


2020 Connecticut State Building & Fire Codes : Projected Development Timetable

Most current schedule will be posted at <https://portal.ct.gov/DASCodeChange>

- Drafting of 2020 SBC amendments 1/1/19 – 2/28/19
- **Code Change Proposals Received** 2/1/19 – 4/30/19
Code Change Proposal Form on Web
- Committees/Work groups Review 3/1/19 – 6/30/19
 - Codes Amendment Subcommittee
 - Work groups
- Final drafts development 7/1/19 – 8/31/19
- Review drafts 9/1/19 – 10/31/19
- Codes & Standards Drafts Approval 11/13/19
- **Public comment period** 12/1/19 – 2/29/20
- Legislative review/approval 3/1/20 – 5/31/20
- Effective 10/1/20



Focus on Height & Area: 2015 IBC Chapters 3-10
Spring 2019 Career Development Series

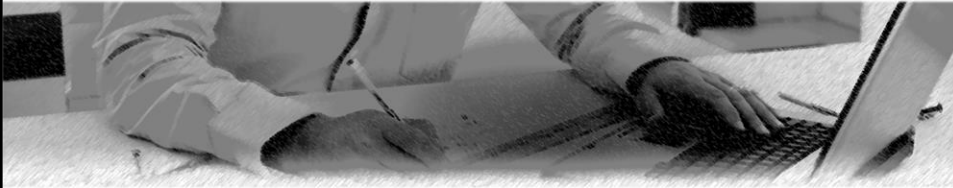
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DAS Office of Education and Data Management



Errata Central

<http://www.iccsafe.org/errata-central>



- IBC 2012 had 35 changes between first and eleventh printings
- IBC 2015 had 28 changes between the first and third printings
- IBC 2018 already has 17 changes in its first two printings

<https://www.iccsafe.org/submit-errata>

Course Objectives

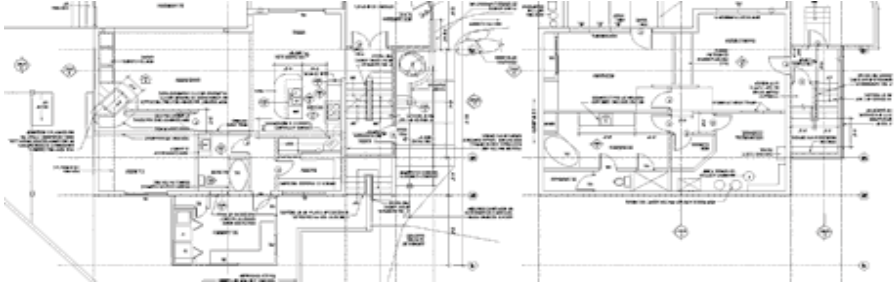
At the end of this session participants will be able to

- Locate requirements within the 2015 IBC portion of the 2018 CT State Building Code that will influence a building's height and area.
- Identify information required to be included in construction documents and on plans for building permit applications.
- Cite key building code requirements for each of the major classifications of use and occupancy.
- Explain the procedure for determining the maximum Height and Area for a building.



Information on the Documents

Section 107.2 – Submittal Documents



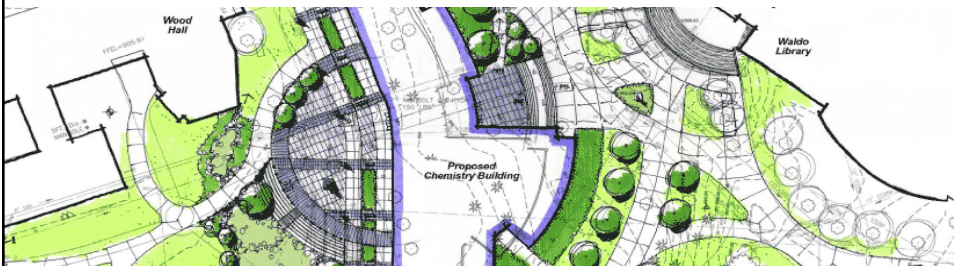
- 107.2.1 Documents indicate location, nature, extent of work, conformity to the code, laws, ordinances, rules, and regulations
- 107.2.2 Fire protection system details - as shop drawings.
- 107.2.3 Means of egress
- 107.2.4 Exterior wall envelope
- 107.2.5 Site Plan
- 107.2.6 Structural Information per 1603.1.3
- 107.6 29-276c requirements
- 107.7 Threshold requirements

Information on Documents

Section 107.2.5 Site Plan


CD's shall show (to scale):

- Accurate boundary survey
- Established street grades
- New & Existing structures
- Other constructed site features
- Lot line separations for all
- Any flood hazard areas/floodways/design elevations
- All proposed finish grades



Definitions / General

202 Definitions; 501.2 Address I.D.

- Height - Building
 - Area - Building
 - Multi-story Unit
 - Live/Work Unit (2012)
 - Penthouse
 - Mezzanine
 - Exercise spa (CT)
 - Special Flood Hazard Area
 - Story Above Grade Plane
 - Lowest Floor (Appdx. G)
 - Wood – Fire-retardant treated
 - Wood – Pressure treated
- 
 - Stepped aisles (assembly seating)
 - Address Identification (required for both new and existing buildings)

Definitions, Acronyms

Section 201 – CT Amendments – Definitions Added or Amended

Added

- BED & BREAKFAST ESTABLISHMENT
- COMPLEX, GUEST ROOM, HOTEL
- SELF-PRESERVATION, STORY
- STREET FLOOR
- SUNROOM (greenhouse undefined)



Amended

- BUILDING, EXISTING.
- EXISTING STRUCTURE
- FIRE SEPARATION DISTANCE
- REGISTERED DESIGN PROFESSIONAL
- SPECIAL AMUSEMENT BUILDING

Acronyms – None in ICC

NFPA Codes & Standards

101.4.5.1 CT SFSC - IBC Chapter 35 Referenced Standards - NFPA



- NFPA 13 Sprinkler Systems
- NFPA 14 Standpipe Systems
- NFPA 30 Flammable and Combustible Liquids
- NFPA 31 Oil-Burning Equipment
- NFPA 58 LPG Code
- NFPA 70 National Electrical Code
- NFPA 72 National Fire Alarm Code
- NFPA 96 Hoods
- *NFPA 101 Life Safety Code
- (and many others)

Fire Protection Shop Drawings

Section 107.2.2 CT Amendments

- Conform to Code and to CT Law
- Approved prior to start of installation
- Contain all information required per Chapter 9
- Drawings accompanied by evidence of licensure





Classification of Use & Occupancy

Section 302 IBC Classification - General

- Major Use Groups
 - ✓ hierarchy within subgroups.
 - ✓ how characteristics are dissimilar.
- Activity type; Familiarity, type.
- Sub-Classification w/Fire Code
- Addition of new subsections.
- New definitions added.
- Section numbers slightly different than those of CT 2012



Use & Occupancy – Group A

Section 303 Group A: Assembly

General:

- A-1 – fixed seating
- A-2 – food and/or drink consumption
- A-3 – general assembly✓
- A-4 – indoor sporting events with spectator seating
- A-5 – outdoor sporting events

✓ *Exception – assembly spaces < 50 people or < 750 sf can be treated as Use Group B*

NEW IBC Sub-Sections:

- 303.1.1 Small Buildings & Tenant Spaces (CT amends)
- 303.1.2 Small Assembly Spaces
- 303.1.3 Associated w/ Group E occupancies
- 303.1.4 Accessory to places of religious worship

Use & Occupancy Classifications

Chapter 3: Assembly Classifications: Exceptions

- 303.1.3 Assembly Uses included within Group E
- 303.1.4 Education/rooms < 100 part of A-3 worship
- 303.3 Kitchens included in A-2 dining facilities
- 303.4 Gyms, pools, courts with no spectator seating
- 303.4 Indoor sports with spectator seating



Use & Occupancy – Group B

Section 304.1 Business

- Airport traffic control towers
- **Ambulatory care facilities (CT FSC)**
- Animal hospitals, kennels and pounds
- Banks
- Barber and beauty shops
- Car wash
- Civic administration
- **Clinic, outpatient (IBC)**
- Dry cleaning
- Educational occupancies for students above the 12th grade
- And More.....



Use & Occupancy - Group E

Section 305 Group E: Educational



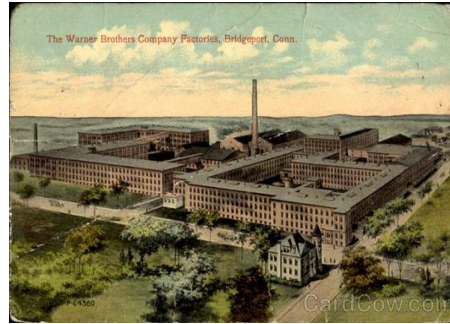
New Sub-Sections

- Schools for 6+ people ≤ 12th grade
 - ✓ 305.1.1 Accessory to places of religious worship: classified as Group A-3
- Day care for > 6 children at least age 3+ years old.
 - ✓ 305.2.1 within places of religious worship
 - ✓ 305.2.2 Five or fewer children
 - ✓ Six or fewer children in a dwelling unit classified as Group R-3

Use & Occupancy – Group F

Section 306 Group F: Factory

- **F-1 moderate-hazard** – all factory industrial uses not classified as Use Group F-2:
 - ✓ Aircraft manufacturing
 - ✓ Automobiles
 - ✓ **Food processing & commercial kitchens not associated with restaurants/cafes**
 - ✓ And Many More...
- **F-2 low-hazard** – industrial fabrication/ manufacturing of noncombustible materials:
 - ✓ Brick & Masonry
 - ✓ Metal products
 - ✓ Beverages



Use and Occupancy – Group H

Section 307 Group H – High Hazard

- H-1 – detonation hazard
- H-2 – deflagration or accelerated burning hazard
- H-3 – readily supports combustion or poses physical hazard
- H-4 – health hazard
- H-5 – semiconductor fabrication and similar R&D
- Detached Building (IBC errata)
307.1 Lots of new exceptions for uses (13) added.
- **307.1.1 New H-Use Requirements (IFC 415)**
- **307.2 New Definitions moved to Chapter 2:**
 - ✓ Baled Cotton (AMD)
 - ✓ Baled Cotton; Densely Packed (ADD)
 - ✓ Day Box (ADD)
 - H1 storage method)
 - ✓ Inert Gas
- **307.5.2 Consumer Fireworks (coordinated w/FSC NFPA 1124)**

Use and Occupancy – Institutional Care

308.3 I-1 Conditions 1 & 2

- 202 Definitions:
- Personal Care – assistance in general task
- Medical Care – unable to respond
- Incapable of Self-preservation
- 24-hour care
- Custodial Care – evacuate during emergencies
- 308.3 I-1; R-4 limited: 4 to 16 occupants; uses 13R
 - ✓ Condition 1 - Physical limitations (slow)
 - ✓ Condition 2 - Cognitive limitations; 10% HCP
- 308.4.3 – See 407.13 alternative for I-2 homes w/ 4-6 clients



Use and Occupancy – Institutional Care

I-1 308.3 Classifications

Condition 1

- (AMD) Now allows for “house” living arrangements
- Patient rooms – suite arrangements
- Shared living spaces w/kitchens

Condition 2

- More single-occupancy rooms
- Increased smoke compartmentation to 40 ksf from 22 ksf
- Other changes
- Door locking arrangements
- Moving beds through egress corridors
- Limits on flammable materials
- Evacuation arrangements (defend in place strategy)

Use & Occupancy - Institutional

Section 308 – Group I

General:

- **(AMD) 308.6 Group I-4 – Adult and child day care facilities.**
 - ✓ **(AMD) 308.6.1 Adult care facility**
 - ✓ **Group A-3** if incapable of responding to emergency w/o help.
 - **(AMD) 308.6.2 Child care facility**
 - ✓ **Group E** if located on level of exit discharge w/ exit door leading directly to exterior.
 - ✓ **Group R-3** if Family day care home ≤ 6 children
- Coordinates w/state fire code



Use & Occupancy - Mercantile

Section 309.1 – Group M

- Display and sale of merchandise
- Includes C-stores dispensing motor fuels
 - ✓ Subject to special increased storage limits for hazardous materials; Table 414.2.5

Use & Occupancy - Residential

Section 310 – Group R: CT Amendments

New terms added/amended:

- Bed & Breakfast Establishment
- Guest Room
- Hotel



- 3010.3 R-1 – transient hotels, motels; **B&B's**
- R-2, 3, 4 residential > 3 stories high
- 310.4 R-2 – non-transient apartments, dormitories
- 310.5 R-3 – Adult and child day care for < 5 people, < 24-hrs
- (DEL) 310.5.2 Lodging houses
- 310.6 R-4 – Residential care/assisted living with 5 to 16 people excluding staff

Chapter 3 – Classification of Use & Occupancy

Section 311 – Group S: Storage

- S-2 low-hazard – storage of noncombustible materials
- S-1 moderate-hazard – storage uses not classified as Use Group S-2



Chapter 3 – Classification of Use & Occupancy

Section 312 – Group U: Utility & Miscellaneous



- Carports/Private Garages
- Barns/Sheds
- Fences > 6 ft and retaining walls
- Tanks/Towers
- Retaining wall guards

Special Detailed Requirements

General Information – Use Groups

- Some sub-sections deleted from old 2003 edition.
- New definitions added to existing terms.
- NEW sections introduced in 2012; mostly by IBC
- **419 Live / Work Units**
- **420 Groups I-1, R-1, R-2, R-3 & R-4**
- **421 Hydrogen Fuel Gas Cutoff Rooms**
- **422 Ambulatory Care Facilities (including CT 420)**
- **423 Storm Shelters**
- **424 Play Structures (Within Buildings)**
- **425 Hyperbaric Facilities**
- **426 Combustible Dusts, Grain Processing & Storage**
- **427 Group E Preschool and Primary Occupancies**

Covered Mall Buildings

Section 402 Large Mixed-Use Spaces



- 402.1.1 Must be surrounded on all sides by permanent open space.
- 402.1.2 Perimeter line shall be established.

High Rise Buildings

Section 403.3 Construction over 75 feet high

403.2 Automatic Sprinkler System— Construction

403.2.1.1 Type IA construction in buildings \leq 420 feet height permitted to be reduced to the min. *fire-resistance ratings* for the building elements in Type IB.

403.4 Emergency Systems

- Smoke Detection
- Fire Alarms
- Standpipes
- Voice Alarms
- Responder Radio
- Fire Command Center
- Smoke Removal
- Standby & Emergency Power

403.5.2 Additional Egress stairway - 2012 (over 1006.3 # of exits)

- Communications system
- Smokeproof enclosures
- Luminous egress path markings

Building Height in Stories

403.6 High-Rise Buildings



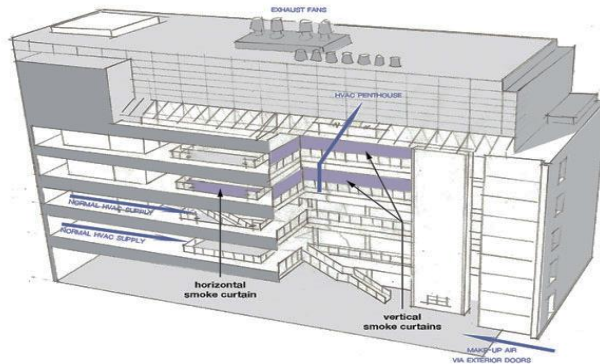
- High-Rise > 75 feet;
- Special Provisions for buildings \geq 420 feet
- Elevator / Lobby Requirements (**3006.1 - new**)

Atriums

Section 404.3 Automatic Sprinkler Protection

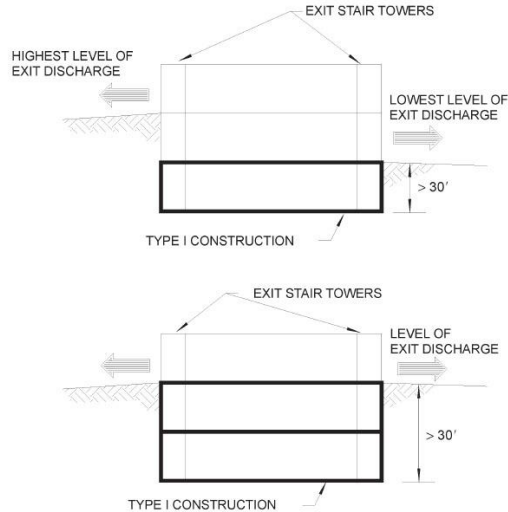
- 404.1.2 Not applicable to vertical openings in Group R-1 bed & breakfast
- (AMD) 404.3 Automatic sprinkler system installation required.
- 404.4 Fire Alarm system required
- 404.5 Smoke control system required for buildings connecting > 2 stories.

404.6 Exception: Glazed wall substitute for fire barrier under 3 distinct conditions



Underground Buildings

Section 405 Construction requirements



Motor Vehicle-Related Occupancies

Section 406 Garages; Fuel Dispensing; Repairs

- ✓ 406.2 Definitions:
 - ✓ Mechanical-Access Open Parking Garages
 - ✓ Open Parking Garage
 - ✓ Ramp-Access Open Parking Garages
 - ✓ 406.3.4 Separation of private garages (AMD)
 - ✓ Garage walls, Ducts
 - 406.4 Public Parking Garages amends height, guards & barriers (IBC)
 - 406.5 Open Parking Garages
 - 406.7 Motor fuel-dispensing facilities
 - 406.8 Repair garages

Table 406.5.4 Open Parking Garages Area & Height

TABLE 406.5.4
OPEN PARKING GARAGES AREA AND HEIGHT

TYPE OF CONSTRUCTION	AREA PER TIER (square feet)	Ramp access	HEIGHT (in tiers)	
			Mechanical access	
			Automatic sprinkler system	
			No	Yes
IA	Unlimited	Unlimited	Unlimited	Unlimited
IB	Unlimited	12 tiers	12 tiers	18 tiers
IIA	50,000	10 tiers	10 tiers	15 tiers
IIB	50,000	8 tiers	8 tiers	12 tiers
IV	50,000	4 tiers	4 tiers	4 tiers

For SI: 1 square foot = 0.0929 m².



Open Parking Garages

Table 406.5.4 Area & Height

Construction Type	Area per Tier (9'6" /tier)	Height (in tiers)		
		Ramp Access	Mechanical Access	
			Automatic Sprinkler	
			NO	YES
IA	Unlimited	Unlimited	Unlimited	Unlimited
IB	Unlimited	12	12	18
IIA	*50,000 sf	10	10	15
IIB	*50,000 sf	8	8	12
IV	50,000 sf	4	4	4

406.5.5 : Area & height Increases

- 50% open perimeter: 25% and one tier
- 100% open perimeter: 50% and one tier
- Type II unlimited area with 100% open perimeter

Medical Care Group I-2

Section 407 Egress; Protections; Exceptions; Compliance Option

- **407.2 Corridors Continuity & Separation**
 - ✓ 407.2.1 *Waiting Areas open to corridor, not occupied as sleeping room/treatment room etc, protected by automatic fire detection system, & smoke compartment protected by automatic fire detection system.*
- **407.2.2 Care Providers' Stations permitted to be open to corridors**
- **407.2.3 Psychiatric Treatment Area permitted to be open to corridors if :**
 - ✓ *Each area ≤ 1,500sf, located to allow for supervision by staff, area arranged so as not to obstruct any required exits, equipped with an automatic fire detection system, one space per one smoke compartment, walls & ceilings constructed as required for corridors.*
- **407.2.4 Gift Shops ≤ 500 sf permitted to be open to corridor**
- **407.11 Outside door or window per patient room**
- **407.12 Laboratories protected under NFPA 99-2002**
- **407.4 Means of Egress**
 - ✓ **(AMD) 407.11 Locking devices not restrictive of the MOE from patient room**
 - ✓ *Unlocking of all devices required to move a patient from smoke compartment to refuge area.*
- **407.13 Anesthetizing locations protected**
- **407.14 Medical gas**
- **407.15 Small group home alternative compliance**

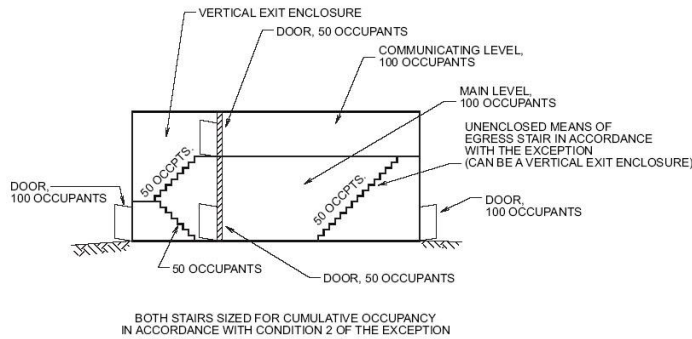


Prisons, Jails, Confined Care

Section 408 Group I-3 Institutional

- 408.1.1 Definitions
 - Cell
 - Cell Tier
 - Housing Unit
 - Sallyport
- **408.3.8 (NEW)** Interior exit stairway & ramp construction
 - **408.5** Vertical Openings protected by a shaft enclosure (*Definition Change*)
 - **408.7 (NEW)** Security Glazing
 - **408.10 (NEW)** Fire Alarm System

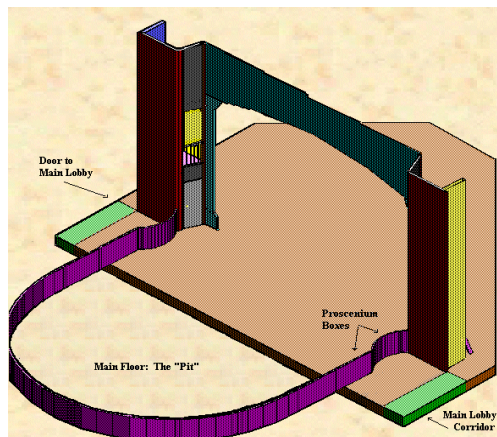
Figure 408.5(2) Group I-3 Commentary



Stages and Platforms

Section 410 Protections and Safety Features

- Definitions:
 - ✗ Fly Gallery, Girdiron, Pin Rail ~~Deleted~~
 - ✓ **410.2 Proscenium Wall, Technical Production Area (NEW)**
- **410.6 Means of Egress (AMD)**
- 410.7 Automatic sprinkler system required
- 410.8 Standpipe system required



Hazardous Materials

Section 414 Table 414.2.2 Design and # of Control Areas

(F) TABLE 414.2.2
DESIGN AND NUMBER OF CONTROL AREAS

FLOOR LEVEL	PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA*	NUMBER OF CONTROL AREAS PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS*
Above grade plane	Higher than 9	1	2
	7-9	2	2
	6	2	2
	5	2	2
	4	2	2
	3	2	1
	2	3	1
Below grade plane	1	4	1
	75	3	1
	50	2	1
Lower than 2	Not Allowed	Not Allowed	Not Allowed

■ **414.7.2 Dispensing, use & handling**

- *Emergency telephone system, local manual alarm station*

■ **414.7.3 (ERRATA) Supervision and monitoring**

■ **414.2 Control areas**

✓ **414.2.4 Fire-resistance-rating requirements (NEW SUB-SECTION)**

- ✓ *Fire-resistance-rating ≥ 2hrs*

Exception: Allowed to be 1hr fire-resistance rated in buildings of **Types IIA, IIIA, & VA** construction provided there is automatic sprinkler system in **building ≤ 3 stories** above grade.

HAZMAT (continued)

Section 415 High hazard occupancies: Reorganization w/extensive IBC & CT amendments

■ **415.2 NEW Definitions:**

- Detached Building,
- Physiological Warning
- Threshold Level

■ **415.3 Automatic Fire Detection System** required (NEW)

■ **415.4 Automatic Sprinkler System** required (NEW)

■ **415.5 Fire Separation Distance** (NEW)

- ✓ *In Groups H-2 & H-3 not < 25% of perimeter wall shall be an exterior wall.*
- ✓ **Exceptions:** Liquid use w/floor area ≤ 500 sf, Liquid storage rooms w/ floor area ≤ 1,000 sf, Spray paint booths



Residential: Groups I-1, R-1, R-2, R-3

NEW Section 420

- 420.2 Separation Walls
- 420.3 Horizontal Separation
- 420.4 Automatic Sprinkler System
- 420.5 Smoke Detection & Fire Alarm System



Ambulatory Care Facilities

NEW Section 422 – Use Group B

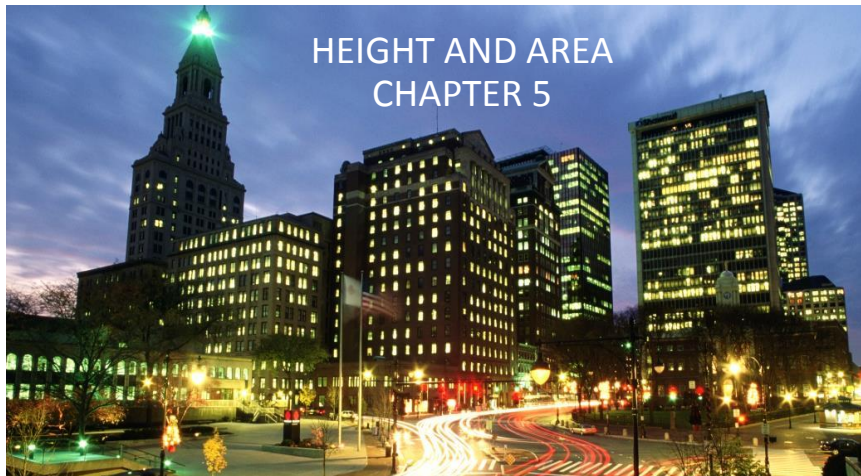
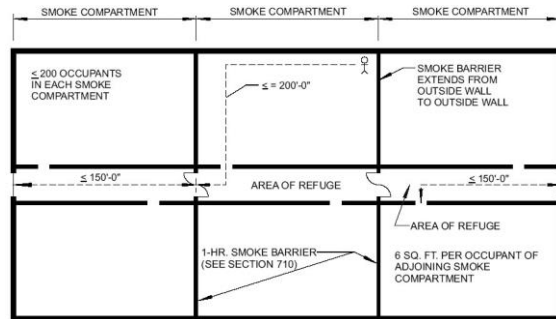
- 422.2 Separation
- 422.3 Smoke compartments
- 422.4 Refuge area
- 422.5 Independent egress
- 422.6 Laboratories
- 422.7 Medical Gas systems



Group E

NEW SECTION 427

- **427.1 Proximity to the level of exit discharge**
 - ✓ **427.1.1 Preschool, kindergarten & first grade located on level of discharge**
 - ✓ **427.1.2 Second grade rooms located not more than 1 story above level of discharge**
- **427.2 Compartmentation – Group E occupancies subdivided into compartments by smoke barriers**



Q. Are CT-specific editions of IBC/IRC barred to show: changes? Amendments?

General Information

Section 501.1 Scope: Structures and Their Additions

Changes:

- Definition changes
- Deleted Sub-Sections
- Change in wording
- 2 New Sections 509 & 510

Based on 3 main items:

- Open perimeter
- Fire Separation/Suppression
- Mixed occupancy

Special Conditions:S

- Unlimited area buildings
- Open parking structures

Definitions in Chapter 2:

- Equipment Platform (NEW)
- ~~Height Story~~
- ~~Industrial Equipment Platform~~
- ~~Story~~ (ALL DELETED)

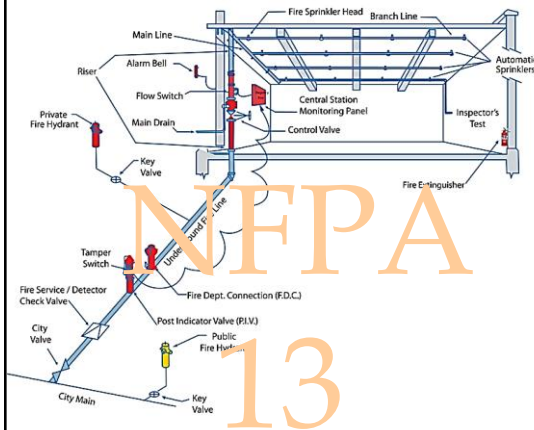
Exceptions

- 503.1.1 Special Industrial Uses

Area Increases Due to Sprinkler Protection

Tables 504.3 Building Stories; 504.4 Building Height in Feet

Know Your Fire Sprinkler Systems Components



- 903.2.11.7 All buildings > 4 stories in height must be sprinklered per CT 29-315
- 903.3.1.1 – NFPA 13 Full Systems
- 903.3.1.2 – NFPA 13R systems
- 903.3.1.3 – NFPA 13D systems
- NS - No sprinkler protection
- Table 903.2.11.6 Add'l. rqmts.
- 901.6.1 Monitoring exception

Building Height

Table 504.3 Allowable Building Height In Feet Above Grade Plane

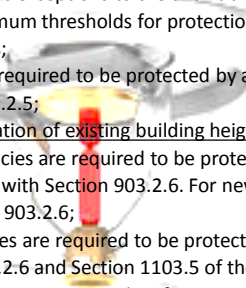
OCCUPANCY CLASSIFICATION	See Footnotes	TYPE OF CONSTRUCTION								
		Type I		Type II		Type III		Type IV	Type V	
		A	B	A	B	A	B	HT	A	B
A,B,E,F,M,S,U	NS ^b	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
H-1, H-2, H-3, H-5	NS ^{c,d}	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
H-4	NS ^{c,d}	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
I-1 Condition 1, I-3	NS ^{d,e}	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
I-1 Condition 2, I-2	NS ^{d,e,f}	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
I-4	NS ^{d,g}	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
R	NS ^{d,h}	UL	160	65	55	65	55	65	50	40
	S13R	60	60	60	60	60	60	60	60	60
	S	UL	180	85	75	85	75	85	70	60

Building Height & Number of Stories

Tables 504.3, 504.4 Number of Stories / Feet Above Grade Plane (NOTES)

Note: UL = unlimited height; NS = buildings not equipped throughout with an automatic sprinkler system; S = buildings equipped throughout with an automatic sprinkler system installed in accordance with 903.3.1.1; S13R = buildings equipped throughout with an automatic sprinkler system installed in accordance with 903.3.1.2

- a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter;
- b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies;
- c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5;
- d. NS value is used only for evaluation of existing building height in accordance with IEBC;
- e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of 903.2.6;
- f. New and existing I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with 903.2.6 and Section 1103.5 of the *International Fire Code*;
- g. For new I-4 occupancies, see Exceptions 2 and 3 of 903.2.6;
- h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with 903.2.8.
- i. E occupancies shall have automatic sprinkler systems in accordance with 29-315 CGS



504.4 Number of Stories

Table 504.4 Number of Stories Above Grade Plane

OCCUPANCY CLASSIFICATION	See Footnotes	TYPE OF CONSTRUCTION									
		Type I		Type II		Type III		Type IV	Type V		
		A	B	A	B	A	B	HT	A	B	
A-1	NS ^b	UL	5	3	2	3	2	3	2	1	
	S	UL	6	4	3	4	3	4	3	2	
A-2, A-3, A-4	NS	UL	11	3	2	3	2	3	3	1	
	S	UL	12	4	3	4	3	4	4	2	
A-5	NS	UL	U	U	U	UL	UL	UL	UL	UL	
	S	UL	L	L	L	UL	UL	UL	UL	UL	
B	NS	UL	11	5	3	5	3	5	3	2	
	S	UL	12	6	4	6	4	6	4	3	
E	NS	UL	5	3	2	3	2	3	1	1	
	S	UL	6	4	3	4	3	4	2	1	
F-1	NS	UL	11	5	3	4	2	4	2	1	
	S	UL	12	6	4	5	3	5	3	2	
F-2	NS	UL	11	5	3	4	3	5	3	2	
	S	UL	12	6	4	5	4	6	4	3	
H-1	S, NS	1	1	1	1	1	1	1	1	NP	
H-2	S, NS ^{c,d}	UL	3	2	1	2	1	2	1	1	
H-3	S, NS ^{c,d}	UL	12	6	4	5	4	6	4	3	
H-4	NS ^{c,d}	UL	7	5	3	5	3	5	3	2	
	S	UL	8	6	4	6	4	6	4	3	
H-5	S, NS ^{c,d}	4	4	3	3	3	3	3	3	2	
	NS ^{e,g}	UL	9	4	3	4	3	4	3	2	
I-1 Condition 1	S	UL	10	5	4	5	4	5	4	3	
	NS ^{g,h,i}	UL	9	4	3	4	3	4	3	2	
I-1 Condition 2	S	UL	10	5	3	4	3	4	3	2	
	NS ^{g,i}	UL	4	2	1	1	NP	1	1	NP	
I-2	S	UL	5	3	1	1	NP	1	1	NP	
	NS ^{g,h}	UL	4	2	1	2	1	2	2	1	
I-3	S	UL	5	3	2	3	2	3	3	2	
	NS ^{g,h}	UL	4	2	1	2	1	2	2	1	

504.4 Number of Stories

Table 504.4 Number of Stories Above Grade Plane (cont.)

OCCUPANCY CLASSIFICATION	See Footnotes	TYPE OF CONSTRUCTION									
		Type I		Type II		Type III		Type IV	Type V		
		A	B	A	B	A	B	HT	A	B	
I-4	NS ^{4,e}	UL	5	3	2	3	2	3	1	1	
	S	UL	6	4	3	4	3	4	2	2	
	NS	UL	11	4	2	4	2	4	3	1	
M	S	UL	12	5	3	5	3	5	4	2	
	NS ^{4,h}	UL	11	4	4	4	4	4	3	2	
R-1, R-2, R-4	S13R	4	4						4	3	
	S	UL	12	5	5	5	5	5	4	3	
R-3	NS ^{4,h}	UL	11	4	4	4	4	4	3	3	
	S13R	4	4						4	4	
	S	UL	12	5	5	5	5	5	4	4	
S-1	NS	UL	11	4	2	3	2	4	3	1	
	S	UL	12	5	3	4	3	5	4	2	
S-2	NS	UL	11	5	3	5	3	4	4	2	
	S	UL	12	6	4	5	4	5	5	3	
U	NS	UL	5	4	2	3	2	4	2	1	
	S	UL	6	5	3	4	3	5	3	2	



Mezzanines

505. 2 Mezzanines

- Aggregate area: $\leq 1/3$ of floor space / room in which located
 - $2/3$ for Special Industrial Occupancies (503.1.1) Type I or II
 - $1/2$ for Type I or II construction; w/voice alarm
- Shall not contribute to the *building area* or number of stories
- Shall contribute to the occupant load and the fire area
- Shall have < 7 foot clear headroom above and below
- Some Exceptions to Openness:
 - Occupant load ≤ 10
 - Access to two or more exits (except Groups H & I)
- Equipment platforms shall not be considered a part of mezzanine area

Building Area Determinations

Table 506.2 Allowable Area Factor / sf

Occupancy Classification	See Footnote	TYPE OF CONSTRUCTION									
		Type I		Type II		Type III		Type IV	Type V		
		A	B	A	B	A	B	HT	A	B	
A-1	NS	UL	UL	15,500	8,500	14,000	8,500	15,000	11,500	5,500	
	S1	UL	UL	62,000	34,000	56,000	34,000	60,000	46,000	22,000	
	SM	UL	UL	46,500	25,500	42,000	25,500	45,000	34,500	16,500	
A-2, A-3, A-4	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000	
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000	
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	11,500	6,000	
A-5	NS	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000	
	S1	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000	
	SM	UL	UL	112,500	69,000	85,500	57,000	108,000	74,000	38,000	
B	NS	UL	UL	26,500	14,500	23,500	14,500	25,500	18,500	9,500	
	S1	UL	UL	106,000	58,000	94,000	58,000	102,000	74,000	38,000	
	SM	UL	UL	79,500	43,500	70,500	43,500	76,500	55,500	28,500	
E	NS	UL	UL	25,000	15,500	19,000	12,000	33,500	14,000	8,500	
	S1	UL	UL	100,000	62,000	76,000	48,000	134,000	56,000	34,000	
	SM	UL	UL	75,000	46,500	57,000	36,000	100,500	42,000	25,500	
F-1	NS	UL	UL	37,500	23,000	28,500	18,000	50,500	21,000	13,000	
	S1	UL	UL	150,000	92,000	114,000	72,000	202,000	84,000	52,000	
	SM	UL	UL	112,500	69,000	85,500	54,000	151,500	63,000	39,000	
H-1	NS	UL	UL	75,000	46,500	57,000	36,000	100,500	42,000	25,500	
	S1	UL	UL	37,500	23,000	28,500	18,000	50,500	21,000	13,000	
	SM	UL	UL	150,000	92,000	114,000	72,000	202,000	84,000	52,000	
H-2	NS	UL	UL	112,500	69,000	85,500	54,000	151,500	63,000	39,000	
	S1	UL	UL	21,000	16,500	11,000	7,000	10,500	7,500	3,000	
	SM	UL	UL	60,000	26,500	14,000	17,500	13,000	10,000	5,000	
H-3	NS	UL	UL	37,500	23,000	28,500	17,500	36,000	18,000	6,500	
	S1	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000	
	SM	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000	
H-4	NS	UL	UL	112,500	69,000	85,500	57,000	108,000	74,000	38,000	
	S1	UL	UL	75,000	46,500	57,000	36,000	100,500	42,000	25,500	
	SM	UL	UL	21,000	16,500	11,000	7,000	10,500	7,500	3,000	
H-5	NS	UL	UL	37,500	23,000	28,500	17,500	36,000	18,000	6,500	
	S1	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000	
	SM	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000	



Building Area Determinations

Table 506.2 Allowable Area Factor /sf (cont.)

Occupancy Classification	See Footnote	Type I		Type II		Type III		Type IV	Type V	
		A	B	A	B	A	B	HT	A	B
I-1	NS	UL	55,000	19,000	10,000	16,500	10,000	18,000	19,500	4,500
	S1	UL	220,000	76,000	40,000	66,000	40,000	72,000	42,000	18,000
	SM	UL	165,000	57,000	30,000	49,500	30,000	54,000	31,500	13,500
I-2	NS	UL	UL	15,000	11,000	12,000	NP	12,000	9,500	NP
	S1	UL	UL	60,000	44,000	48,000	NP	48,000	38,000	NP
	SM	UL	UL	45,000	33,000	36,000	NP	36,000	28,500	NP
I-3	NS ^{1a}	UL	UL	15,000	10,000	10,500	7,500	12,000	7,500	5,000
	S1	UL	UL	45,000	40,000	42,000	30,000	48,000	30,000	20,000
	SM	UL	UL	45,000	30,000	31,500	22,500	36,000	22,500	15,000
I-4	NS ^{1a}	UL	UL	60,500	26,500	13,000	23,500	13,000	25,500	18,500
	S1	UL	121,000	106,000	52,000	94,000	52,000	102,000	74,000	36,000
	SM	UL	181,500	79,500	39,000	70,500	39,000	76,500	55,500	27,000
M	NS	UL	UL	21,500	12,500	18,500	12,500	20,500	14,000	9,000
	S1	UL	UL	86,000	50,000	74,000	50,000	82,000	56,000	36,000
	SM	UL	UL	64,500	37,500	55,500	37,500	61,500	42,000	27,000
R-1, R-2, R-4	NS ^{1a}	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
	S1	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000
	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000
R-3	NS ^{1a}	UL	UL	UL	UL	UL	UL	UL	UL	UL
	S1	UL	UL	UL	UL	UL	UL	UL	UL	UL
	SM	UL	UL	UL	UL	UL	UL	UL	UL	UL
S-1	NS	UL	46,000	26,000	17,500	26,000	17,500	25,500	14,000	9,000
	S1	UL	102,000	104,000	70,000	104,000	70,000	102,000	56,000	36,000
	SM	UL	144,000	78,000	52,500	78,000	52,500	76,500	42,000	27,000
S-2	NS	UL	79,000	39,000	26,000	39,000	26,000	38,500	21,000	13,500
	S1	UL	316,000	156,000	104,000	156,000	104,000	154,000	84,000	54,000
	SM	UL	237,000	117,000	78,000	117,000	78,000	115,500	63,000	40,500
U	NS	UL	35,500	19,000	8,500	14,000	8,500	18,000	9,000	5,500
	S1	UL	142,000	76,000	34,000	56,000	34,000	72,000	36,000	22,000
	SM	UL	106,500	57,000	25,500	42,000	25,500	54,000	27,000	16,500



Tabular Building Area Notes

Table 506.2 NOTES

- Note: UL = unlimited height; NS = buildings not equipped throughout with an automatic sprinkler system; S = buildings equipped throughout with an automatic sprinkler system installed in accordance with 903.3.1.1; S13R = buildings equipped throughout with an automatic sprinkler system installed in accordance with 903.3.1.2
- See Chapters 4 for specific exceptions to the allowable height in this chapter;
- See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies;
- New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5;
- NS value used only for evaluation of existing building height in accordance with the IEBC;**
- New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 0,500 occupancies, Condition 1, see Exception 1 of 903.2.6;
- New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with 903.2.6 and Section 1103.5 of the *International Fire Code*;
- For new I-4 occupancies, see Exceptions 2 and 3 of 903.2.6;
- New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with 903.2.8.



BOCA Plan Review Record (for the Record)

Section 503 (old)

GENERAL BUILDING LIMITATIONS (Chapters 5 & 6)	
Address identification (501.2)	
Apply Case 1 to determine the allowable height and area and permitted types of construction for a building containing a single occupancy or nonseparated mixed occupancies. Apply Case 2 to determine the allowable height and area and permitted types of construction for a building containing separated mixed occupancies.	
AREA MODIFICATIONS TO TABLE 503	
Allowable tabular area, A_t (Table 503)	_____ 1
Area Increase Factor due to frontage, I_f (506.2)	+ _____
Area Increase Factor due to automatic sprinklers, I_s (506.3)	+ _____
Conversion factor	= _____

Frontage (506.2)	North	East	South	West	
Total Frontage (F)	_____ ft.				Perimeter (P) _____ ft.
Width of open space (W) = _____					
Area Increase Factor due to frontage, I_f (506.2)					
$I_f = \left[\frac{F}{P} - 0.25 \right] \frac{W}{30}$					

CASE 1 — SINGLE OCCUPANCY OR NONSEPARATED MIXED OCCUPANCIES (508.3)

Using Table 503, identify the allowable height and area of the single occupancy or the most restrictive of the nonseparated mixed occupancies. Construction types that provide an allowable tabular area equal to or greater than the adjusted building area and allowable heights (as modified by Section 504) equal to or greater than the actual building height are permitted.

DETERMINE CONSTRUCTION TYPE	CHECK ALLOWABLE AREA (506.4)
Actual building area _____ ft ²	Allowable area per floor (A_a) _____ ft ²
Adjusted building area _____ ft ² <small>actual building area ÷ conversion factor</small>	conversion factor × tabular area (Table 503) = _____ ft ²
Actual building height: _____ feet _____ stories	Total floor area (all stories) _____ ft ²
Allowable building height _____ feet _____ stories	Allowable floor area (all stories) _____ ft ²
Permitted types of construction _____	Allowable area per floor (A_a) × number of stories (maximum 3) = _____ ft ²
Type of construction assumed for review (502.1) _____	Compliance verified _____

Area Increase Due to Building Perimeter

506.2.1 Single-Occupancy, Single Story Buildings

$$A_a = A_t + (NS \times I_f) \quad \text{[Equation 5-1]}$$

- A_a = Allowable area
- A_t = Tabular allowable area (NS, S1, S13R) per Table 506.2
- NS = Non-sprinklered tabular allowable area factor per Table 506.2
- I_r = Area factor frontage increase (per 506.3)

506.2.2 Mixed Occupancy, One-story Buildings

- Use same formula for each separate use group to derive area
- Add use/occupancy type areas for each use
 - ✓ Do not add area increases for any H-2 or H-3 occupancies



EXAMPLE: Single-Story Area Increase

Use of Equation 5-1

- Group A-3 Free-Standing Restaurant with Banquet Facility
- Type VB construction; **14,000 square feet** – requires sprinkler (504.3”d”)
- 100% Open Perimeter (no parking that blocks fire access)
- EQUATION 5-5 Increase (includes sprinkler allowance*)

$$A = 24,000* + [6,000 \times (1.00 - 0.75)] = \underline{\mathbf{33,000 \text{ square feet}}}$$

T506.2 T506.2 Open Perimeter

Area Increase Due to Building Perimeter

506.2.3 Single-Occupancy, Multi-story Buildings

$$A_a = [A_t + (NS \times I_f)] \times S_a \quad \text{[Equation 5-2]}$$

- A_a = Allowable area
- A_t = Tabular allowable area (NS, S1, S13R) per Table 506.2
- NS = Non-sprinklered tabular allowable area factor per Table 506.2
- I_r = Area factor frontage increase (per 506.3)
- S_a = Actual # stories (cannot exceed four)
 - ✓ ≤ 3 (NS)
 - ✓ ≤ 4 (S13R)



EXAMPLE: Multi-Story Area Increase

Use of Equation 5-2

- Group B; R-2 Residential Building; 36 dwelling units; 12,000 sf/floor
- Type IIIB Construction; four-story; surface parking; sprinkled
 - ✓ Number of actual floors cannot exceed four using 13R system
- 75% Open Perimeter; fire access unavailable one side; surface parking
- Equation 5-5 increase (includes sprinkler allowance)
- $A = [16,000 + (7,000 \times 0.75 \times 0.75)] \times 4^* = 63,750$ square feet
- $A_{\text{actual}} = 48,000$ square feet

Area Increase Due to Building Perimeter

506.3 Mixed Occupancy, Multi-Story Buildings

$$A_a = A_t + (NS \times I_f) \quad \text{[Equation 5-3]}$$

- A_a = Allowable area
- A_t = Tabular allowable area (NS, S1, S13R) per Table 506.2
- NS = Non-sprinklered tabular allowable area factor per Table 506.2
- I_r = Area factor frontage increase (per 506.3)
- S_a = Actual # stories
 - ✓ ≤ 3 (NS)
 - ✓ ≤ 4 (S13R)



EXAMPLE: Multi-Story Area Increase

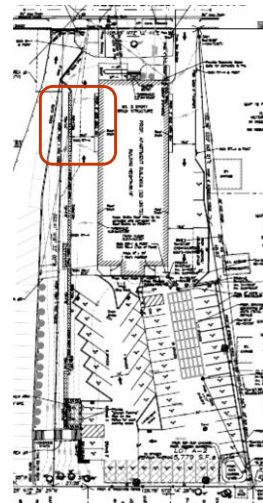
Use of Equation 5-3

- Group B Business Occupancies First Floor: 12,000 sf
- Group R-2 18 Dwelling Unit Occupancies: 12,000 sf - floors 2&3
- Type IIIB Construction; Three-story; surface parking; sprinkled
- 75% Open Perimeter; fire access unavailable one side; surface parking
- Equation 5-5 increase (includes sprinkler allowance)
- $A_B = [19,000 + (9,000 \times 0.75 \times 0.75)] \times 1^* = 24,062.5$ sf
- $A_R = [16,000 + (7,000 \times 0.75 \times 0.75)] \times 2^* = 39,875.0$ sf
 - Number of actual floors cannot exceed four using 13R system
- **Total Allowable is 63,937.5 sf**
- **$A_{\text{actual}} 3 \times 12,000$ sf = 36,000 sf**

Open Space (Unobstructed)

506.3 Frontage Increase Rules

- Minimum 25% of building perimeter faces:
- Unobstructed open space ≥ 20 feet from:
 1. Closest interior lot line to face of wall +
 2. Width of street, ROW +
 3. Exterior face of another building on lot
 - ✓ Calculate average width of any perimeter ≥ 20 but < 30 feet (Equation 5-4)
 - ✓ Add to remainder of perimeter ≥ 30 feet
- Amount of Increase is 75% of tabular value multiplied by adjusted perimeter factor (Equation 5-5)
- *Highlight is the side access to the street, limited by a retaining wall next to the P/L and a 3 ft. wide areaway against the side of the building*



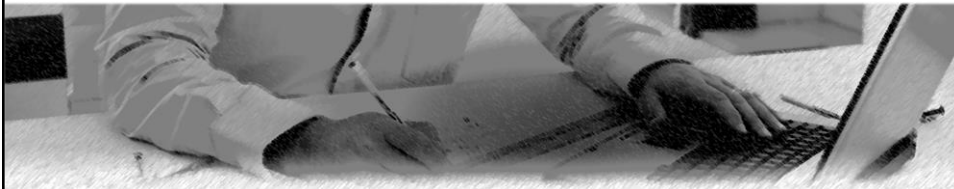
Calculating Frontage Increase

Where To Begin???



Frontage Increase

506.3 Access Rules Limitations



Buildings Using 503, 504, 506, 507

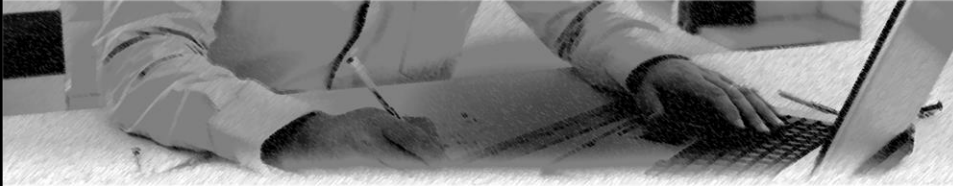
- Adjoin or have access to a public way
- Have $\geq 25\%$ perimeter $\geq 20'$ setback
 - ✓ On the same lot
 - ✓ From space dedicated for public use
 - ✓ Accessed from street or approved fire lane

Unlimited area buildings (507)
– rules change

- Have 100% perimeter $\geq 60'$ setback
- Limitations:
 - ✓ Uses
 - ✓ Stories
 - ✓ Egress

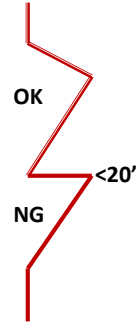
Calculating Frontage Increase

$$506.2 \quad W = (l_1 \times w_1 + l_2 \times w_2 + l_3 \times w_3 \dots + l_{30} \times w_{30}) / F \quad [\text{Equation 5-4}]$$



- W = weighted average of wall segments $\geq 20'$ to $30'+$
- l = wall segment setback (or average setback)
- F = Overall portion of Building Perimeter facing on setback ≥ 20 feet
- P = Entire perimeter of the building walls
- I_f = Increased area due to increased frontage:

$$I_f = [F/P - 0.25] W/30 \quad [\text{Equation 5-5}]$$



Unlimited Area Buildings

507.1 General



- Use Group(s)
- Types of Construction
- Sprinkler Protection
- Building Area - Limitations
- Building Height
- Open Perimeter
- Perimeter Exceptions
- Limitations

Unlimited Area Buildings

Section 507.1 General (New)

- 507.1 General (New section added)
 - ✓ Requires determination of open yards, public spaces around building
- 507.6 Group A-3 buildings of Type II Construction (Types Split)
- 507.7 Group A-3 buildings of Type III & IV Construction
 - ✓ Many additional specific limitations

Unlimited Area Buildings

507 Allowable Uses, Conditions

Use Groups	Code	S/NS	Stories	Setback	Limitations
F-2, S-2	507.3	NS	1	60'	
B, F, M, S	507.4	S	1	60' (40')	
A-4	"	S	1	60'	Exc. Type V
Mixed w/A-1 & A-2	"	S	1		Areas ≤ Tabular (w/o S)
B, F, M, S	507.5	S	2	60'	
A-3	507.6	S	1	60'	
A-3 Type III/IV	507.7	S	1	60'	M.O.E. ramps reqd.
H-2*, H-3, H-4	507.8	S	1*	60'	10% within Use Group
H-5	507.9	S	2	60'	Type 1 or II; ≤ tabular
E	507.10	S	1	60'	Or 1 ½ times height
E	507.11	S	1	60'	Type II, IIA, IV – 2 M.O.E.

Mixed Use and Occupancy

508.1 Accessory Uses; Limitations

- More than one Occupancy Group
- Exceptions:
 - ✓ Separated per 510 requirements
 - ✓ Group H-1, H-2, H-3 required to be detached structures by Table 415.6.2
 - ✓ Uses within *live/work units*
- Tabular area(NS) limits based on each classification 508.2.3
- 508.2 Allowable Building area and height
- 508.3 Non-separated occupancies
- 508.4 Separated Occupancies



Mixed Use and Occupancy

508.2 Accessory Uses

- 508.2.1 Code requirements comply for each separate Occupancy
- 508.2.2 Building height/# stories shall be for the principal Occupancy
- 508.2.3 Accessory Use aggregate area shall not exceed:
 - ✓ 10% of floor area of story wherein located
 - ✓ ≤ NS tabular area value in Table 506.2 for each Accessory Use
 - ✓ Non-separated other than for certain H, I-1 , R-1, R-2, R3 Uses

Mixed Use and Occupancy

508.3 Non-separated Occupancies

- 508.3.1 Classification based on the most restrictive height/area for uses
- High-rise buildings shall be restricted further by 403 compliance
- 508.3.2 Height and Area based on the most restrictive tabular value
- Separations required for:
 - Group H-2, H-3, H-4, H-5 occupancies
 - Group R-1, R-2 and R-3 occupancies



Mixed Use and Occupancy

508.4 Separated Occupancies

- 508.4.1 Occupancy separations shall comply with Table 508.4 values
- 508.4.2 Ratios of aggregate areas of each occupancy shall not exceed 1.
- 508.4.3 Each occupancy shall comply with height/# stories for its Use
- 508.4.4 Individual use areas shall be separated

Mixed Use and Occupancy

Table 508.4 Required Separation of Occupancies

OCCUPANCY	A ^d , E		I-1, I-3, I-4		I-2		R		F-2, S-2 ^b , U		B, 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	S	NS
A ^d , E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3 ^a
I-1, I-3, I-4	-	-	N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
I-2	-	-	-	-	N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R	-	-	-	-	-	-	N	N	1 ^c	2 ^c	1	2	NP	NP	3	NP	2	NP
F-2, S-2 ^b , U	-	-	-	-	-	-	-	-	N	N	1	2	NP	NP	3	4	2	3 ^a
B, F-1, M, S-1	-	-	-	-	-	-	-	-	-	-	N	N	NP	NP	2	3	1	2 ^a
H-1	-	-	-	-	-	-	-	-	-	-	-	-	N	NP	NP	NP	NP	NP
H-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	NP	1	NP
H-3, H-4, H-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 ^{e, f}	NP

S = Buildings equipped with an automatic sprinkler system in accordance with 903.3.1.1

NS = Buildings not equipped throughout with an automatic sprinkler system

N = No separation requirement

NP = Not permitted Required separation

a. See Section 420

b. Required separation from areas used only for private or pleasure vehicles shall be reduced 1 hr, but not less than 1hr

c. See Section 406.3.4

d. Separation is not required between occupancies of the same classification

e. See Section 422.2 for ambulatory care facilities



Incidental Use Separation and Protection

ROOM or AREA	Table 509 Incidental Uses	RATING or Suppression
Furnace Room: Any eqpt > 400 kBtuh		1 hr. OR suppression
Boiler Room: Any boiler > 15psi and 10hp		1 hr. OR suppression
Refrigerant Machinery Room		1 hr. OR suppression
Hydrogen Fuel Gas Room (other than Group H)		1 hr. B, F, M, S, U / 2 hr. A, E, I, R
Incinerator Rooms		2 hr AND suppression
Paint Shops (other than Group H) in other than Group F		2 hr AND suppression
Group E labs & VO-Tech shops other than Group H Use		1 hr. OR suppression
Labs in I-2 other than Group H		1 hr. AND suppression
Ambulatory Care labs other than Group H		1 hr. OR suppression
Laundry Rooms > 100 sf		1 hr. OR suppression
Laundry Rooms in I-2 > 100 sf		1hr.
I-3 cells / I-2 patient rooms with padded surfaces		1 hr.
I-2 Physical Plant Maintenance shops		1 hr.
Ambulatory Care or I-2 waste & linen collection w/bins > 10 cf		1 hr.
Waste & linen collection rooms > 100 sf		1 hr. OR suppression
Stationary battery storage systems > 50gal or 1,000# dry		1 hr. B, F, S, M, U / 2 HR. A, E
CT - Storage Rooms over 100 sf		1 hr. OR suppression

Special Provisions

Section 510 Modifications to height and area

- ***510.2 Horizontal building separation allowance***
- ***510.3 Group S-2 (open above enclosed)***
- ***510.4 Parking beneath Group R***
- ***510.5 Group R-1 & R-2 Type IIIA***
- ***510.6 Group R-1 & R-2 Type IIA***
- ***510.7 Open parking garage beneath Groups A, I, B, M & R***
- ***510.8 Group B or M below Group S-2 Open Parking Garage***
- ***510.9 Multiple buildings above a horizontal assembly***



Special Provisions

510.2 Horizontal Building Separation Allowance

- Minimum 3-hour* fire rating assembly
- Lower building: Type IA (any Use except H)
- Shafts, stair/ramp/escalator enclosures \geq 2-hours; **except**
 - ✓ Upper building can be < Type I construction
 - ✓ Enclosure connects < 4 stories
 - ✓ Opening protectives \geq 1-hour (not $\frac{3}{4}$ hour)
- Upper building(s): Group A (< 300 each); B, M, R or S
- Lower building is fully suppressed (903.3.1.1)
- Maximum building height \leq lowest allowed in Table 504.3

Special Provisions

510.3 Groups S-2 Enclosed Garage; Open Garage Above

- Allowable building area \leq sum of the individual actual areas divided by their tabular areas shall not exceed 1.0
- Enclosed garage Type I or II construction is equivalent to the fire resistant requirements of the open parking garage
- Height and # tiers of S-2 open parking garage must comply with Table 406.5.4
- Floor assembly separation shall meet S-2 requirements. Openings other than exits between the uses shall not be required to be protected
- S-2 parking garage is used exclusively for private motor vehicles but may contain incidental office, waiting and toilet rooms \leq 1,000 sf



Special Provisions

510.4 Parking Beneath Group R

- One story S-2 parking garage, Type I (enclosed) or Type IV (open) construction beneath an R Use Group building, the number of stories determining the minimum construction type shall be measured from the separating floor, provided that floor is the same type as the garage construction underneath, with a fire rating as required in 508.4

Special Provisions

510.5 / 510.6 Group R-1 & R-2

510.5 Type IIIA Construction

- Height of Group R-1 and R-2 buildings may be increased to six stories / 75 feet where the first floor above the basement has a fire rating of not less than 3 hours and the building is subdivided into not more than 3,000 square feet by 2 hour firewalls

510.6 Type IIA Construction

- Height of Group R-1 and R-2 buildings may be increased to nine stories / 100 feet where the first floor above the basement has a fire rating of not less than 1½ hours and the building is separated by not less than 50 feet from any other building and from the lot lines, and exits segregated in 2 hour enclosures.



Special Provisions

510.7 Open Parking Beneath Groups A, I, B, M, R

- Open parking garages under A, I, B, M and R Uses shall not exceed height and area limitations of 406.5. Uppermost story of the building shall not exceed the limitations of 503 for its Use Classification. Overall height and stories of garage and upper floors shall be measured from the grade plane of the building.

Special Provisions

510.8 Group B or M With Group S-2 Open Parking Above

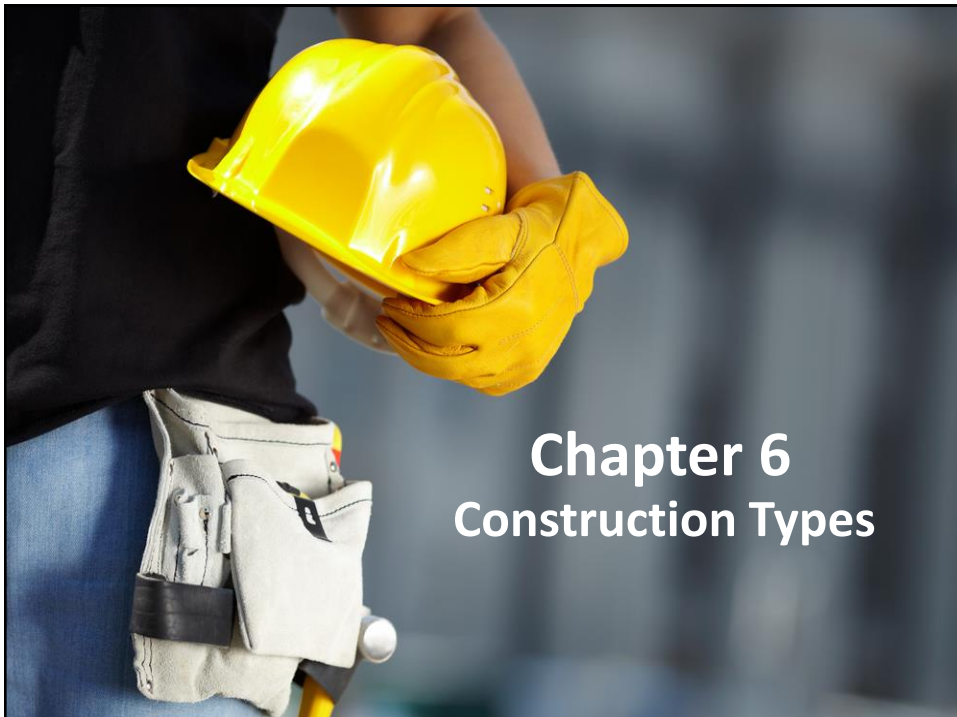
- Group B or M buildings located beneath a Group S-2 open parking garage of a lesser type of construction shall be considered as a separate and distinct building for determining the type of construction when in compliance with all of the following:
 1. Horizontal assembly separation of ≥ 2 hours
 2. Occupancies beneath are limited to Groups B and M
 3. Occupancy above limited to S-2 parking garage
 4. Building below is Type IA construction (see Exception Type IB/II)
 5. Height and Area of lower building shall not exceed limits of 503
 6. Height and Area of S-2 shall not exceed limits of 406.5
 7. Exits for S-2 garage shall be separated by 2 hour enclosures from B, M exits and discharge directly to the public way.



Special Provisions

510.9 Multiple Buildings Above a Horizontal Assembly

- Two or more buildings above the horizontal assembly separating an S-2 parking garage or building below and in compliance with 510.2, 510.3 or 510.8 shall be considered as separate and distinct from each other and shall comply with all other provisions applicable to each separate and distinct building.



Chapter 6 Construction Types



Types of Construction

Table 601 Fire Resistant Ratings for Building Elements (hours)

Building Element	Type I		Type II		Type III		Type IV	Type V	
	A	B	A ^d	B	A ^d	B	HT	A ^d	B
Primary structural frame	3	2	1	0	1	0	HT	1	0
Bearing Walls / Exterior	3	2	1	0	1	0	2	1	0
Interior	3	2	1	0	1	0	1/HT	1	0
Nonbearing walls; partitions Exterior	See Table 602								
Nonbearing walls; partitions Interior	0	0	0	0	0	0	Section 602.4.6	0	0
Floor construction; secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction; secondary members (see Section 202)	1.5	1	1	0	1	0	HT	1	0

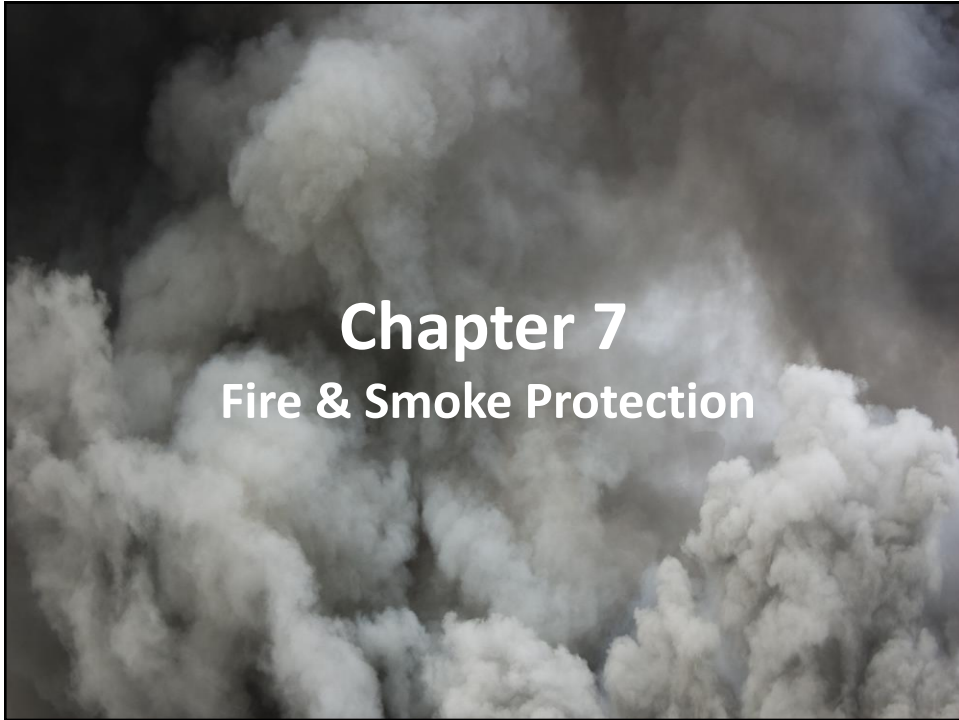
R-2 Mid-Rise Dwelling Units

602.3 Performance of R-2 Framing: 4 & 5 Stories



Issues:

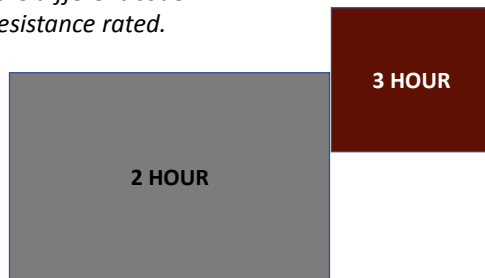
- Construction Type
- Use of FRT
- Penetrations and sealing
- Effective compliance



Chapter 7 – Fire & Smoke Protection

Section 701.2 Multiple Use Fire Assemblies

- Multiple purpose fire assemblies must comply with requirements for each adjoining use fire assembly.
- **For example:** Some building elements are required by two or more different code provisions to be fire-resistance rated.



Chapter 7 – Fire & Smoke Protection

Section 703.4 Automatic Sprinklers

- Sprinklers SHALL not used to establish fire-resistance rating.

Section 703.7 Marking & Identification

- Label fire walls/barriers/partitions, smoke barriers/partitions
- Permanent marking above ceilings.
- Located within 15ft of the end of each wall at intervals ≤ 30ft.
- Include lettering ≥ 3inches in height.



Chapter 7 – Fire and Smoke Protection

Section 705.2 Combustible Projections

- Projections into separation distances
- Structural stability

TABLE 705.2 MINIMUM DISTANCE OF PROJECTION

FIRE SEPARATION DISTANCE (FSD)	MINIMUM DISTANCE FROM LINE USED TO DETERMINE FSD
0 feet to less than 2 feet	Projections not permitted
2 feet to less than 5 feet	24 inches
5 feet or greater	40 inches

For SI: 1 foot = 304.8 mm; 1 inch = 25.4 mm.

Section 603.1 Fire-Retardant-Treated Wood

- Permitted:
 - ✓ Nonbearing partitions w/ fire-resistance rating 2 hours or less.
 - ✓ Nonbearing exterior walls where fire-resistance rated construction is not required.
 - ✓ Roof construction

Chapter 7 – Fire and Smoke Protection

Section 706.1 CT Amendments – Fire Walls

- Portions of buildings separated by one or more fire walls shall be considered separate buildings.
- Specific wall assemblies must comply with requirements.



Fire Separations of S-2 / R-2

706.4 Parking Garages Attached to Apartments

- Fire separation construction Table 706.4 – 2 hr.
- Allows single 90 min. access door opening on S-2 side (new 2015)
- Smoke barriers separating areas of refuge; elevator lobbies
- HVAC shaftway transitions protected with fire dampers where allowed
- New prescriptive requirements for plastic decking materials
- New provisions for water mist suppression systems (residential)
- Stand-alone section for CO detection Group E (from fire alarm rqmts)



Chapter 8 Interior Finishes

Interior Floor Finish

Section 804.4.2 Minimum Critical Radiant Flux

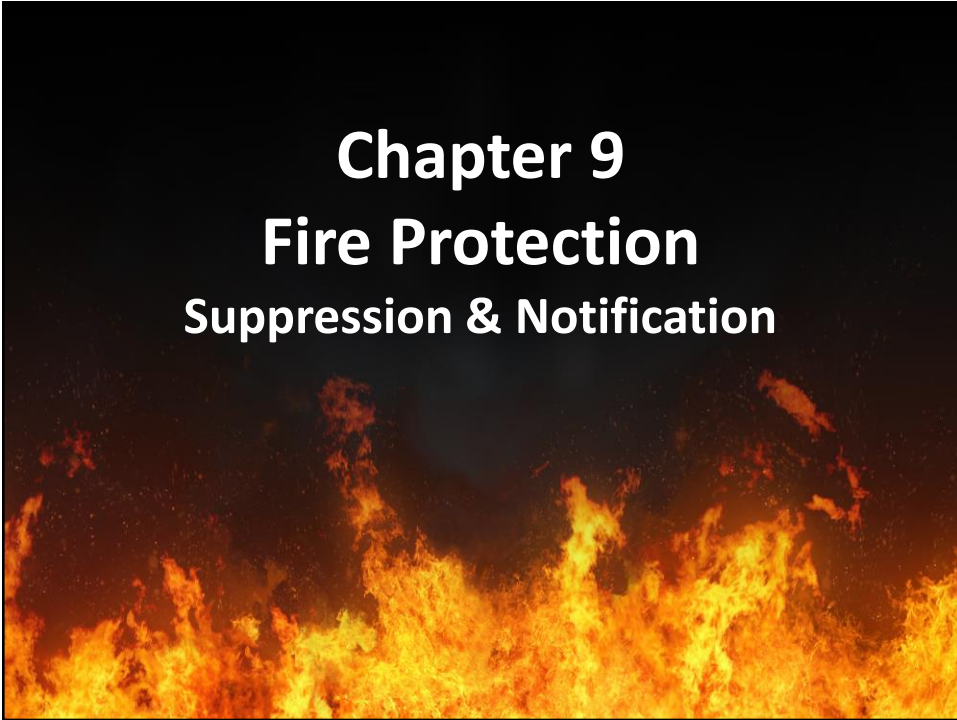
- Groups I-1, I-2 & I-3;
✓ Not less than Class I
- Groups A, B, E, H, I-4,
M, R-1, R-2, S;
✓ Not less than Class II



Chapter 9

Fire Protection

Suppression & Notification



Automatic Sprinkler Systems

Table 903.2.11.6 Specific Building Areas & Hazards

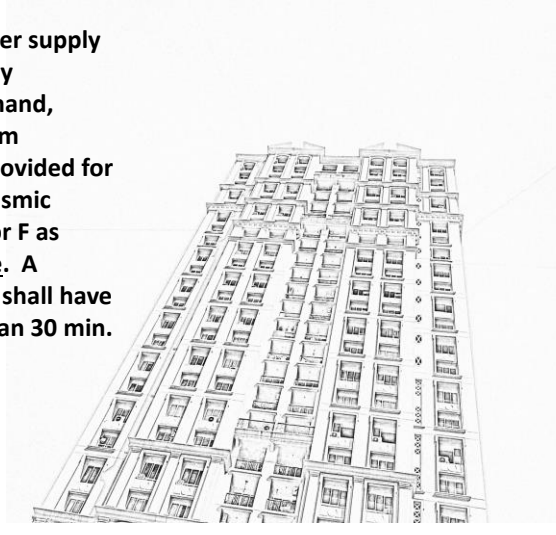
Section	Subject
402.5, 402.6.2	Covered and Open Mall Buildings
403.3	High-Rise Buildings
404.5	Atriums
405.3	Underground Structures
407.6	Group I-2
410.7	Stages
411.4	Special Amusement Buildings
412.3.6	Aircraft Traffic Control Towers
412.4.6, 412.4.6.1, 412.6.5	Aircraft Hangers
415.11.11	Group H-5 HPM exhaust ducts
416.5	Flammable Finishes
417.4	Drying Rooms
419.5	Live-Work Units
424.3	Children's Play Structures
507	Unlimited Area Buildings
509.4	Incidental Uses
1020.6.2.3	Smoke-Protected Assembly Uses
IFC	Requirements per Section 903.2.11.6 of the IFC



Secondary Water Supply

Section 403.3.3 CT Amendments – High-Rise Buildings

- A secondary on-site water supply equal to the hydraulically calculated sprinkler demand, including the hose stream requirement, shall be provided for high-rise buildings in Seismic design category C, D, E or F as determined by this code. A secondary water supply shall have a duration of not less than 30 min.



Piping Design - Standpipes

905.2.1 CT IFC/IBC Coordination



- Riser, supply and water service piping shall be sized to maintain residual pressure of ≥ 100 psi at the topmost outlet of each riser while flowing minimum specified water quantities based upon an available pressure of 150 psi at the service connection
 - ✓ Exception: In buildings equipped throughout with an automatic sprinkler system per 903.3.1.1 or 903.3.1.2, and where the highest floor level is not more than 150 ft. above the lowest level of fire department access, Class I standpipes shall have an automatic or manual-wet supply.

Fire Alarm & Detection Systems

Section 907

- Fire sprinklers and other suppressions systems/devices
- Emergency notification alarms



Smoke Control Panel

Section 909.16 CT Amendments (see Section 911)



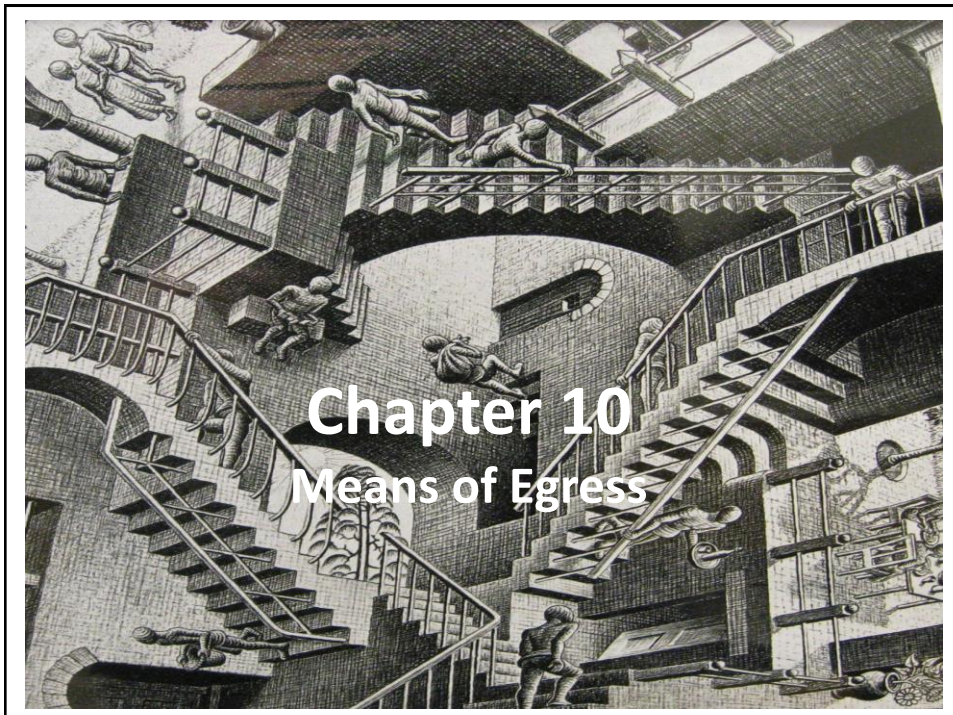
Fire Fighter smoke control panel

- Located in Fire Command center
- Used solely for emergency response
- In high-rise buildings
- In other buildings with smoke-protected assembly seating

Fire Department Connections

Section 912 (NEW)

- Locations
- Access
- Connection identifications
- Backflow prevention



Means of Egress - General

Section 1003 IBC General M.O.E.

- Controls the design, construction, & arrangement of the required means of egress
- Unlawful to alter a building to reduce the number of exits or capacity of the means of egress
- **Headroom 1003.2 adds 3 ceiling height exceptions: mezzanines, ramps, parking garages**



Maximum Floor Area Allowances

Table 1004.1.2 (Partial) - Occupant Loads by Use Type

TABLE 1004.1.2 MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR ^a
Accessory storage areas, mechanical equipment room	300 gross
Agricultural building	300 gross
Aircraft hangers	500 gross
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 runway, and for additional areas	7 net
Business areas	100 gross
Courtrooms-other than fixed seating areas	40 net
Day care	35 net
Dormitories	50 gross
Educational	
Classroom area	20 net
Shops and other vocational room areas	50 net
Exercise rooms	50 gross
Group H-5 Fabrication and manufacturing areas	200 gross

(NEW Uses)

- Day Care
- Malls
- Museums



Means of Egress Sizing

AMD Section 1005.1 Egress Width by Component, by Occupant Load



- Minimum width of M.O.E.
- (DEL) Table 1005.1; adds text
- Multiple M.O.E. widths
- (AMD) Encroachments
- Doors & handrails shall not decrease the means of egress by > seven (7) inches - Except when 34-48 inches AFF
- Non-structural protrusions shall not decrease the means of egress more than 1 ½ inches on each side

Exit Access

Section 1015 Spaces with Single Exit Access

TABLE 1015.1 SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E ^a , F, M, U	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-3, I-4, R	10
S	29

Travel Distance

Section 1016 Travel Distance Measurement

- Maximum distance, measured from the most remote point on the story along the natural and unobstructed path of egress travel

Table 1016.1 Exit Access Travel Distance

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200	250
I-1	Not Permitted	250
B	200	300
F-2, S-2, U	300	400
H-1	Not Permitted	75
H-2	Not Permitted	100
H-3	Not Permitted	150
H-4	Not Permitted	175
H-5	Not Permitted	200
I-2, I-3, I-4	Not Permitted	200

Egress Components

1001.2 The Exitway: Putting the Pieces Together

- EXIT ACCESS**
 - Common Path of Travel
 - Dead Ends
 - Corridors
 - Access stairways
- EXIT**
 - Remote Locations
 - Exit Stairs
 - Exit Convergence
 - Lobby / Vestibule
 - Exit Passageway
 - Horizontal Exits
- EXIT DISCHARGE**
 - Public Way
 - Area of Refuge
 - Balconies
 - Exterior Egress stairs
- ACCESSIBLE EXIT**
 - Remote Exit Locations
 - Stairway
 - Lobby
 - Exit Passageway



Egress Illumination

1006.2 Emergency Power

- CLICK



- Emergency electrical system power in buildings with two or more exits shall serve:
 - Corridors
 - Interior exit stairways
 - Interior exit ramps
 - Exit passageways
 - Exterior landings

Emergency Lighting

2015 Changes 1009.4, 1024; 1008.3

1009.2 MOE

- Exit Access
- Area of Refuge
- Exit Access stairs & ramps

EXIT

- Exit Stairways & ramps
- Exit Passageway
- 1009.4 Elevators & Access
- 1009.5 LULU's
- Vestibules, lobbies level of exit discharge
- Horizontal Exit
- Exit Discharge

2015 1008.3.3 (ADD)

- Electrical Equipment Rooms
- Fire Command Centers
- Fire Pump Room
- Generator Room
- Public Restrooms > 300sf

Other Requirements – M.O.E.

1006; 1007 Elevators Used as Exits

- M.O.E. 1015 Exit from Space & 1021 Exit from story folded into 1006 # exits/access doorways and 1007 Exit / exit access doorway configuration
- Exit access stair openings moved to 713; enclosure requirements given a section
- Mercantile first floor & basement occupant load reduced to 60sf from 30sf/person

Travel Distance

Section 1016 Travel Distance Measurement

- Maximum distance, measured from the most remote point on the story along the natural and unobstructed path of egress travel

Table 1016.1 Exit Access Travel Distance

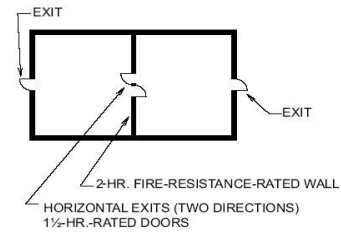
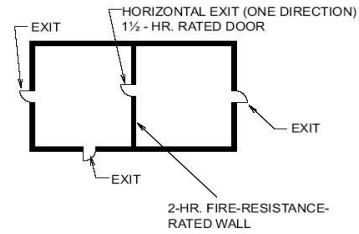
OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200	250
I-1	Not Permitted	250
B	200	300
F-2, S-2, U	300	400
H-1	Not Permitted	75
H-2	Not Permitted	100
H-3	Not Permitted	150
H-4	Not Permitted	175
H-5	Not Permitted	200
I-2, I-3, I-4	Not Permitted	200



Horizontal Exit Requirements, Limitations

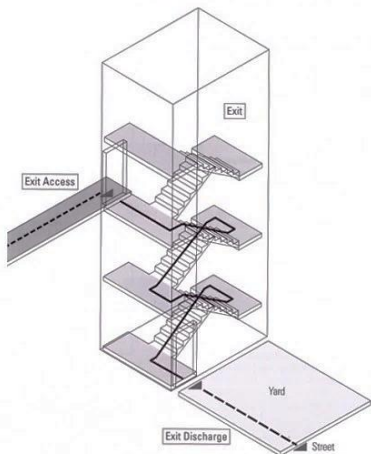
Section 1025 IBC Horizontal Exits

- Limited to not more than ½ of the total # of exits
- 2-hr fire wall or 2-hr fire barrier
- Extend though all levels unless supported by 2-hr rated floors
- Refuge area
 - 3 nsf / person, in general
 - 6 nsf / person for I-3
 - 15 nsf / person for ambulatory I-2
 - 30 nsf / person for non-ambulatory I-2



Exit Discharge Requirements

Section 1027 Exit Discharge



- Discharge directly to the exterior of the building at grade level or provide access to grade, w/o re-entering the building
- The capacity of the exit discharge is greater than the discharge capacity of the exits being served
- The exit discharge must provide a direct and unobstructed access to a public way or area of refuge
- The exit discharge located min. 10 feet from adjacent lot lines & other buildings on the same lot.

Elevator Lobbies

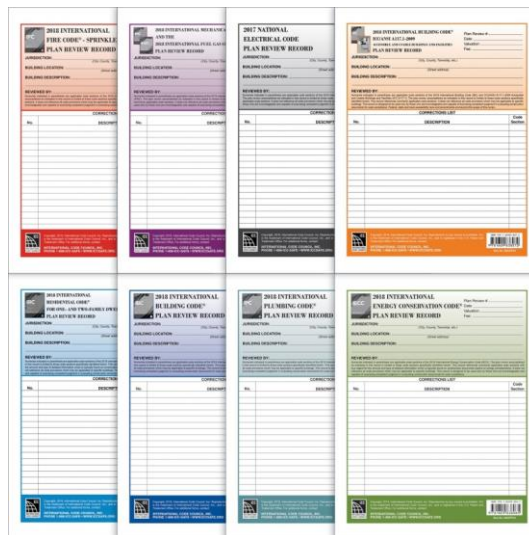
Chapter 30

- Lobbies moved to elevator requirements
- Coordinate with other construction, safety and controls required
- Revised lobby provisions for additional protection of hoistway openings and minimization of smoke spread



Plan Review Checklists

R103.2 Information on Documents



PLAN REVIEW RECORD *(modified)*

ICC Review Record Communication Tool

- ✓ Plan detail / Spec section
- ✓ Code Reference
- ✓ Reason for Citation
- ✓ Record of response
- ✓ Record of Resolution

#	DWG	Spec	AHJ	Code #	Rqmt.	Comment	Response	Resolution
1	A003	72006		R103.2	Info on CDs	Missing		
2	A109		CT	R202	Definition	Incorrect		
3								
4								
5								

Other Key CT Changes

- 105.1.3 SFC Abatements list
- 407.13 Small I-2 homes compliance
- 907.2 Additions: B&B fire alarms; R-4 I-4 & E day care additional smoke alarms
- 913.6 Standby power for sprinkler systems
- CO interconnected detector locations in Group E, with signage
- R-1, I-1, I-2, I-4 & B&B CO detectors w/o interconnection



Other Key CT Changes

Chapter 10 M.O.E.

- 915.5.4 Interconnected CO detector locations in Group E, with signage
- 915.7 R-1, I-1, I-2, I-4 & B&B CO detectors w/o interconnection
- 1003.8 Prohibits obscuring the exitway
- 1010.9.5.1 R-4 Closet & bathroom doors
- 1013.1.1 Adds HCP symbols to exit signs
- 1013.2 Exempts B&B from floor exit path
- 1015.9 Guard rails on retaining walls > 4'
- 1025.6.3 Luminous exit markings required in even of power failure
- 1030.1.2 Emergency escape provided in Group E spaces w/o direct exit to outside



Other Key CT Changes to B&B's

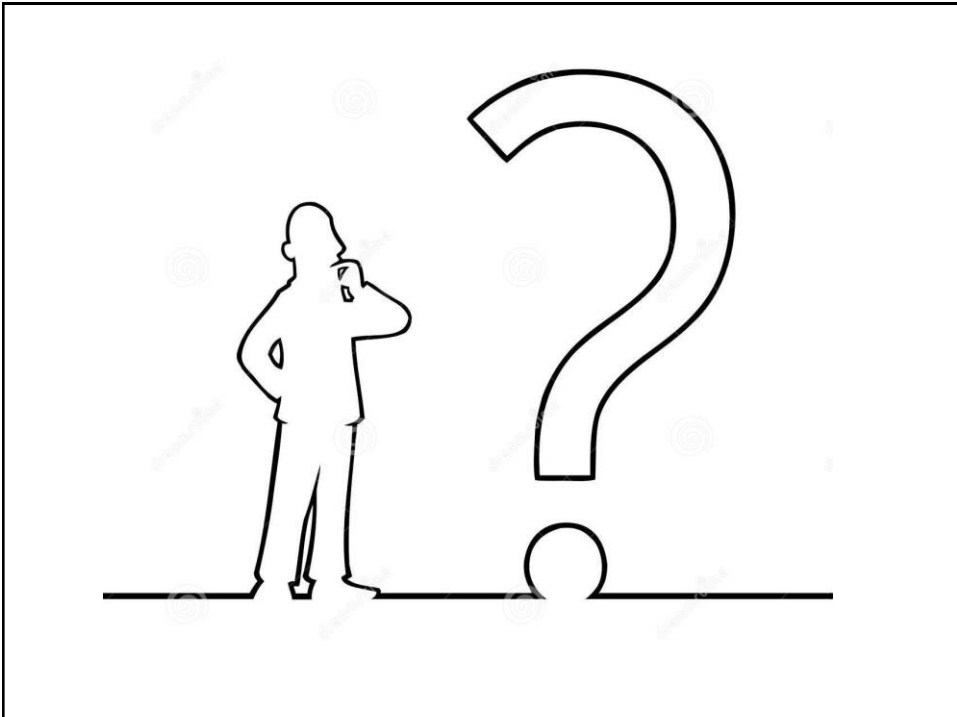
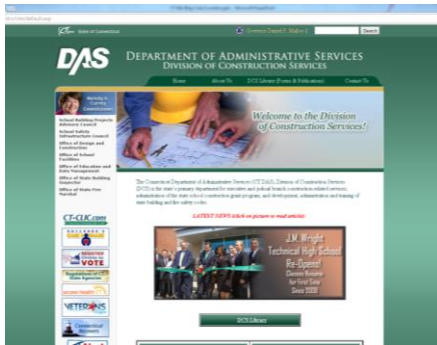
Chapter 10 M.O.E.

- Prohibits obscuring the exitway 1003.8
- 1010.1.1.2 Door clearances; swing
- 1011.5.2(5) B&B stair requirements
- 1011.11(1) B&B Stair handrails
- 1015.3(4) Guard/rail height lowered $\leq 34''$
- 1015.4(7) Guardrail openings $\leq 6''$
- 1019.3(4) Stair enclosures 1st to 2nd story
- 1020.1.1 Unrated corridors permitted



Where to Find, Purchase and Maintain

- 2015 IBC, IFC, IEBC, IMC, IPC, IECC
 - ✓ www.iccsafe.org/publications
 - ✓ Errata Central
- CT Amendments
 - ✓ portal.ct.gov/das/osbi





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