BUILDINGS	
The New NYC Building	g Code
New York City Department	of Buildings
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Learning Objectives

This seminar will focus on detailed provisions of Chapter 10 Means of Egress of the New 2008 New York City Building Code including the following:

- General concept of means of egress
- Occupant load calculations
- Egress width calculations
- Accessible means of egress
- Doors and doorways
- Stairways
- Egress illumination

- Exit access, exit access doorways and travel distance
- Corridors
- Exits, vertical exit stairways, exit passageways, horizontal exits
- Exit discharge
- Assembly requirements

1003 General means of egress 1004 Occupant load 1005 Egress width 1006 Means of egress illumination	1013 Exit Access > 1014 Exit & exit access doorways 1015 Exit access travel distance 1016 Corridors
1007 Accessible means of egress 1008 Doors, gates & turnstiles 1009 Stairways & handrails 1010 Ramps 1011 Exit signs	1017 Exit 1018 Number of exits & continuity 1019 Vertical exit enclosures 1020 Exit passageways 1021 Horizontal exits 1022 Exterior exit stairs & stairways
1012 Guards	> 1023 Exit Discharge
Organization of Chapter 10	1024 Assembly 1025 Emergency escape & rescue 1026 Signage















Section 1003 – General Means of Egress

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Means of Egress Continuity

Section 1003.6:

"The path of egress travel along a means of egress shall not be interrupted by any building element other than a means of egress component as specified in this chapter. Obstructions shall not be placed in the required width of a means of egress except projections permitted by this chapter. <u>The required capacity of a means of egress</u> <u>system shall not be diminished along the path of egress</u> <u>travel."</u> Elevators, escalators and moving walks:

Cannot be used as a component of a required means of egress (§ 1003.7)

Section 1004 – Occupant Load

Actual Number (1004.1.1)

Actual number is used:

When a certain number of occupants is expected, and

When such number exceeds the number given by Table 1004.1.2

Number by Table 1004.1.2

- Lists maximum floor area per occupant based on occupancy classification
- Uses both gross and net floor area for various occupancies

For example:

- In Business occupancies: 100 Gross SF/occupant required
- In Assembly occupancies (without fixed seats): 7 Net SF/occupant required





Exiting from multiple levels (1004.4)

Where an exit serves more than one floor:

•The occupant load of each floor is considered individually

•The exit capacity cannot be decreased in the direction of egress travel

•Where occupants of a mezzanine level exit through the room or area below, the occupant load is cumulative (combination of both the mezzanine and the room below)







Multiple occupancies (1004.9)

In buildings containing 2 or more occupancies (i.e. accessory use, mixed-nonseparated, and mixed-separated occupancies):

•If they <u>don't</u> share the means of egress system, egress requirements are applied individually

(Continue on next slide)

Multiple occupancies (1004.9)

(Continued)

•If they <u>share</u> the same means of egress system, the capacity of means of egress shall be based on the combination of both, but no less than that required for the most stringent occupancy

Example: Hospital I-2 \rightarrow 250 persons

Business $B \rightarrow 50$ persons

Capacity for shared corridor = $(250 + 50) \times 0.2 = 60$ "

However, min. corridor width for I-2 \rightarrow 96"

96" shall be the corridor width

Section 1005 – Egress Width

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<u>TABLE 1005.1</u> EGRESS WIDTH PER OCCUPANT SERVED

		<u>Stairways</u>	Other components
OCCUPANCY		<u>(inches per occupant)</u>	<u>(inches per occupant)</u>
Occupancies		<u>0.3</u>	<u>0.2</u>
other	than		
those listed below			
Hazardous:	H - 1,	0.7	0.4
<u>H-2, H-3 and H-4</u>			
Ear SL 1 in al. -25.4			

For SI: 1 inch = 25.4 mm

Occupant load X Factors = Egress width *

* But not less than elsewhere in the code





Means of Egress Illumination (1006)

Illumination is required at all times in:

- Exits
- Exit discharges, and
- Public corridors

Illumination is required in Exit Access during occupancy

Exceptions: Group U, aisle accessway in assemblies, dwelling units in I-1, R-1, R-2 and R-3, and sleeping units in Group I.

Section 1008 – Means of Egress Doors





Doors must swing in the direction of egress travel in:

- •Group F and Group H
- •Rooms / spaces with 50 or more occupants
- •Rooms / spaces requiring more than 1 exit door
- •ATM

Doors need not swing in the direction of travel for exterior street floor exit doors from lobbies serving only Group R-2 or R-3 occupancies



Access-controlled Entrance Doors (1008.1.3.4)

Permissible for exterior entrance doors or entrance doors to tenant spaces in Group A, B, E, M, R-1 or R-2 provided:

•On the egress side, the door shall unlock by sensor or loss of power

•"Push to Exit" button required within 5 feet

•The door shall unlock upon activation of fire alarm system, automatic sprinkler system, or fire detection system

In Group A, B, E or M, door shall not be secured from egress side during business hours

Delayed Egress Doors (1008.1.8.6)

Delayed egress locks may be permitted by ReCon (I-3 doesn't need recon) where:

- 1. The lock is approved, listed
- 2. Extra safeguards are required
- 3. The building is equipped throughout with an automatic sprinkler system, or an approved automatic smoke or heat detection system
- 4. Building occupants won't pass through more than 1 delayed egress door before entering an exit, and
- 5. The door unlocks in accordance with all 6 conditions (continued)

Delayed egress lock is not permitted in Group A, E, F and H (museums by recon)

Delayed Egress Doors (1008.1.8.6)

Delayed egress doors shall comply with the following conditions:

- 1. Unlock upon actuation of sprinkler or fire detection system
- 2. Unlock Upon loss of power
- 3. Unlock by a signal from the fire command center
- 4. Unlock when a max. 15 lbs. force is applied for 1 second (30 sec. by recon.)
- 5. A sign that reads "Push Until Alarm Sounds. Door can be opened in 15 Seconds"
- 6. Emergency lighting at the door

Section 1009 – Stairways and Handrails



Treads and Risers (1009.3)

7" max. Risers 11" min. Treads	Exceptions: In R-2 occupancies: Riser height = 7.75" max. Tread depth = 9.5" min. + Nosing (2 treads + 1 riser) \ge 24" and \le 25.5"
Exceptions for: •Winders (1009.8) •Circular stairs (1009.7) •Spiral Stairs (1009.9) •Aisle Stairs in PA (1024)	In R-2 dwelling units and R-3 residential occupancies: Riser height = 8.25" max. Tread depth = 9" min. + Nosing (2 treads + 1 riser) \ge 24" and \le 25.5"

Roof Access (1009.12)

One stairway shall extend to the roof through a stairway bulkhead in buildings \geq 4 stories in height, or > 40' above grade

Exception: Roofs that are steeper than 20 degrees

For setback roofs, access may be via a door or a window that is accessible from the stair

Exception: Setback roof that is less than 4' X 10' does not require access

Specific requirements for I-1, R-1 and R-2 (continued...)

Roof Access (1009.12.1) Continued

In Group I-1, R-1 and $R-2 \ge 2$ stories in height:

All stairs shall extend to the roof unless roof slope is steeper than 15 degrees

Alternatively, non-combustible roof hatch or trap door is permitted in:

R-1 and R-2 two stories in height, or

R-2 three stories in height, with only 1 dwelling unit/story

Certain R-2 buildings that are permitted with 1 exit (per 1018.2) may have stairways constructed against the street wall with windows at stair landings and scuttles for roof access

Guards (1012)

Required on open sides of most walking surfaces that are more than 30" above the adjacent surfaces

In general, at least 42" high, with balusters preventing 4" sphere to pass through

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Section 1013 through 1016 – Exit Access

Egress through Intervening Spaces (1013.2) Permitted if:

- 1. The intervening room is accessory to the area from which egress begins
- 2. Intervening room is not a high-hazard occupancy, a kitchen (except in dwelling units), a storage room, a closet, a lockable room etc.
- 3. An egress path to the exit is discernable
- 4. The egress path complies with all code requirements (i.e. travel distance, no. of doorways, egress width etc.)

Where there is more than one tenant on the floor, each tenant space must be provided with independent access (without passing through other tenant's spaces) to the required exits Specific requirements for patient sleeping rooms in I-2 occupancies



Common Path of Egress Travel (1013.3)

2 exits/exit access doorways required when the common path of egress travel exceeds:

1) 25 feet in H-1, H-2, H-3, and

2) 75 feet in all other occupancies

Exceptions:

100 feet of Common path of egress travel distance permitted in:

1. Sprinklered Group B, F, and S

2. Group B, S, and U with only 30 occupants

3.I-3



Spaces where 1 exit/exit access doorway is permitted			
SPACES WITH ONE MEANS OF EGRESS			
OCCUPANCY	MAXIMUM OCCUPANT		
	LOAD		
<u>A, B, E, M, U</u>	<u>74</u>		
<u>F</u>	<u>50</u>		
<u>H-1, H-2, H-3</u>	<u>3</u>		
<u>H-4, H-5, I-1, I-3, I-4</u>	<u>10</u>		
<u>I-2</u>	See Section 1013.2.2		
<u>R</u>	<u>20</u>		
<u>S</u>	30		

2 exits or exit access doorways are required from a room or space:

- •Where occupant load exceeds the values in Table 1014.1
- Where common path of egress travel exceeds the limitations in 1013.3

per occupant load Table 1018.1

 In certain boiler, incinerator, furnace, and refrigeration rooms per 1014.3 through 1014.5
Note: 3 or more exits may be required from a FLOOR









Scissor Stairs Exceptions (1014.2.1)

Generally counted as 1 exit stairway, except:

- In R-2 occupancies with 2-hr-rated masonry (or equivalent) enclosure & separation, and 15 feet separation between exit doors
- In B occupancies of Type I or II construction ≤ 60' in height, ≤ 2000 SF/story, ≤ 50 feet travel distance, and with 2-hr-rated masonry (or equivalent) enclosure & separation, and 15 feet separation between exit doors

Exit Access Travel Distance (1015.1)

- Measured from the most remote point to the nearest exit
- Distance is limited per Table 1015.1
- Longer distances allowed in sprinklered buildings

<u>OCCUPANCY</u>	<u>WITHOUT SPRINKLER</u> <u>SYSTEM</u> <u>(feet)</u>	<u>WITH SPRINKLER</u> <u>SYSTEM</u> <u>(feet)</u>
<u>A</u>	See Section	<u>1024.7</u>
<u> </u>	<u>_150</u>	<u>_200^b</u>
B	200	<u>300^c</u>
<u>F-2, S-2, U</u>	200	<u>250</u> ^b

Interior Corridor	Public Corridor
Serves only one tenant	Serves more than one tenant
Fire-rating reduced with sprinklers	Sprinklers not a factor (except as noted on next slide)
Occupant load a factor	Occupant load not a factor
In Group E occupancy, corridor serving one institution is an <i>Interior Corridor</i>	
Constructed as a <i>fire partition</i>	Constructed as a <i>fire barrier</i>

Public Corridor Fire-Resistance-Rating (Table 1016.1.2)

Fire-resistance-rating is not required in high-rise buildings in Group B where:

- 1. An automatic sprinkler system is provided, and
- 2. Smokeproof enclosures are provided in stairways

1-hour-rating permitted in R occupancies for:

- Buildings not exceeding 2 stories
- Buildings not exceeding 3 stories with only 1 family/story







Minimum Number of Exits Per Story (1018.1)

- Each story must be provided with and have access to the minimum number of exits per Table 1018.1
- Number is based on occupant load of the story
- Occupied roof is treated the same as a story

OCCUPANT LOAD	MINIMUM NUMBER OF EXITS
1-500	2
501-1,000	3
More than 1,000	4

Buildings with One Exit (1018.2)

There are 5 instances where one building exit is permitted:

1. Buildings listed in Table 1018.2 (mostly low-rise w/small occupant load)

<u>OCCUPANCY</u>	MAXIMUM HEIGHT OF <u>BUILDING ABOVE</u> <u>GRADE PLANE</u>	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
<u>A, B^c, E, F, M U</u>	<u>1 Story</u>	50 occupants and 75 feet travel distance
<u>H-2, H-3</u>	<u>1 Story</u>	<u>3 occupants and 25 feet travel</u> <u>distance</u>
<u>H-4, H-5, I, R</u>	<u>1 Story</u>	10 occupants and 75 feet travel distance
<u>S</u> ^a	<u>1 Story</u>	<u>30 occupants and 100 feet</u> <u>travel distance</u>
<u>B, F, M, S</u> ^a	<u>2 Stories</u>	30 occupants and 75 feet travel distance
<u>R-2</u> ^{d, e}	<u>2 Stories^b</u>	4 dwelling units and 50 feet travel distance

Buildings with One Exit (1018.2)

(Continued)

- R-3 Occupancies
- Single-level buildings permitted by 1014.1 as a space with 1 means of egress
- 2. R-2 Occupancies, Type I or II construction, ≤ 6 stories, and ≤ 2,000 SF/story

Buildings with One Exit (1018.2)

(Continued)

- 5. R-2 Occupancies, where:
 - $1. \leq 4$ stories
 - 2. \leq 3 dwellings/story
 - 3. Type I or II construction
 - 4. ≤ 2,500 SF/story
 - 5. Each DU has 1 window facing a street, or a lawful yard with direct access to the street
 - 6. The stairway extends to the roof or the stairway is facing a street with access through 1 window for every landing
 - 7. The stairway is 2-hour-rated with 1 ½-hour doors
 - 8. Sprinklered throughout

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Vertical Exit Enclosures (1019)

Interior exit stairways/ramps must be enclosed with fire barriers, and:

- When <u>connecting</u> ≥ 4 stories, 2-hour fire-resistancerating is required (incl. basement, not mezzanines)
- When <u>connecting</u> < 4 stories, 1-hour fire-resistancerating is required (incl. basement, not mezzanines)

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Vertical Exit Enclosures (1019)

Unenclosed stairways permitted:

- Where occupant load is < 10, with only 1-story above the level of exit discharge
- Within individual single residential dwelling unit
- In ornamental stairs that are in excess of required exit stairways

(See Section 1019.1 for other exceptions) Masonry construction (or equivalent) is required in R-1 and R-2 where 2-hour rating is required at the exit enclosures









Exit Passageways (1020)

- Must be at least 1-hr. fire barrier, but not less than that required for connecting vertical exit enclosure
- Width per 1005.1, but no less than 44" (36" OK < 50 occupants)
- Openings & penetrations limitations similar to those of exit enclosure
- Fire-rated door required where exit stairway meets exit passageway
- Elevators shall not open into exit passageways

Horizontal Exits (1021)

- Cannot serve as the only exit (except for I-3)
- •Where 2 or more exits are required, only up to ½ of the exits may be horizontal exits (except for I-2)
- Separation required by fire wall or fire barrier \geq 2 hours
- Fire doors must be self-closing or auto-closing upon activation of smoke detector, and be fire-rated consistently with that of the separation wall

















What is an Assembly? (Section 303.1 & 1024)

In general, Assembly Group A occupancy includes, among others:

- the use of a building or structure or a portion thereof, excluding a dwelling unit, for the gathering together of any number of persons for purposes such as civic, social or religious functions, recreation, food or drink consumption, awaiting transportation, or similar group activities; or
- when occupied by 75 persons or more for educational or instructional purposes

Exceptions (Section 303.1, Exception 1 & 2)

1. A room or space used for assembly purposes by < 75 persons and accessory to another occupancy shall be included as a part of that occupancy

2. A building or non-accessory tenant space used for assembly purposes by < 75 persons <u>shall be</u> <u>considered a Group B occupancy</u>

Certificate of Operation (1024.1.1)

Required for:

- Indoor places of assembly ≥ 75 persons, including open spaces at 20 feet (6096 mm) or more above or below grade, such as roofs or roof terraces
- Outdoor places of assembly \geq 200 persons

Exit Requirements (1024.2)

In addition to complying with means of egress requirements in other sections of Chapter 10, certain assembly occupancies must be provided with <u>either/both</u> of the following:

•Where the occupant load > 300, a <u>main exit</u> capable of handling $\geq \frac{1}{2}$ of the occupant load is required (but cannot be less than the total required width of all means of egress leading to the main exit)

•Where the net floor area per person < 12 SF, different classes of exits must be provided (*i.e. Class 1, 2, and 3*)

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Exit Openings Classification

Class 1 - Exit openings that are used for normal entry to the assembly space, and that open directly to a safe area or to an open exterior space

Class 2 - Exit openings that are not used for normal entry to the assembly space, and that open directly to a safe area or to an open exterior space

Class 3 - Exit openings that open from the assembly space into corridors, exit passageways, or vertical exits

Exit Openings Distribution			
Where the mean floor level is not more than 15 feet above or below the adjoining grade elevation	Where the mean floor level is more than 15 feet above or below the adjoining grade elevation		
Class 1- not less than 40 %	Class 1 - not less than 60 %		
Class 2- not more than 60 %	Class 3 - not more than 40 %		
Class 3- not more than 40 %			
	1		

Travel Distance (Section 1024.7) <u>TABLE 1024.7</u> <u>TRAVEL DISTANCE</u>				
OCCUPANCY NON-SPRINKLERED SPRINKLERED				
	PRIMARY	SECONDARY	PRIMARY	SECONDARY
<u>A-1, A-2,</u>	100	<u>150</u>	<u>150</u>	250
<u>A-3, A-4</u>				
<u>A-5</u>	200	<u>300</u>	200	300
At least 1 exit must be within the Primary travel distance An alternate exit must be within the Secondary travel distance				
Exit openings satisfying the primary and secondary travel distance must be 25' apart min.				

Common Path of Travel

The common path of travel shall not exceed 30 feet from any seat to a point where a person has a choice of two paths of egress travel to two exits

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QUESTIONS	;?
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