required to be accessible, at least one accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways and to the public way.



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1104.4 Multistory buildings and facilities



- At least one accessible route shall connect each accessible story, mezzanine and occupied roofs in multilevel buildings and facilities.
 - Exceptions

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1104.5 Location

- Accessible routes shall coincide with or be located in the same area as a general circulation path.
- Where the circulation path is interior, the accessible route shall be interior.
- Where only one accessible route is provided, the accessible route shall not pass through kitchens, storage rooms, restrooms, closets or similar spaces.



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1105.1 Public entrances



- In addition to accessible entrances required by Sections 1105.1.2 through 1105.1.8, at least 60 percent of all public entrances shall be accessible.

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1108.6.2
Residential R-2 Apartments



- ≥Four dwelling units in single structure
 - Every unit – Type B
- R-2 > 20 units
 - 2% - Type A

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1110.2
Toilet and bathing facilities




- Each toilet room and bathing room shall be accessible.
- Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor.
- Except as provided for in Sections 1110.2.4 and 1110.2.5, at least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

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FIRE RESISTANCE-RATED CONSTRUCTION

CHAPTER 7




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Fire Resistance Rating of Structural Members - 704

- The fire-resistance rating of structural members and assemblies shall comply with the requirements for the type of construction and shall not be less than the rating required for the fire-resistance-rated assemblies supported




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Fire Walls 706

- Each portion of a building separated by one or more fire walls that comply with the provisions of this section shall be considered a separate building



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Fire Barriers 707

- Shaft enclosures
- Interior exit stairways
- Enclosures of exit access stairways
- Exit passageways
- Horizontal exits
- Atriums
- Incidental uses
- Control areas
- Separated occupancies
- Separate a single occupancy into different fire areas



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Fire Partitions 708




- Dwelling/Sleeping unit separations in I-1, R-1, R-2 & R-3
- Tenant separations in mall buildings
- Corridor walls
- Elevator lobby separation
- Egress balconies

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Smoke Barriers 709

- 1-hour fire-resistance rated
- Continuous from outside wall to outside wall and slab to floor/roof deck above
- Supporting structure the same
- 20 minute opening protectives
- Except I-2 occupancies where doors are installed across the corridors




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Horizontal Assemblies 711


- Floor and roof assemblies required to have a fire-resistance rating



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712 – Vertical Openings




- Should always be referenced first.
- Contains option for dealing with vertical openings.
 - Escalator
 - Atrium
 - Two-story opening

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713 – Shaft Enclosures



- Referenced from Section 712.1.1
 - Always start code assessment in 712!
 - One-hour – less than 4 stories
 - Two-hour – 4 or more stories.
- 707 Fire Barrier walls
- 711 Fire Barrier assemblies for horizontal shafts

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ASTM E 119 or UL 263 Documentation




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Installation Requirements 903.3

- 903.3.1.1
 - NFPA 13
- 903.3.1.2
 - NFPA 13 R
- 903.3.1.3
 - NFPA 13 D



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Fire Alarm & Detection Systems - 907

- An approved fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.23 and provide occupant notification in accordance with Section 907.5, unless other requirements are provided by another section of this code.
- Not fewer than one manual fire alarm box shall be provided in an approved location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.



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Effective Use of the Code

- Classify the building
- Review occupancy requirements
- Review type of construction requirements
- Review means of egress requirements
- Review detailed code requirements
- **Review structural & material requirements**

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