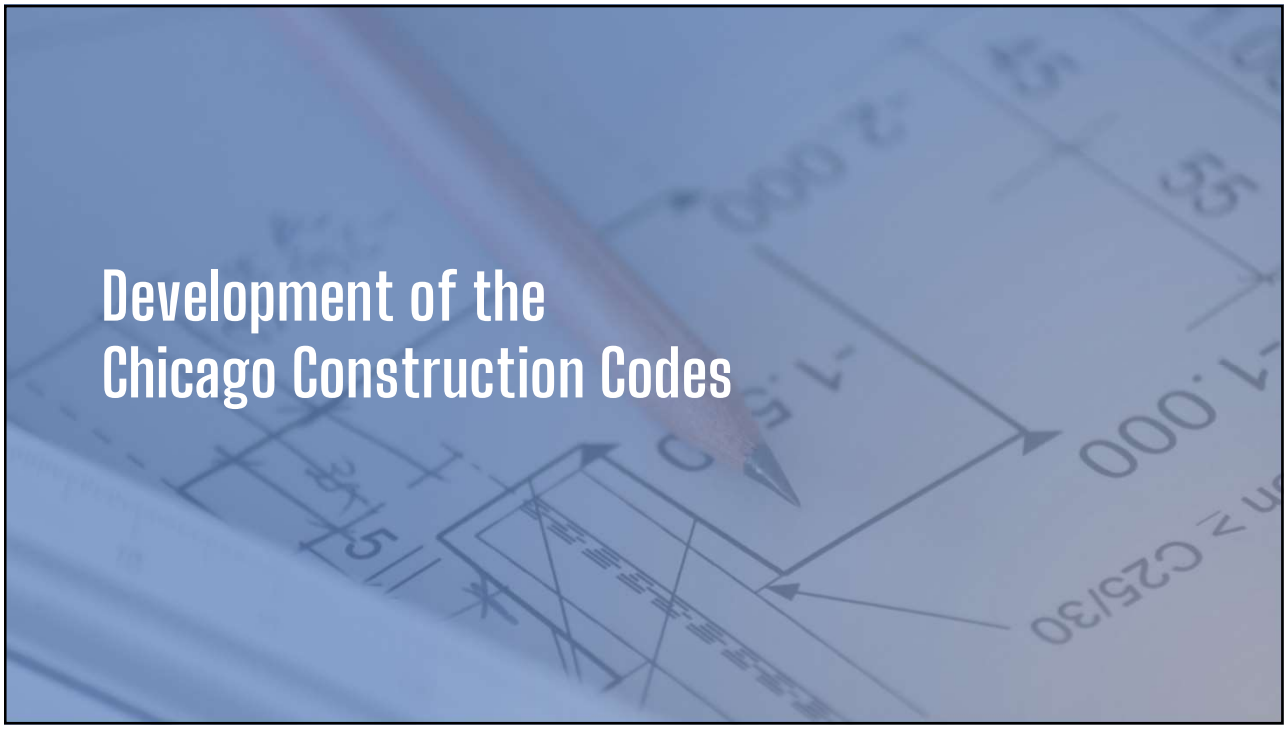
1

Overview

❶ Development of the Chicago Construction Codes

❷ Finding and Using the Chicago Construction Codes

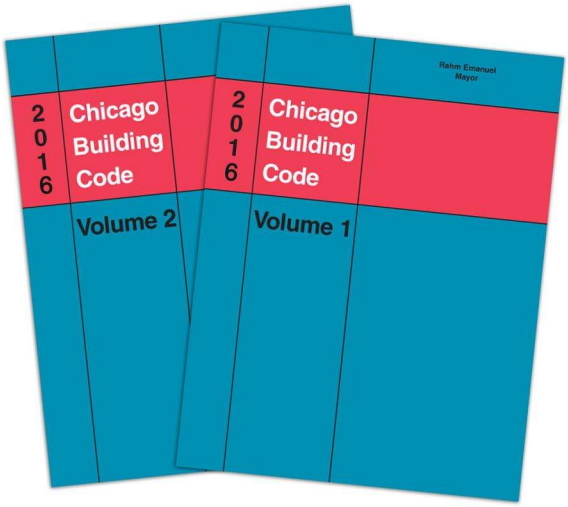
2



3

The Pre-2019 Chicago Building Code

- Last major "homegrown" code in the United States
- Last comprehensive revision: 1949



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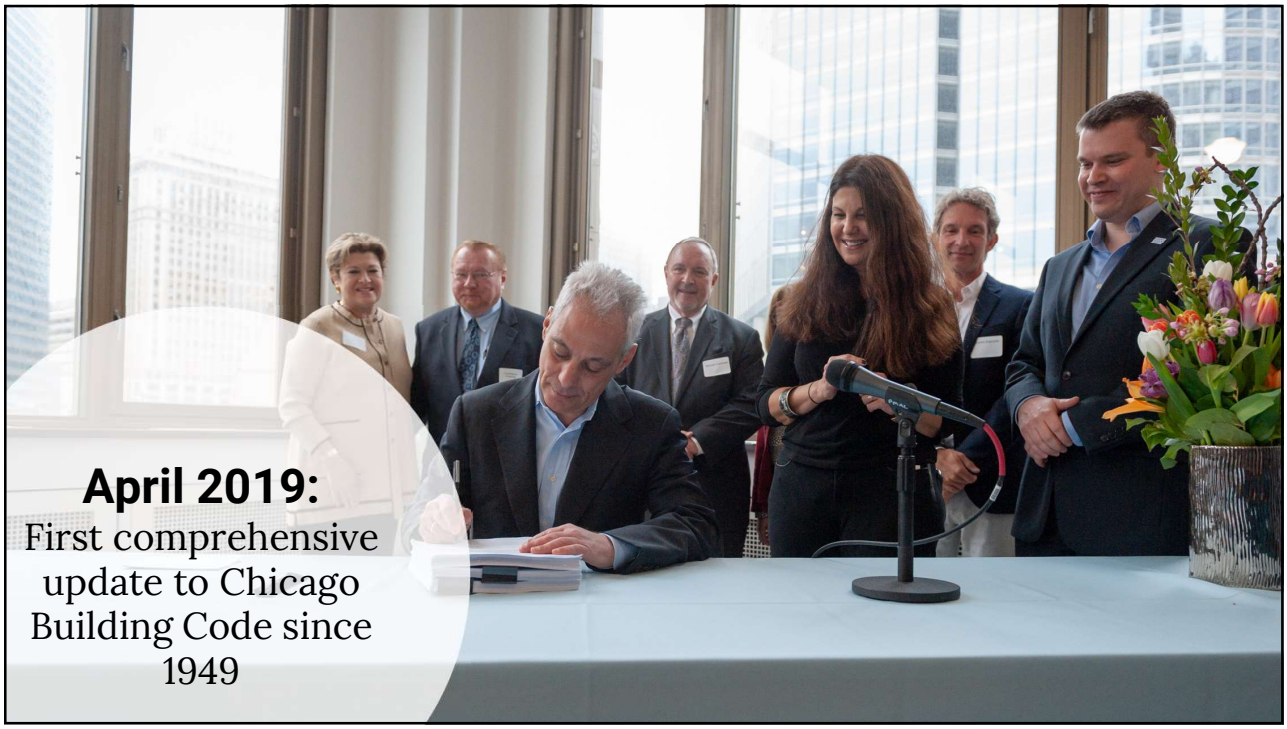
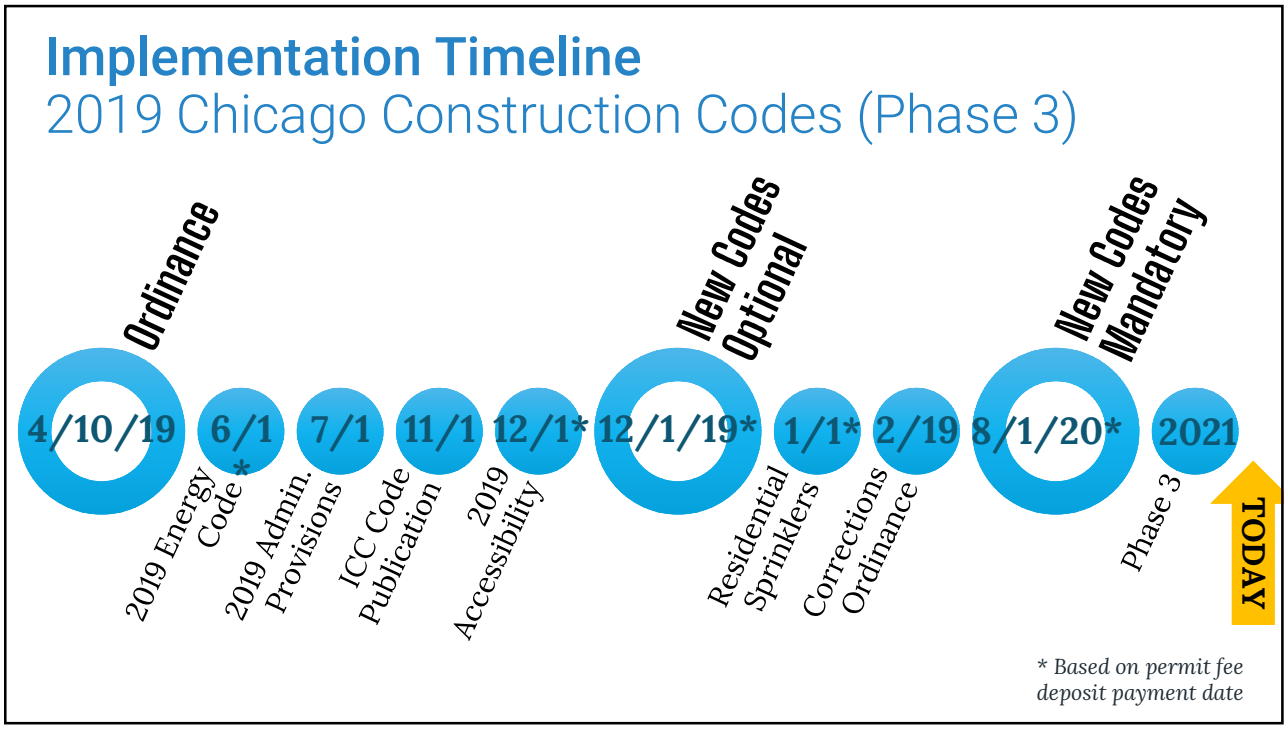

April 2019:
First comprehensive update to Chicago Building Code since 1949

5


ALLIANCE
DEMOLITION
August 2020:
New *Chicago Construction Codes* become mandatory.

6


Implementation Timeline
2019 Chicago Construction Codes (Phase 3)
Ordinance
4/10/19
2019 Energy Code
6/1*
2019 Admin. Provisions
7/1
ICC Code Publication
11/1
2019 Accessibility
12/1*
New Codes Optional
12/1/19*
Residential Sprinklers
1/1*
Corrections Ordinance
2/19
New Codes Mandatory
8/1/20*
Phase 3
2021
TODAY
* Based on permit fee deposit payment date

7


Code Organization and Definitions

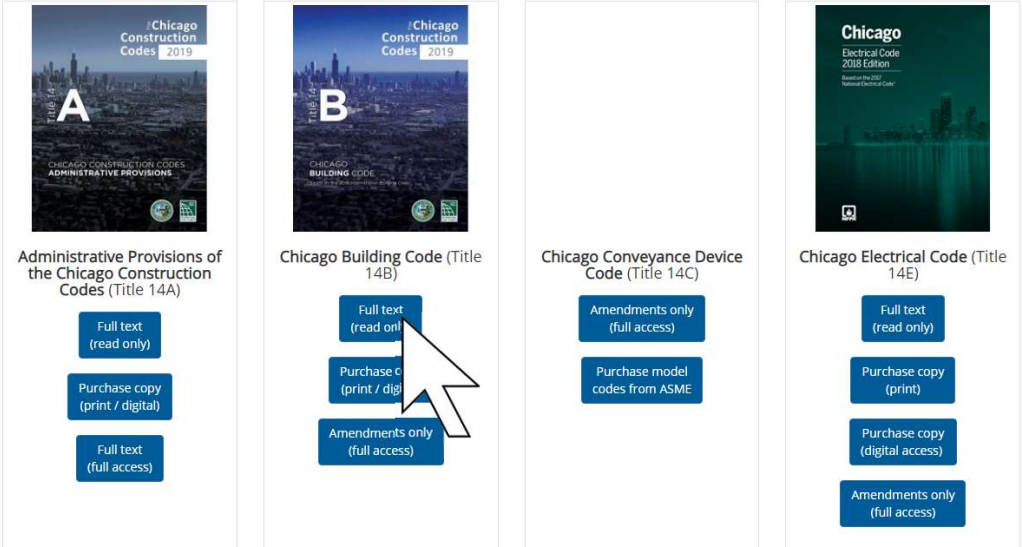
8

Finding the 2019 Chicago Construction Codes

1. http://www.chicago.gov/buildings
2. Scroll to bottom of any page on the Department of Buildings' website and click "Chicago Construction Codes" in Quick Links:

9

Finding the Codes (continued)



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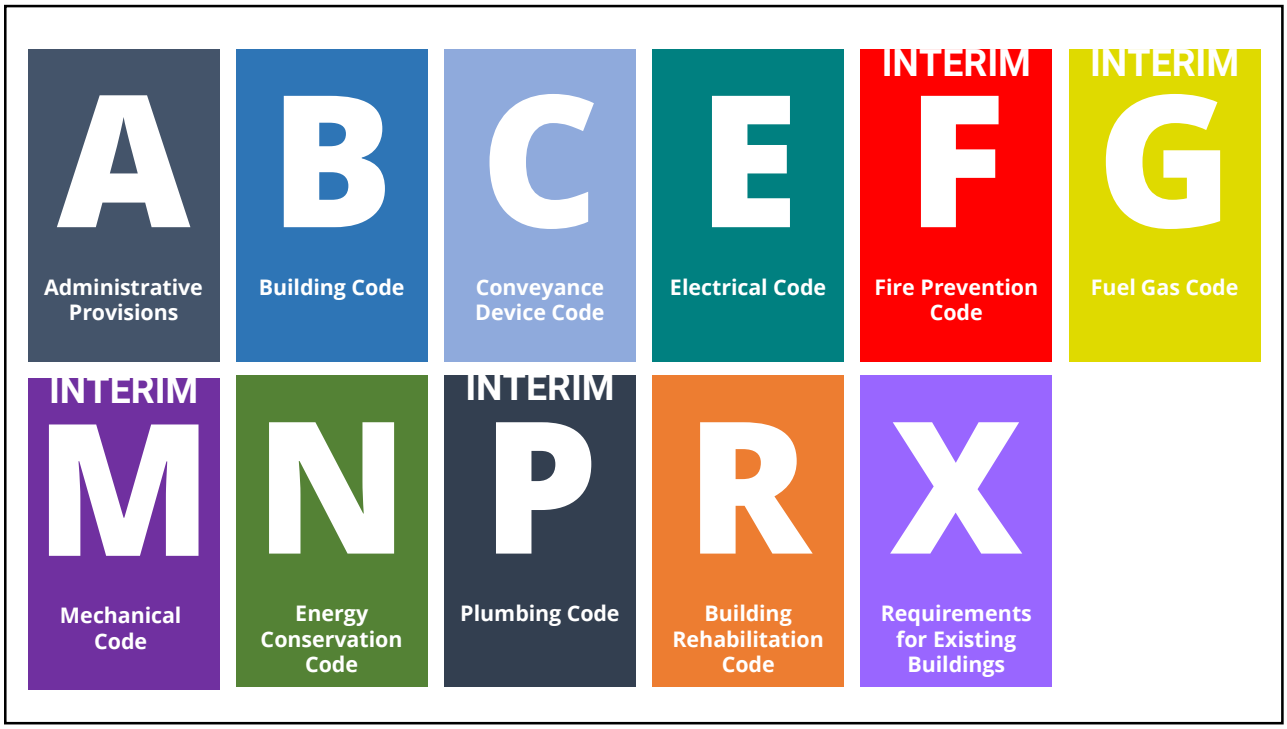
A
Administrative Provisions
B
Building Code
C
Conveyance Device Code
E
Electrical Code
INTERIM
F
Fire Prevention Code
INTERIM
G
Fuel Gas Code
INTERIM
M
Mechanical Code
N
Energy Conservation Code
INTERIM
P
Plumbing Code
R
Building Rehabilitation Code
X
Requirements for Existing Buildings

11


ICC
ICC
AmLegal
NFPA
AmLegal
AmLegal
AmLegal
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ICC

12

CODE BOOK

Margin Markings and Italics (ICC publications)

1207.3 Room area. Every *dwelling unit* shall have at least one room that shall have not less than 120 square feet (11.2 m^2) of *net floor area*. Dining spaces shall have a *net floor area* of not less than 60 square feet (5.6 m^2). Other *habitable spaces* shall have a *net floor area* of not less than 70 square feet (6.5 m^2). Where a single room is provided for cooking, dining and living purposes, it shall have a *net floor area* of not less than 180 square feet (16.7 m^2).

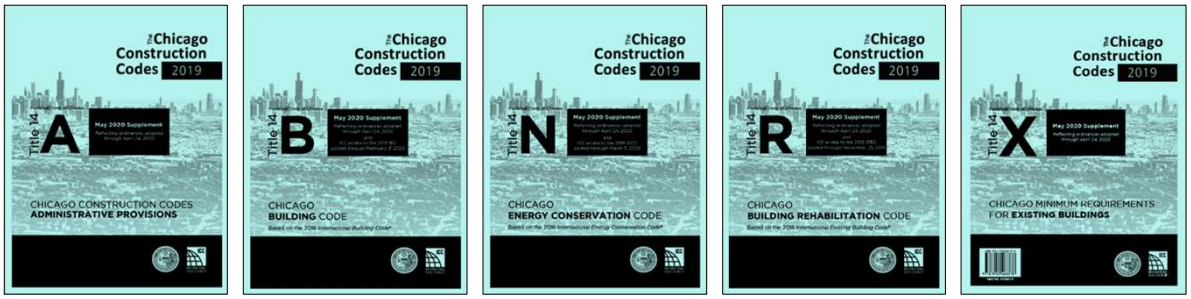
> **1207.4 [Reserved]**

- Double line in margin indicates Chicago amendment to I-Code
- Carat (arrow) in margin indicates Chicago deletion from I-Code
- Italic text indicates defined term (Definitions in Chapter 2)

13

CODE BOOK

March 2021 Supplements



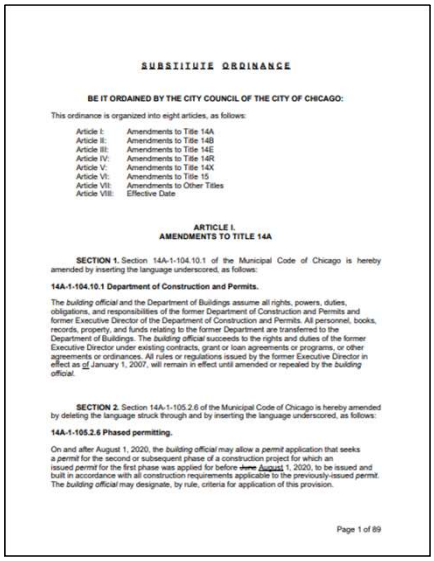
- Supplements reflect amendments adopted through January 2021
- In free read-only and PDF versions, supplement chapter follows original chapter; also in ICC Premium Access
- Available in print from ICC

14

CODE BOOK

2021 Amendments

- Technical corrections and adjustments to Chicago Construction Codes
- Available on Department of Buildings web site
- Will be incorporated into supplements, likely available in early 2021



SUBSTITUTE ORDINANCE

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CHICAGO:

This ordinance is organized into eight articles, as follows:

Article I: Amendments to Title 14A
Article II: Amendments to Title 14B
Article III: Amendments to Title 14E
Article IV: Amendments to Title 14R
Article V: Amendments to Title 14X
Article VI: Amendments to Title 15
Article VII: Amendments to Other Titles
Article VIII: Effective Date

ARTICLE I.
AMENDMENTS TO TITLE 14A

SECTION 1. Section 14A-1-104.10.1 of the Municipal Code of Chicago is hereby amended by inserting the language underscored, as follows:

14A-1-104.10.1 Department of Construction and Permits.

The *building official* and the Department of Buildings assume all rights, powers, duties, obligations, and responsibilities of the former Department of Construction and Permits and former Executive Director of the Department of Construction and Permits. All personnel, books, records, property, and funds relating to the former Department are transferred to the Department of Buildings. The *building official* succeeds to the rights and duties of the former Executive Director under existing contracts, grant or loan agreements or programs, or other agreements or ordinances. All rules or regulations issued by the former Executive Director in effect as of January 1, 2007, will remain in effect until amended or repealed by the *building official*.

SECTION 2. Section 14A-1-105.2.6 of the Municipal Code of Chicago is hereby amended by deleting the language struck through and by inserting the language underscored, as follows:

14A-1-105.2.6 Phased permitting.

On and after August 1, 2020, the *building official* may allow a *permit* application that seeks a *permit* for the second or subsequent phase of a construction project for which an issued *permit* for the first phase was applied for before ~~June~~ August 1, 2020, to be issued and built in accordance with all construction requirements applicable to the previously-issued *permit*. The *building official* may designate, by rule, criteria for application of this provision.

Page 1 of 89

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CHICAGO AMENDMENT

Chicago-specific Definitions

- **"*Approved*"** means approval outside the normal permitting process: ACAR, S&T, BBA (14A-2-202)
- **"*Building official*"** means the Building Commissioner or designee (14A-2-202)
- **"*Deck*"**, **"*exterior balcony*"** and **"*porch*"** defined (14B-2-202)
- **"*Occupiable rooftop*"** defined (requirements in Ch. 15) (14B-2-202)
- **"*Telecommunications equipment area*"** replaces "technology center" (14B-2-202)

16

CHICAGO AMENDMENT

Measurements (Sec. 203)

- Grade Plane
- Building Height
  - 7 exceptions
- Building Area
- Floor Area
  - Gross Floor Area (*default*)
  - Net Floor Area

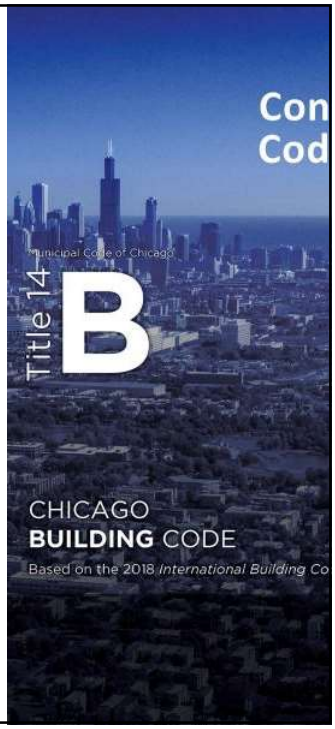
17

CODE BOOK

Building Code Appendices

- Appendix **D**: Fire Limits
- Appendix **E**: Supplementary Accessibility Requirements
- Appendix **S**: Optional Smoke Control Systems

- ICC A117.1-2009: *Accessible and Usable Buildings and Facilities* – reproduced at end of building code book

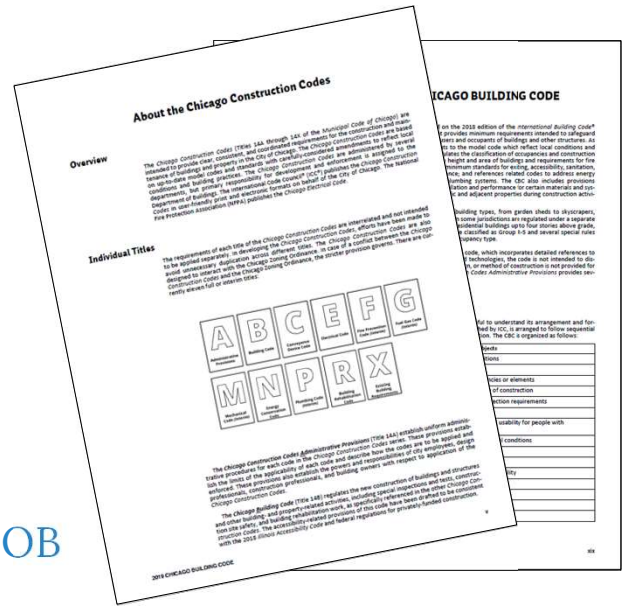


18

REFERENCE

For More Information . . .

- *About the Chicago Construction Codes* at the front of each book
- *Effective use of the . . . Code* at the front of each book
- Other presentations and materials at: http://www.chicago.gov/DOB



19

REFERENCE

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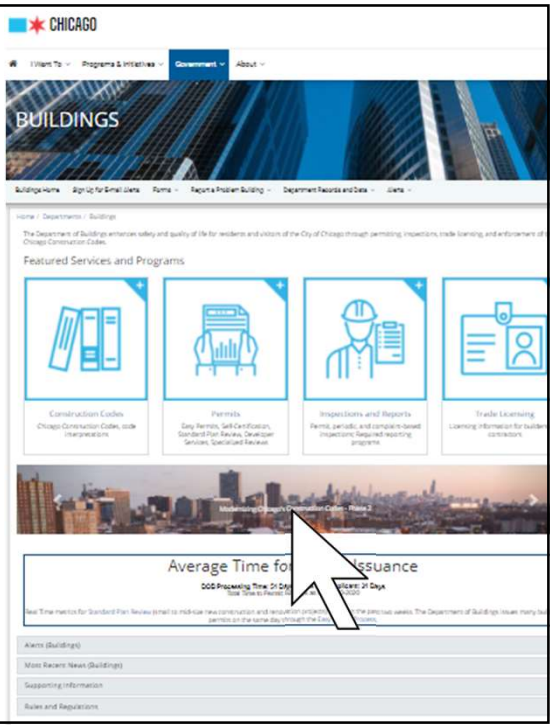
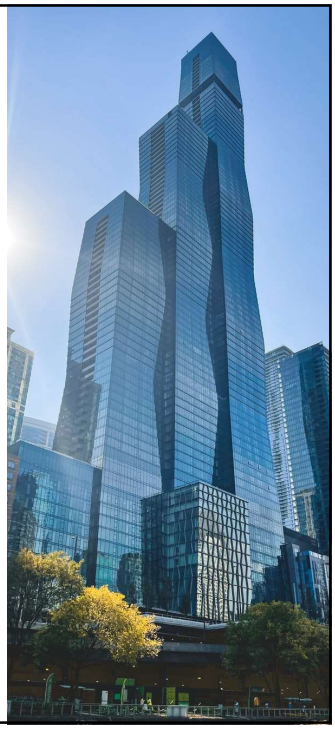


20

22

Overview

1. Occupancy Classification
2. Types of Construction
3. Height and Area Limitations
4. Special Building Features, Uses, and Occupancies



23

Occupancy Classification

For more information see **Task 2.1** in the *Chicago Plan Review Manual.*

24

Occupancy Classification

Occupancies are classified to determine the approximate level of risk created by the intended use(s) of a building and the systems and features required by code to address that risk.

25

Assembly (Group A)

Group A occupancy includes the use of a building for the gathering of persons for purposes such as civic, social, or religious functions; recreation; food or drink consumption; or awaiting transportation.

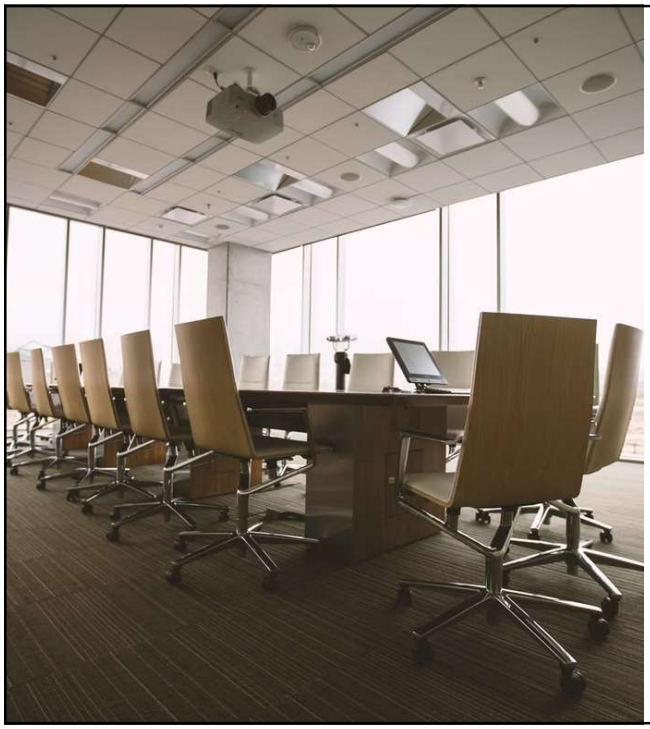
28

Small occupancies are not classified as Group A

Buildings or spaces that are used for assembly purposes and that have an occupant load of less than 50 shall be classified as a Group B occupancy.

- For example: a small eat-in restaurant or coffee shop, a small library or museum, or a storefront church.
- A carry-out-only restaurant, retail art gallery, or bookstore, however, should be classified as Group M.

29



Small occupancies are not classified as Group A

Rooms or spaces used for assembly purposes with an occupant load of less than 50 persons and accessory to another occupancy are considered part of the main occupancy classification of the building or classified as a Group B occupancy.

30

Group A-1

⚠ Self-cert limited to occupant load less than 300

Examples

- Movie theaters
- Symphony and concert halls
- Television/radio studios (with audience)
- Theaters with stage performances

Typical Features

- High occupant density
- Low or specialized lighting
- Scheduled performances
- Foyer
- Seating in rows

31

Group A-2

⚠ Self-cert limited to occupant load less than 300

Examples

- Banquet halls
- Casino (gaming area)
- Dance halls
- Nightclubs
- Restaurants, cafeterias
- Taverns and bars

Typical Features

- On-site consumption of food or drink
- High occupant density

Note: Assembly-type occupancies with an occupant load *less than* 50 are classified as Group B.

32

Group A-3

⚠ Self-cert limited to occupant load less than 300

Examples

- Courtrooms
- Funeral parlors
- Museums
- Places of religious worship
- Recreational centers
- Waiting areas (airport, bus, train)

Typical Features

- Potential for high occupant density
- Significant areas of open floor space

33

Group A-4

⚠ Self-cert limited to occupant load less than 300

Examples

- Arenas
- Skating rinks
- Swimming pools
- Tennis courts

Typical Features

- Indoor spectator seating
- Significant area of indoor floor space for athletic activities
- High occupant density

34

Group A-5

⚠ Self-cert limited to occupant load less than 300

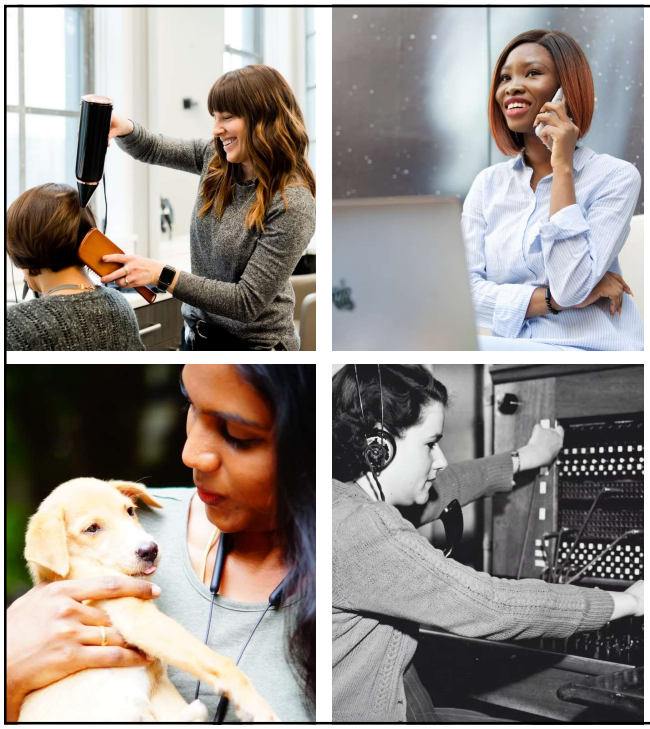
Examples

- Amusement parks
- Bleachers
- Drive-in theaters
- Fairgrounds
- Racetracks
- Stadiums

Typical Features

- Outdoor activities
- High occupant density

35



Business (Group B)

Group B occupancy includes the use of a building for office, professional or service-type transactions, including storage of records and accounts.

36

Group B

Examples

- Banks
- Car washes
- Dry cleaning
- Adult education (students above grade 12)
- Food processing/ commercial kitchen
- Laboratories (testing and research)
- Post offices
- Professional services (architects, lawyers, dentists, physicians, engineers, etc.)
- Radio and television stations

Note: Assembly-type occupancies with an occupant load *less than* 50 are classified as Group B.

37

CHICAGO AMENDMENT

Telecommunications Equipment Area

Self-cert limited to 150 ft²

An area or enclosed room within a building where electronic equipment used for the transmission of audio, video and data, power equipment (e.g., dc converters, inverters and batteries), technical support equipment (e.g., computers), and conductors dedicated solely to the operation of the equipment are located, including support rooms served by the same ventilation system.

- Server room
- Data center

38

KEY CONCEPT

Ambulatory Care Facility

Self-cert prohibited

Buildings used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24-hour basis to persons who are rendered incapable of self-preservation by the services provided or staff has accepted responsibility for care recipients already incapable.

- Day surgery centers
- Dialysis centers
- Dentists with anesthesia

39

Educational (Group E)

Group E occupancy includes use of a building for educational purposes through the 12th grade or to provide child day care services.

40

Group E

Group E-1

- Preschools
- Elementary schools
- Junior high schools
- High schools

Group E-2

- Child day care facilities*

⚠ Self-cert limited to alterations/repairs

Self-cert prohibited

41

Factory/Industrial (Group F)

Group F occupancy includes use of a building for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H or Group S occupancy.

42

Group F

Self-cert prohibited

Examples

- Automobiles
- Bakeries
- Beverages
- Clothing
- Dry cleaning/ laundries
- Electronics
- Furniture
- Machinery
- Motion picture/TV studios
- Recycling plants
- Woodworking

43

High-hazard (Group H)

Group H occupancy includes uses that involve the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in control areas complying with Section 414 based on maximum allowable quantities listed in Section 307.

44

Group H

Self-cert prohibited

H-1: Detonation Hazard
H-2: Deflagration or Accelerated Burning Hazard
H-3: Combustion or Physical Hazard
H-4: Health Hazard
H-5: Semiconductor Fabrication

"Control areas" (sec. 414.2) may be used to avoid classification as a Group H occupancy.

Consult CFD early in the design process.

45

Institutional (Group I)

Group I occupancy includes uses in which care or supervision is provided to persons who are or are not capable of self-preservation without physical assistance; in which persons are detained for penal or correctional purposes; or in which the liberty of the occupants is restricted.

46

Group I

care or supervision is provided to persons who are not cable of self-preservation without assistance or in which liberty of occupants is restricted.

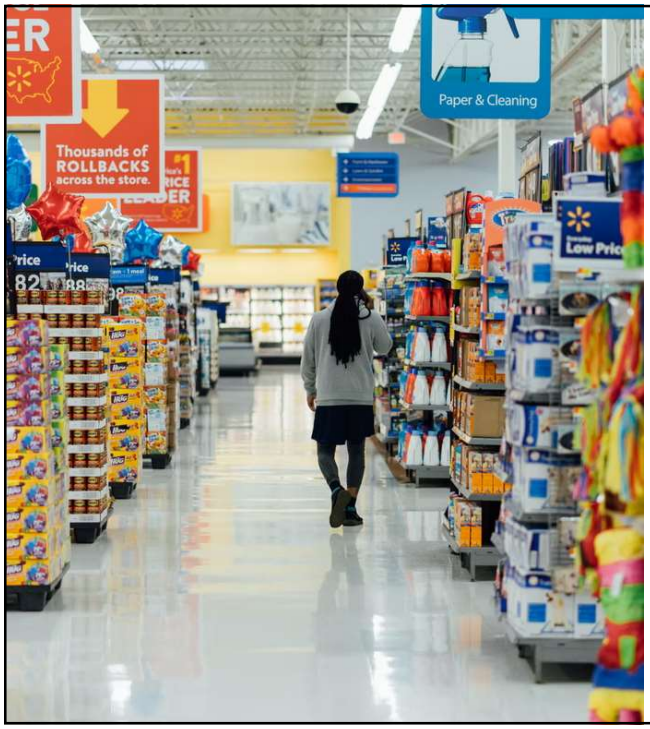
I-1: Non-medical care
I-2: Medical or nursing care

⚠ Self-cert limited to alterations/repairs

I-3: Detention/correctional facilities
I-4: Institutional day care

Self-cert prohibited

47



Mercantile (Group M)

Group M occupancy includes use of a building for the display and sale of merchandise and involves stocks of goods, wares, or merchandise incidental to such purposes and accessible to the public.

48

Group M

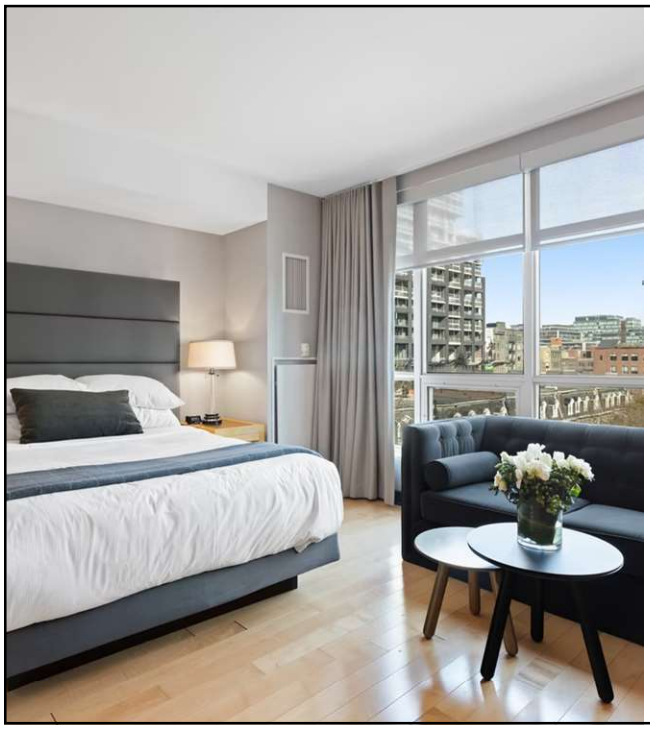
⚠ Self-cert limited to 30,000 ft²

Examples

- Department stores
- Drug stores
- Greenhouses
- Gas stations
- Retail and wholesale stores
- Supermarkets

Note: Food service establishments with an occupant load less than 50 will be classified as Group B.

49



Residential (Group R)

Group R occupancy includes use of a building for sleeping purposes when not classified as Group I.

- In Chicago, Group R has **five** subclassifications.

50

Group R-1

Examples

- Hotels with accommodations for > 10 transient occupants
- Temporary overnight shelters
- Congregate living facilities with accommodations for > 10 transient occupants

⚠ Self-cert prohibited for congregate living

51

Group R-2

Examples

- Apartments
- Dormitories
- Live/work units (Section 419)

⚠ Self-cert prohibited for congregate living

52

Group R-3

Examples

- Bed-and-breakfast establishments
- Care facilities that provide accommodations for 5 or fewer individuals receiving care
- Hotels with accommodations for 10 or fewer transient occupants
- Congregate living facilities (nontransient), such as a fraternity house, sorority house, convent, or monastery, ≤ 16 occupants

⚠ Self-cert prohibited for congregate living

53

Group R-4

Care facilities that provide accommodations for 6 to 16 individuals receiving care, including:

- Alcohol and drug abuse treatment centers
- Assisted living facilities
- Congregate care facilities
- Group home
- Halfway houses
- Rehabilitation facilities

⚠ Self-cert prohibited for congregate living

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CHICAGO AMENDMENT

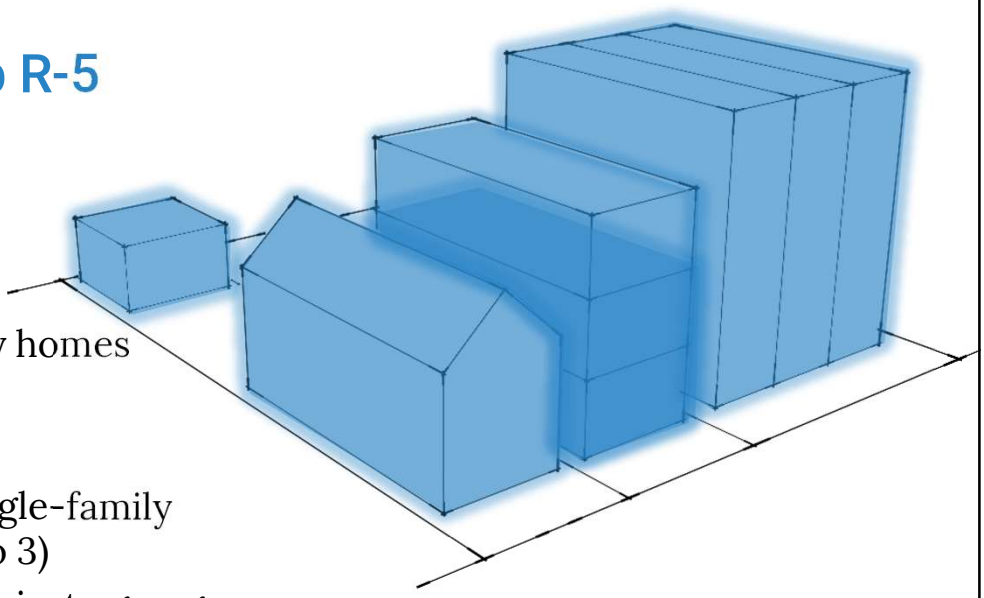
Group R-5

Criteria:

- No more than four stories above grade plane
- Containing 1, 2 or 3 dwelling units (including live/work units) and no other occupancy
- Each dwelling unit is primarily occupied on a non-transient basis by a single household.
- Also: accessory buildings with no more than two stories above grade plane located on the same lot as Group R-5 dwelling units.

55

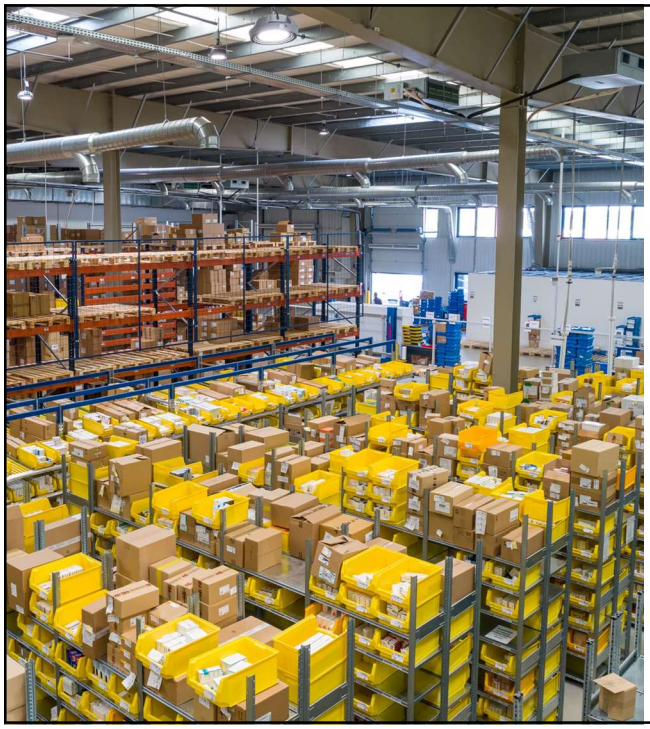
Group R-5



Examples:

- Detached single-family homes
- Two-flats
- Three-flats
- Attached single-family homes (up to 3)
- Associated private garages and accessory structures

56



Storage (Group S)

Group S includes the use of a building for storage that is not classified as a Group H occupancy.

57

Group S

Self-cert prohibited

Examples

- Aerosol products-level 2 and 3
- Aircraft hangars
- Dry boat storage (indoor)
- Food product storage
- Glass storage
- Metal storage
- Motor vehicle repair garages
- Parking garages
- Pottery storage
- Self-service storage facilities (mini-storage)
- Textile/clothing storage
- Tires, bulk storage

58

Utility/Miscellaneous (Group U)

Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped, and maintained to conform to the requirements of this code commensurate with the fire and life-safety hazard incidental to their occupancy.

59

Group U

⚠ Consult DOB prior to self-cert

Examples

- Agricultural buildings
- Greenhouses
- Lumber yards (exterior)
- Parking facilities
- Private garages and carports (except accessory to Group R-5)
- Stables

60

KEY CONCEPT

Mixed Occupancies

Many buildings contain more than one occupancy. Three strategies for dealing with mixed occupancy:

- **Separated mixed occupancy**
  - Traditional approach
  - Fire-resistance-rated separations (Table 508.4)
- **Unseparated mixed occupancy**
  - Design for the worst case (height, area, fire protection systems)
- **Accessory occupancy** (*replaces "auxiliary uses"*)

62

Mixed Occupancies (continued)

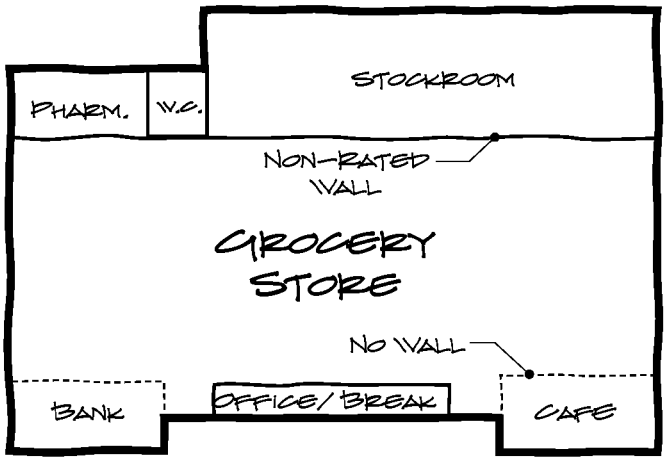
There are special separation rules for:

- **Group H** occupancies must always be separated.
- **Parking** and motor-vehicle related occupancies per Sec. 406.
- **Dwelling Units** and **Sleeping Units** require 1-hour per Sec. 420.
- **"Large" Assembly** (occupant load ≥ 300) 1-hour in fully-sprinklered building and 2-hours in nonsprinklered building per Sec. 508.3.3.

63

64

Mixed Occupancies (continued)



65

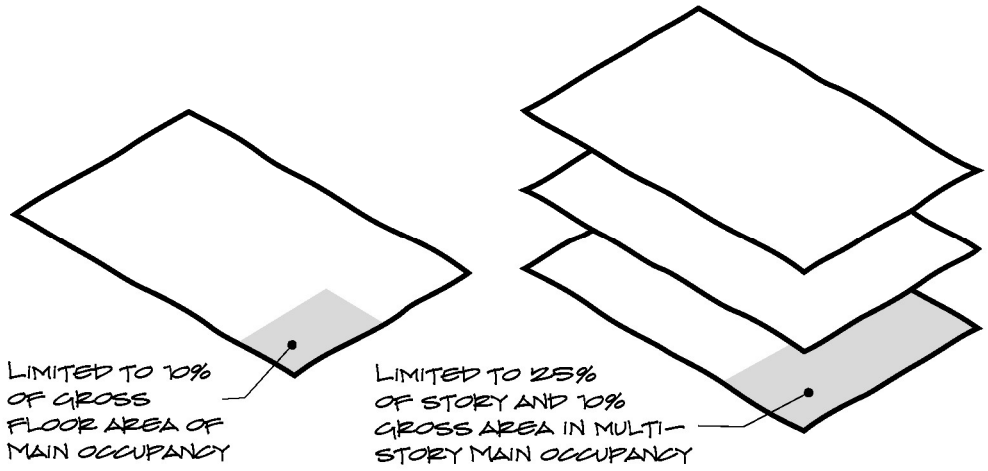
KEY CONCEPT

Accessory Occupancies

- Necessary to support main occupancy
- Aggregate of accessory occupancies limited to 25% floor area of story, and 10% total floor area of main occupancy
- Floor area of accessory occupancy limited to max. area for that occupancy class in nonsprinklered building
- Accessory occupancies are classified per Ch. 3
  - Classification is ***used*** for determining means of egress and fire protection requirements (Chs. 9 & 10)
  - Classification is ***ignored*** for height and area determination (Ch. 5)

66

Accessory Occupancies (continued)



67

Accessory Occupancies (continued)

Special rules for:

- Accessory assembly-type use, OL < 50 *or* area < 750 ft² (303.1.2)
- Accessory classroom(s) (305.2, Exception)
- Accessory child daycare (305.3, Exception)
- Accessory storage (311.1.1)

68

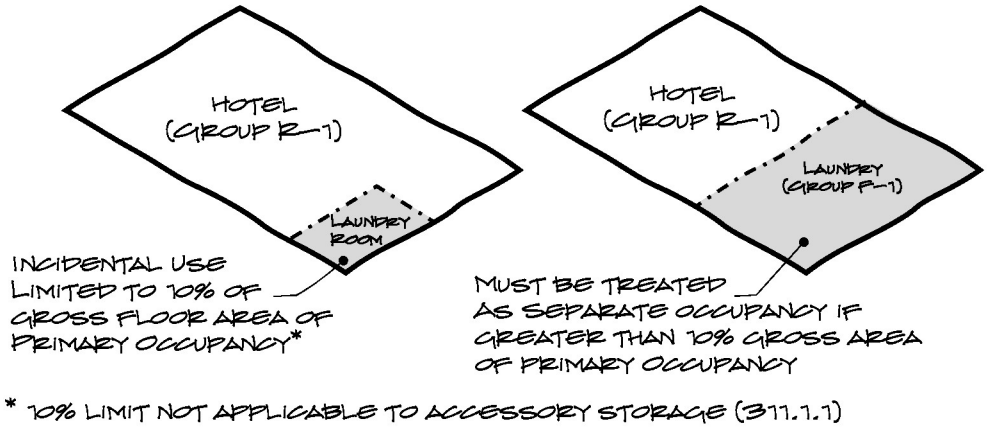
KEY CONCEPT

Incidental Uses

- Incidental uses are areas which create additional hazards
- Not classified as separate occupancies
- Limited to 10% of floor area of primary occupancy
- Must be separated/protected as provided in Table 509

69

Incidental Uses (continued)



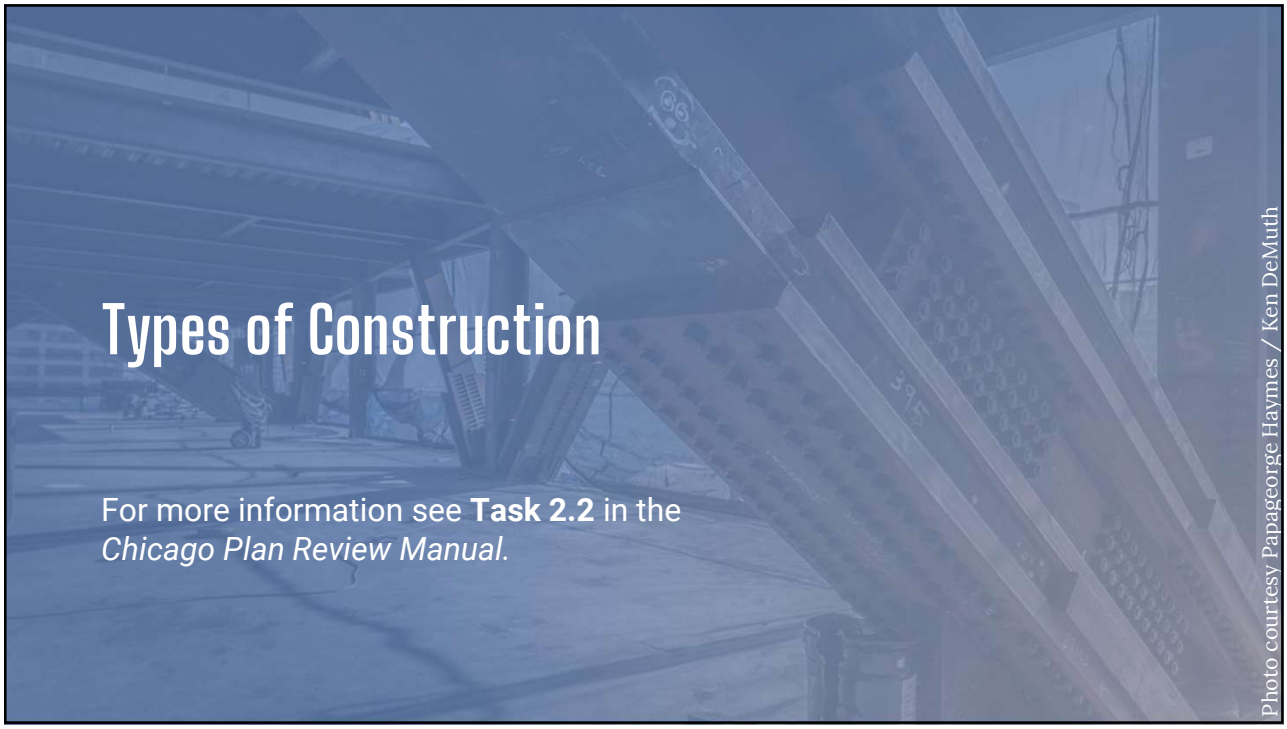
70

Incidental Uses (continued)

TABLE 509
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	2 hours
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	2 hours
Furnace rooms and boiler rooms in *buildings* having an *occupant load* exceeding 200 persons	2 hours
Furnace rooms and boiler rooms in Group I occupancies	2 hours
Furnace rooms and boiler rooms in other than Group R-5 occupancies	1 hour
Refrigerant machinery room	1 hour
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide *automatic sprinkler system*
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide *automatic sprinkler system*
In Group E occupancies, laboratories and vocational shops not classified as Group H	1 hour
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide *automatic sprinkler system*
In ambulatory care facilities, laboratories not classified as Group H	1 hour
Laundry rooms over 100 square feet	1 hour

71



73

KEY CONCEPT

Construction Type Basics

- Construction type classification is based on the combustibility and fire-resistance of the materials and assemblies used.
- More fire-resistive construction types are required for larger buildings and occupancy types with a greater risk of fire.

Under the *Chicago Building Code*, a building can only have one construction type.

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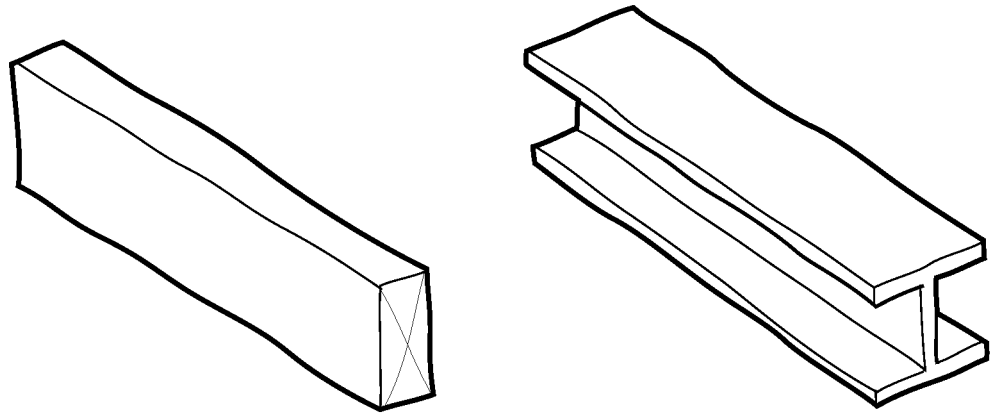
CODE BOOK

Combustible vs. Noncombustible

- A building material is "noncombustible" if it has been tested to show:
  - It is a solid (elemental) material that meets performance criteria after being placed in a 1382°F furnace for 30 minutes per ASTM E136
  - It is a composite material with a base of solid material that passes the ASTM E136 test plus a surfacing not more than 1/8-inch thick that has a flame spread index ≤ 50
- Any non-tested material is classified as combustible.

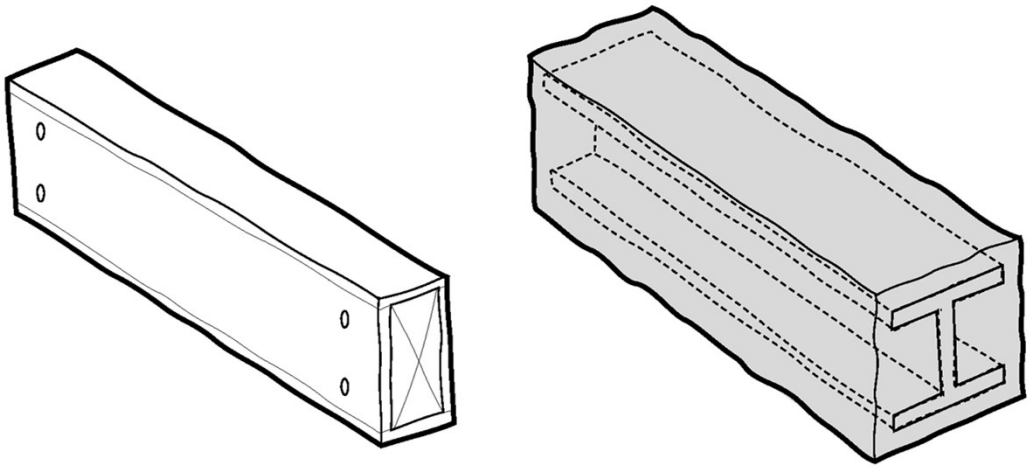
75

Protected vs. Unprotected



76

Protected vs. Unprotected



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CODE BOOK

Fire-resistance Rating for Building Elements (Table 601)

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

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame[f]	3[a, b]	2[a, b]	1[b]	0	1[b]	0	HT	1[b]	0
Bearing walls Exterior[e, f] Interior	 3 3[a]	 2 2[a]	 1 1	 0 0	 2 1	 2 0	 2 1/HT	 1 1	 0 0
Nonbearing walls and partitions — Exterior	See Table 602								
Nonbearing walls and partitions — Interior[d]	0	0	0	0	0	0	Note i	0	0
Floor construction and associated *secondary members*	2	2	1	0	1[g]	0	HT	1[g]	0
Roof construction and associated *secondary members*	1.5[b]	1[b]	1[b]	0[c]	1[b, c, h]	0	HT	1[b, c, h]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: *Fire-resistance ratings* of *primary structural frame* and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of *primary structural frame* members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below.
c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less *fire-resistance rating* is required.
d. Not less than the *fire-resistance rating* required by other sections of this code.
e. Not less than the *fire-resistance rating* based on *fire separation distance* (see Table 602).
f. Not less than the *fire-resistance rating* as referenced in Section 704.10.
g. In single-family dwellings, the floor construction over *basements* and unexcavated spaces below the first *story above grade plane* is not required to have a *fire-resistance rating*.
h. In buildings of exclusively Group R-2, R-3, R-4 or R-5 occupancy with no more than four *stories above grade plane*, the required *fire-resistance rating* of roof construction and associated secondary members shall be reduced to 30 minutes.
i. See Section 2304.11.2.

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CODE BOOK

Fire-resistance Rating for Building Elements (Table 601)

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

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV
	A	B	A	B	A	B	HT
Primary structural frame[f]	3[a, b]	2[a, b]	1[b]	0	1[b]	0	HT
Bearing walls Exterior[e, f] Interior	 3 3[a]	 2 2[a]	 1 1	 0 0	 2 1	 2 0	 2 1/HT
Nonbearing walls and partitions — Exterior	See Table 602						
Nonbearing walls and partitions — Interior[d]	0	0	0	0	0	0	Note i
Floor construction and associated *secondary members*	2	2	1	0	1[g]	0	HT
Roof construction and associated *secondary members*	1.5[b]	1[b]	1[b]	0[c]	1[b, c, h]	0	HT

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CODE BOOK

Fire-resistance Rating for Building Elements (Table 601)

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

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV
	A	B	A	B	A	B	HT
Primary structural frame[f]	3[a, b]	2[a, b]	1[b]	0	1[b]	0	HT
Bearing walls							
Exterior[e, f]	3	2	1	0	2	2	2
Interior	3[a]	2[a]	1	0	1	0	1/HT
Nonbearing walls and partitions — Exterior	See Table 602						
Nonbearing walls and partitions — Interior[d]	0	0	0	0	0	0	Note i
Floor construction and associated *secondary members*	2	2	1	0	1[g]	0	HT
Roof construction and associated *secondary members*	1.5[b]	1[b]	1[b]	0[c]	1[b, c, h]	0	HT

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KEY CONCEPT

Fire-resistance Rating for Exterior Walls (Table 602)

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE[a, d, g]

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H[e]	OCCUPANCY GROUP F, S[f]	OCCUPANCY GROUP A, B, E, M, I, R, U[h]
X < 3[b]	VA, VB	NP	NP	2[h, j]
	Others	3	2	2
3 ≤ X < 5	All	3	2	1
5 ≤ X < 10	IA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA, IB	2	1[k]	1[c, k]
	IIB, VB	1	0	0
	Others	1	1[k]	1[c, k]
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

a. Load-bearing *exterior walls* shall also comply with the *fire-resistance rating* requirements of Table 601.
b. See Section 706.1.1 for party walls.
c. *Open parking garages* complying with Section 406 shall not be required to have a *fire-resistance rating*.
d. The *fire-resistance rating* of an *exterior wall* is determined based upon the *fire separation distance* of the *exterior wall* and the *story* in which the wall is located.
e. For special requirements for Group H occupancies, see Section 415.6.
f. For special requirements for Group S aircraft hangars, see Section 412.3.1.
g. Where Table 705.8 permits nonbearing *exterior walls* with unlimited area of unprotected openings, the required *fire-resistance rating* for the exterior walls is 0 hours.
h. A single-*story* detached *private garage*, *carport* or storage building not exceeding 600 square feet (56 m^2) in *building area*, not exceeding 12 feet (3658 mm) in *building height* and with a roof slope of 2:12 or greater shall be permitted in Type VA or Type VB construction when the *fire separation distance* is 2 feet (610 mm) or greater and the *exterior wall* shall not be required to have a *fire-resistance rating*.
i. [Reserved]
j. Any *exterior wall* with a *fire separation distance* of less than 3 feet shall have a *fire-resistance rating* of not less than 2 hours and shall be built of noncombustible materials, materials allowed by Section 603 or *fire-retardant treated wood* framing complying with Section 2303.2 with a noncombustible *exterior wall covering*.
k. The required *fire-resistance rating* of *exterior walls* with a *fire separation distance* of 10 feet or greater shall only be required to be rated for exposure to fire from the inside in accordance with Section 705.5.

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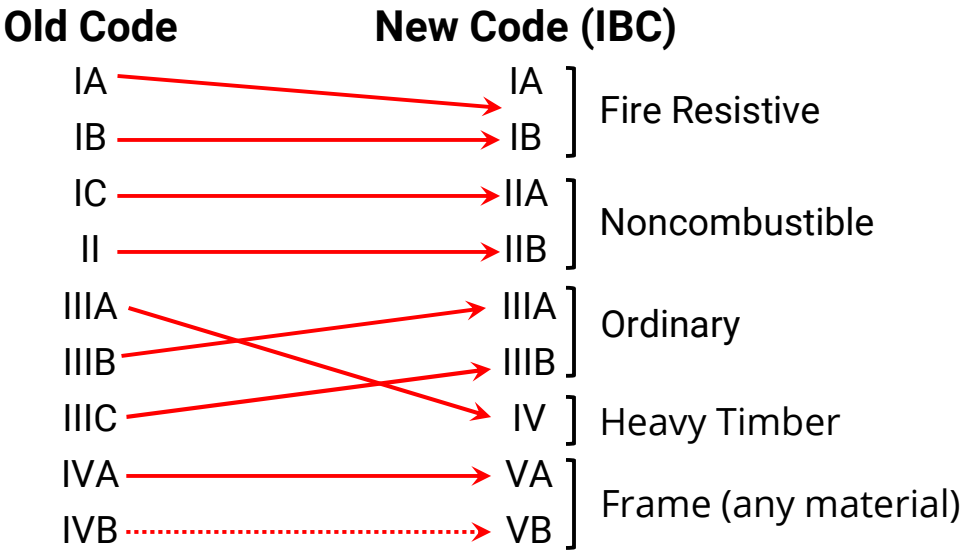
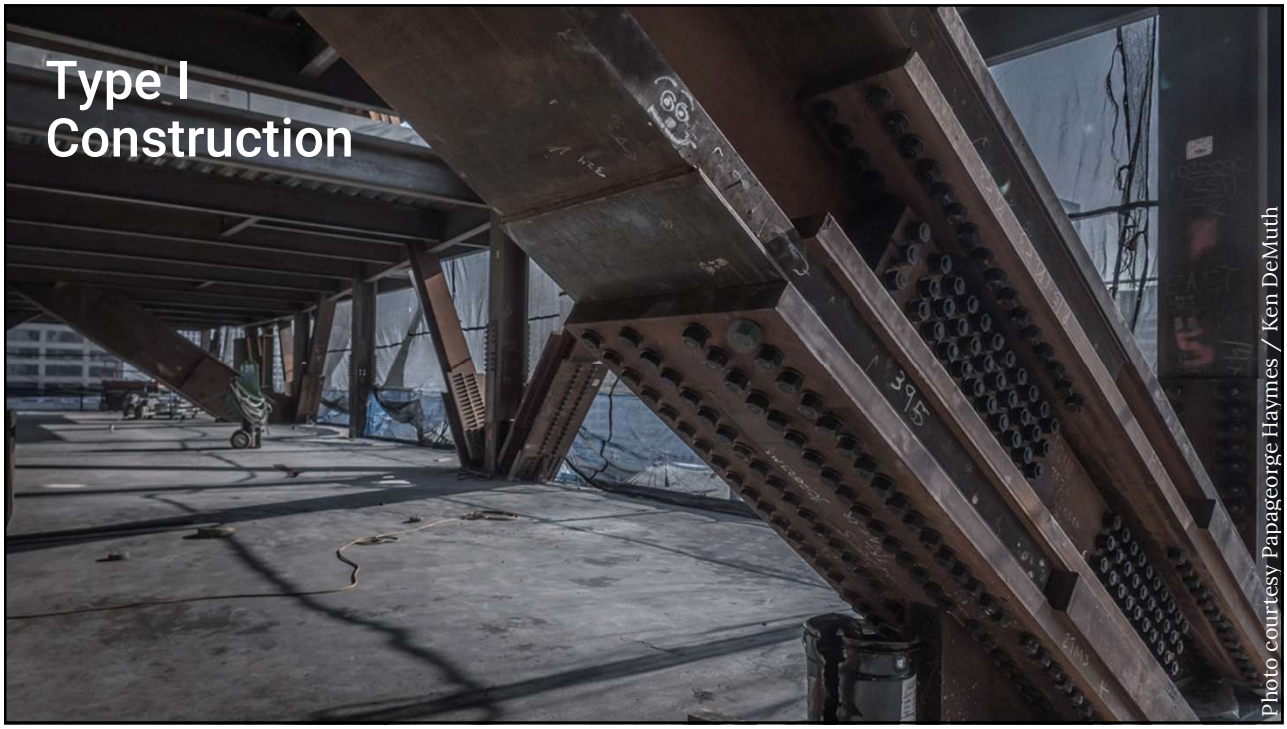
Conversion (approximate)

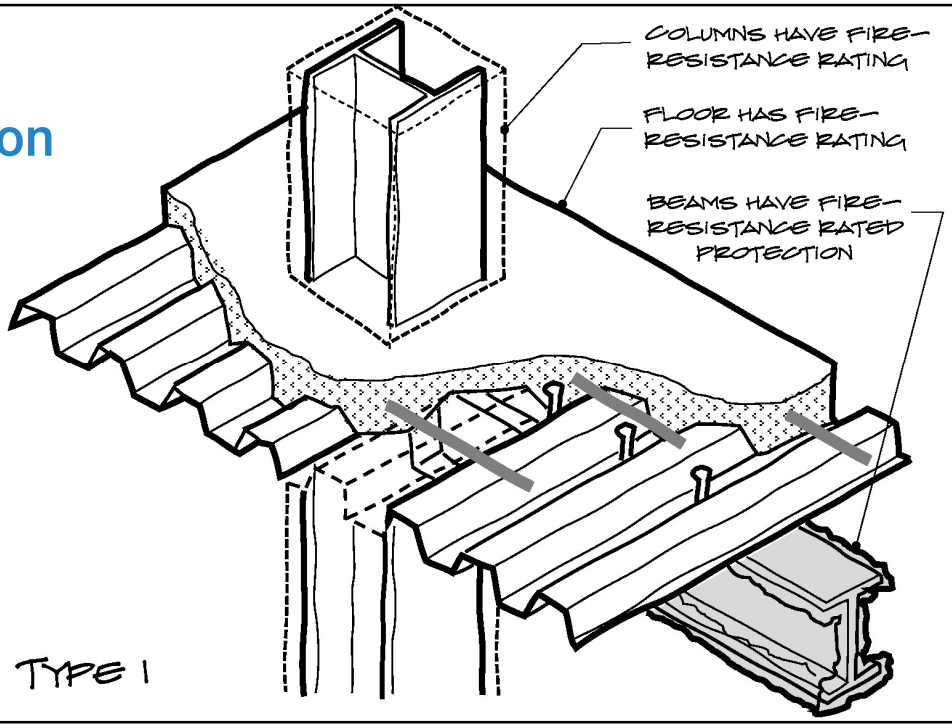


82



83

Type I Construction



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Type I Construction (continued)

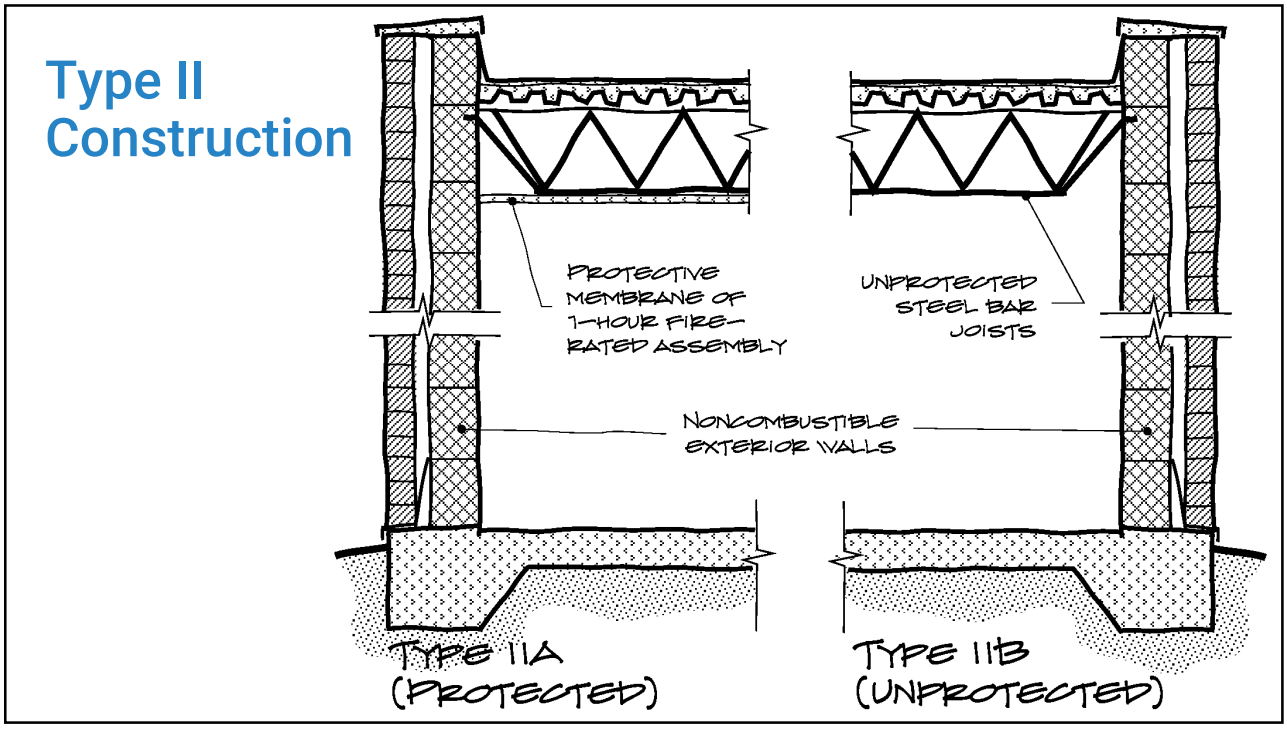
Fire-Resistance Ratings in Table 601		
	Type IA	**Type IB**
Primary Structural Frame	3	2
Exterior Bearing Walls	3	2*
Interior Bearing Walls	3	2
Floor Construction	2	2
Roof Construction	1.5	1

*not less than the rating based on fire separation distance (see Table 602)

85


Type II
Construction
sandid / Pixabay.com

86


Type II
Construction
PROTECTIVE MEMBRANE OF 1-HOUR FIRE-RATED ASSEMBLY
UNPROTECTED STEEL BAR JOISTS
NONCOMBUSTIBLE EXTERIOR WALLS
TYPE IIA (PROTECTED)
TYPE IIB (UNPROTECTED)

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Type II Construction (continued)

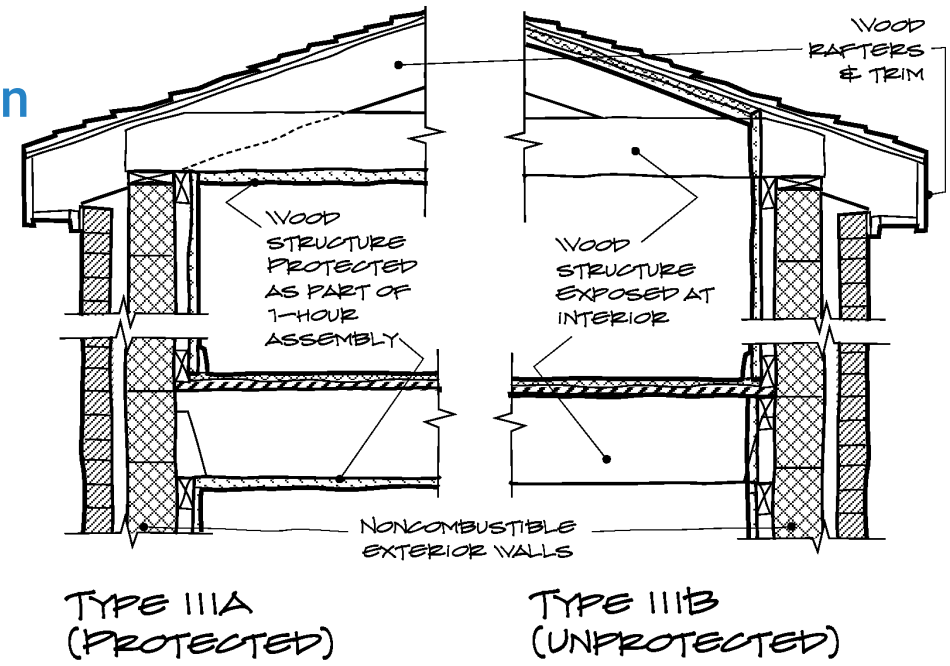
Fire-Resistance Ratings in Table 601		
	Type IIA	**Type IIB**
Primary Structural Frame	1	0
Exterior Bearing Walls	1*	0*
Interior Bearing Walls	1	0
Floor Construction	1	0
Roof Construction	1	0

*not less than the rating based on fire separation distance (see Table 602)

88

89

Type III Construction



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Type III Construction (continued)

Fire-Resistance Ratings in Table 601		
	Type IIIA	**Type IIIB**
Primary Structural Frame		
Exterior Bearing Walls		
Interior Bearing Walls		
Floor Construction		
Roof Construction		

* not less than the rating based on fire separation distance (see Table 602)

** For nontransient residential bldgs. up to 4 stories, may be reduced to 30 min. (note h)

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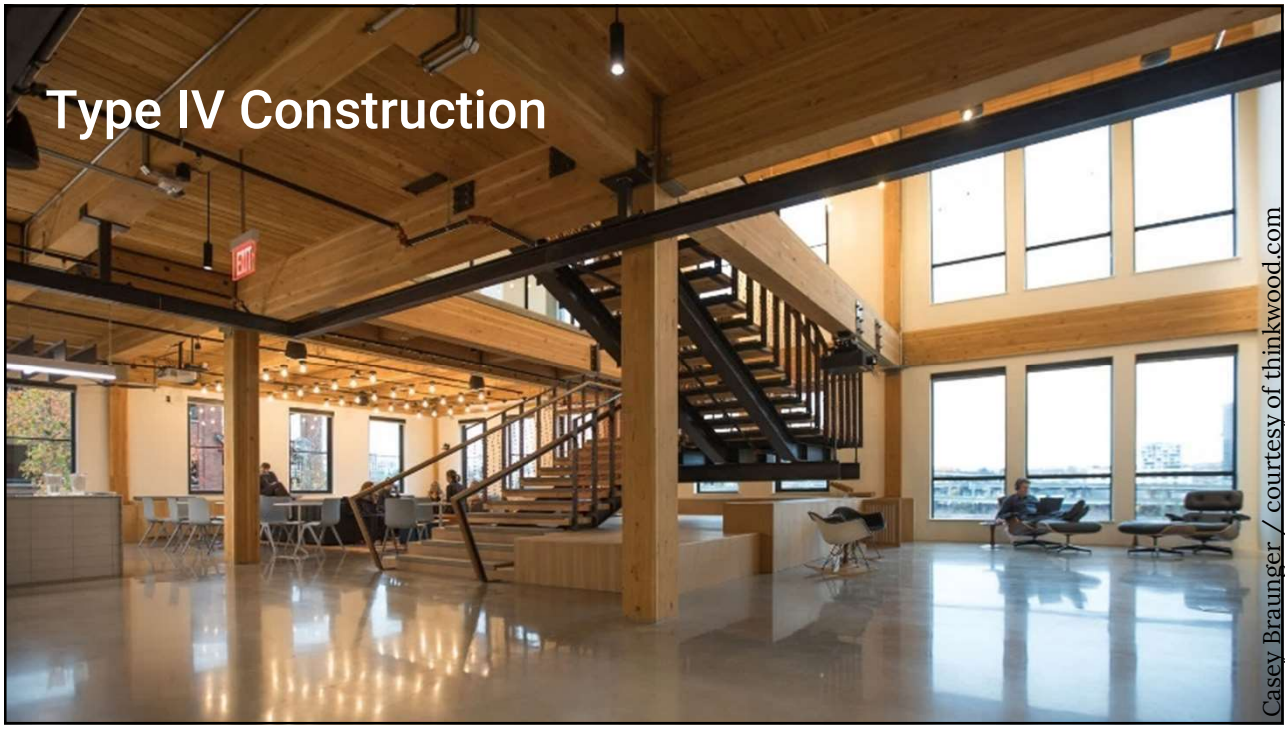

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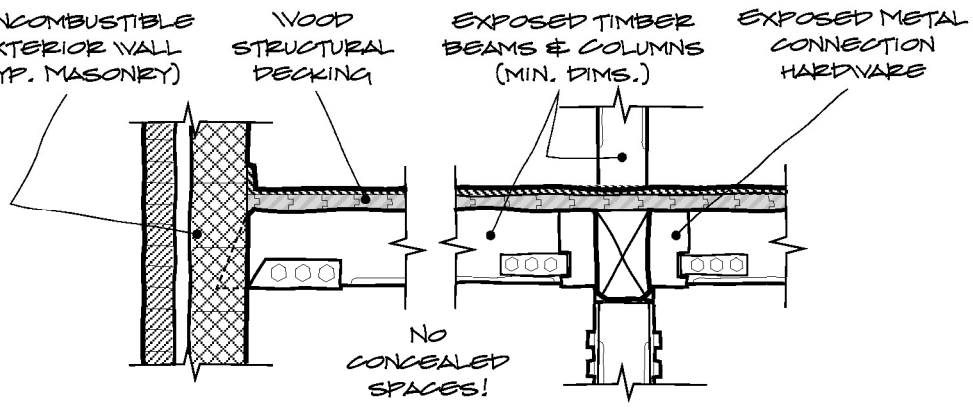
Type IV Construction



94

Type IV Construction (continued)

Fire-Resistance Ratings in Table 601	
	Type IV (HT)
Primary Structural Frame	HT
Exterior Bearing Walls	2*
Interior Bearing Walls	1/HT
Floor Construction	HT
Roof Construction	HT

*not less than the rating based on fire separation distance (see Table 602)

95

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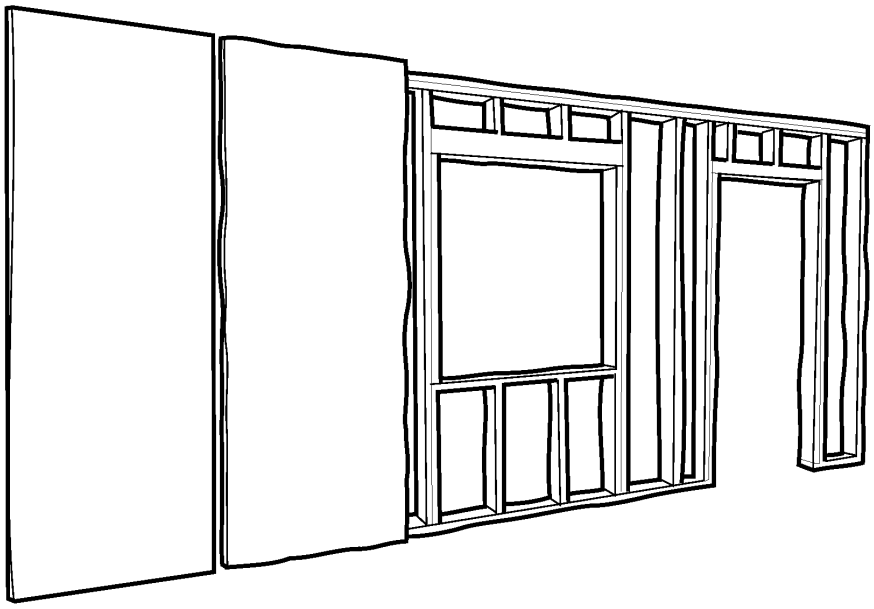
Type V Construction



97

Type V Construction (continued)

Fire-Resistance Ratings in Table 601		
	Type VA	**Type VB**
Primary Structural Frame		
Exterior Bearing Walls		
Interior Bearing Walls		
Floor Construction		
Roof Construction		

* not less than the rating/materials based on fire separation distance (see Table 602)

** For nontransient residential bldgs. up to 4 stories, may be reduced to 30 min.

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Type V Construction (continued)

- For exterior walls of Type V construction that are closer than 3 feet to an interior property line there are 2 options (Table 602, note j):
  - Noncombustible materials/materials allowed in noncombustible walls
  - Fire-retardant treated wood framing with a noncombustible exterior wall covering (e.g. fiber cement)

American Wood Council, Design for Code Acceptance (DCA3), July 2019

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Combustible Materials in Noncombustible Construction (Secs. 603, 604)

- Sections 603 and 604 make limited exceptions for allowing combustible materials in Types I and II construction and in the exterior walls of Types III and IV construction.
- Exceptions include insulation, finish flooring, doors, windows, and trim.
- A summary of these allowances is on p. I-82 of the *Manual.*

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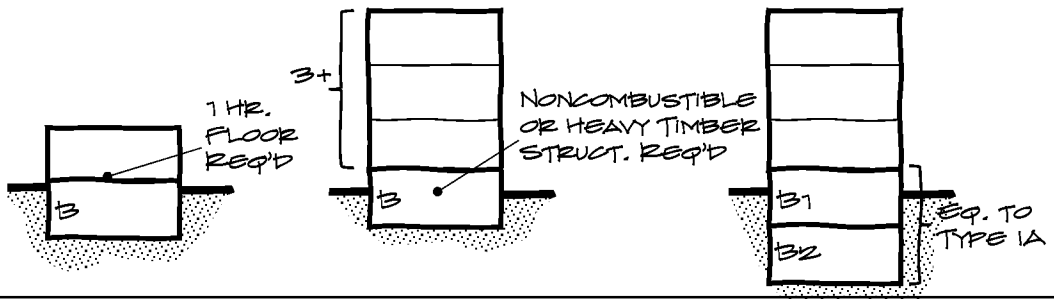
CHICAGO AMENDMENT

Basement Construction (Sec. 605)

- Because below-grade basements are more difficult to access for firefighting, additional requirements apply to basement construction for all construction types.
- Additional requirements apply to "underground buildings" (Sec. 405)



102

Height and Area Limitations

For more information see **Tasks 2.3, 2.4, and 2.5** in the *Chicago Plan Review Manual*.

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KEY CONCEPT

Height and Area

❶ Building Height

❷ Building Area—Single Occupancy

❸ Building Area—Separated Mixed Occupancy

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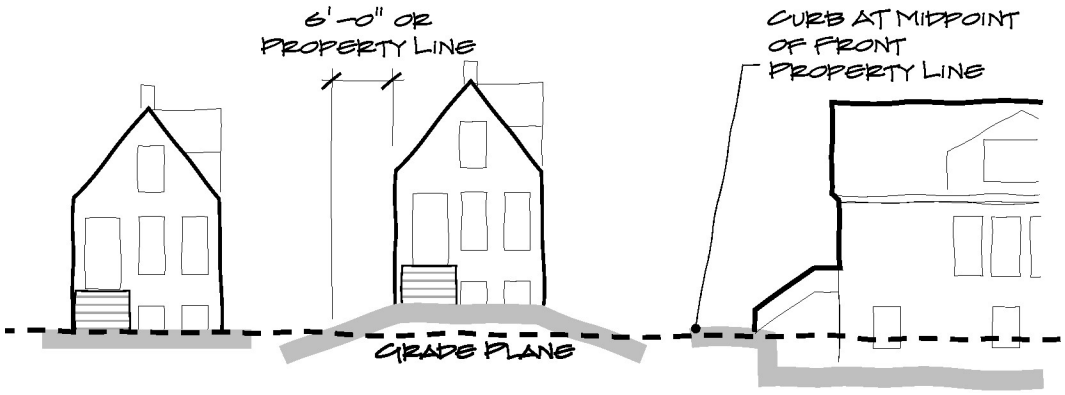
KEY CONCEPT

Grade Plane



"flat" lot sloped lot raised street

* On zoning lot up to 10,000 ft^2 can use zoning "grade"

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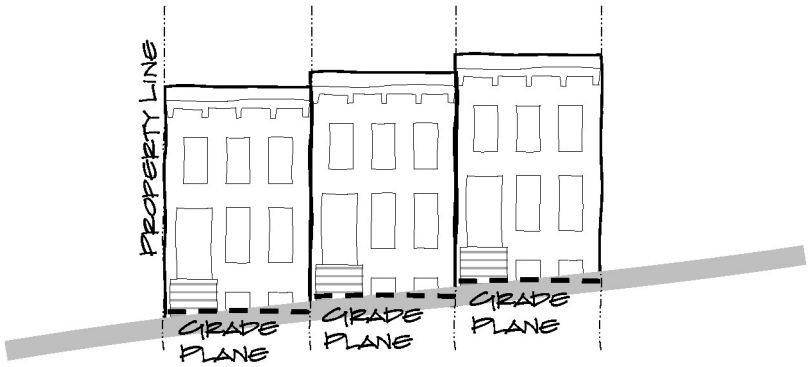
KEY CONCEPT

Grade Plane



Rowhouses as separate buildings

108

KEY CONCEPT

Building Height

- Vertical distance from grade plane to the mean elevation of the highest roof plane.
  - ≠ zoning height
  - ≠ mean roof height (structural)
- 7 exceptions to deal with occupiable rooftops, parapet walls, mechanical penthouses, certain dormers, above-deck continuous insulation (Sec. 203.3, Exceptions)

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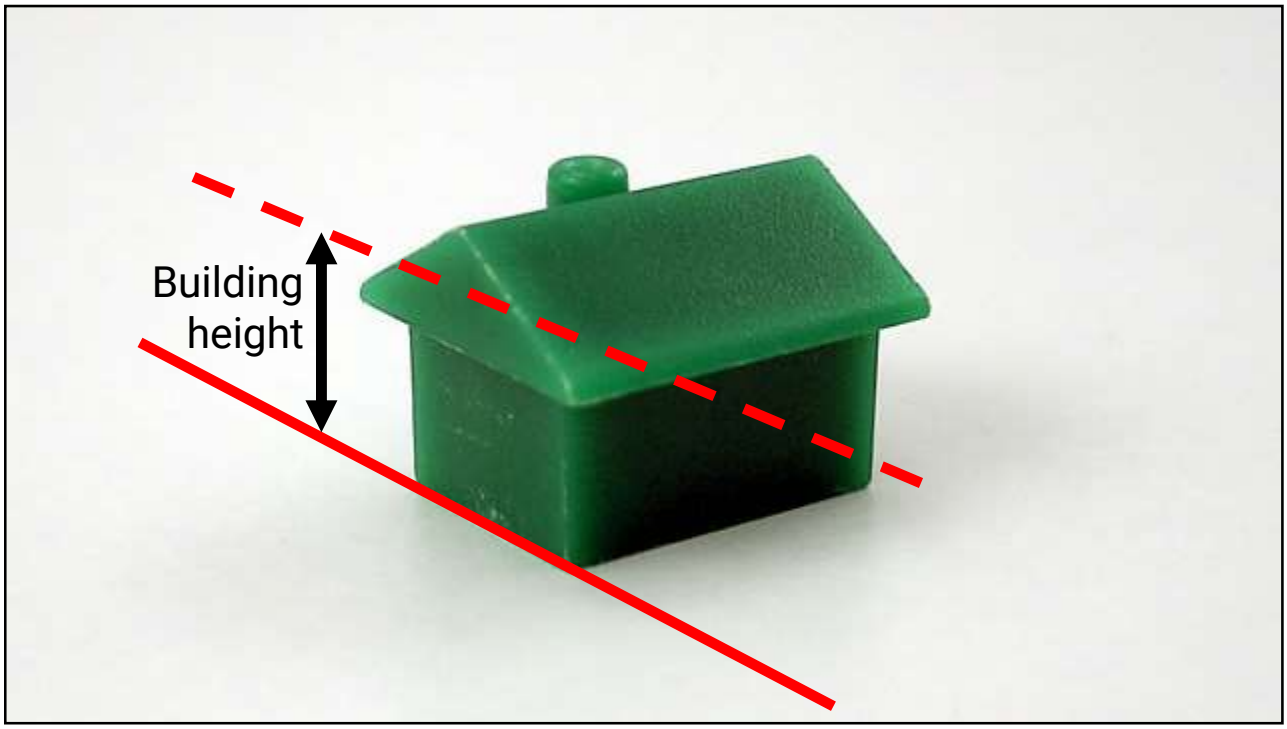
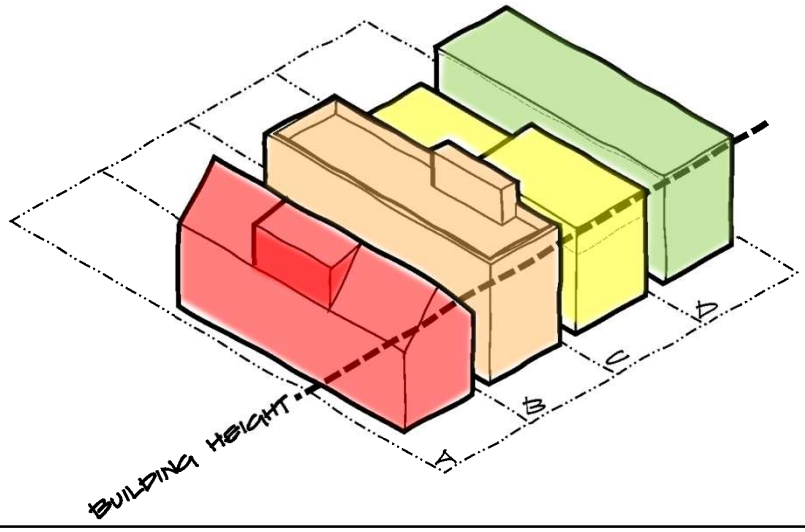


110

Building Height (continued)



111

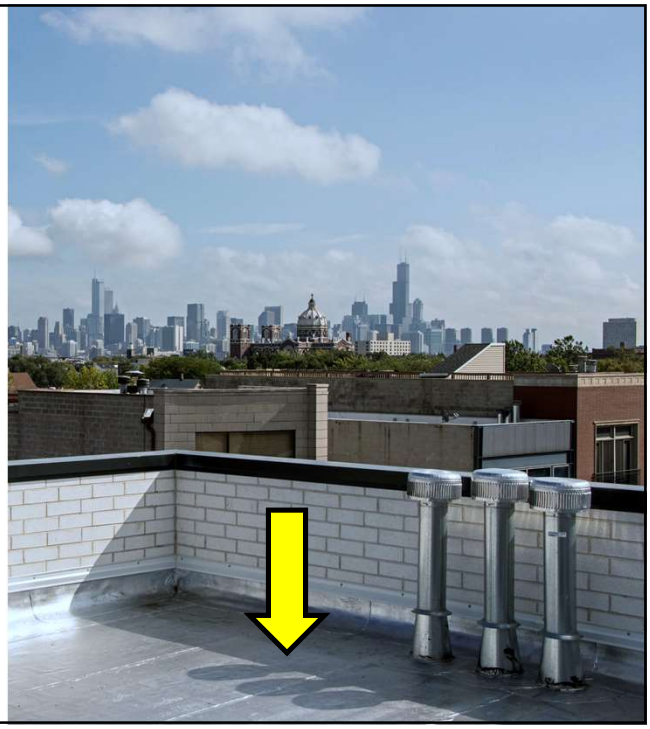
Building Height

Exception 1: Measure to highest walking surface of occupiable rooftop above highest story.

112

Building Height

Exception 2: Exclude parapets up to **42”** above highest point of a low-sloped (> 2:12) roof or occupiable rooftop.

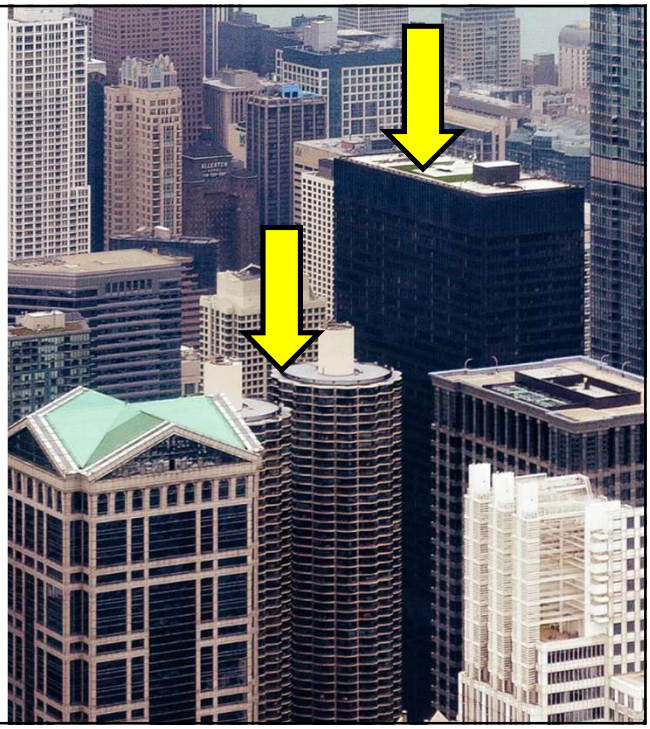


113

Building Height

Exceptions 3 and 4: Exclude unoccupied rooftop features (mechanical penthouses) per Sec. 1510 and rooftop access penthouses per 1513:

- 1/3 area of supporting roof deck
- Height limits specified for various features



114

Building Height

Exception 5: Dormers that do not have a low-sloped roof, are not higher than highest point of roof plane, and do not exceed 1/3 of horizontal area of roof plane

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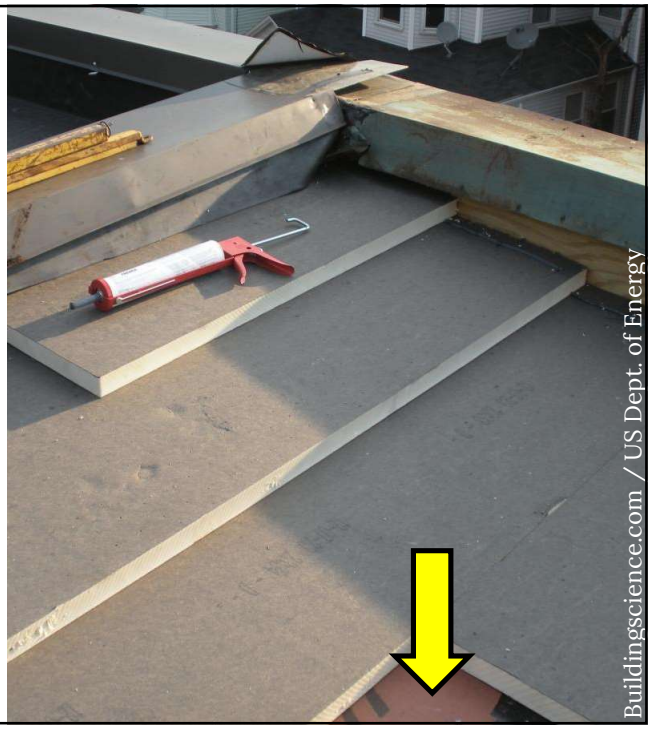
Building Height

Exception 7: For low-sloped roofs (> 2:12), exclude up to 12" continuous insulation above structural roof deck.



116

KEY CONCEPT

Stories vs. Stories Above Grade Plane

- **STORY.** That portion of a *building* included between the upper surface of a floor and the upper surface of the floor or roof next above.
  - Story above grade plane
  - Basement
  - Attic (sometimes)

Not a story (if requirements met):

- Mezzanine
- Occupiable rooftop

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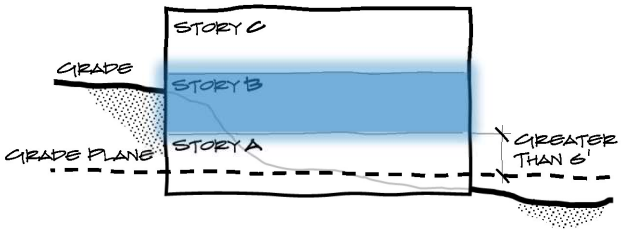
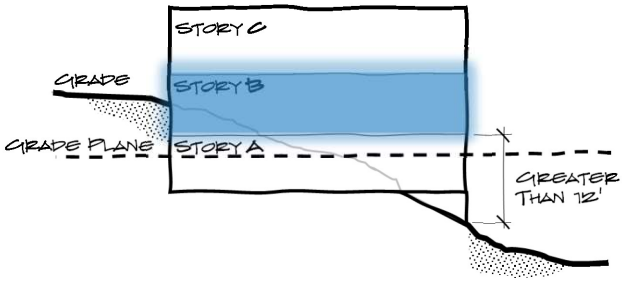
Stories Above Grade Plane

Any *story* having its finished floor surface entirely above *grade plane*, or in which the finished surface of the floor next above is:

1. More than 6 feet above *grade plane*.
2. More than 12 feet above the adjacent finished ground level at any point.





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Lofts, Mezzanines, and Equipment Platforms

- **LOFT.** A floor level located above the main floor level within a *dwelling unit* or *sleeping unit*, open to the main floor on at least one side and used as a living or sleeping space.
- **MEZZANINE.** An intermediate level or levels between the floor and ceiling of any *story* and in accordance with Section 505.
- **EQUIPMENT PLATFORM.** An unoccupied, elevated platform used exclusively for mechanical systems or industrial process equipment, including the associated elevated walkways, stairways, alternating tread devices and ladders necessary to access the platform (see Section 505.3).

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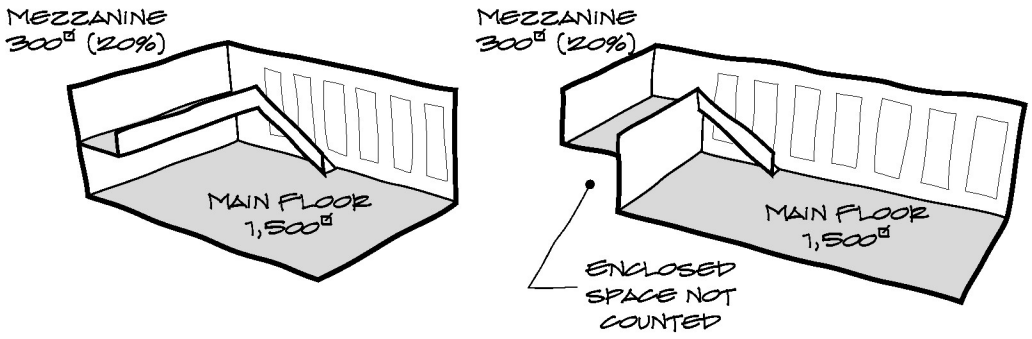
Mezzanines



122

Lofts (Sec. 1207.5)

- Sleeping/living (no plumbing)
- Max 9' above main living level
- 35-150 ft² floor area
- Portion must have 5' ceiling height
- Allowed to use ladder or steep stairs for access
- Guards must be 36" or half floor-ceiling distance

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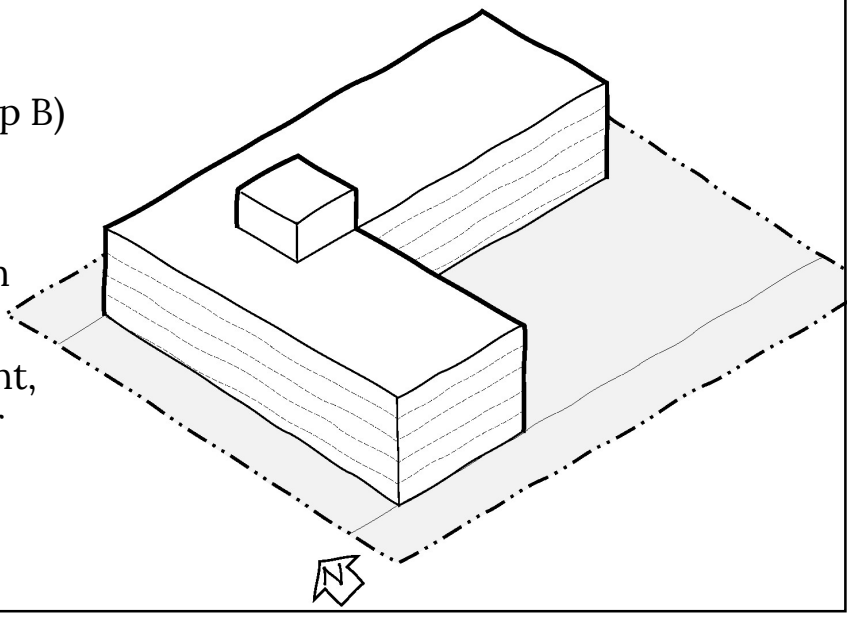
FOR EXAMPLE

Determining Height for Office Building (p. I-96)

- Office building (Group B)
- NFPA 13 sprinkler system (full)
- Type IIA construction
- Penthouse contains mechanical equipment, stairway and elevator serving roof



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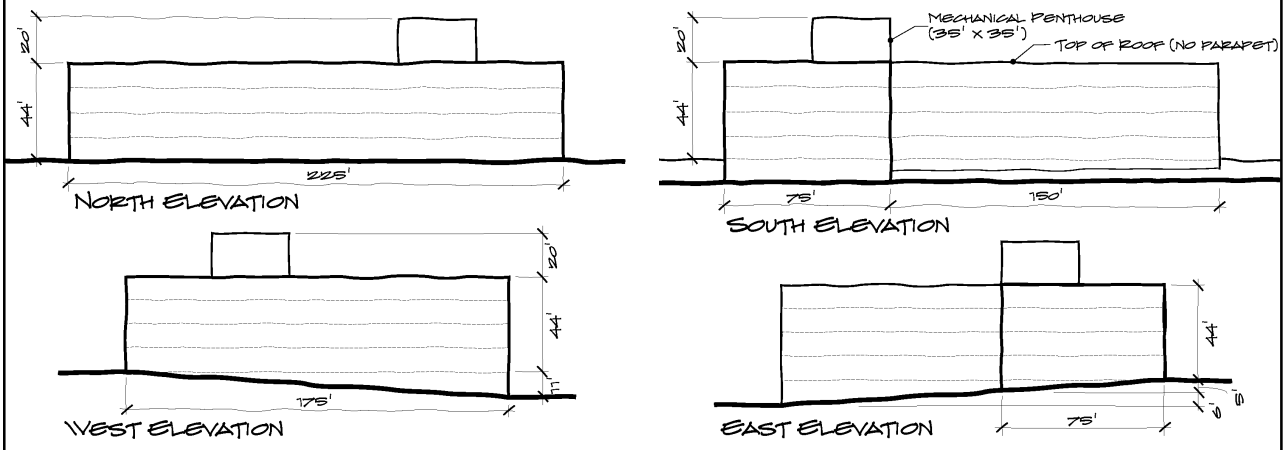
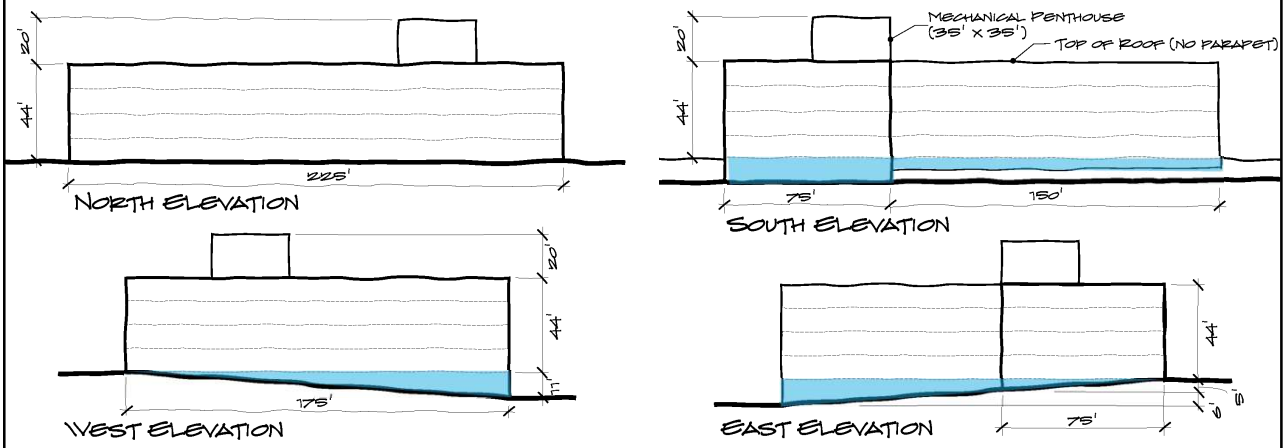
Manual p. I-97



* Wall height dimensions shown are taken from lowest point within 6'-0" horizontally from base of wall to average height of roof.

125

Step 1.1: Determine Grade Plane



* Wall height dimensions shown are taken from lowest point within 6'-0" horizontally from base of wall to average height of roof.

126

Step 1.1: Determine Grade Plane (continued)

Calculate the above-ground area of each wall between the highest and lowest ground elevations adjoining the building:

NORTH: 0 FT x 225 FT = 0 FT²

WEST: 11 FT x 175 FT ÷ 2 = 962.5 FT²

SOUTH: 11 FT x 75 FT + 4 FT x 150 FT = 1,425 FT²

EAST: 11 FT x 175 FT ÷ 2 = 962.5 FT²

TOTAL: 0 FT² + 962.5 FT² + 1,425 FT² + 962.5 FT² = 3,350 FT²

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Step 1.1: Determine Grade Plane (continued)

To find the vertical distance between the highest point and grade plane, divide the total wall area by the building perimeter.

Here, the building perimeter is:

225 FT + 175 FT + 75 FT + 100 FT + 150 FT + 75 FT = 800 FT

3,350 FT² ÷ 800 FT = 4.2 FT

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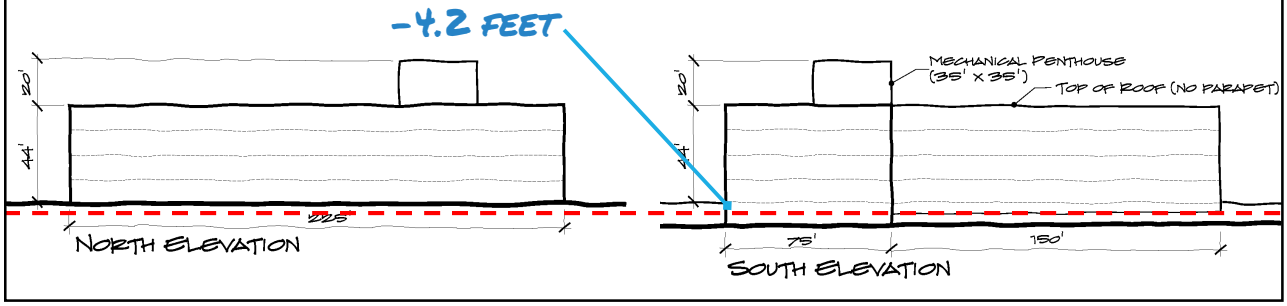
Step 1.1: Determine Grade Plane (continued)

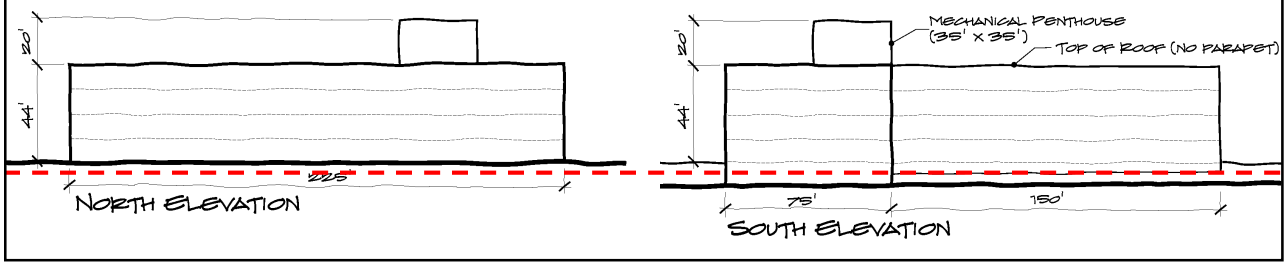
Grade plane is **4.2 feet below** the highest ground level adjoining the building (here, the ground level adjoining the north wall.)



129

Step 1.2: Determine Height in Feet

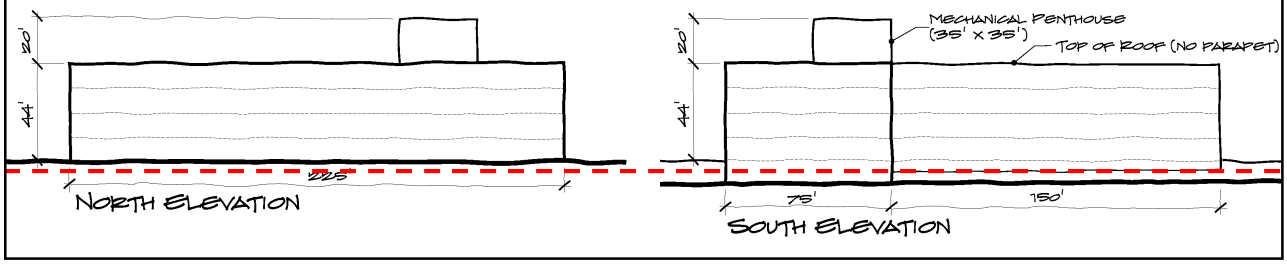
- Vertical distance from grade plane to main roof = 48.2 ft
- Vertical distance from grade plane to penthouse roof = 68.2 ft
- Mechanical penthouse area is < 33% of roof area (Sec. 1510.1.1)
- Mechanical/elevator penthouse height OK (Sec. 1510.2)
- **Building height = 48.2 ft**



130

Step 1.3: Determine Stories Above Grade

- Mechanical/rooftop access penthouse is not a story.
- Floor level of second story is 4.2 feet above grade plane.
- Floor level of second story is 11 feet above ground at SW corner (lowest point).
- Lowest story is basement.
- **Building height = 4 stories above grade plane**



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Step 2.1: Allowable Bldg. Height in Feet

TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE[a]

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, H-4[c] M, S, U	NS[b]	80	80	65	30	55	30	65	30	15
	S	UL	150	85	45	70	45	85[g]	45	30
H-1, H-2, H-3, H-5	NS[c, d]	UL	80	65	30	55	NP	65	NP	NP
	S									
I	NS[b]	80	80	65	30	55	30	65	30	NP
	S	UL	150	85						
R	NS[b]	80	80	65	30	55	30	65	30[e]	20
	S13D	40	40	40	40	40	40	40	40	35
	S13R	55	55	55	45	55	45	55	45[f]	35
	S	UL	150	85	45	70	45	85[g]	45[f]	35

For SI: 1 foot = 304.8 mm.

UL = Unlimited; NS = *Buildings* not equipped throughout with an *automatic sprinkler system*; S = *Buildings* equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1; S13R = *Buildings* equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.2; S13D = *Buildings* equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable *building height* height in this chapter.

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Step 2.2: Allowable Stories Abv. Grade Plane

TABLE 504.4
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE[a, b]

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	UL	5	3	1	2	NP	2	1	NP
	S-13	UL	6	4	2	3	1	3	1	NP
A-2	NS	UL	10	3	1	2	NP	2	1	NP
	S-13	UL	11	4	2	3	1	3	1	NP
A-3	NS	UL	10	3	1	2	NP	2	1	NP
	S-13	UL	11	4	2	3	1	3	1	NP
A-4	NS	UL	10	3	1	2	NP	2	1	NP
	S-13	UL	11	4	2	3	1	3	1	NP
A-5	NS	UL	UL	UL	UL	*	*	*	*	*
	S-13	UL	UL	UL	UL	*	*	*	*	*
B	NS	UL	11	6	1	4	2	5	1	NP
	S-13	UL	12	7	2	5	3	6	2	1

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Step 3: Verify Proposed Height is Allowed

Category	Actual Value	Maximum Allowed	OK?
Height (ft)	48.2 FT	85 FT	YES
Height (stories above grade)	4 STORIES	7 STORIES	YES

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Building Height Activity

Height	Construction Type Acceptable? IIB	IIIA	IIIB	IV	VA	VB
48.2 feet						30 FT
						N
4 stories						1 STORY
						N

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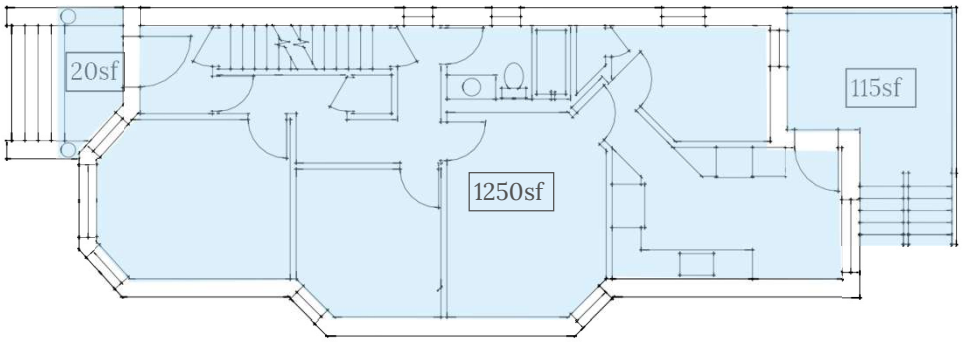
Building Area

- Building area excludes thickness of exterior walls.
- Includes covered porches (open or enclosed), balconies, etc.
- Includes all stories above grade plane with a ceiling height of 5'-0" or more



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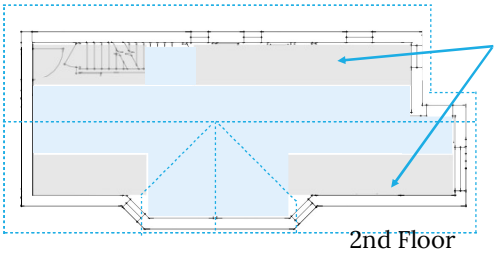
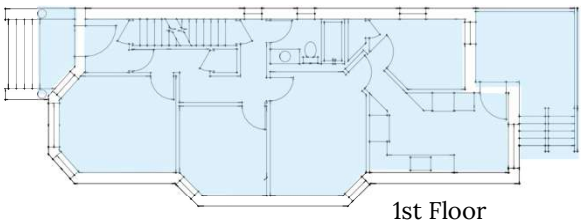
Building Area (continued)

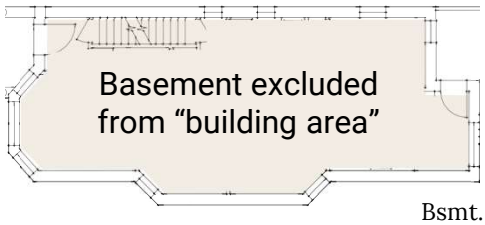


Areas with less than 5'-0" of headroom excluded from "building area"

2nd Floor



1st Floor



Bsmt.

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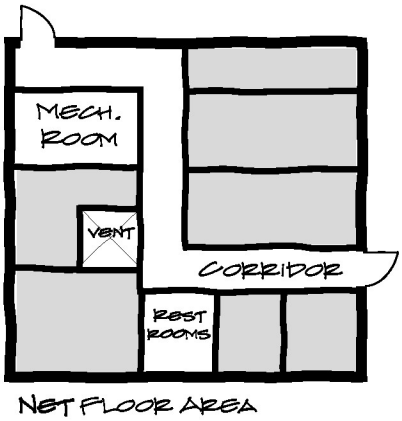
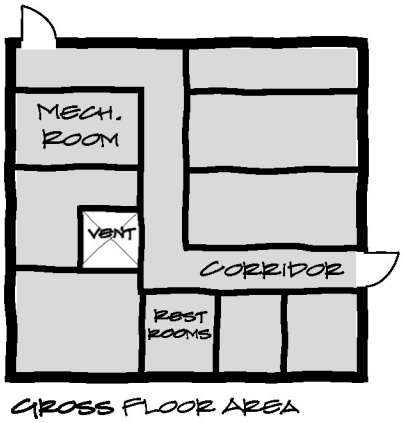
KEY CONCEPT

Net vs. gross floor area



NET FLOOR AREA



GROSS FLOOR AREA

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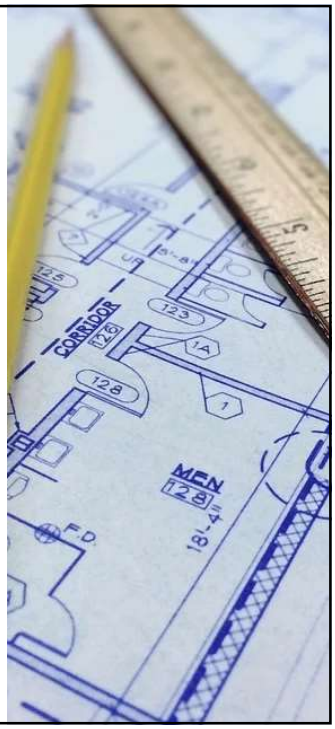
KEY CONCEPT

Three Approaches to Building Area

- Single occupancy
  - Accessory occupancies
  - Incidental uses
- Nonseparted mixed occupancy
- Separated mixed occupancy

- Possible to combine these approaches



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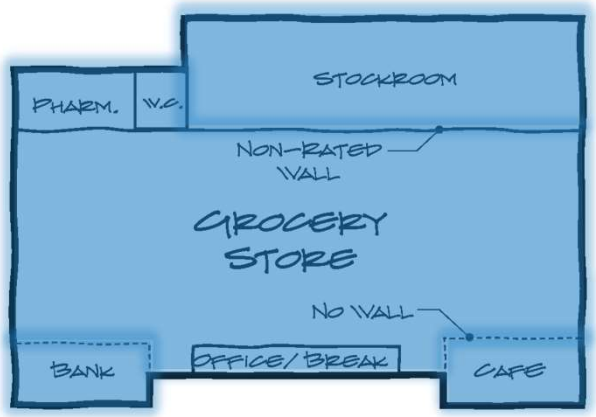
FOR EXAMPLE

Single Occupancy (p. I-105)

Single occupancy can include accessory occupancies:

- Grocery and pharmacy ➔ main occupancy Group M
- Stockroom allowed as accessory storage (311.1.1)
- Café OL < 50, ➔ Classify with main occupancy (303.1.2(1))
- Bank < 5% floor area ➔ accessory occupancy (508.2)



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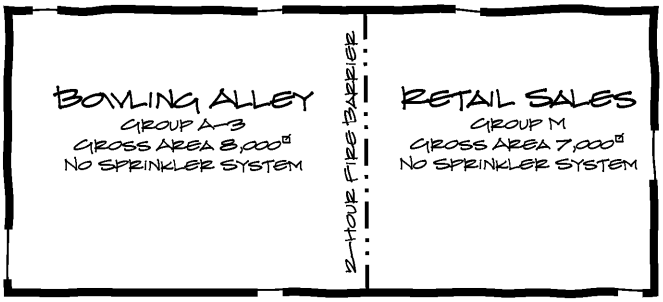
FOR EXAMPLE

Separated Mixed Occupancies

Separating mixed occupancies is traditional approach:

- Classify each portion
- Height and area limits are determined for each occupancy
- Fire protection system requirements are applied to each fire area



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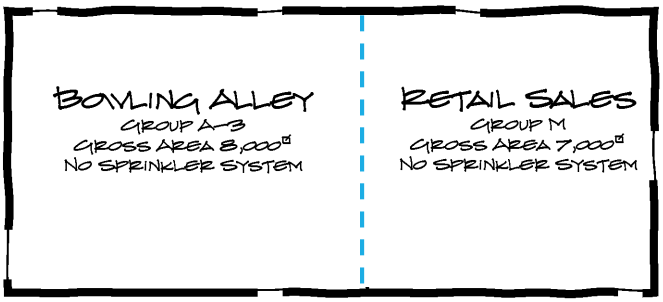
FOR EXAMPLE

Nonseparated Mixed Occupancy

Nonseparated mixed occupancies allowed (508.3):

- Classify each portion
- Use most restrictive height/area limits (Group M areas more restrictive)
- Use most restrictive Ch. 9 (fire protection) reqs. Through fire area



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KEY CONCEPT

11 Steps to Check Area for Separated Mixed Occupancy

1. Verify occupancy classifications.
2. Verify construction type.
3. Verify height in feet and stories above grade plane.
4. Determine tabular allowed area factor (A_t) and tabular nonsprinklered factor.
5. Calculate the increase factor for frontage (I_f).
6. Check occupancy separations.
7. Calculate allowable area.
8. Check actual area ≤ allowable area per occupancy.
9. Check actual area ≤ allowable area for each story.
10. Check actual area ≤ allowable building area.
11. Check actual height (feet and stories) ≤ than allowable.

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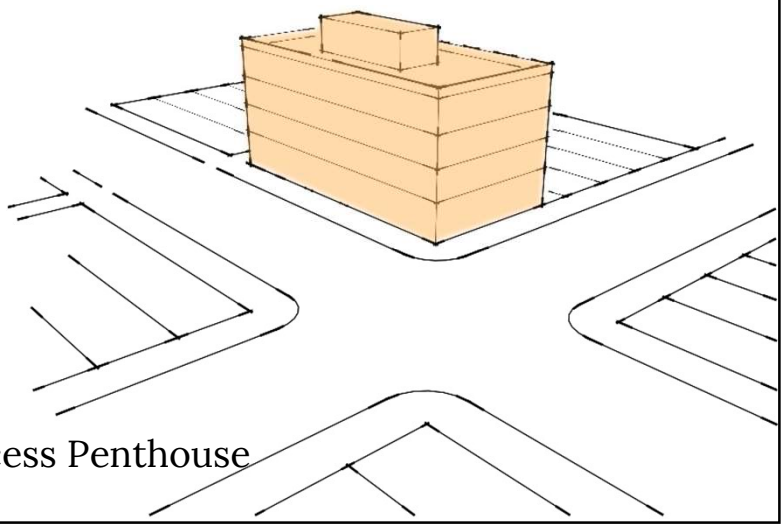
FOR EXAMPLE

Mixed Occupancy Example (p. I-117)

- Basement
  - Parking Garage
- First Story Above Grade
  - Professional Office
  - Retail Store
  - Restaurant (OL ≥ 50)
- 2nd – 4th Stories
  - 8 apartments / story (24 total apartments)
- Mechanical/Rooftop Access Penthouse



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Mixed Occupancy Example (continued)

Step 1. Check Occupancy Classifications

- Groups **S-2** (parking garage), **A-2** (restaurant), **B** (office), **M** (retail store), **R-2** (apartments)

Step 2. Check Construction Type

- Type VA (Protected Frame)

Step 3. Check Bldg. Height in Feet and Stories Above Grade Plane

- 54 feet
- 4 stories above grade

Step 4. Determine tabular allowed area factors (A_t) and factors for nonsprinklered occupancies (NS)

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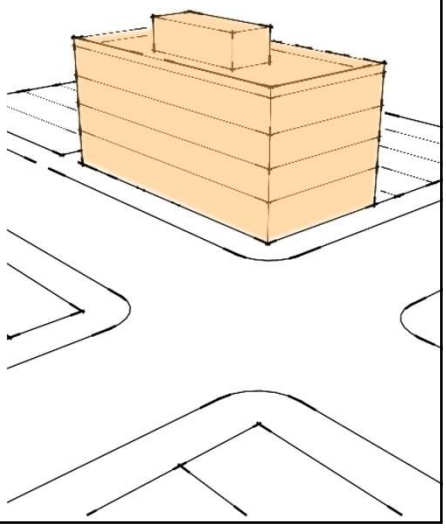
Mixed Occupancy Example (continued)

Step 5. Calculate the area increase factor for frontage (I_f) using Section 506.3.3.

- Use equation 5-5 (for detailed example see *Manual* p. I-106)
- Here, for rectangular corner building, because ½ perimeter faces public way > 30' and ½ perimeter faces open space < 20', I_f for sprinklered building is **100%**



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SEPARATED MIXED-OCCUPANCY BUILDING: SPACE ALLOCATION		
Space	**Occupancy Group**	**Floor Area**
Basement		
Parking Garage	Group S-2	7,000
	TOTAL	**7,000**
First Story Above Grade Plane		
Professional Office	Group B	2,000
Retail Store	Group M	2,000
Restaurant	Group A-2	3,000
	TOTAL	**7,000**
Second Story Above Grade Plane		
Apartments (8)	Group R-2	7,000
	TOTAL	**7,000**
Third Story Above Grade Plane		
Apartments (8)	Group R-2	7,000
	TOTAL	**7,000**
Fourth Story Above Grade Plane (and Penthouse Above)		
Apartments (8)	Group R-2	7,000
Mechanical Penthouse	Accessory to Group R-2	2,000
	TOTAL	**9,000**

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Mixed Occupancy Example (continued)

Occupancy Groups: A-2, B, M, R-2, S-2

Construction Type: VA (PROTECTED FRAME)

Sprinkler System: FULL NFPA 13

Proposed Height: 54 FEET
4 STORIES ABOVE GRADE PLANE

Tabular factors:

	A_t (SM)	NS
A-2	9,000 FT²	3,000 FT²
B	18,000 FT²	6,000 FT²
M	15,000 FT²	5,000 FT²
R-2	15,000 FT²	5,000 FT²
S-2 (GARAGE)	18,000 FT²	6,000 FT²

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Step 6: Check Occupancy Separations

- The basement parking garage must be separated from all other occupancies by construction with a fire-resistance rating of at least 3 hours per Section 406.2.8.
- The restaurant (A-2) must be separated from the business (B) and mercantile (M) occupancies by construction with a fire-resistance rating of at least 1 hour per Table 508.4.
- The restaurant (A-2) must be separated from the residential (R-2) occupancy by construction with a fire-resistance rating of 1 hour.
- The business (B) and mercantile (M) occupancies must be separated from the residential (R-2) occupancy by construction with a fire-resistance rating of 1 hour.

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Step 7: Allowable Area per Occupancy

The allowable building area for each occupancy in a multi-story separated mixed-occupancy building is determined per Equation 5-3:

$$A_a = [A_t + (NS \times I_f)]$$

where:

A_a = Allowable area (square feet).

A_t = Tabular allowable area factor (NS, S13R, S13D or SM value, as applicable) in accordance with Table 506.2.

NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building (regardless of whether the building is sprinklered).

I_f = Area factor increase due to frontage (percent).

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Step 7: Allowable Area (continued)

The allowable building area for each occupancy in a multi-story separated mixed-occupancy building is determined per Equation 5-3:

$$A_a = [A_t + (NS \times I_f)]$$

GROUP A-2 A_A = 9,000 FT² + (3,000 FT² x 100%) = 12,000 FT²

GROUP B A_A = 18,000 FT² + (6,000 FT² x 100%) = 24,000 FT²

GROUP M A_A = 15,000 FT² + (5,000 FT² x 100%) = 20,000 FT²

GROUP R-2 A_A = 15,000 FT² + (5,000 FT² x 100%) = 20,000 FT²

GROUP S-2 A_A = 18,000 FT² + (6,000 FT² x 100%) = 24,000 FT²

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Step 8: Check Actual Area by Occupancy

Calculate the ratio of proposed floor area to allowable area for each occupancy on each story above grade plane. The ratio for each occupancy group on each story cannot exceed 1.

FIRST STORY:

- GROUP A-2: 3,000 FT² ÷ 12,000 FT² = 0.25 — 0.25 ≤ 1
- GROUP B: 2,000 FT² ÷ 24,000 FT² = 0.083 — 0.083 ≤ 1
- GROUP M: 2,000 FT² ÷ 20,000 FT² = 0.1 — 0.1 ≤ 1

SECOND + THIRD STORIES:

- GROUP R: 7,000 FT² ÷ 20,000 FT² = 0.35 — 0.35 ≤ 1

FOURTH STORY (INCL. PENTHOUSE ABOVE):

- GROUP R: 9,000 FT² ÷ 20,000 FT² = 0.45 — 0.45 ≤ 1

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Step 9: Check Actual Area by Story

Sum the ratios from Step 8 for each story above grade plane. The sum of the ratios for each story cannot exceed 1.

First Story:

- 0.25 + 0.083 + 0.1 = 0.433 $\quad$ $0.433 \leq 1$

Second + Third Stories:

- 0.35 $\quad$ $0.35 \leq 1$

Fourth Story (incl. penthouse above):

- 0.45 $\quad$ $0.45 \leq 1$

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Step 10: Check Max. Building Area

Sum all ratios from Step 9 to determine if the building complies.

The sum of the ratios for all stories above grade plane cannot exceed 2 for a 2-story building or 3 for a building with 3 or more stories. (Section 506.2.4)

$0.433 + 0.35 + 0.35 + 0.45 = 1.583 \quad 1.583 \leq 3$

The total building area of 30,000 ft² is acceptable in Type VA construction with an automatic sprinkler system throughout.

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Step 11: Check Building Height/Stories

Occupancy	Actual Ht. (feet)	Max Height (feet)	Actual Ht. (stories)	Max Height (stories)	OK?
A-2	20 FT	45 FT	1	1	YES
B	20 FT	45 FT	1	2	YES
M	20 FT	45 FT	1	1	YES
R-2	54 FT	55 FT*	4	4	YES*
S-2	0 FT	45 FT	0	1	YES

* Per Table 504.3, note f, 55 feet provided the highest finished floor is no more than 40 feet above grade plane.

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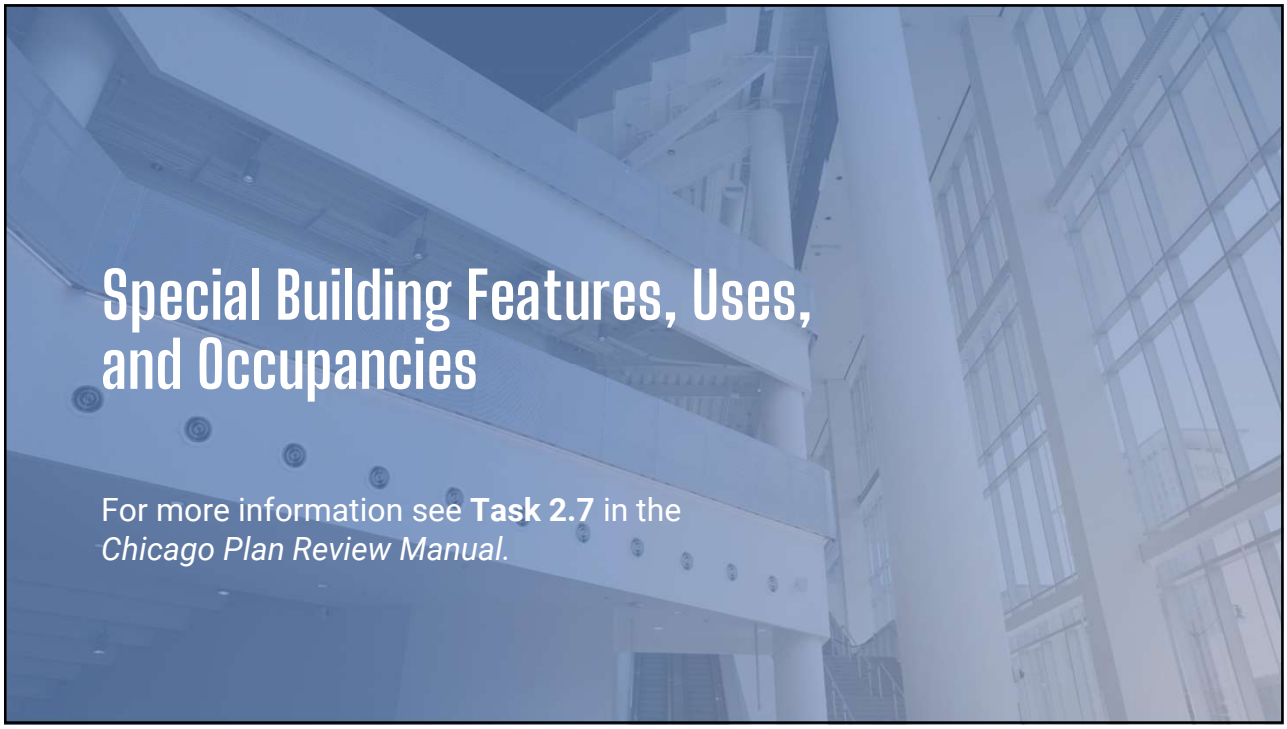

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High-rise buildings

- High-rise buildings = buildings greater than 80' in building height (simpler than IBC definition)
- High-rise buildings have specialized requirements in Sec. 403 for:
  - construction
  - fire protection systems
  - means of egress
  - elevators

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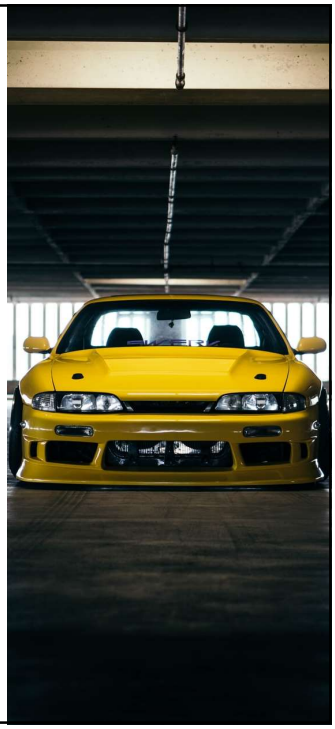
Motor Vehicle Related Occupancies

- Motor-vehicle related occupancies range from single-car carports to large repair garages. Task 2.7 applies requirements for:
  - Carports/private garages
  - Public garages
  - Parking facilities



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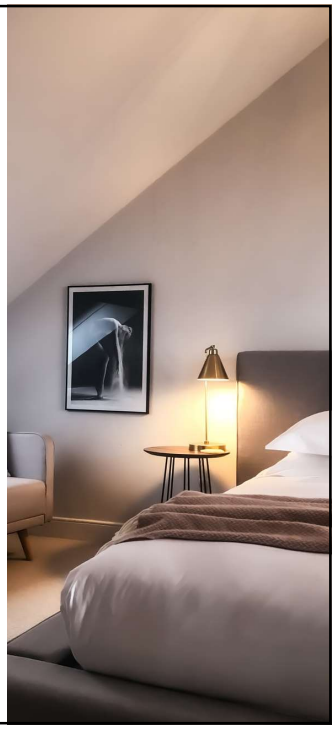
Dwelling Units and Sleeping Units

- Unit fire separation
- Shared cooking facilities
- Unit features
- Space dimensions
- Natural light and ventilation



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REFERENCE

For More Information . . .

- List of Special Occupancies and Uses in *Chicago Building Code* and *Interim Chicago Fire Prevention Code* (p. I-19)
- Task 2.7: Reviewing certain special occupancies and uses:
  - High-rise buildings
  - Motor-vehicle-related occupancies
  - Residential units (dwelling units, sleeping units, and shared cooking facilities)
  - Occupiable rooftops
  - Institutional occupancies

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Means of Egress
Self-Certification Training Class
January 18-20, 2022
CHICAGO
Department of Buildings

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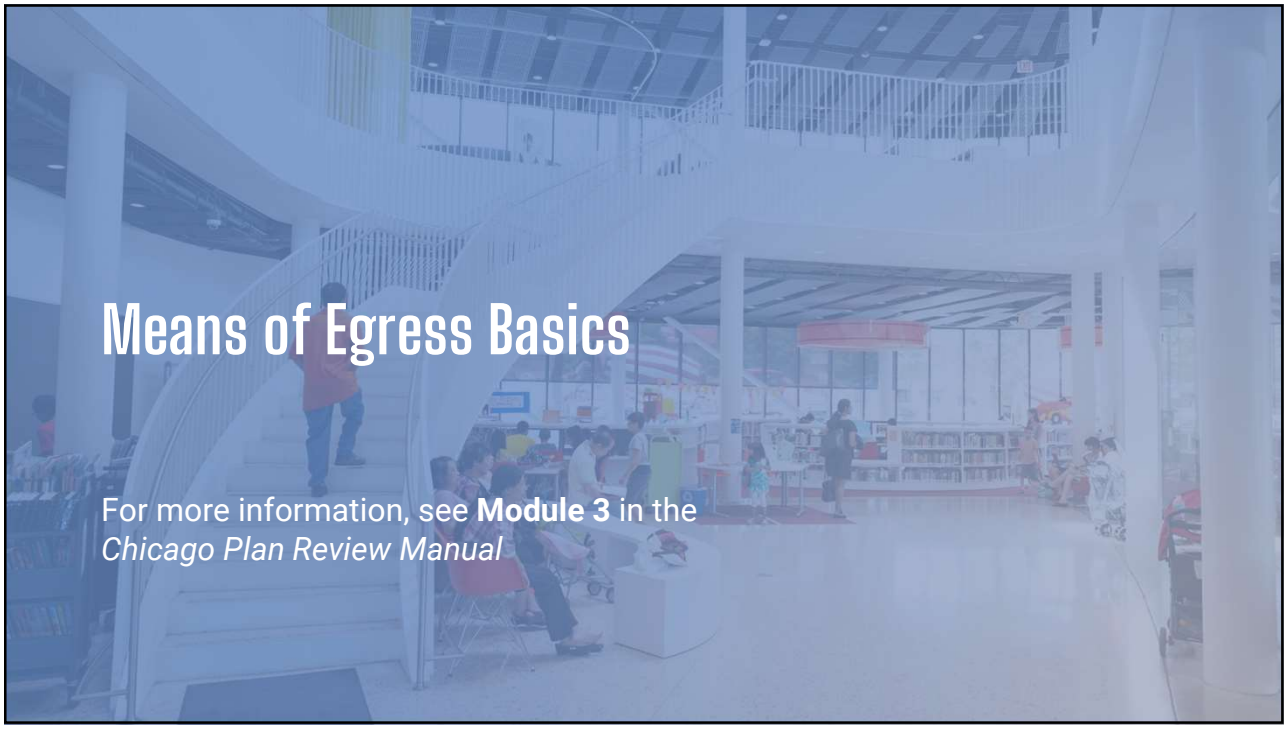
Means of Egress Basics
For more information, see **Module 3** in the
Chicago Plan Review Manual

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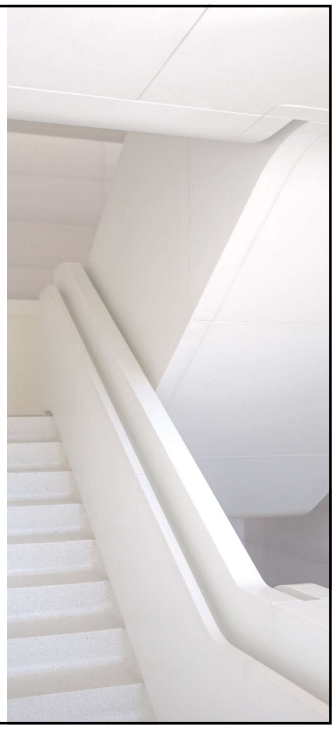
Means of Egress

MEANS OF EGRESS. A continuous and unobstructed path of vertical and horizontal egress travel from any *occupiable space* in a *building* or *structure* to a *public way*.

A means of egress consists of three separate and distinct parts:

- the ***exit access***,
- the ***exit***, and
- the ***exit discharge***.



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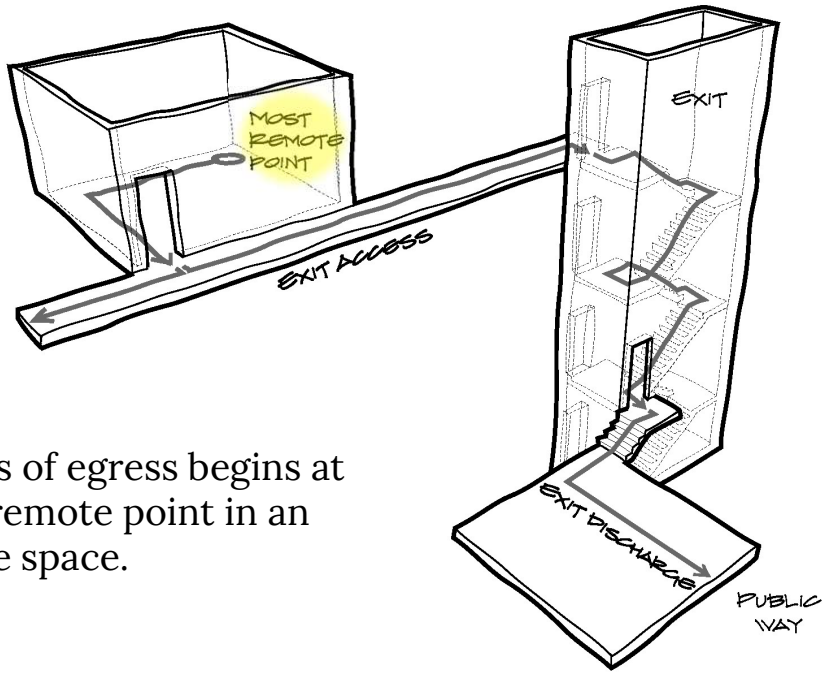

- The means of egress begins at the most remote point in an occupiable space.

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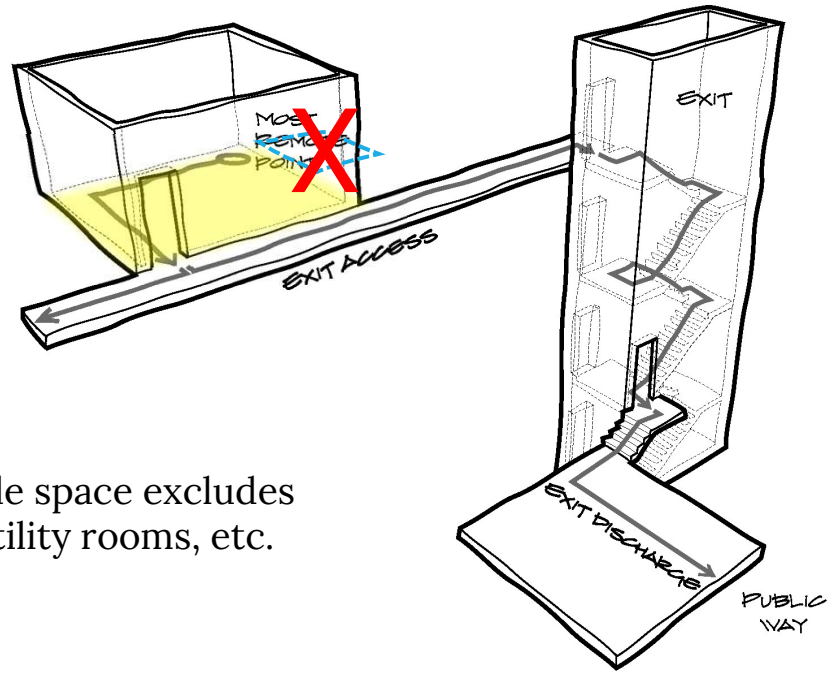

- Occupiable space excludes closets, utility rooms, etc.

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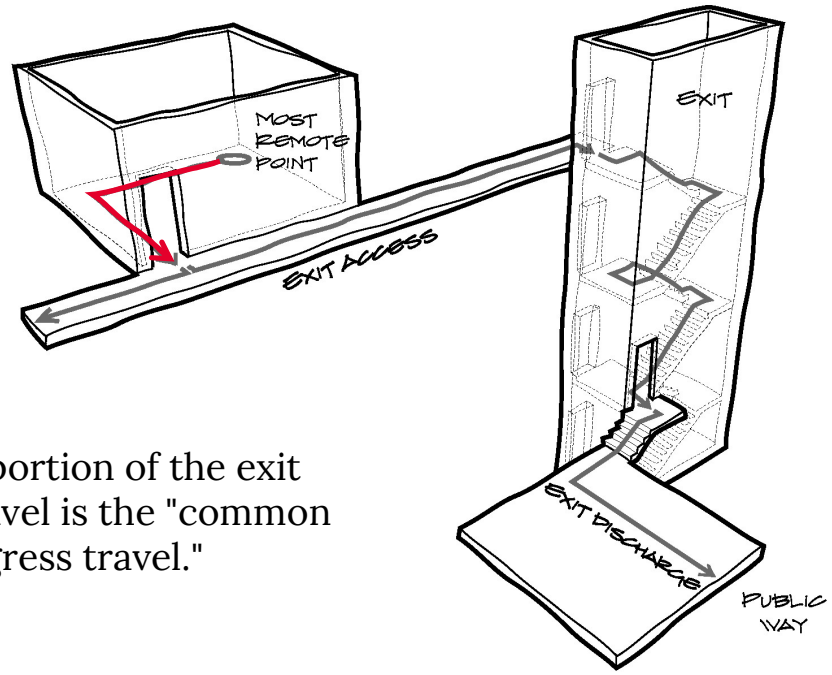

- The first portion of the exit access travel is the "common path of egress travel."

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- Exit access travel is measured along the "natural and unobstructed" path of travel.

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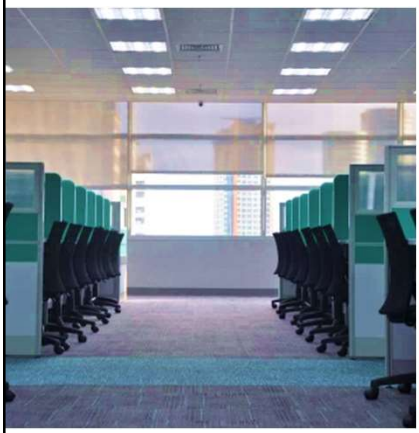
Exit Access



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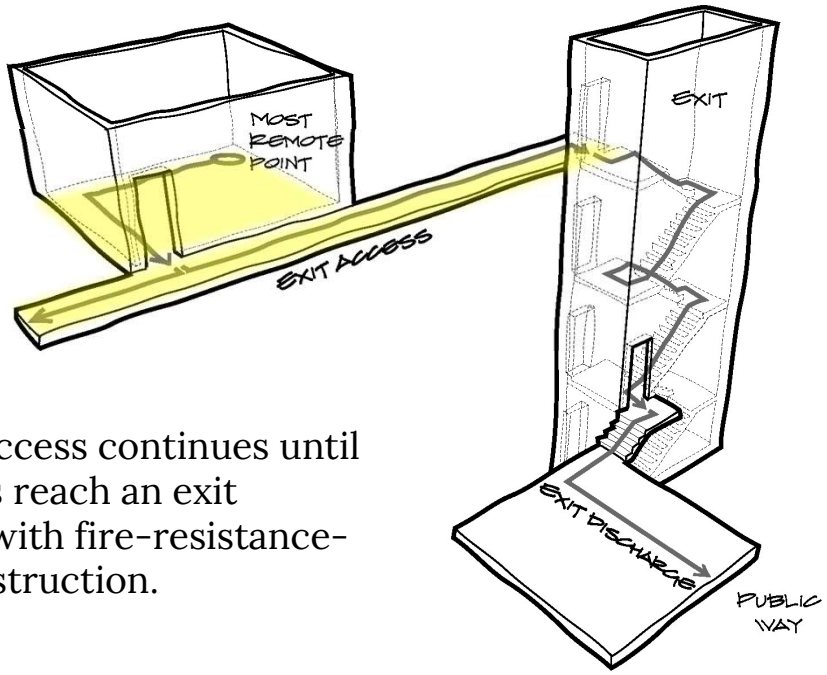

- The exit access continues until occupants reach an exit enclosed with fire-resistance-rated construction.

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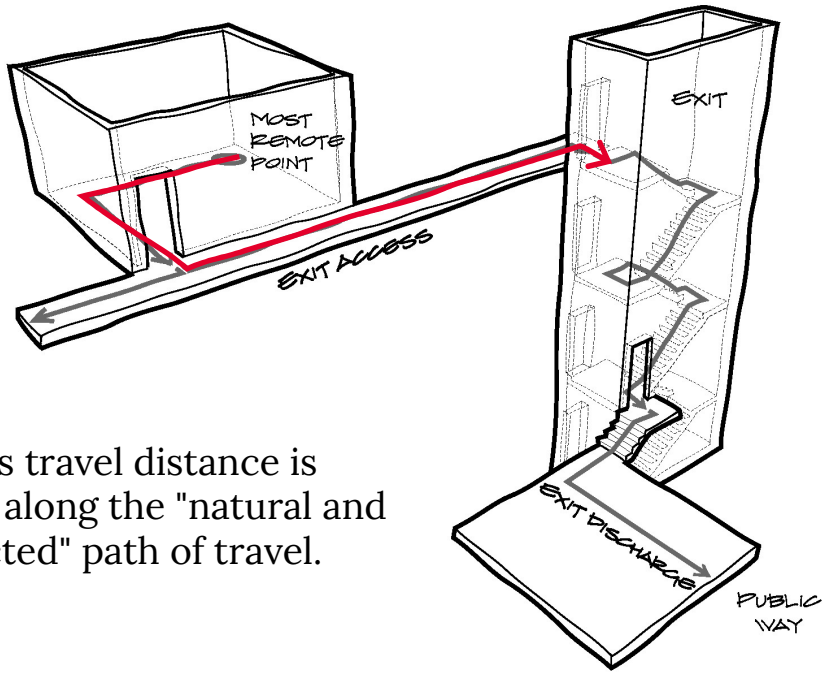
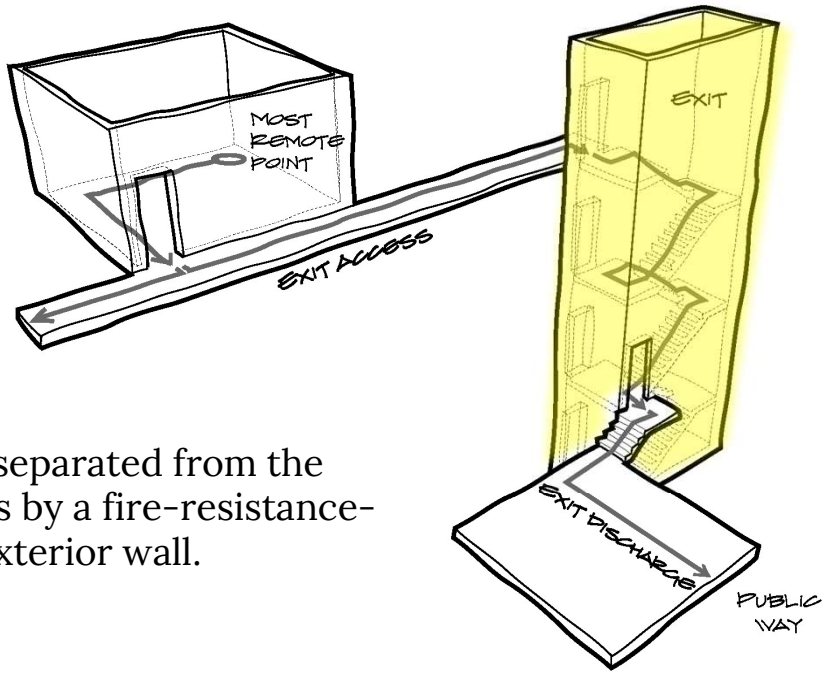


- Exit access travel distance is measured along the "natural and unobstructed" path of travel.

175



- An exit is separated from the exit access by a fire-resistance-rated or exterior wall.

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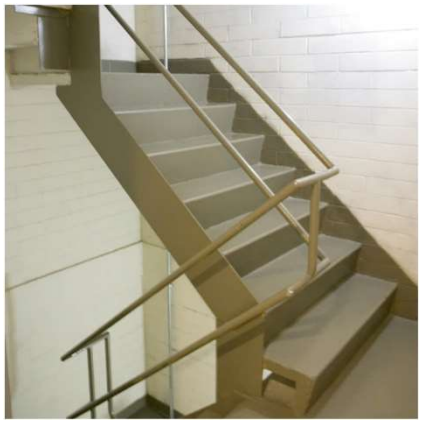
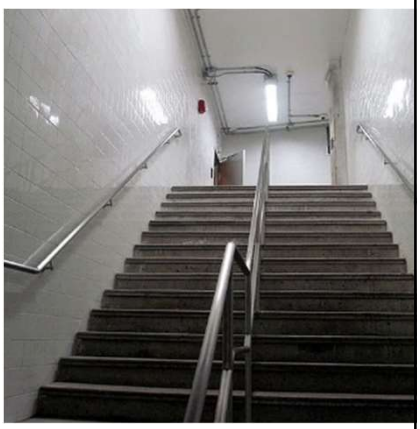
Exit





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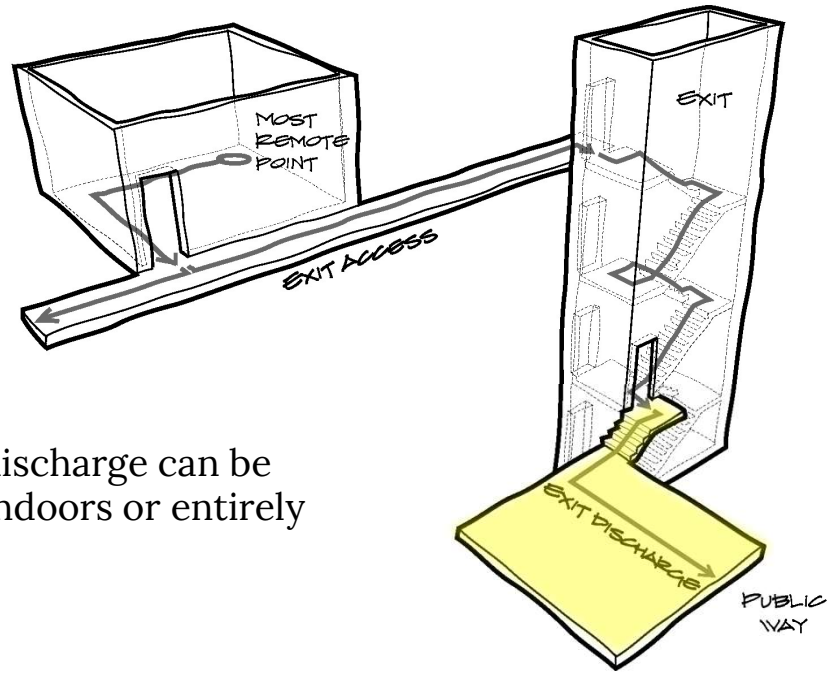

- The exit discharge can be partially indoors or entirely outdoors.

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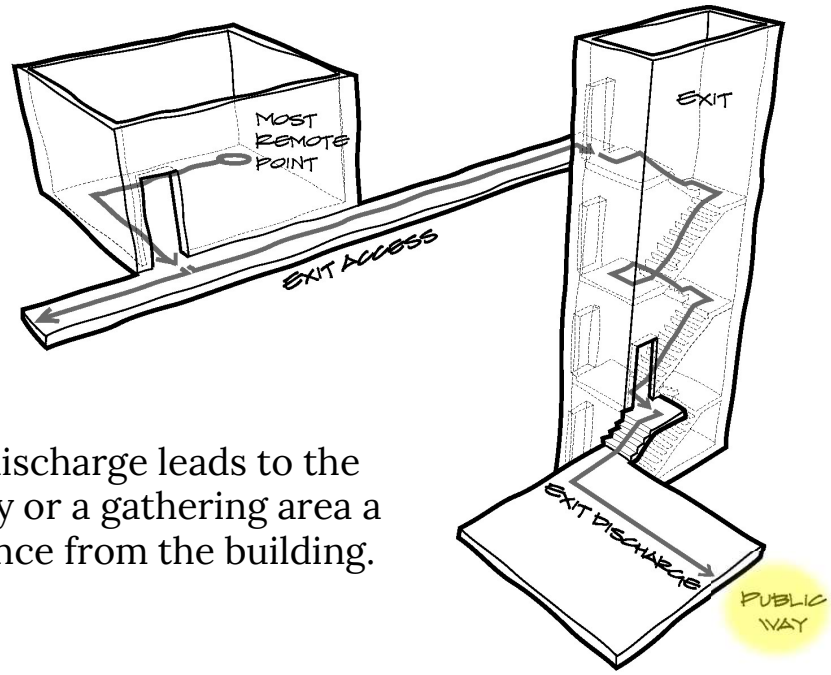

- The exit discharge leads to the public way or a gathering area a safe distance from the building.

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Exit Discharge

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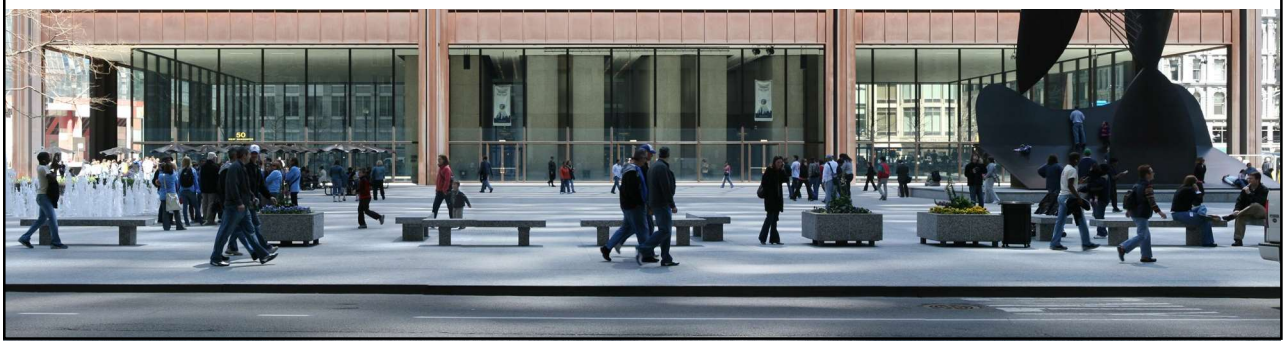
FOR EXAMPLE

Exit Discharge – Daley Center

- At the Daley Center, the exit stairs discharge into the ground-level lobby. After exiting the building, occupants must cross the plaza (egress court) to reach a public way. Both the lobby and the plaza are exit discharge components.



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Determining Occupant Load

- Floor area factors in Table 1004.5
- Always safe to use gross floor area, but net floor area is allowed for some categories (see Sec. 203.5 for difference)
- Fixed seating (incl. benches, stools, booths) per Sec. 1004.6
- Include outdoor areas (limited exceptions)

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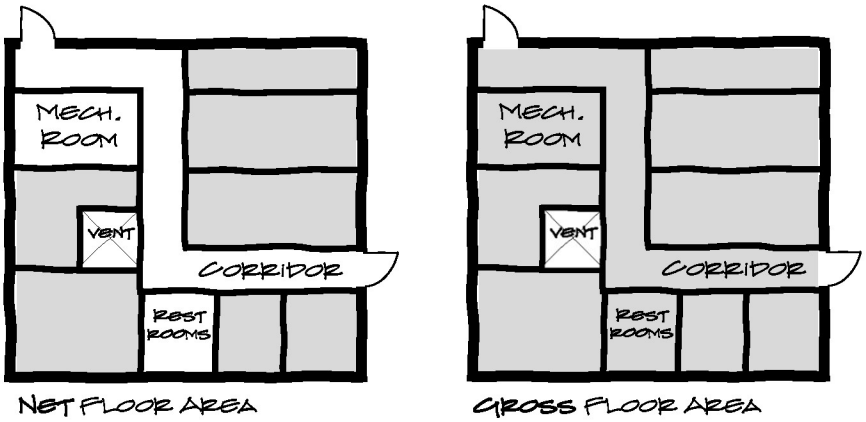
KEY CONCEPT

Net vs. gross floor area



185

KEY CONCEPT

5 Steps to Determine Occupant Load

❶ Categorize the function for each area without fixed seating using closest category in Table 1004.5

❷ Identify the occupant load factor for each use/area. Note whether the factor is based on gross or net floor area.

❸ Calculate the design occupant load using factors for open floor areas and for fixed seating per Sec. 1004.6.

❹ Calculate combination loads at areas of convergence.

❺ Determine the design occupant load.

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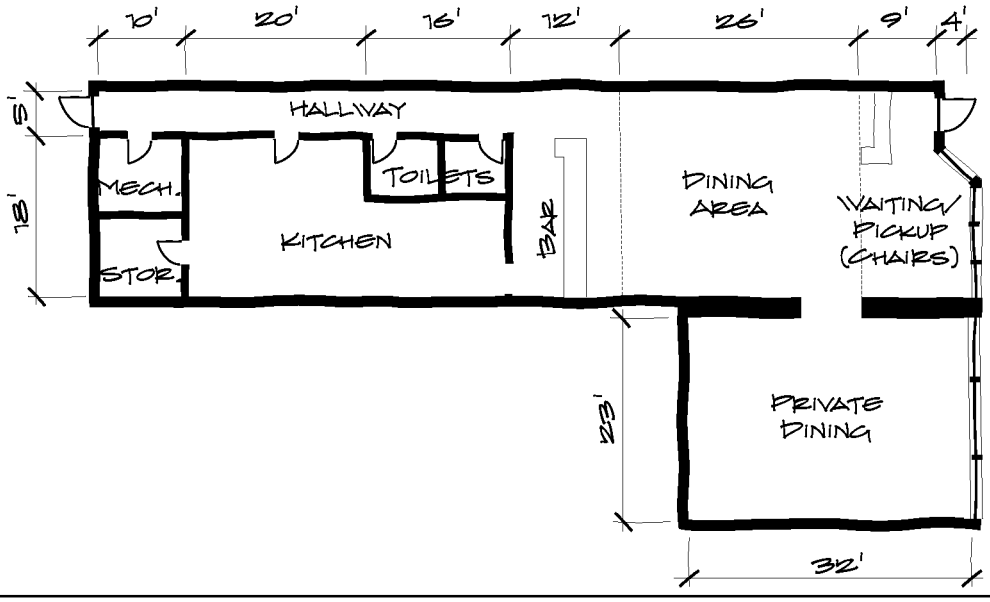
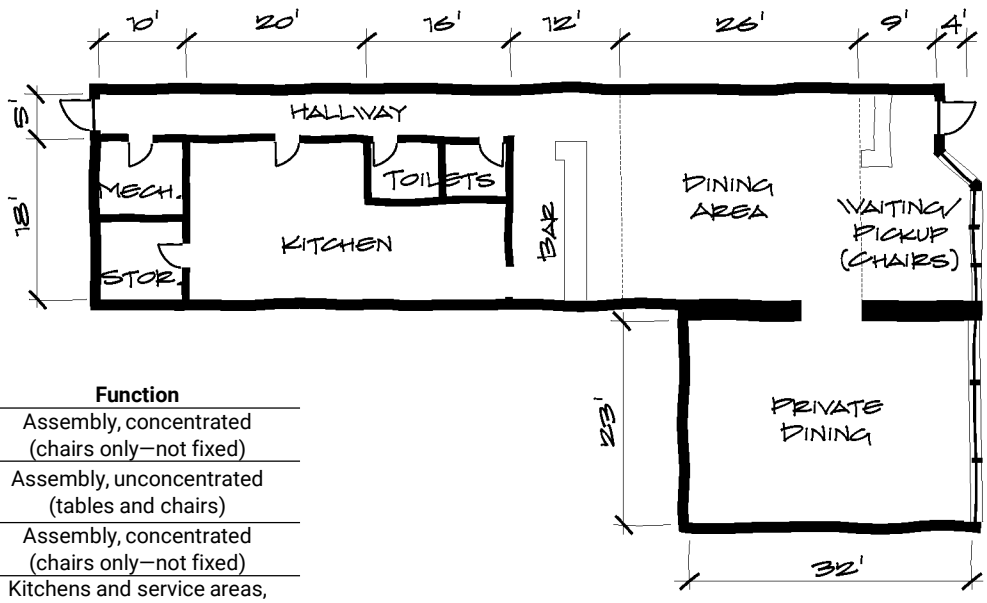
FOR EXAMPLE

Restaurant Example (p. I-162)



187



Room/Space	Function
Waiting/Pickup	Assembly, concentrated (chairs only—not fixed)
Dining Area Private Dining	Assembly, unconcentrated (tables and chairs)
Bar (seating)	Assembly, concentrated (chairs only—not fixed)
Kitchen and behind bar	Kitchens and service areas, commercial
Storage Mechanical	Accessory storage areas, mechanical equipment room

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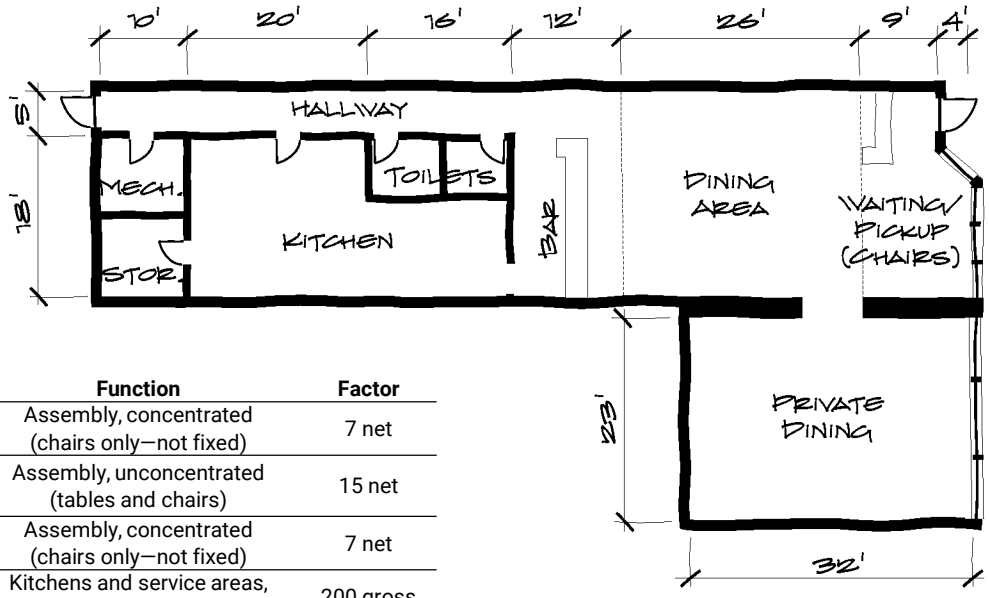

Room/Space	Function	Factor
Waiting/Pickup	Assembly, concentrated (chairs only—not fixed)	7 net
Dining Area Private Dining	Assembly, unconcentrated (tables and chairs)	15 net
Bar (seating)	Assembly, concentrated (chairs only—not fixed)	7 net
Kitchen and behind bar	Kitchens and service areas, commercial	200 gross
Storage Mechanical	Accessory storage areas, mechanical equipment room	300 gross

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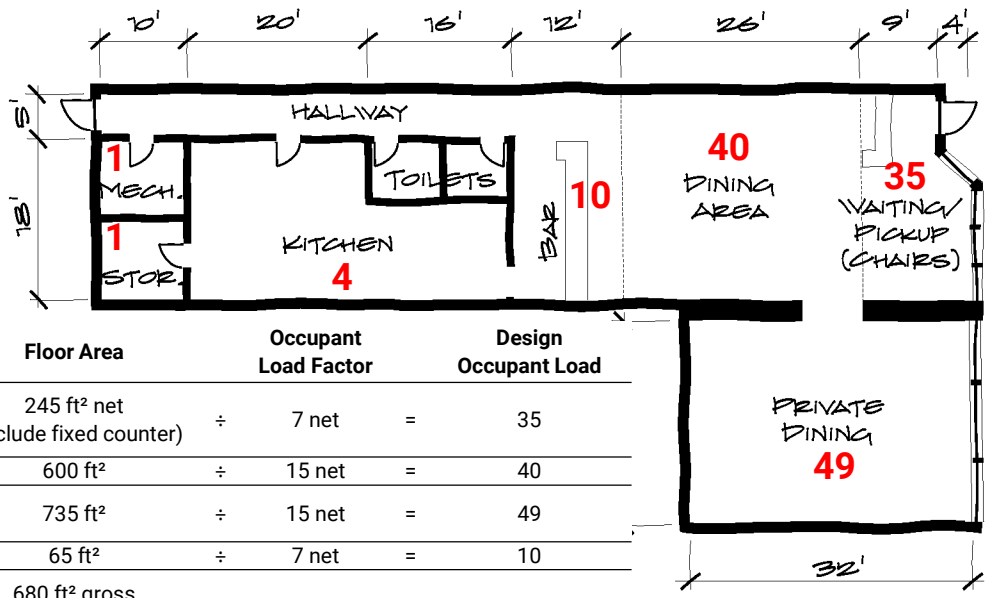

Room/Space	Floor Area		Occupant Load Factor		Design Occupant Load
Waiting/Pickup	245 ft² net (exclude fixed counter)	÷	7 net	=	35
Dining Area	600 ft²	÷	15 net	=	40
Private Dining	735 ft²	÷	15 net	=	49
Bar (seating)	65 ft²	÷	7 net	=	10
Kitchen and behind bar	680 ft² gross (include counters, etc.)	÷	200 gross	=	4
Storage	80 ft²	÷	300 gross	=	1
Mechanical	80 ft²	÷	300 gross	=	1

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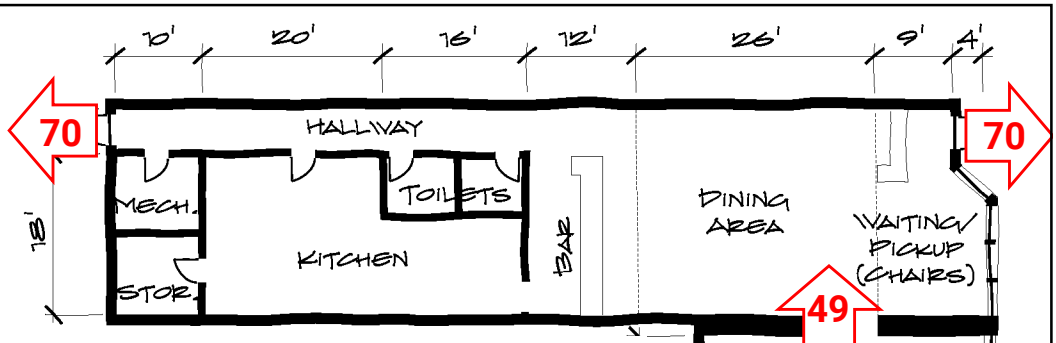

Room/Space	Floor Area		Occupant Load Factor		Design Occupant Load
Waiting/Pickup	245 ft² net (exclude fixed counter)	÷	7 net	=	35
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Bar (seating)	65 ft²	÷	7 net	=	10
Kitchen and behind bar	680 ft² gross (include counters, etc.)	÷	200 gross	=	4
Storage	80 ft²	÷	300 gross	=	1
Mechanical	80 ft²	÷	300 gross	=	1

140/2=70

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CHICAGO AMENDMENT

Limited Areas of Assembly-type Functions

Section 1004.10 provides an alternative means of calculating (reducing) the occupant load for limited areas used for assembly-type functions within Group B, F or M occupancies and reducing the *cumulative* occupant load of a suite or story.

- For rooms/spaces up to 150 ft², use factor applicable to predominant function of adjacent spaces
- For rooms/spaces up to 750 ft² (if no more than 10% of floor area of suite/story) use factor applicable to predominant function of adjacent spaces
- In spaces with tables and chairs and primarily for employee training use 20 ft²/person (classroom factor)

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Number and Access to Exits

For more information, see **Task 3.2** in the *Chicago Plan Review Manual*

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Check Number and Location of Exits / Access to Exits

- Check number of exits (or access to exits) provided / required from each story and occupiable rooftop.
- If two exits are required from the story, check that each room/space on that story has the required number of exits, based on occupant load, and access to the number of exits required for the story.

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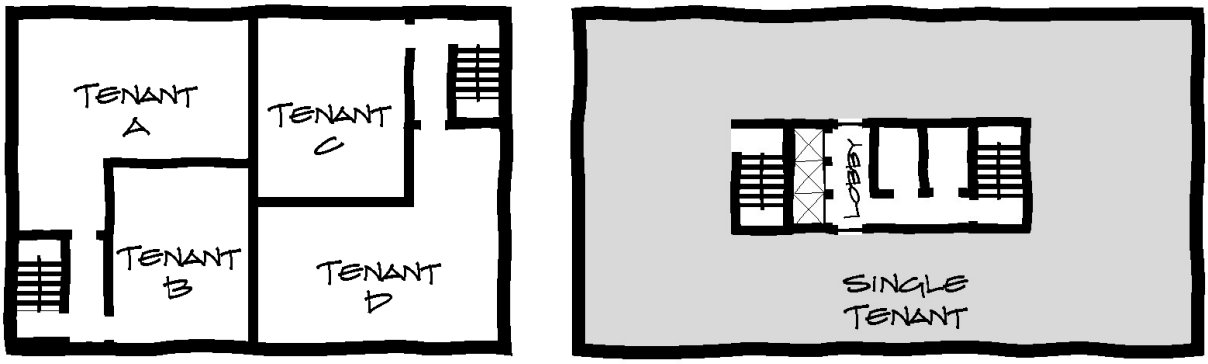
FOR EXAMPLE

Egress Arrangement



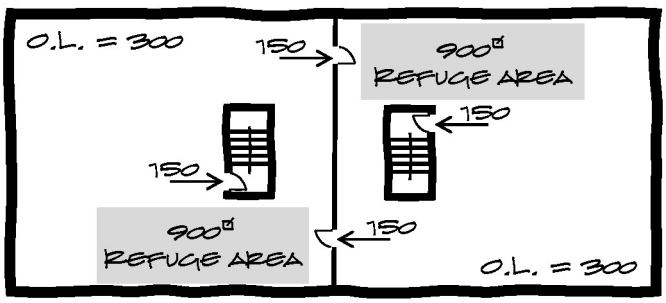
3RD STORY ABOVE GRADE PLANE (NOT ALLOWED)

3RD STORY ABOVE GRADE PLANE (ALLOWED)

196

Check Number and Location of Exits / Access to Exits (continued)

- Story with occupant load of 501 to 1,000 requires access to 3 exits.
- Story with occupant load > 1,000 requires access to 4 exits.
- Interlocking or scissor stairs are counted as one exit.
- Exit access stairways must connect to enclosed exits +/- 1 story in most occupancies.



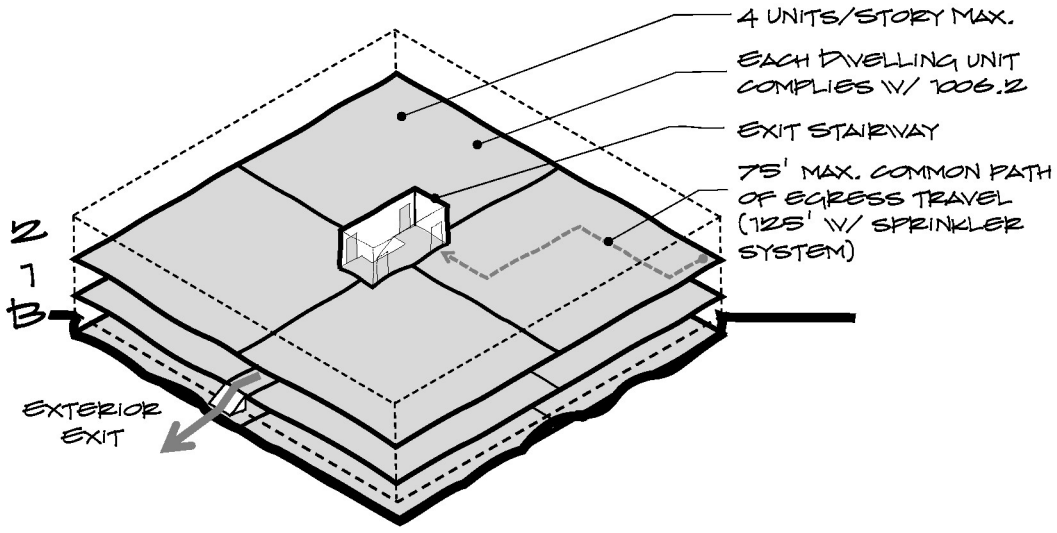
197

Check Number and Location of Exits / Access to Exits (continued)

- Twelve conditions allow a single means of egress from a story or occupiable rooftop.
- Seven conditions apply exclusively to residential occupancies. The five remaining conditions apply to all occupancies (residential and non-residential).
- Chicago single-exit rules substituted for IBC/IRC requirements for egress windows (not required by CBC)
- One exit allowed from mech. penthouse because treated as part of story below

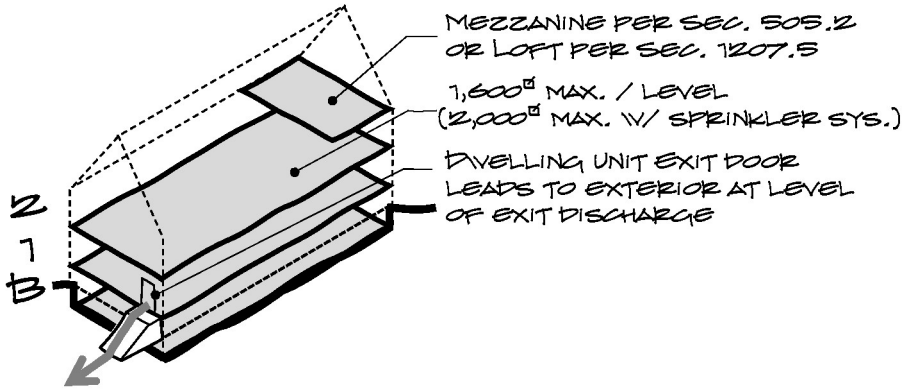
198

Single Means of Egress **Condition 1**



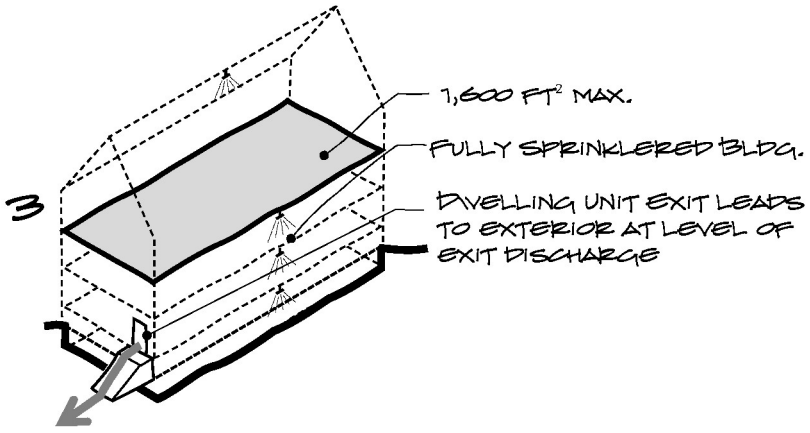
199

Single Means of Egress
Condition 6



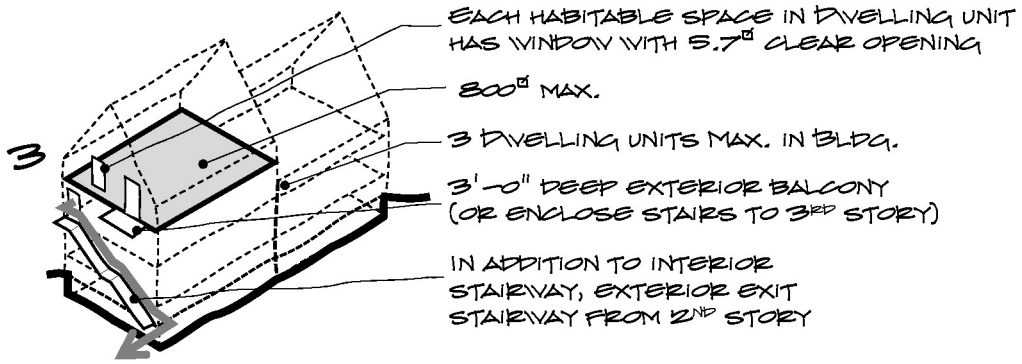
200

Single Means of Egress
Condition 7



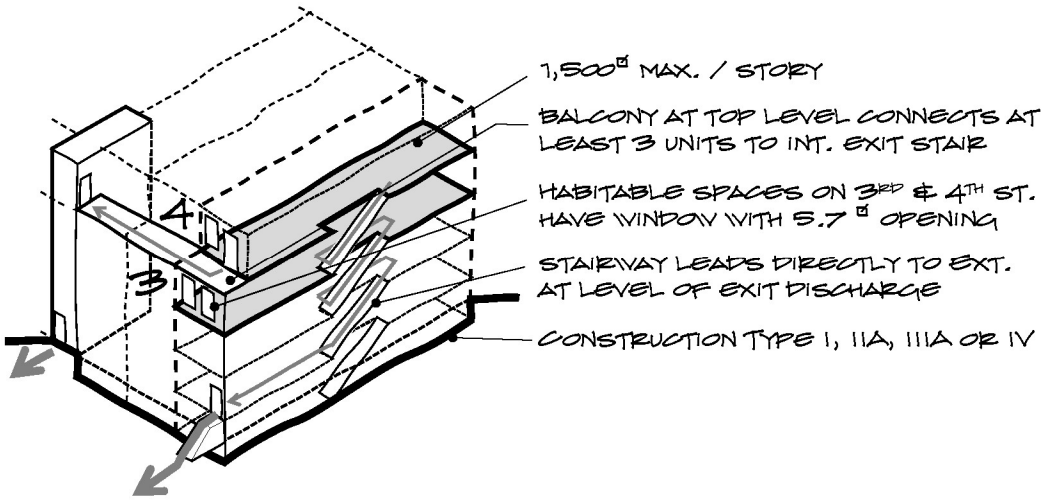
201

Single Means of Egress
Condition 8



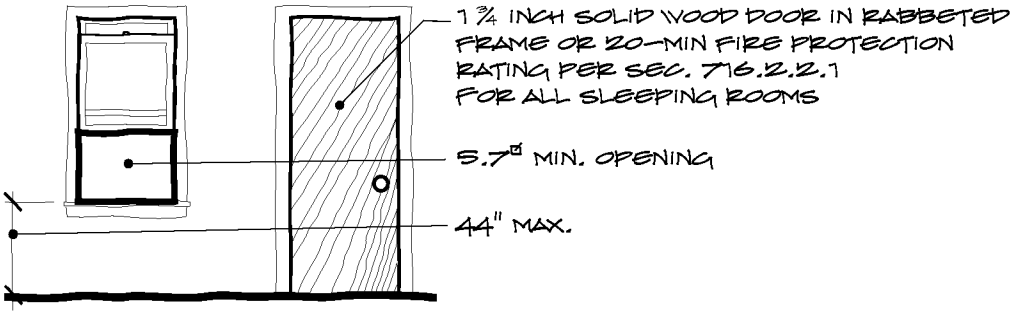
202

Single Means of Egress
Condition 9



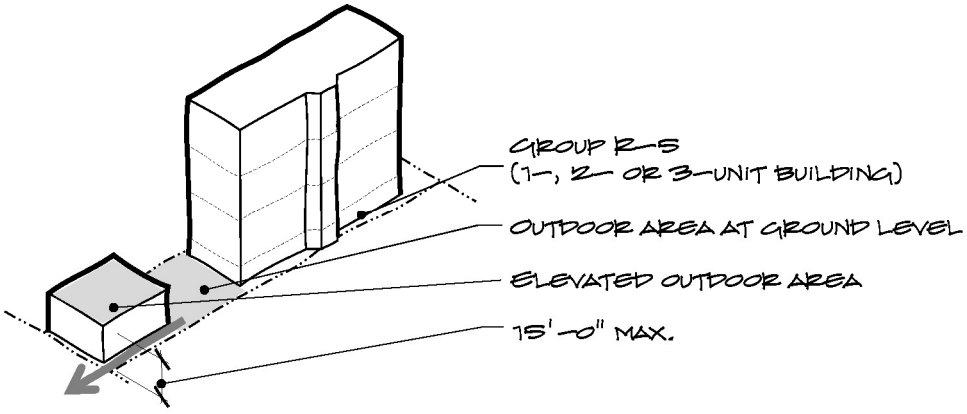
203

Single Means of Egress
window and door requirements for Conditions 8 & 9



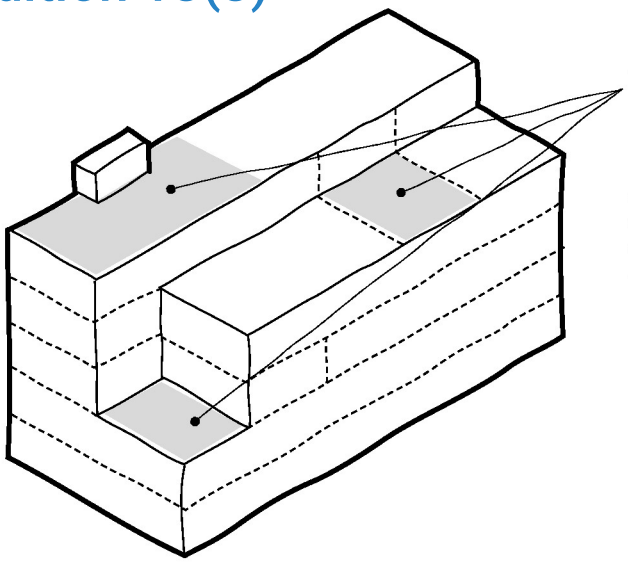
204

Single Means of Egress
Condition 13(2)



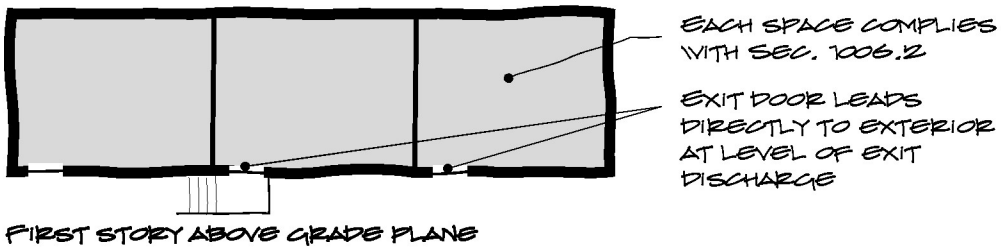
205

Single Means of Egress
Condition 13(3)



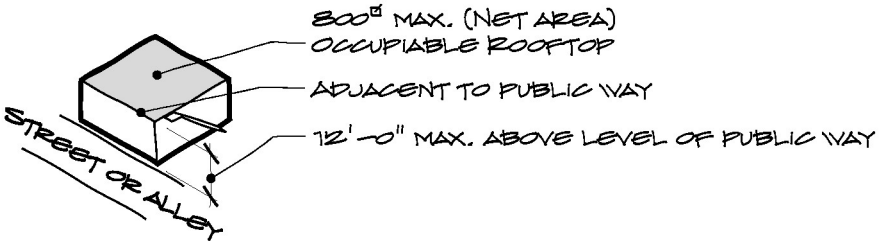
206

Single Means of Egress
Condition 2



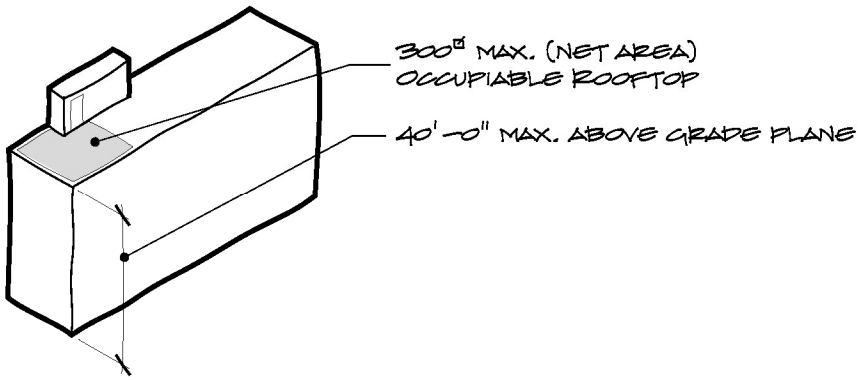
207

Single Means of Egress
Condition 10



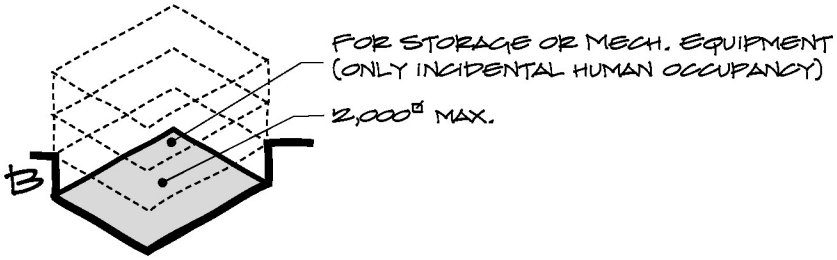
208

Single Means of Egress
Condition 11



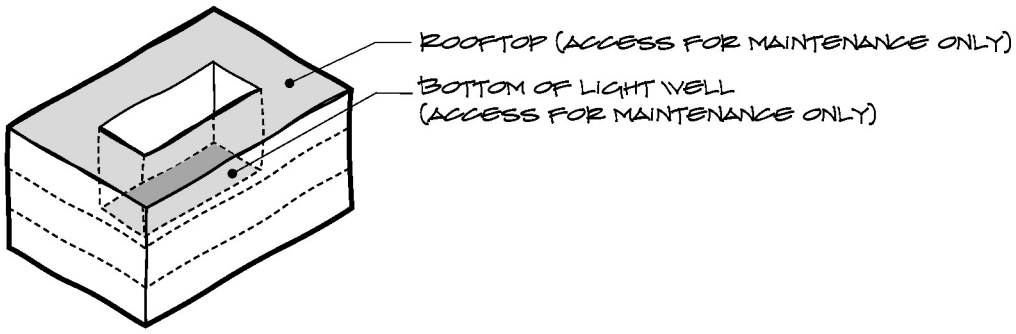
209

Single Means of Egress
Condition 12



210

Single Means of Egress
Condition 13(1)



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Check Number and Location of Exits / Access to Exits (continued)

Number of exits from room/space determined by three factors:

- Floor area over 4,000 ft² requires 2 exits
- Occupant load exceeds limit in Table 1006.2.1
- Common path of egress travel exceeds limit in Table 1006.2.1

3 exits are required for room or space with OL > 500, 4 if OL > 1,000

2 exits may be required based on use: boiler and equipment rooms, electrical equipment rooms, etc.

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Common Path of Egress Travel

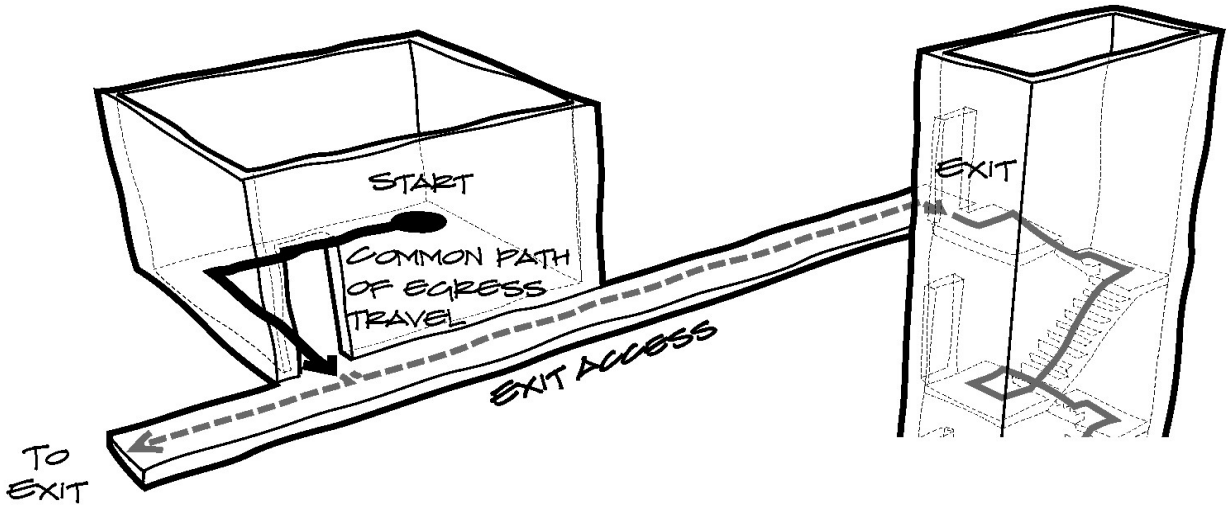

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TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Sprinkler System (feet)	With Sprinkler System (feet)	
A[c], E	49	75	75[a]	
B, M	49	75	115[a]	
F	49	75	115[a]	
H-1, H-2, H-3	3	NP	25[b]	
H-4, H-5	10	NP	75[b]	
I-1, I-2[d], I-4	10	NP	75[a]	
I-3	10	NP	100[a]	
R-1	10[h]	60	75[i]	115[a]
R-2	10[h]	60	75[i]	115[a]
R-3[e], R-5[e]	10[h]	60	75[g, i]	115[a]
R-4[e]	10[h]	60	75[g, i]	115[a]
S[f]	29	75	115[a]	
U	49	75	75[a]	

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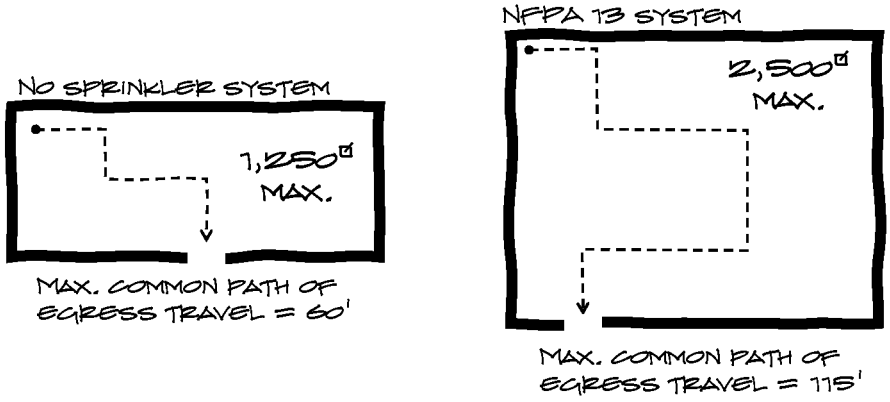
One Means of Egress from a Dwelling Unit Table 1006.2.1, note h



h. 20 in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. For spaces in Group R occupancies required by Section 1004 to use an occupant load factor more intensive that 125 gross, the maximum occupant load is 49.

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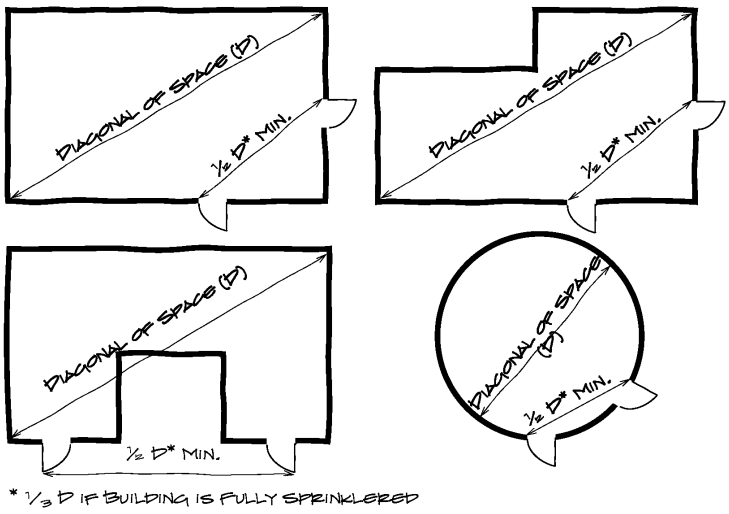
Separation of Exits / Exit Access Doorways

- When a room, space, or story is required to have 2 or more means of egress, they must be separated from each other.
  - Fully sprinklered building: 1/3 diagonal
  - Other buildings: ½ diagonal



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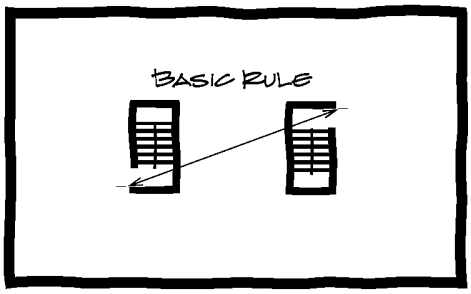
Separation of Exits / Exit Access Doorways (continued)

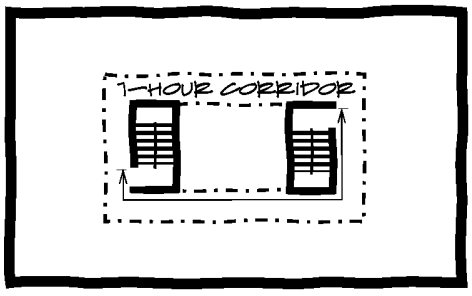
Measurement Rules

- Separation distance to an exit or exit access doorway is measured to any point along the width of the doorway.
- Separation distance to an exit access stairway is measured to any point on the closest riser.
- Separation distance to an exit access ramp is measured to any point on the start of the ramp run.
- Where the path between the two exits for a story is a 1-hour fire-resistance-rated corridor, the separation distance may be measured along the shortest direct line of travel in the corridor.

221

Separation of Exits / Exit Access Doorways (continued)





222

Separation of Exits / Exit Access Doorways (continued)

Exceptions to Mathematical Separation

- *Old rule*: two means of egress must be remote from one another to minimize the change of both being blocked by smoke/fire.
  - Group R-5 occupancies
  - Within dwelling units or sleeping units
  - Group B or M tenant spaces separated from other spaces by 1-hour rated construction, with ACAR approval
- Fully sprinklered Group R-2, with dead ends not exceeding 20', may reduce separation to 15'

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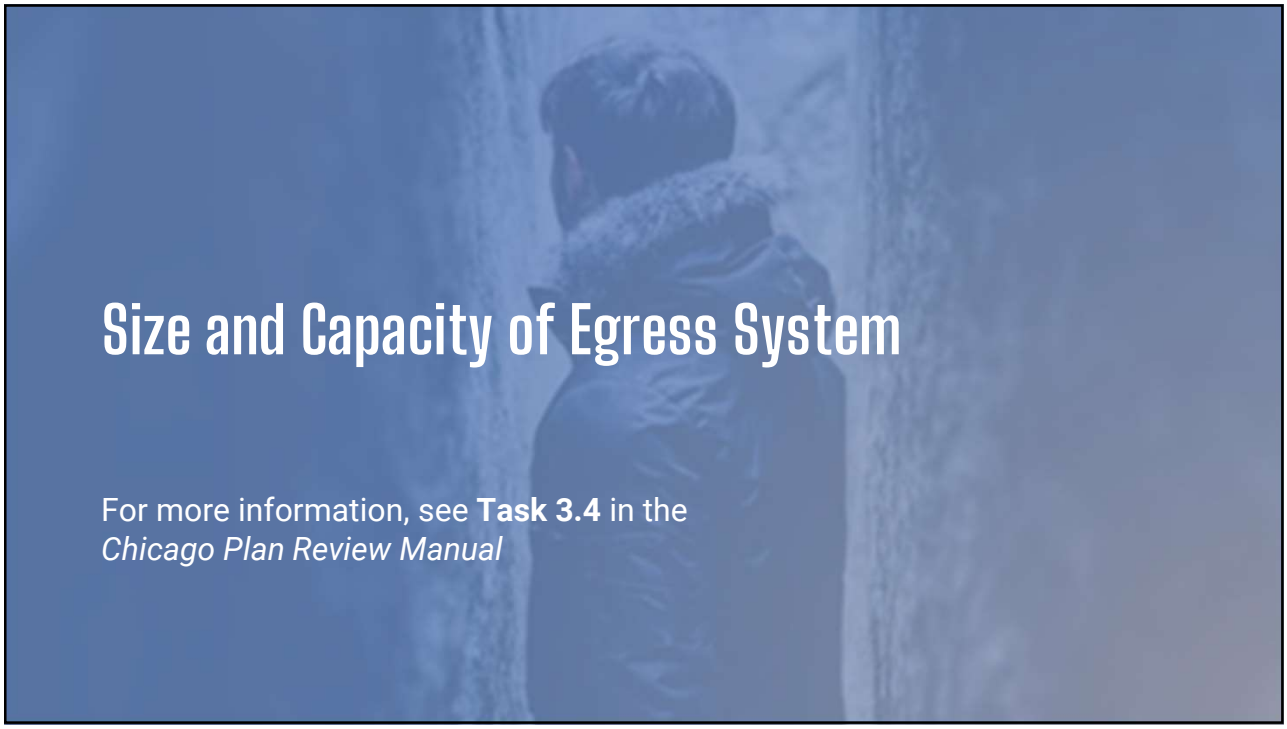

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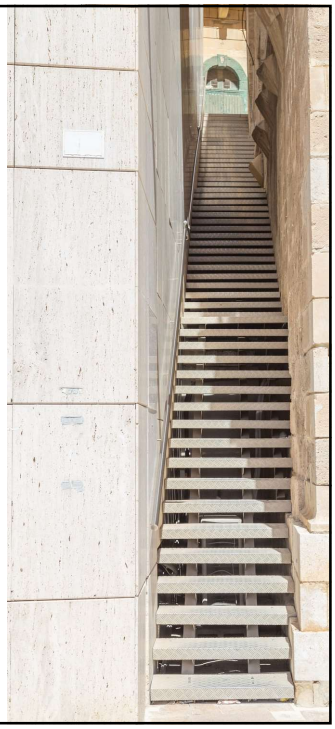
Check Size and Capacity of Egress System

- Fractional inch/occupant factors replace units of exit width.
- Egress components also have minimum widths.

Capacity of Egress Components

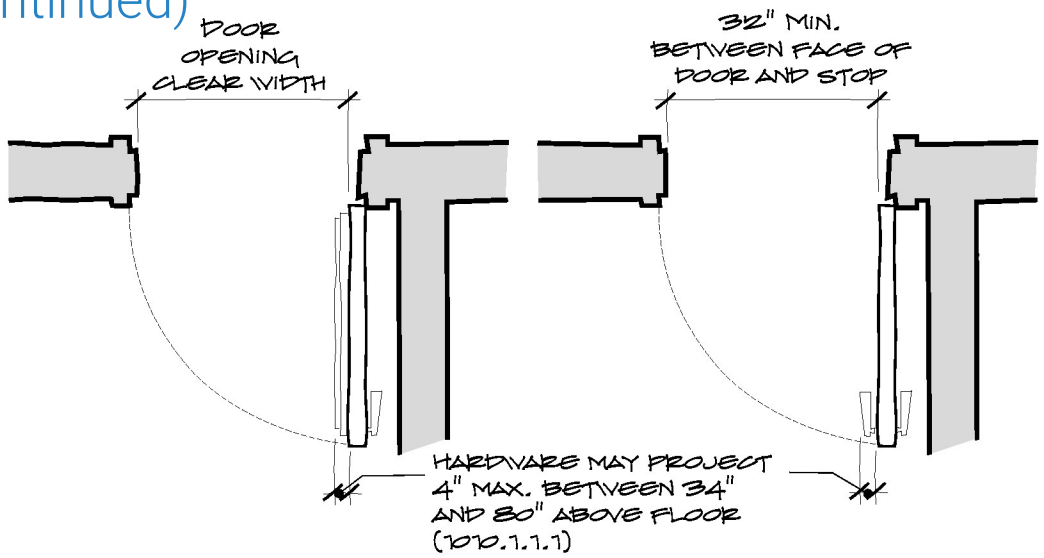
Component Type	NFPA 13 or 13R system throughout building	
	No	Yes[a]
Stairway	0.3 inch / occupant	0.2 inch / occupant
Indoor assembly seating aisles	See Section 1029.6.1	
Open air assembly seating aisles	See Section 1029.6.3	
Assembly aisle accessways	See Section 1029.13	
Other egress component (Doors, gates, etc.)	0.2 inch / occupant	0.15 inch / occupant

a. Use non-sprinklered factor for Group H and I-2 occupancies.



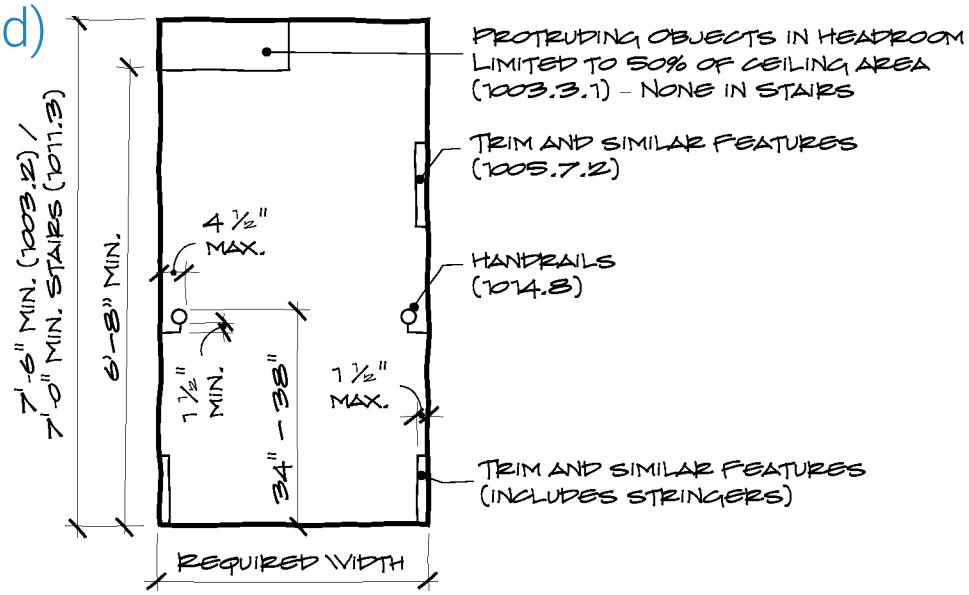
225

Check Size and Capacity of Egress System (continued)



226

Check Size and Capacity of Egress System (continued)



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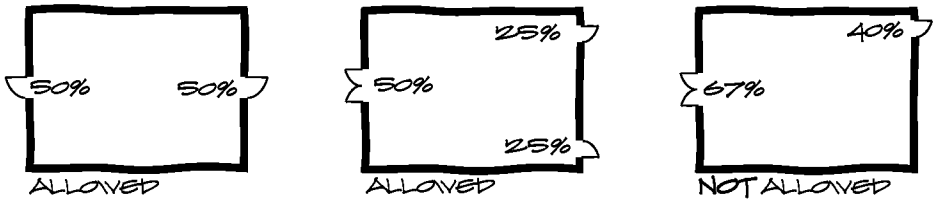
Check Size and Capacity of Egress System (continued)



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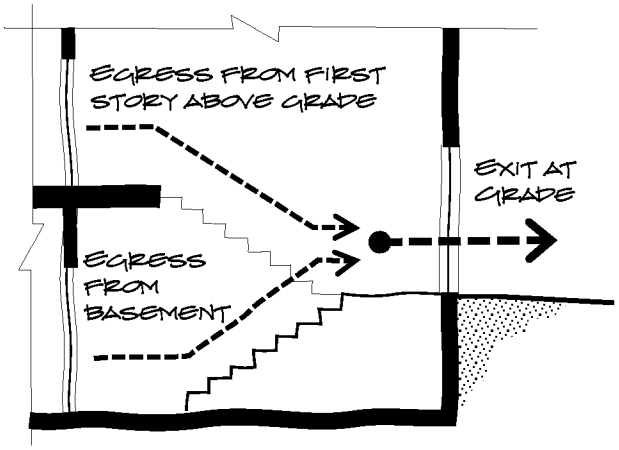
Check Size and Capacity of Egress System (continued)



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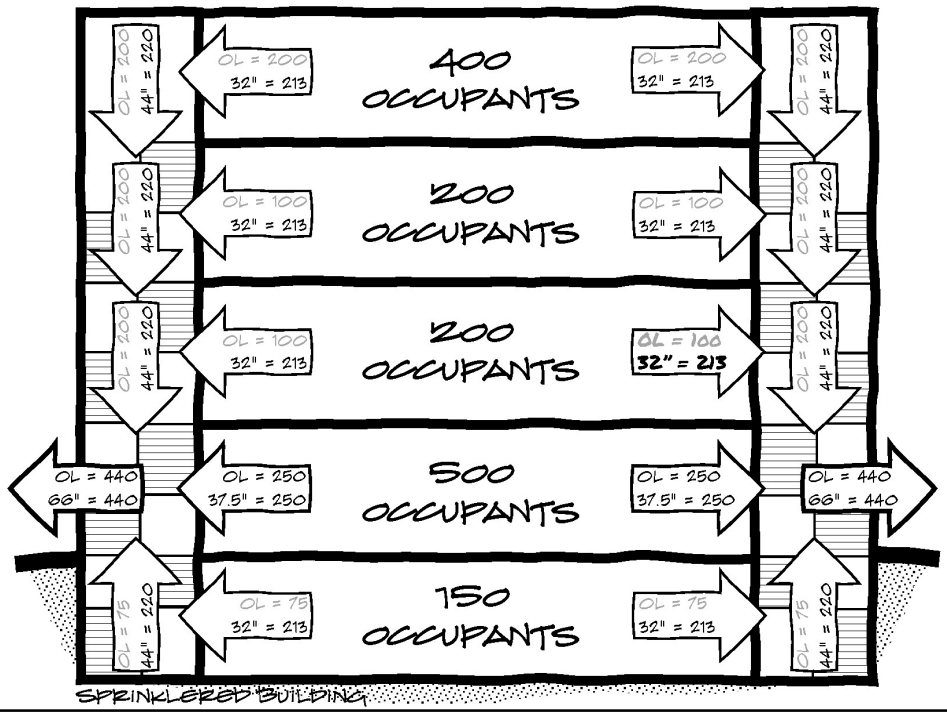

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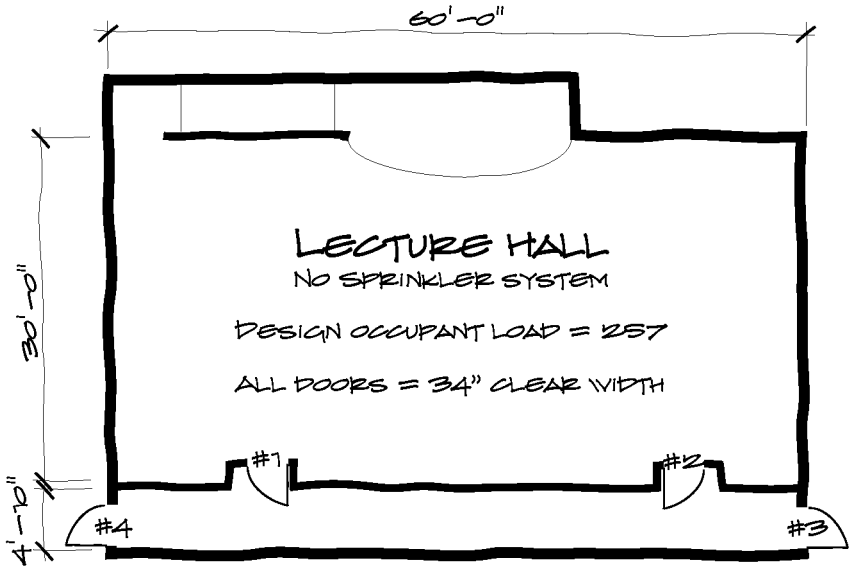
FOR EXAMPLE

Exit Capacity Example (p. I-197)



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FOR EXAMPLE

Exit Capacity Example (continued)

1.	Determine the occupancy of the building or space.	GROUP A-3
2.	Determine the type of component(s) (stair, ramp, door, corridor, egress court).	2 DOORS, 1 CORRIDOR
3.	Determine whether the building is equipped with a sprinkler system in accordance with the applicable standard.	NO
4.	Determine the design occupant load.	257

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FOR EXAMPLE

Exit Capacity Example (continued)

1. Determine the occupancy of the building or space. GROUP A-3

2. Determine the type of component(s) (stair, ramp, door, corridor, egress court). 2 DOORS, 1 CORRIDOR

3. Determine whether the building is equipped with a sprinkler system in accordance with the applicable standard. NO

4. Determine the design occupant load. 257

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FOR EXAMPLE

Exit Capacity Example (continued)

5. Compute the maximum capacity of the egress components.

   a. Determine the clear width of each component.

DOOR #1 = 34"
DOOR #2 = 34"
DOOR #3 = 34"
DOOR #4 = 34"
CORRIDOR = 58"

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FOR EXAMPLE

Exit Capacity Example (continued)

b. Determine whether the components are sized to accommodate the design occupant load.

i. Determine the egress width per occupant for each component.

0.2 IN / OCCUPANT

DOOR #1 = 34"
DOOR #2 = 34"
DOOR #3 = 34"
DOOR #4 = 34"
CORRIDOR = 58"

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FOR EXAMPLE

Exit Capacity Example (continued)

ii. Divide the clear width(s) by the allowed egress width per occupant. Add the capacities of similar components together.

[DOOR #1 = 34" ÷ 0.2 = 170] +
[DOOR #2 = 34" ÷ 0.2 = 170] = 340
[DOOR #3 = 34" ÷ 0.2 = 170] +
[DOOR #4 = 34" ÷ 0.2 = 170] = 340

CORRIDOR = 58" ÷ 0.2 = 290

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FOR EXAMPLE

Exit Capacity Example (continued)

6. Compare the design occupant load with the lowest maximum capacity of the egress component(s).

DESIGN OCCUPANT LOAD = 257 ≤ 340 (CAPACITY OF DOORS)
DESIGN OCCUPANT LOAD = 257 ≤ 290 (CAPACITY OF CORRIDOR)

7. Determine compliance.

Do egress components satisfy the design occupant load? YES

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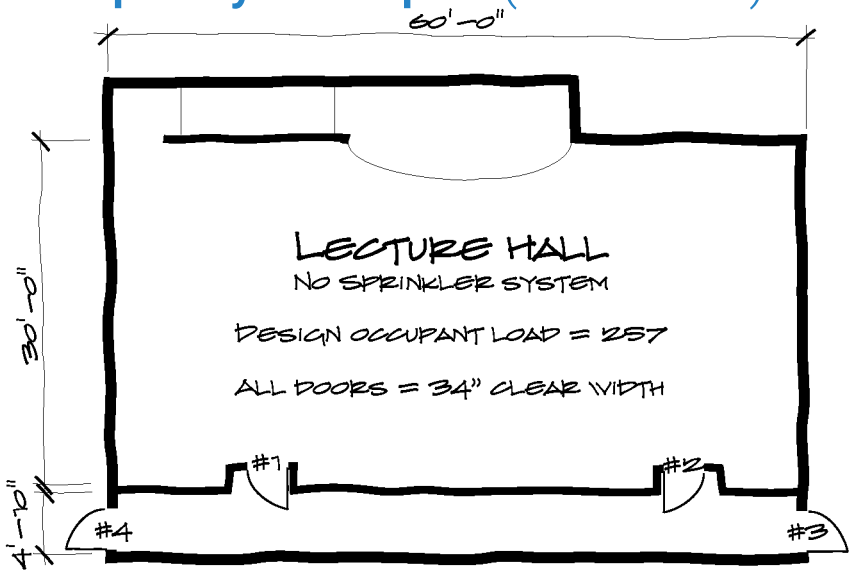
FOR EXAMPLE

Exit Capacity Example (continued)



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Exit Access Design

For more information, see **Task 3.5** in the *Chicago Plan Review Manual.*

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Check Exit Access Components

Exit access travel distance

- The distance from the most remote point of each room, area, or space to the entrance to the nearest exit.
- Measured along the natural, unobstructed path of horizontal and vertical egress travel.

- The length of exit access travel may not exceed the length specified in Table 1017.2.

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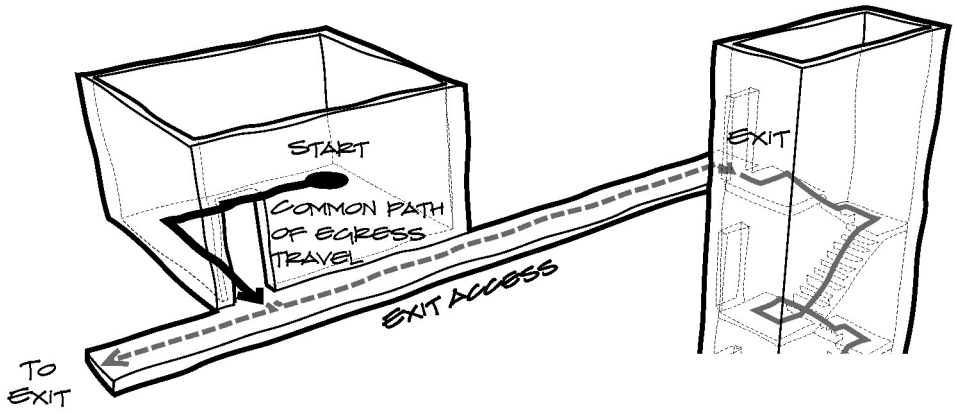
Exit Access Travel Distance



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Check Exit Access Components (continued)

TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE[a]

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

243

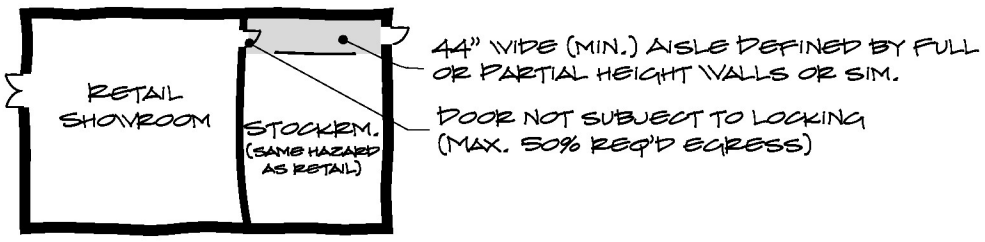
Check Exit Access Components (continued)

Egress through intervening spaces:

- Egress from a room or space to an exit may not pass through an adjoining room or space unless all the following conditions are met.
- Egress may not pass through a room that can be locked to prevent egress.
- Egress may not pass through a toilet room or bathroom.
- Egress from a sleeping area (bedroom) may not pass through another sleeping area (bedroom).
- Egress may not pass through a commercial kitchen, storage room, closet, or space used for similar purposes.
- Egress from a dwelling unit, sleeping unit, or tenant space may not pass through another dwelling unit, sleeping unit, or tenant space.

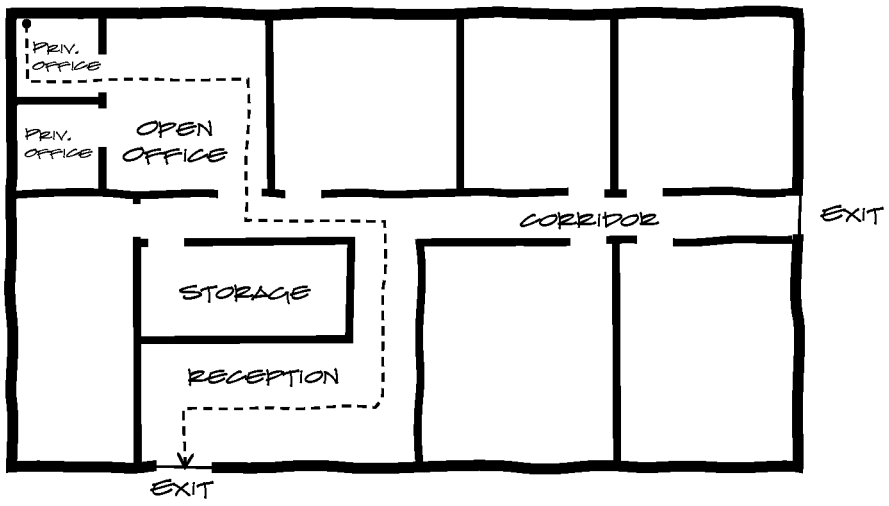
244

Egress Through Intervening Space



245

Egress Through Intervening Space



246

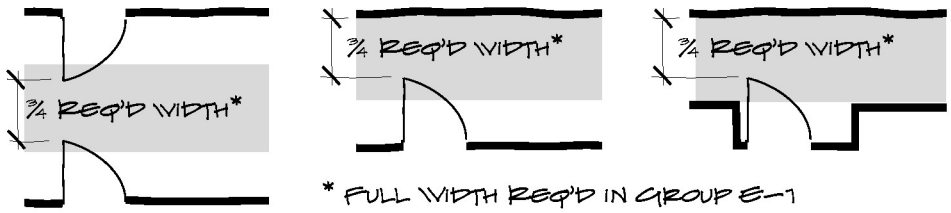
Check Exit Access Components (continued)

Exit access corridors:

- Required to have a fire-resistance rating in some occupancies (Table 1020.1)
- Minimum width varies by occupancy (Table 1020.2)
- Doors from occupiable spaces at any point in door swing may not reduce width to less than ¾ required width.
  - Does not apply to closet doors.
  - Does not apply within a dwelling unit.
- Dead end corridors limited by occupancy and sprinkler system
- Exit access corridors may not be used for air movement (with exceptions).

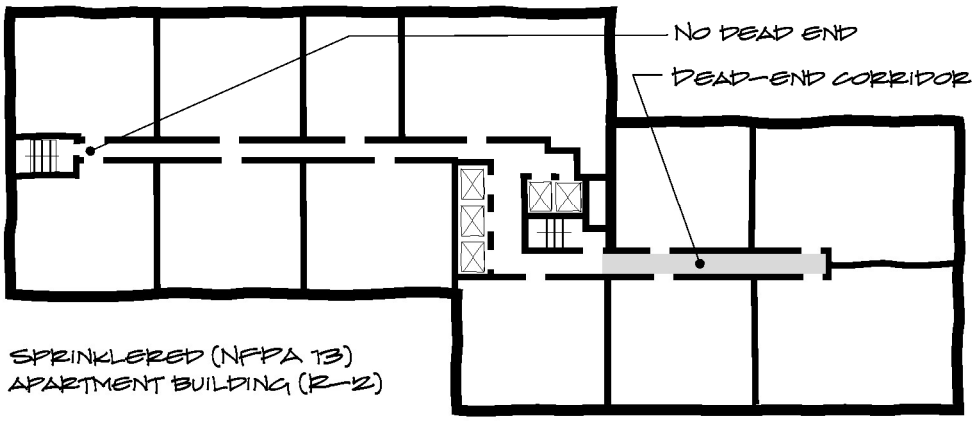
247

Encroachments



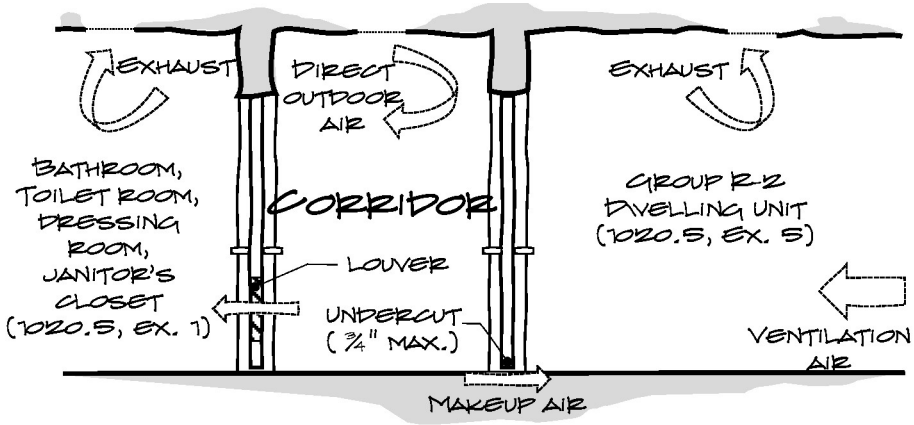
248

Dead-end Corridors



249

Air Movement in Corridors



250

Exit and Exit Discharge

For more information, see **Task 3.6** in the *Chicago Plan Review Manual*.

251

Check Exits and Exit Discharge Components

- Interior exit stairways (or ramps) provide a protected vertical path of egress travel, separated from other areas of the building by fire-resistance rated construction with limited openings and penetrations.
- Exit discharge is the portion between the enclosed exit and the public way.
  - Lobbies (where allowed)
  - Vestibules
  - Outdoors (on private property)

252

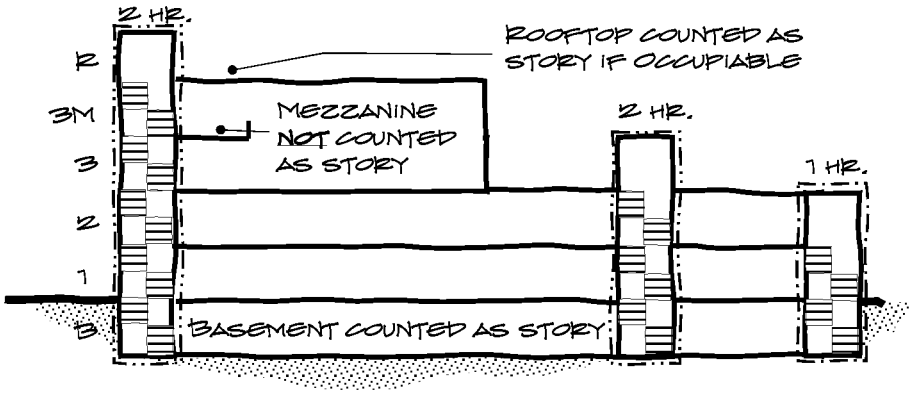
Exits and Exit Discharge Components (continued)

Interior Exit Enclosures

- Fire-resistance rated enclosure (fire barriers)
  - 1-hour if connecting 3 or fewer stories
  - 2-hour if connecting 4 or more stories
- Openings limited to those needed for access from normally-occupied spaces
  - No elevators, mechanical rooms, toilet rooms, utility access
- Penetrations into enclosure are prohibited, except as listed in Section 1023.5 and 1023.6

253

Exit Enclosure Rating



254

Exits and Exit Discharge Components (continued)

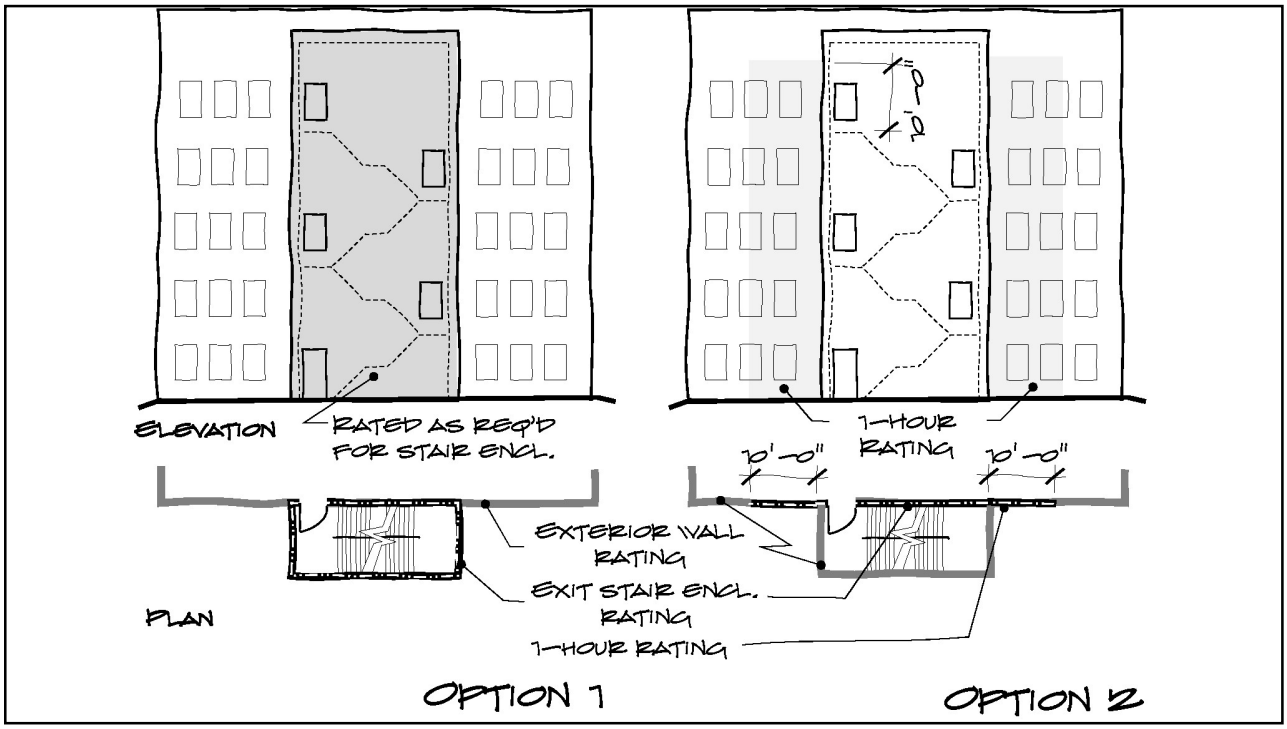
Exterior walls of exit enclosures

- Two options
  - Exterior wall is rated as required for exit enclosure and openings are limited
  - Adjoining exterior wall within 10 feet is 1-hour rated and openings have ¾-hour protectives.

Doors

- Opening protectives required per Table 716.1(2)

255



256

Exits and Exit Discharge Components (continued)

Discharge identification

- The level of exit discharge must be clearly identified for users of the exit stairway/ramp.
- Directional exit signs should be used within stair at discharge level.
- If it continues below the level of exit discharge, a barrier should be provided.

257

Exits and Exit Discharge Components (continued)

Exit passageways (typ. horizontal transfer between two exit stairs)

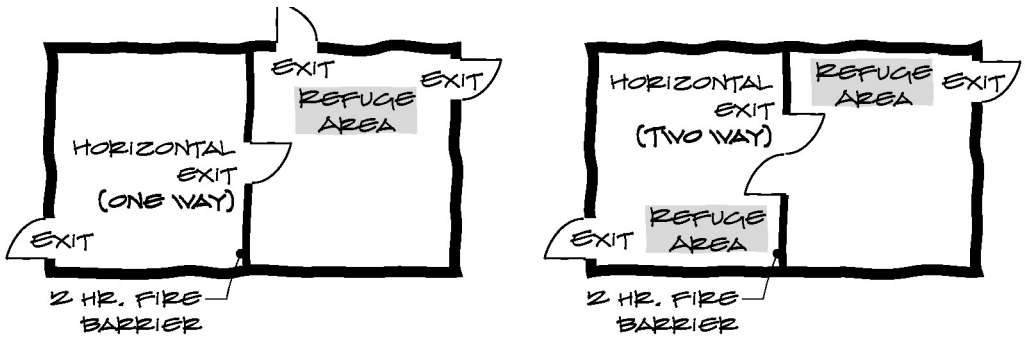
- Construction, openings and penetrations limited similar to requirements for exit stair enclosures.

Horizontal exits

- Limited to 50% of required exit capacity.
- 2-hour fire-resistance rated construction.
- Continuous from wall to wall, and 2-hour floor/ceiling required if not vertically continuous.
- Refuge areas must be provided 3 ft²/occupant.

258

Horizontal Exits – Refuge Areas

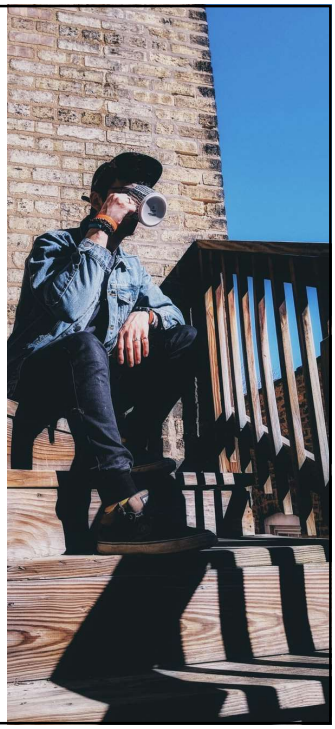


259

Exits and Exit Discharge Components (continued)

Exterior exit stairways and ramps

- Not allowed for Group I-2 or levels (stories or occupiable rooftops) more than 45 feet above grade at discharge of stair
- Limited to 50% of required exit capacity
- Protection and separation required
  - Exceptions for residential porches up to 4 stories



260

Exits and Exit Discharge Components (continued)

Exit discharge

- Chicago allows 100% of exits to discharge through a lobby per Sec. 1028.1, Exception 4 (fully sprinklered building)
- In non-sprinklered building 50% of exits may pass through lobby if lobby level is sprinklered
- Discharge through vestibules
- Discharge directly to outside

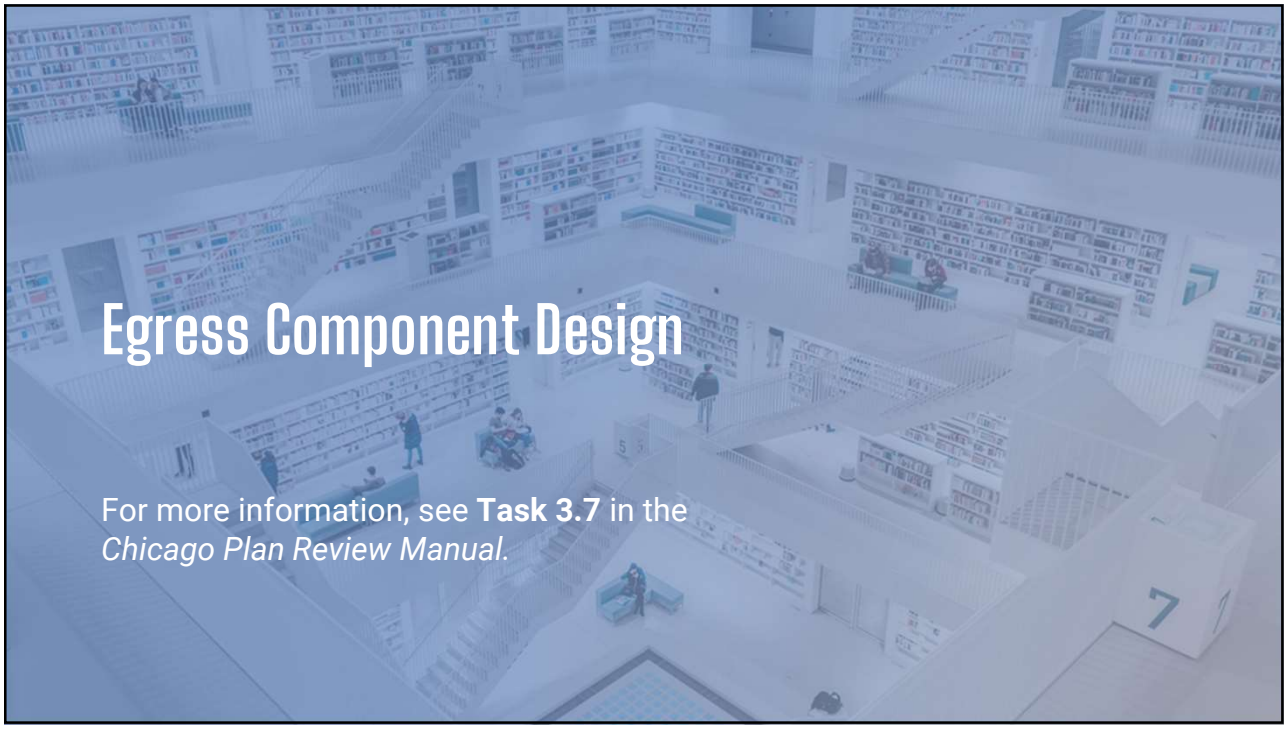
261

Exits and Exit Discharge Components (continued)

Egress courts and exterior travel

- Minimum width and capacity must be maintained in outside areas.
- Minimum width of egress courts is 44" (except 36" for R-3, R-5)
- Walls within 10' of egress court must be fire-resistance rated and have opening protectives
- Egress should discharge to public way
  - Dispersal area allowed when access to public way not possible (rare)

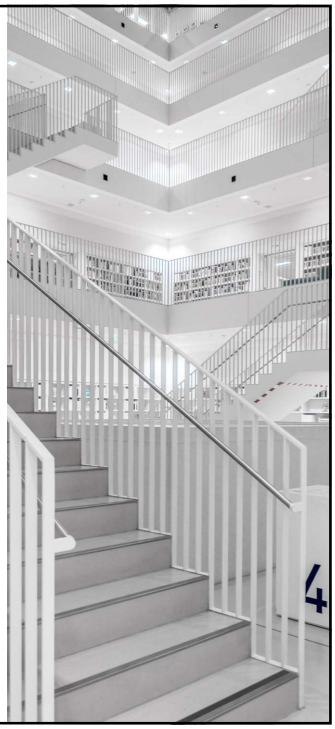
262



264

Check General Egress Requirements

- Doors
  - Locks and latches
- Stairs
- Handrails
- Guards
- Exit signs
- Means of egress illumination
- Assembly



265

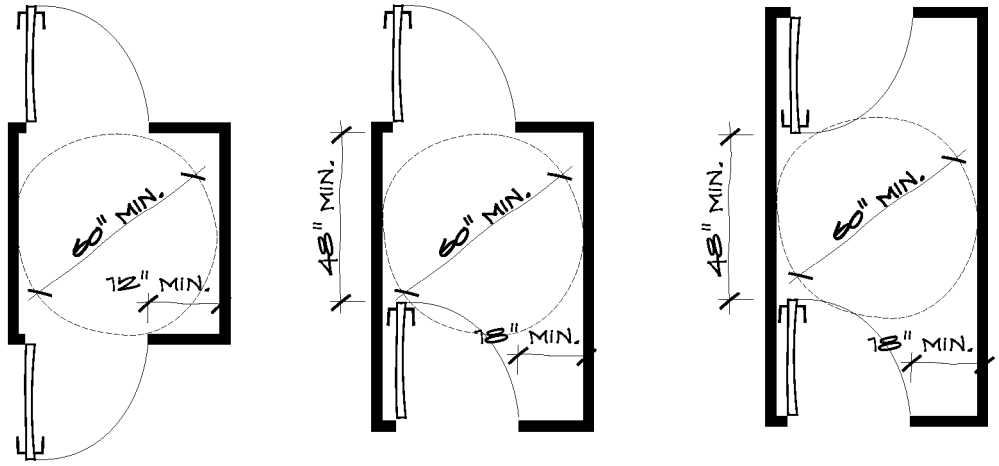
General Egress Requirements (continued)

Egress doors

- Minimum clear width: 32“ (within non-accessible dwelling units, 28”)
- Maximum width/leave: 48” nominal
- Minimum height: 80” (within dwelling unit 78”)
- Must be pivoted or side-hinged (limited exceptions)
- Must swing in direction of travel where OL > 49
- Opening force for doors and gates, other than fire doors

266

Doors in a Series



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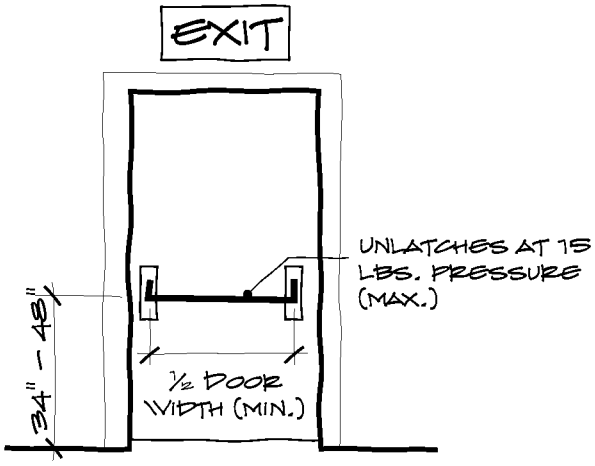
Exit Door – Panic Hardware



268

General Egress Requirements (continued)

Locks and latches

- Egress doors must be readily openable without key or special knowledge.
- Delayed egress locks allowed in Group B, F, I, M, R, S and U occupancies (limited allowances for Group A occupancies)
  - 15 sec. delay max
  - Must swing in direction of egress
  - Only one delayed lock on egress path
- Panic hardware required for Group A, E occupancies with OL > 49.

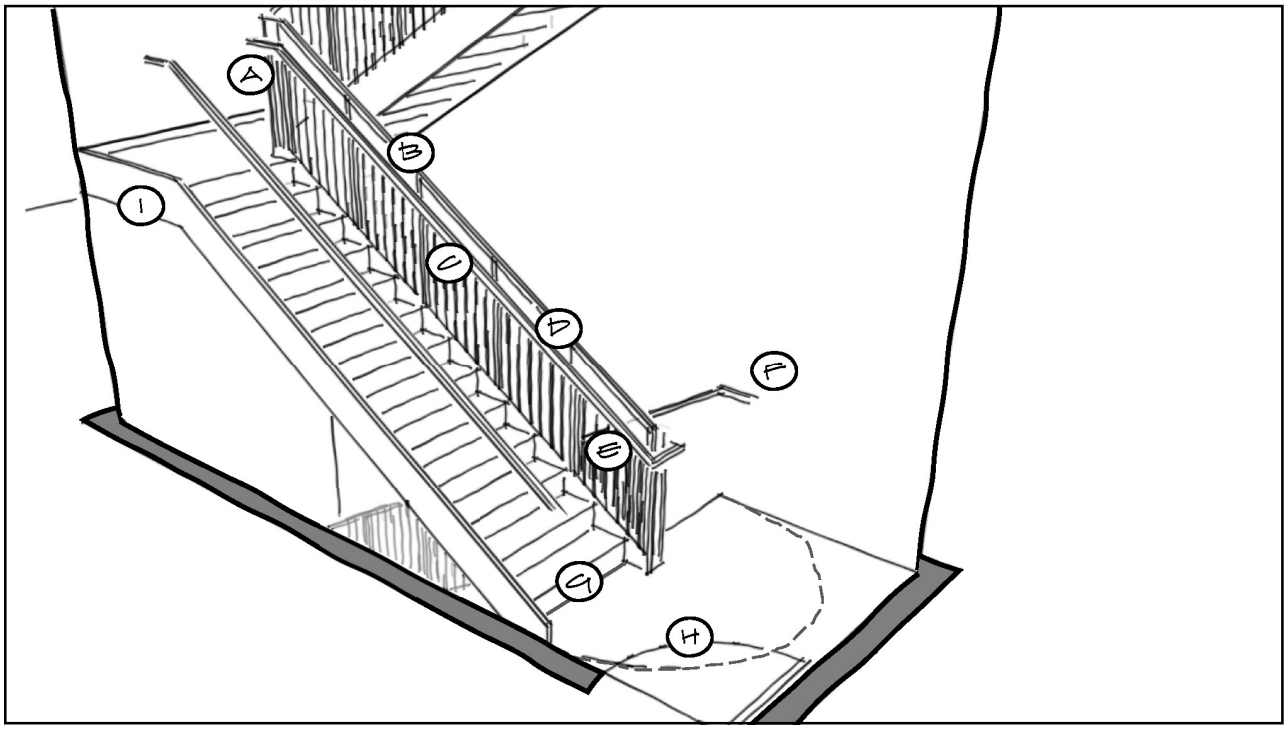
269

General Egress Requirements (continued)

Stairways

- 44” wide min. (36” if OL < 50)
- Measured in clear at narrowest point, excluding allowed projections
- Handrail required on both sides.
- Guard will be required at center of stairways under new code.
- Landings depth must equal width of stair, but max. 48”
- Minimum width will be measured with radius when path of egress turns

270



271

General Egress Requirements (continued)

Stairways

- Minimum headroom 7'-0"
- Maximum rise between landings: 12'-0" (all occupancies)
  - 12'-7" within dwelling units, Group R-5
- Door swinging into stairway, in any position, may not reduce clear width to less than ¾ required width

272

General Egress Requirements (continued)

Treads and risers

- Tread depth: 11" min.
- Riser height: 7" max.
- Solid risers required.
- Consult code for circular and spiral stairs.
- In Group R-5 and within dwelling units, stairs allowed to be steeper and use Chicago-style winders

273

General Egress Requirements (continued)

Handrails

- Handrails required on both sides of stairs
  - Limited exceptions
- Stairs wider than 60" require intermediate handrail
- Ramps with rise > 6" require handrails on both sides
- Handrails must meet dimensional requirements for graspability
  - Type II handrails allowed within dwelling units and Group R-5
- Handrails must be continuous and return to a wall or guard
- Handrail height: 34" to 38" above nosing

274

General Egress Requirements (continued)

Guards

- Required at open side of walking surfaces more than 30" above floor or grade within 36" horizontally
  - Surface that is 12" or less in depth, measured perpendicular to face of guard is not a walking surface, nor are planting beds or countertops at least 34" high. Benches are a walking surface.
- Common sense exceptions for loading platforms, transit platforms, stages, etc.
- 42" high, except 36" allowed in Group R-5 up to 3 stories above grade and within dwelling units.
- 4" sphere rule applies to guards up to 36" high

275

General Egress Requirements (continued)

Exit signs

- Remain as in pre-2019 Chicago Code
- "EXIT" and "STAIR" required.
- Must be illuminated, red lettering on translucent white background.
- Arrows required, no chevrons.
- Required in all rooms that require more than one exit or exit access.
- Must be readily visible and at least every 100' along corridor.

276

General Egress Requirements (continued)

Means of egress illumination

- Required for all portions of means of egress, including exit discharge (exterior)
- 1 fc at walking surface
- May be dimmed in Group A during exhibits or performances

Emergency lighting

- Rooms required to have 2 exits
- Corridors and exits
- Equipment rooms
- Public restrooms > 300 ft²

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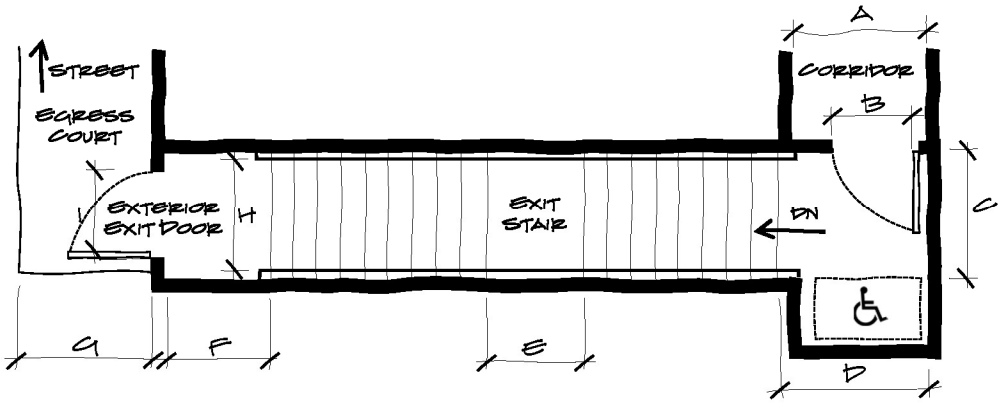
ACTIVITY

Means of Egress Activity 3 (p. I-247)



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