

CODE 101

How To Read The California Building Code

Part 3

MA Continuing Education
August 3, 2015

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Part 6: Amount of exterior openings allowed

- a. The CBC has requirements regarding the maximum openings allowed on an exterior wall. Generally this is based on a percentage of the total surface area of the wall in a given story. (In multiple-story buildings it is not the average of the entire wall.)

Allowable Openings

- The allowable amount of openings is based on fire separation distance and varies based on three factors:
 - Is the building sprinklered?
 - Is the opening “protected?”
 - Is the opening “unprotected?”.

Table 705.8

FIRE AND SMOKE PROTECTION FEATURES

where:

A_e = Equivalent area of protected openings.

A = Actual area of protected openings.

A_y = Area of exterior wall surface in the story under consideration exclusive of openings, on which the temperature limitations of ASTM E 119 or UL 263 for walls are exceeded.

F_{eo} = An "equivalent opening factor" derived from Figure 705.7 based on the average temperature of the unexposed wall surface and the fire-resistance rating of the wall.

705.8 Openings. Openings in exterior walls shall comply with Sections 705.8.1 through 705.8.6.

705.8.1 Allowable area of openings. The maximum area of unprotected and protected openings permitted in an exterior wall in any story of a building shall not exceed the percentages specified in Table 705.8.

Exceptions:

1. In other than Group H occupancies, unlimited unprotected openings are permitted in the first story above grade plane either:

1.1. Where the wall faces a street and has a fire separation distance of more than 15 feet (4572 mm); or

1.2. Where the wall faces an unoccupied space. The unoccupied space shall be on

TABLE 705.8
MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON
FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION

FIRE SEPARATION DISTANCE (feet)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA ^a
0 to less than 3 ^{b,c}	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S) ⁱ	Not Permitted
	Protected (P)	Not Permitted
3 to less than 5 ^{d,e}	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S) ⁱ	15%
	Protected (P)	15%
5 to less than 10 ^{e,f,j}	Unprotected, Nonsprinklered (UP, NS)	10% ^h
	Unprotected, Sprinklered (UP, S) ⁱ	25%
	Protected (P)	25%
10 to less than 15 ^{e,f,g}	Unprotected, Nonsprinklered (UP, NS)	15% ^h
	Unprotected, Sprinklered (UP, S) ⁱ	45%
	Protected (P)	45%
15 to less than 20 ^{e,f,g}	Unprotected, Nonsprinklered (UP, NS)	25%
	Unprotected, Sprinklered (UP, S) ⁱ	75%
	Protected (P)	75%
20 to less than 25 ^{e,f,g}	Unprotected, Nonsprinklered (UP, NS)	45%
	Unprotected, Sprinklered (UP, S) ⁱ	No Limit
	Protected (P)	No Limit
25 to less than 30 ^{e,f,g}	Unprotected, Nonsprinklered (UP, NS)	70%
	Unprotected, Sprinklered (UP, S) ⁱ	No Limit
	Protected (P)	No Limit
30 or greater	Unprotected, Nonsprinklered (UP, NS)	No Limit
	Unprotected, Sprinklered (UP, S) ⁱ	Not Required
	Protected (P)	Not Required

For SI: 1 foot = 304.8 mm.

UP, NS = Unprotected openings in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

UP, S = Unprotected openings in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

P = Openings protected with an opening protective assembly in accordance with Section 705.8.2.

a. Values indicated are the percentage of the area of the exterior wall, per story.

b. For the requirements for fire walls of buildings with differing heights, see Section 706.6.1.

c. For openings in a fire wall for buildings on the same lot, see Section 706.8.

d. The maximum percentage of unprotected and protected openings shall be 25 percent for Group R-3 occupancies.

e. Unprotected openings shall not be permitted for openings with a fire separation distance of less than 15 feet for Group H-2 and H-3 occupancies.

f. The area of unprotected and protected openings shall not be limited for Group R-3 occupancies, with a fire separation distance of 5 feet or greater.

g. The area of openings in an open parking structure with a fire separation distance of 10 feet or greater shall not be limited.

h. Includes buildings accessory to Group R-3.

i. Not applicable to Group H-1, H-2 and H-3 occupancies.

j. For special requirements for Group U occupancies, see Section 406.3.2.

How to use Table 705.8

- Identify the fire separation distance
- Use the table to identify the allowable percentage of openings in each story
- Verify that the project is in compliance with the Code.
- Check the footnotes for additional information.

Ground Floor Exceptions – 705.8.1

- In other than H Occupancies, unlimited unprotected openings are permitted in the first story above the grade either:
 - Where the wall faces a street and has a fire separation distance of more than 15 feet; or
 - Where the wall faces an unoccupied space on the same lot or dedicated to public use and not less than 30' in width.

Nonrated Buildings

- Buildings whose exterior bearing, non-bearing walls or structural frame are not required to be fire-protected shall be permitted to have unlimited unprotected openings.

Conclusion

Part 7 Extra Credit

- Why I don't memorize code sections.
- They can, and do change both through California Amendments and at each Code Cycle. The next edition of the IBC will have 618 separate changes – some minor and some significant.

2010 Table 503

GENERAL BUILDING HEIGHTS AND AREAS

**TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS^a**

Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of "Area, building" per story

GROUP		TYPE OF CONSTRUCTION									
		TYPE I		TYPE II		TYPE III		TYPE IV		TYPE V	
		A	B	A	B	A	B	A	B	A	B
		HEIGHT(feet)	160	65	55	65	55	65	55	60	40
STORIES(S) AREA (A)											
A-1	S	UL	5	3	2	3	2	3	2	1	
	A	UL	15,500	8,500		14,000	8,500	15,000	11,500	5,500	
A-2	S	UL	11	3	2	3	2	15,000	2	1	
	A	UL	15,500	9,500		14,000	9,500	2	11,500	6,000	
A-3	S	UL	11	3	2	3	2	15,000	11,500		
	A	UL	15,500	9,500		14,000	9,500	15,000	11,500	6,000	
A-4	S	UL	11	3	2	3	2	3	2	1	
	A	UL	15,500	9,500		14,000	9,500	15,000	11,500	6,000	
A-5	S	UL	UL	UL	UL	UL	UL	UL	UL	UL	
	A	UL	UL	UL	UL	UL	UL	UL	UL	UL	
B	S	UL	11	5	3	5	3	5	3	2	
	A	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000		
E	S	UL	5	14,500	23,500	2	25,000	28,500	9,500	1	
	A	UL	26,500	14,500	23,500	14,500	2	28,500	9,500	1	
F-1	S	UL	11	4	2	3	2	33,500	14,000	8,500	
	A	UL	25,000	15,500	19,000	12,000	33,500	14,000	8,500	1	
F-2	S	UL	11	5	3	4	18,000	5	21,000	13,000	
	A	UL	37,500	23,000	28,500	3	50,500	3	21,000	13,000	
H-1	S	UL	1	1	1	1	1	10,500	7,500	NP	
	A	UL	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500	NP
H-2 ^d	S	UL	20	3	2	1	2	2	1	1	
	A	UL	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500	1
H-3 ^d	S	UL	20	6	4	2	4	2	7,500	3,000	
	A	UL	60,000	26,500	14,000	17,500	13,000	25,500	10,000	5,000	
H-4	S	UL	20	7	5	3	5	3	5	3	
	A	UL	37,500	17,500	28,500	17,500	36,000	18,000	6,500		
H-5	S	UL	4	4	2	3	3	3	3	2	
	A	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000		
I-2/II-2, I ^f	S	UL	4	2	1	1	NP	NP	NP	NP	
	A	UL	15,000	11,000	12,000	NP	12,000	9,500	NP	NP	
I-3 ^e	S	UL	2	NP	NP	NP	NP	NP	NP	NP	
	A	UL	15,100	NP	NP	NP	NP	NP	NP	NP	
I-4	S	UL	3	5	2	2	2	25,500	18,500	9,000	
	A	UL	60,500	26,500	13,000	23,500	13,000	25,500	18,500	9,000	
L	S	UL	20	6	5	3	5	3	3	2	
	A	UL	60,000	37,500	17,500	28,500	17,500	36,000	14,000	6,500	
M	S	UL	11	4	2	4	2	3	3	1	
	A	UL	21,500	12,500	18,500	12,500	20,500	14,000	9,000		
R-1	S	UL	11	4	4	4	4	4	3	2	
	A	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000		
R-2	S	UL	11	4	4	4	4	4	3	2	
	A	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000		
R-2.1	S	UL	6 ^d	3 ^e	NP	3 ^e	NP	NP	NP	NP	
	A	UL	55,000	19,000	NP	NP	NP	NP	10,500	NP	
R-3/R-3.1	S	UL	11	4	4	4	4	4	3	3	
	A	UL	UL	UL	UL	UL	UL	UL	UL	UL	
R-4	S	UL	11 ^d	4 ^e	4 ^e	4 ^e	4 ^e	4 ^e	3 ^e	2 ^e	
	A	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000		
S-1	S	UL	11	4	2	3	2	4	3	1	
	A	UL	48,000	26,000	17,500	26,000	17,500	25,500	14,000	9,000	
S-2 ^{b,c}	S	UL	5	11	3	3	3	38,500	21,000	13,500	
	A	UL	79,000	39,000	26,000	39,000	26,000	38,500	21,000	13,500	
U ^e	S	UL	5	4	2	3	2	18,000	9,000	5,500	
	A	UL	35,500	19,000	8,500	14,000	8,500	18,000	9,000	5,500	

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

A = building area per story, S = stories above grade plane. UL = Unlimited, NP = Not permitted.

a. See the following sections for general exceptions to Table 503:

- Section 504.2, Allowable building height and story increase due to automatic sprinkler system installation.
- Section 506.2, Allowable building area increase due to street frontage.
- Section 506.3, Allowable building area increase due to automatic sprinkler system installation.

b. Section 507, Unlimited area buildings.

c. For open parking structures, see Section 406.3.

d. For private garages, see Section 406.1.

e. See Section 415.5 for limitations.

f. [SFM] See Section 408.1.1 for specific exceptions for one-story Type IIA, Type IIIA or Type VA construction.

g. Restraint shall not be permitted in any building except in Group I-3 occupancies constructed for such use (see Section 408.1.2).

h. Nonambulatory persons shall be limited to the first two stories.

i. Nonambulatory persons shall be limited to the first five stories.

j. Nonambulatory elderly clients are not permitted in buildings of these types of construction. See Sections 425.3.3 and 425.3.4.

FIRE AND SMOKE PROTECTION FEATURES

where:

A_p = Equivalent area of protected openings.

A = Actual area of protected openings.

A_f = Area of exterior wall surface in the story under consideration exclusive of openings, on which the temperature limitations of ASTM E 119 or UL 263 for walls are exceeded.

F_{eq} = An "equivalent opening factor" derived from Figure 705.7 based on the average temperature of the unexposed wall surface and the fire-resistance rating of the wall.

705.8 Openings. Openings in exterior walls shall comply with Sections 705.8.1 through 705.8.6.

705.8.1 Allowable area of openings. The maximum area of unprotected and protected openings permitted in an exterior wall in any story of a building shall not exceed the percentages specified in Table 705.8.

Exceptions:

1. In other than Group H occupancies, unlimited unprotected openings are permitted in the first story above grade plane either:

1.1. Where the wall faces a street and has a fire separation distance of more than 15 feet (4572 mm); or

1.2. Where the wall faces an unoccupied space. The unoccupied space shall be on

**TABLE 705.8
MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON
FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION**

FIRE SEPARATION DISTANCE (feet)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA ^a
0 to less than 3 ^{b,c}	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S) ^f	Not Permitted
	Protected (P)	Not Permitted
3 to less than 5 ^{d,e}	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S) ^f	15%
	Protected (P)	15%
5 to less than 10 ^{d,e}	Unprotected, Nonsprinklered (UP, NS)	10% ^h
	Unprotected, Sprinklered (UP, S) ^f	25%
	Protected (P)	25%
10 to less than 15 ^{d,e}	Unprotected, Nonsprinklered (UP, NS)	15% ^h
	Unprotected, Sprinklered (UP, S) ^f	45%
	Protected (P)	45%
15 to less than 20 ^{d,e}	Unprotected, Nonsprinklered (UP, NS)	25%
	Unprotected, Sprinklered (UP, S) ^f	75%
	Protected (P)	75%
20 to less than 25 ^{d,e}	Unprotected, Nonsprinklered (UP, NS)	45%
	Unprotected, Sprinklered (UP, S) ^f	No Limit
	Protected (P)	No Limit
25 to less than 30 ^{d,e}	Unprotected, Nonsprinklered (UP, NS)	70%
	Unprotected, Sprinklered (UP, S) ^f	No Limit
	Protected (P)	No Limit
30 or greater	Unprotected, Nonsprinklered (UP, NS)	No Limit
	Unprotected, Sprinklered (UP, S) ^f	Not Required
	Protected (P)	Not Required

For SI: 1 foot = 304.8 mm.

UP, NS = Unprotected openings in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

UP, S = Unprotected openings in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

P = Openings protected with an opening protective assembly in accordance with Section 705.8.2.

a. Values indicated are the percentage of the area of the exterior wall, per story.

b. For the requirements for fire walls of buildings with differing heights, see Section 706.6.1.

c. For openings in a fire wall for buildings on the same lot, see Section 706.8.

d. The maximum percentage of unprotected and protected openings shall be 25 percent for Group R-3 occupancies.

e. Unprotected openings shall not be permitted for openings with a fire separation distance of less than 15 feet for Group H-2 and H-3 occupancies.

f. The area of unprotected and protected openings shall not be limited for Group R-3 occupancies, with a fire separation distance of 5 feet or greater.

g. The area of openings in an open parking structure with a fire separation distance of 10 feet or greater shall not be limited.

h. Includes buildings accessory to Group R-3.

i. Not applicable to Group H-1, H-2 and H-3 occupancies.

j. For special requirements for Group U occupancies, see Section 406.3.2.

Today's Table 503

GENERAL BUILDING HEIGHTS AND AREAS

exempt from the building height and area limitations of Table 503.

503.1.2 Buildings on same lot. Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building if the building height of each building and the aggregate building area of the buildings are within the limitations of Table 503 as modified by Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each building.

503.1.3 Type I construction. Buildings of Type I construction permitted to be of unlimited tabular building heights and areas are not subject to the special requirements that allow unlimited area buildings in Section 507 or unlimited building height in Sections 503.1.1 and 504.3 or increased building heights and areas for other types of construction.

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS^{a,b}
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

GROUP	HEIGHT (feet)	TYPE OF CONSTRUCTION									
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V		
		A	B	A	B	A	B	HT	A	B	
		UL	160	65	55	65	55	65	50	40	
STORIES(S) AREA (A)											
A-1	S A	UL UL	5 UL	3 15,500	2 8,500	3 14,000	2 8,500	3 15,000	2 11,500	1 5,500	
A-2	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000	
A-3	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000	
A-4	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000	
A-5	S A	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	
B	S A	UL UL	11 UL	5 37,500	3 23,000	5 28,500	3 19,000	5 36,000	3 18,000	2 9,000	
E	S A	UL UL	5 UL	3 26,500	2 14,500	3 23,500	2 14,500	3 25,500	1 18,500	1 9,500	
F-1	S A	UL UL	11 UL	4 25,000	2 15,500	3 19,000	2 12,000	3 33,500	2 14,000	1 8,500	
F-2	S A	UL UL	11 UL	5 37,500	3 23,000	4 28,500	3 18,000	5 50,500	3 21,000	2 13,000	
H-1	S A	21,000 UL	1 16,500	1 11,000	1 7,000	1 9,500	1 7,000	1 10,500	1 7,500	NP NP	
H-2	S A	20 21,000	3 16,500	2 11,000	1 7,000	2 9,500	1 7,000	2 10,500	1 7,500	1 3,000	
H-3	S A	20 UL	6 60,000	4 26,500	2 14,000	4 17,500	2 13,000	4 25,500	2 10,000	1 5,000	
H-4	S A	20 UL	7 UL	5 37,500	3 17,500	5 28,500	3 17,500	5 36,000	3 18,000	2 6,500	
H-5	S A	4 UL	4 UL	3 37,500	3 23,000	3 28,500	3 19,000	3 36,000	3 18,000	2 9,000	
I-2/I-2.1 ^d	S A	UL UL	4 UL	2 15,000	1 11,000	1 12,000	NP NP	1 12,000	1 9,500	NP NP	
I-3 ^e	S A	UL UL	2 15,100	NP NP	NP NP	NP NP	NP NP	NP NP	NP NP	NP NP	
I-4	S A	UL UL	5 60,500	3 26,500	2 13,000	3 23,500	2 13,000	3 25,500	1 18,500	1 9,000	
L	S A	20 UL	6 60,000	5 37,500	3 17,500	5 28,500	3 17,500	5 36,000	3 18,000	2 6,500	
M	S A	UL UL	11 UL	4 21,500	2 12,500	4 18,500	2 12,500	4 20,500	3 14,000	1 9,000	
R-1	S A	UL UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 7,000	

(continued)

GENERAL BUILDING HEIGHTS AND AREAS

TABLE 503—continued
ALLOWABLE BUILDING HEIGHTS AND AREAS^{a,b}

GROUP	HEIGHT (feet)	TYPE OF CONSTRUCTION									
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V		
		A	B	A	B	A	B	HT	A	B	
		UL	160	65	55	65	55	65	50	40	
STORIES(S) AREA (A)											
R-2	S	UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 7,000	
R-2.1	S	UL	6 ^f 55,000	3 ^r 19,000	NP NP	3 ^r 16,500	NP NP	NP NP	3 ^r 16,500	NP NP	
R-3/R-3.1	S	UL	11 UL	4 UL	4 UL	4 UL	4 UL	4 UL	3 UL	3 UL	
R-4	S	UL	11 ^f UL	4 ^r 24,000	4 ^r 16,000	4 ^r 24,000	4 ^r 16,000	4 ^r 20,500	3 ^r 12,000	2 ^r 7,000	
S-1	S	UL	11 UL	4 48,000	2 26,000	3 17,500	2 26,000	2 17,500	3 25,500	1 14,000	
S-2	S	UL	11 UL	5 79,000	3 39,000	4 26,000	3 39,000	5 26,000	4 38,500	2 21,000	
U ^c	S	UL	5 UL	4 35,500	2 19,000	3 8,500	2 14,000	2 8,500	4 18,000	1 9,000	
	S	UL									

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

A = building area per story, S = stories above grade plane, UL = Unlimited, NP = Not permitted.

a. See the following sections for general exceptions to Table 503:

- Section 504.2, Allowable building height and story increase due to automatic sprinkler system installation.
- Section 506.2, Allowable building area increase due to street frontage.
- Section 506.3, Allowable building area increase due to automatic sprinkler system installation.
- Section 507, Unlimited area buildings.

b. See Chapter 4 for specific exceptions to the allowable height and areas in Chapter 5.

c. See Section 408.1.2 for specific exceptions to construction type, allowable building areas and allowable heights.

d. Restraint shall not be permitted in any building except in Group I-3 occupancies constructed for such use (see Section 408.1.2).

e. Nonambulatory persons shall be limited to the first 2 stories.

f. Nonambulatory persons shall be limited to the first 5 stories.

g. Nonambulatory elderly clients are not permitted in buildings of these types of construction. See Section 425.3.3 and 425.3.4.

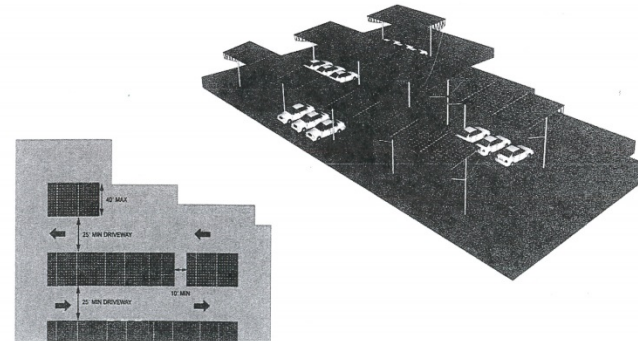


FIGURE 5-1

New Tables 504.3, 504.4 and 506.2 for 2016

GENERAL BUILDING HEIGHTS AND AREAS

exempt from, or modify, the specific requirements of this chapter regarding the allowable heights of buildings based on the occupancy classification and type of construction, provided the special condition complies with the provisions specified in Section 510.

504.2 Mixed occupancy. In a building containing mixed occupancies in accordance with Section 508, no individual occupancy shall exceed the height and number of story limits specified in this section for the applicable occupancies.

504.3 Height in feet. The maximum height, in feet, of a building shall not exceed the limits specified in Table 504.3.

Exception: Towers, spires, steeples and other roof structures shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1510.2.5. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height where of noncombustible materials and shall not extend more than 20 feet (6096 mm) above the allowable building height where of

combustible materials (see Chapter 15 for additional requirements).

504.4 Number of stories. The maximum number of stories of a building shall not exceed the limits specified in Table 504.4.

SECTION 505 MEZZANINES AND EQUIPMENT PLATFORMS

505.1 General. Mezzanines shall comply with Section 505.2. Equipment platforms shall comply with Section 505.3.

505.2 Mezzanines. A mezzanine or mezzanines in compliance with Section 505.2 shall be considered a portion of the story below. Such mezzanines shall not contribute to either the building area or number of stories as regulated by Section 503.1. The area of the mezzanine shall be included in determining the fire area. The clear height above and below the mezzanine floor construction shall be not less than 7 feet (2134 mm).

TABLE 504.3^a
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

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

For SI: 1 foot = 304.8 mm.

Note: 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.

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

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing building height in accordance with the *International Existing Building Code*.

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.

g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

GENERAL BUILDING HEIGHTS AND AREAS

TABLE 504.4^{a,b}
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION		TYPE OF CONSTRUCTION										
		SEE FOOTNOTES	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	2	3	2	3	2	1		
	S	UL	6	4	3	4	3	4	3	2		
A-2	NS	UL	11	3	2	3	2	3	2	1		
	S	UL	12	4	3	4	3	4	3	2		
A-3	NS	UL	11	3	2	3	2	3	2	1		
	S	UL	12	4	3	4	3	4	3	2		
A-4	NS	UL	11	3	2	3	2	3	2	1		
	S	UL	12	4	3	4	3	4	3	2		
A-5	NS	UL	UL	UL	UL	UL	UL	UL	UL	UL		
	S	UL	UL	UL	UL	UL	UL	UL	UL	UL		
B	NS	UL	11	5	3	5	3	5	3	2		
	S	UL	12	6	4	6	4	6	4	3		
E	NS	UL	5	3	2	3	2	3	1	1		
	S	UL	6	4	3	4	3	4	2	2		
F-1	NS	UL	11	4	2	3	2	4	2	1		
	S	UL	12	5	3	4	3	5	3	2		
F-2	NS	UL	11	5	3	4	3	5	3	2		
	S	UL	12	6	4	5	4	6	4	3		
H-1	NS ^{c,d}	1	1	1	1	1	1	1	1	1	NP	
	S											
H-2	NS ^{c,d}	UL	3	2	1	2	1	2	1	1		
	S											
H-3	NS ^{c,d}	UL	6	4	2	4	2	4	2	1		
	S											
H-4	NS ^{c,d}	UL	7	5	3	5	3	5	3	2		
	S	UL	8	6	4	6	4	6	4	3		
H-5	NS ^{c,d}	4	4	3	3	3	3	3	3	2		
	S											
I-1 Condition 1	NS ^{d,e}	UL	9	4	3	4	3	4	3	2		
	S	UL	10	5	4	5	4	5	4	3		
I-1 Condition 2	NS ^{d,e}	UL	9	4	3	4	3	4	3	2		
	S	UL	10	5								
I-2	NS ^{d,f}	UL	4	2	1	1	NP	1	1	NP		
	S	UL	5	3								
I-3	NS ^{d,g}	UL	4	2	1	2	1	2	2	1		
	S	UL	5	3	2	3	2	3	3	2		
I-4	NS ^{d,h}	UL	5	3	2	3	2	3	1	1		
	S	UL	6	4	3	4	3	4	2	2		
M	NS	UL	11	4	2	4	2	4	3	1		
	S	UL	12	5	3	5	3	5	4	2		

(continued)

New Tables 504.3, 504.4 and 506.2 for 2016

GENERAL BUILDING HEIGHTS AND AREAS

TABLE 504.4^{a, b}—continued
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION									
		TYPE I		TYPE II		TYPE III		HT	TYPE V		
		A	B	A	B	A	B		A	B	
R-1	NS ^{d, h}	UL	11						3	2	
	S13R	4	4	4	4	4	4	4	4	3	
	S	UL	12	5	5	5	5	5	4	3	
	NS ^{d, h}	UL	11	4					3	2	
R-2	S13R	4	4	4	4	4	4	4	4	3	
	S	UL	12	5	5	5	5	5	4	3	
	NS ^{d, h}	UL	11						3	3	
	S13R	4	4	4	4	4	4	4	4	4	
R-3	S	UL	12	5	5	5	5	5	4	4	
	NS ^{d, h}	UL	11						3	3	
	S13R	4	4	4	4	4	4	4	4	4	
	S	UL	12	5	5	5	5	5	4	4	
R-4	NS ^{d, h}	UL	11						3	2	
	S13R	4	4	4	4	4	4	4	4	3	
	S	UL	12	5	5	5	5	5	4	3	
	NS	UL	11	4	2	3	2	4	3	1	
S-1	S	UL	12	5	3	4	3	5	4	2	
	NS	UL	11	5	3	4	3	4	4	2	
S-2	S	UL	12	6	4	5	4	5	5	3	
	NS	UL	11	5	3	4	3	4	4	2	
U	NS	UL	5	4	2	3	2	4	2	1	
	S	UL	6	5	3	4	3	5	3	2	

Notes: UL = Unlimited; NP = Not Permitted; 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.

- See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- The NS value is only for use in evaluation of existing building height in accordance with the *International Existing Building Code*.
- New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.
- New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.
- For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
- New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

505.2.1 Area limitation. The aggregate area of a *mezzanine* or *mezzanines* within a room shall be not greater than one-third of the floor area of that room or space in which they are located. The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the *mezzanine* is located. In determining the allowable *mezzanine* area, the area of the *mezzanine* shall not be included in the floor area of the room.

Where a room contains both a *mezzanine* and an *equipment platform*, the aggregate area of the two raised floor levels shall be not greater than two-thirds of the floor area of that room or space in which they are located.

Exceptions:

- The aggregate area of *mezzanines* in buildings and structures of Type I or II construction for

special industrial occupancies in accordance with Section 503.1.1 shall be not greater than two-thirds of the floor area of the room.

- The aggregate area of *mezzanines* in buildings and structures of Type I or II construction shall be not greater than one-half of the floor area of the room in buildings and structures equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1 and an *approved emergency voice/alarm communication system* in accordance with Section 907.5.2.2.

505.2.2 Means of egress. The *means of egress* for *mezzanines* shall comply with the applicable provisions of Chapter 10.

GENERAL BUILDING HEIGHTS AND AREAS

TABLE 505.2^{a, b}
ALLOWABLE AREA FACTOR (A = NS, S1, S13R, or SM, as applicable) IN SQUARE FEET

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

(continued)

New Tables 504.3, 504.4 and 506.2 for 2016

GENERAL BUILDING HEIGHTS AND AREAS

GENERAL BUILDING HEIGHTS AND AREAS

TABLE 506.2^{a,b}—continued
ALLOWABLE AREA FACTOR (A_a = NS, S1, S13R, or SM, as applicable) IN SQUARE FEET

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION									
		TYPE I		TYPE II		TYPE III		TYPE IV		TYPE V	
		A	B	A	B	A	B	A	B	A	B
I-1	NS ^{a,c}	UL	55,000	19,000	10,000	16,500	10,000	18,000	10,500	4,500	
	S1	UL	220,000	76,000	40,000	66,000	40,000	72,000	42,000	18,000	
	SM	UL	165,000	57,000	30,000	49,500	30,000	54,000	31,500	13,500	
I-2	NS ^{d,f}	UL	UL	15,000	11,000	12,000	NP	12,000	9,500	NP	
	S1	UL	UL	60,000	44,000	48,000	NP	48,000	38,000	NP	
	SM	UL	UL	45,000	33,000	36,000	NP	36,000	28,500	NP	
I-3	NS ^{a,c}	UL	UL	15,000	10,000	10,500	7,500	12,000	7,500	5,000	
	S1	UL	UL	45,000	40,000	42,000	30,000	48,000	30,000	20,000	
	SM	UL	UL	45,000	30,000	31,500	22,500	36,000	22,500	15,000	
I-4	NS ^{a,c}	UL	60,500	26,500	13,000	23,500	13,000	25,500	18,500	9,000	
	S1	UL	121,000	106,000	52,000	94,000	52,000	102,000	74,000	36,000	
	SM	UL	181,500	79,500	39,000	70,500	39,000	76,500	55,500	27,000	
M	NS	UL	UL	21,500	12,500	18,500	12,500	20,500	14,000	9,000	
	S1	UL	UL	86,000	50,000	74,000	50,000	82,000	56,000	36,000	
	SM	UL	UL	64,500	37,500	55,500	37,500	61,500	42,000	27,000	
R-1	NS ^{a,h}	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000	
	S13R	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000	
	S1	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000	
R-2	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000	
	NS ^{a,h}	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000	
	S13R	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000	
R-3	S1	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000	
	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000	
	NS ^{a,h}	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000	
R-4	S13R	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000	
	S1	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000	
	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000	
S-1	NS	UL	48,000	26,000	17,500	26,000	17,500	25,500	14,000	9,000	
	S1	UL	192,000	104,000	70,000	104,000	70,000	102,000	56,000	36,000	
	SM	UL	144,000	78,000	52,500	78,000	52,500	76,500	42,000	27,000	
S-2	NS	UL	79,000	39,000	26,000	39,000	26,000	38,500	21,000	13,500	
	S1	UL	316,000	156,000	104,000	156,000	104,000	154,000	84,000	54,000	
	SM	UL	237,000	117,000	78,000	117,000	78,000	115,500	63,000	40,500	
U	NS	UL	35,500	19,000	8,500	14,000	8,500	18,000	9,000	5,500	
	S1	UL	142,000	76,000	34,000	56,000	34,000	72,000	36,000	22,000	
	SM	UL	106,500	57,000	25,500	42,000	25,500	54,000	27,000	16,500	

(continued)

TABLE 506.2^{a,b}—continued
ALLOWABLE AREA FACTOR (A_a = NS, S1, S13R, or SM, as applicable) IN SQUARE FEET

Note: UL = Unlimited; NP = Not permitted;

For S1: 1 square foot = 0.0929 m².

NS = Buildings not equipped throughout with an automatic sprinkler system; S1 = Buildings a maximum of one story above grade plane 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.

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

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing building area in accordance with the *International Existing Building Code*.

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.

g. New Group I-4 occupancies see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

506.2.3 Single-occupancy, multistory buildings. The allowable area of a single-occupancy building with more than one story above grade plane shall be determined in accordance with Equation 5-2:

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

where:

A_a = Allowable area (square feet).

A_s = Tabular allowable area factor (NS, S13R 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_p = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

S_a = Actual number of building stories above grade plane, not to exceed three. For buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2, use the actual number of building stories above grade plane, not to exceed four.

No individual story shall exceed the allowable area (A_a) as determined by Equation 5-2 using the value of $S_a = 1$.

506.2.4 Mixed-occupancy, multistory buildings. Each story of a mixed-occupancy building with more than one story above grade plane shall individually comply with the applicable requirements of Section 508.1. For buildings with more than three stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories, determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed three.

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

where:

A_a = Allowable area (square feet).

A_s = Tabular allowable area factor (NS, S13R 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_p = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

Exception: For buildings designed as separated occupancies under Section 508.4 and equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed four.

506.2.4.1 Group H-2 or H-3 mixed occupancies. For a building containing Group H-2 or H-3 occupancies, the allowable area shall be determined in accordance with Section 508.4.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.

506.3 Frontage increase. Every building shall adjoin or have access to a public way to receive an area factor increase based on frontage. Area factor increase shall be determined in accordance with Sections 506.3.1 through 506.3.3.

506.3.1 Minimum percentage of perimeter. To qualify for an area factor increase based on frontage, a building shall have not less than 25 percent of its perimeter on a public way or open space. Such open space shall be either on the same lot or dedicated for public use and shall be accessed from a street or approved fire lane.

506.3.2 Minimum frontage distance. To qualify for an area factor increase based on frontage, the public way or open space adjacent to the building perimeter shall have a minimum distance (W) of 20 feet (6096 mm) measured at right angles from the building face to any of the following:

1. The closest interior lot line.