

A24 MN

The Minnesota Conference on Architecture

November 11-13, 2024





Building Classification

It all starts here!

Building Classification

Correct classification of occupancy group and construction type is the critical step in code evaluation

WHY?

Many code provisions are focused or only applicable to specific occupancy groups or construction types.

Occupancy Classification Driven

- How will the space be used?
- Is there more than one way?
- What are the abilities of the occupants to respond to an emergency?

Occupancy Groups

- There are 10 occupancy groups.
- These are subdivided into 26 subgroups.

Occupancy classification is the formal designation of the primary purpose of the building, structure or portion thereof. Structures shall be classified into one or more of the occupancy groups specified in this section based on the nature of the hazards and risks to building occupants generally associated with the intended purpose of the building or structure

An area, room or space that is intended to be occupied at different times for different purposes shall comply with all applicable requirements associated with such potential multipurpose.

An area, room or space that is intended to be occupied at different times for different purposes shall comply with all applicable requirements associated with such potential multipurpose.

Structures containing multiple occupancy groups shall comply with Section 508.

Where a *structure* is proposed for a purpose that is not specified in this section, such *structure* shall be classified in the occupancy it most nearly resembles based on the fire safety and relative hazard.

Occupiable roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard, and shall comply with Section 503.1.4.

Occupancy Groups

TYPES OF USE	GENERAL OCCUPANCY GROUP	OCCUPANCY SUB-GROUP
Assembly	Group A	A-2, A-2, A-3, A-4, A-5
Business	Group B	
Educational	Group E	
Factory	Group F	F-1, F-2
High-Hazard	Group H	H-1, H-2, H-3, H-4, H-5
Institutional	Group I	I-1, I-2, I-3, I-4
Mercantile	Group M	
Residential	Group R	R-1, R-2, R-3, R-4
Storage	Group S	S-1, S-2
Utility + Misc	Group U	

A building or portion there of where people gather (typically 50+) for:

- Civic, social or religious functions
- Recreation
- Food and or drink consumption
- Waiting for transportation

303.1.1 Small buildings and tenant spaces.

A *building* or tenant space used for assembly purposes with an *occupant load* of less than 50 *persons* shall be classified as a Group B occupancy.

303.1.2 Small assembly spaces.

The following rooms and spaces shall not be classified as Assembly occupancies:

1. A room or space used for assembly purposes with an *occupant load* of less than 50 *persons* and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

303.1.2 Small assembly spaces.

The following rooms and spaces shall not be classified as Assembly occupancies:

2. A room or space used for assembly purposes that is less than 750 square feet (70 m²) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

303.1.3 Associated with E occupancies

A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

303.1.4 Accessory to Religious worship

Accessory religious educational rooms and religious auditoriums with *occupant loads* of less than 100 per room or space are not considered separate occupancies.



Uses usually with fixed seating, intended for the production and viewing of the performing arts or motion pictures:



Uses intended for food and/or drink consumption:

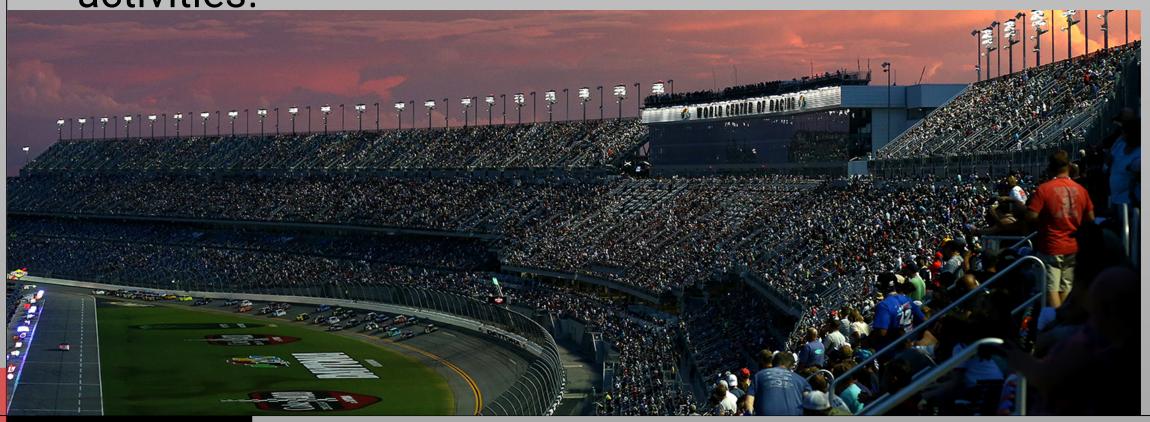
Uses intended for worship, recreation or amusement or otherwise not in another A:





Uses intended for participation in or viewing of indoor sporting events and activities:

Uses intended for participation in or viewing of outdoor activities:



Business Occupancy Group B



Uses among others, Office, professional or service type transactions including storage of records and accounts:

Education Occupancy Group E



Uses by six or more persons at any one time for educational purposes through the 12th grade

Education Occupancy Group E

305.1.1 Associated with places of worship

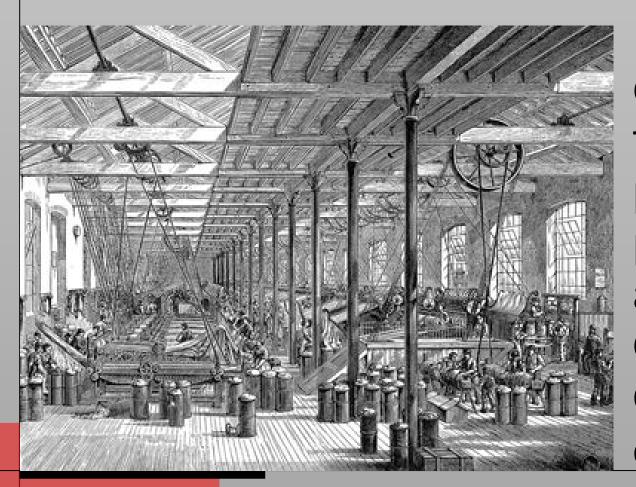
Religious educational rooms and religious auditoriums, which are accessory to *places of religious worship* in accordance with Section 303.1.4 and have *occupant loads* of less than 100 per room or space, shall be classified as Group A-3 occupancies.

Education Occupancy Group E

305.2 Day Care Facilities

More than five children older than $2^1/_2$ years of age who receive educational, supervision or *personal care services* for fewer than 24 hours per day.

Factory Occupancy Group F



Used for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy.

Factory Occupancy Group F-1

Moderate-hazard factory industrial.

Uses that are not classified as Factory Industrial F-2 Low Hazard

- Appliances
- Bakeries
- Beverages over 20% alcohol
- Carpets and rugs
- Electronics
- Shoes
- Trailers
- woodworking

Factory Occupancy Group F-2

Low-hazard factory industrial.

Uses that involve the fabrication or manufacturing of noncombustible materials that during finishing, packing or processing do not involve a significant fire hazard

- Beverages over 20% alcohol
- Brick and masonry
- Foundries
- Ice
- Metal products fabrication and assembly

High Hazard Occupancy Group H

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 the maximum allowable quantity limits for control areas set forth in Tables 307.1(1) + (2).

High Hazard Occupancy Group H

307.1.1 Exemptions

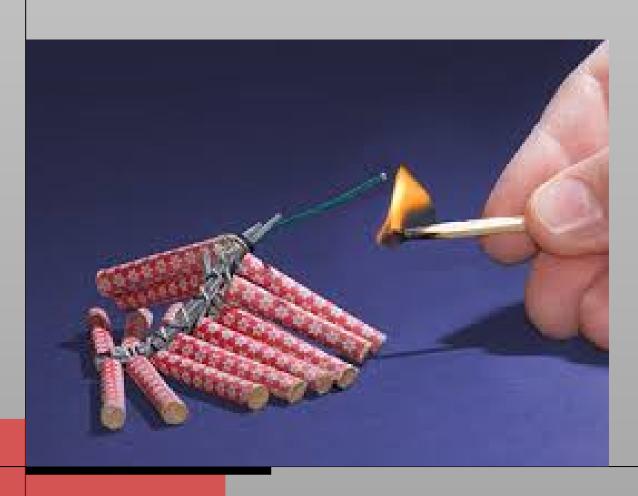
Storage, use and handling of hazardous materials in accordance with Table 307.1.1 shall not be counted as contributing to Maximum Allowable Quantities and shall not cause classification of an occupancy to be Group H. Such storage, use and handling shall comply with applicable provisions of the Fire Code.

High Hazard Occupancy Group H

307.2 Hazardous Materials

Hazardous materials in any quantity shall conform to the requirements of this code, including Section 414, and the *Fire Code*.

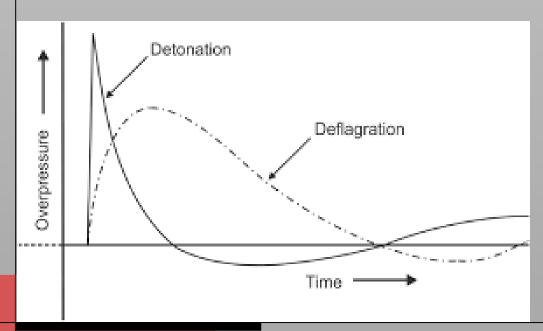
High Hazard Group H-1



Buildings and structures containing materials that pose a detonation hazard.

High Hazard Group H-2

Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning.



High Hazard Group H-3

Buildings and structures containing materials that readily support combustion or that pose a physical hazard.

High Hazard Group H-4

Buildings and structures containing materials that are health hazards.



High Hazard Group H-5

Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used and the aggregate quantity of materials is in excess of those specified in Tables 307.1(1) and 307.1(2).

Uses in which care or supervision is provided to persons who are or are incapable of selfpreservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted.

More than 16 *persons*, excluding staff, who reside on a *24-hour basis* in a supervised environment and receive *custodial care*:

- Alcohol and drug centers
- Assisted living facilities
- Congregate care facilities
- Group homes
- Halfway houses
- Residential board and care facilities
- Social rehabilitation facilities

Condition 1

All persons receiving custodial care who, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

Condition 2

Where any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

308.2.3 6 to 16 persons receiving custodial care Shall be classified as group R-4.

308.2.4 5 or less persons receiving custodial care Shall be classified as group R-3.

Used for *medical care* on a 24-hour basis for more than five *persons* who are *incapable of self-preservation*:

- Foster care facilities
- Detoxification facilities
- Hospitals
- Nursing homes
- Psychiatric hospitals

Condition 1

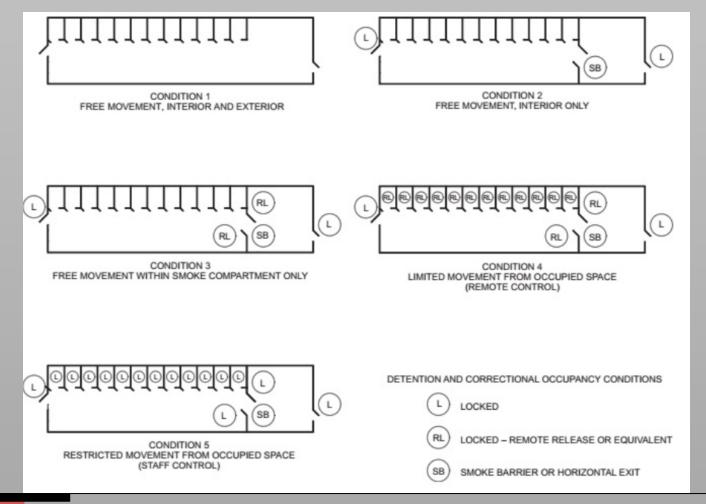
Facilities that provide nursing and medical care but do not provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification.

Condition 2

Facilities that provide nursing and medical care and could provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification.

Occupied by more than persons who are generally *incapable of self-preservation* due to security measures not under occupants' control:

- Correctional facilities
- Detention facilities
- Jails
- Prerelease centers
- Prisons
- Reformatories



More than five *persons* of any age who receive *custodial care* for fewer than 24 hours per day by *persons* other than parents or guardians; relatives by blood, marriage or adoption; and in a place other than the home of the *person* cared for:

- Adult day care
- Child day care

308.5.1 Classification as Group E

A child day care *facility* that provides care for more than five but not more than 100 children $2^{1}/_{2}$ years or less of age, where the rooms in which the children are cared for are located on a *level of exit discharge* serving such rooms and each of these child care rooms has an *exit* door directly to the exterior.

308.5.2 Within places of worship

Rooms and spaces within *places of religious* worship providing such care during religious functions shall be classified as part of the primary occupancy.

308.5.3 Five or fewer persons

Shall be classified as part of the primary occupancy.

Mercantile Occupancy Group M

Uses for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and where the public has access:

- Department stores
- Drug stores
- Greenhouses for sale of plants and provide public access
- Markets
- Motor fuel dispensing facilities
- Retail or wholesale stores
- Sales rooms

Uses containing *sleeping units* or more than two *dwelling units* where the occupants are primarily transient in nature:

- Boarding houses (transient) with more than 10 occupants
- Congregate living facilities (transient) with more than 10 occupants
- Hotels (transient)
- Motels (transient)
- Lodging houses with more than five guestrooms

Uses containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature:

- Apartment houses
- Congregate living facilities (nontransient) with more than 16 occupants
 - Boarding houses (nontransient)
 - Convents
 - Dormitories
 - Emergency services living quarters
 - Fraternities and sororities
 - Monasteries
- Hotels (nontransient) with more than five *guest rooms*
- Live/work units
- Motels (nontransient) with more than five *quest rooms*
- Vacation timeshare properties

Occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I,:

- Buildings that do not contain more than two dwelling units
- Care facilities with accommodations for five or fewer persons receiving care
- Congregate living facilities (nontransient) with 16 or fewer occupants
- Congregate living facilities (transient) with 10 or fewer occupants
- Boarding houses (transient)
- Lodging houses with five or fewer guest rooms
- Hotels (nontransient) with five or fewer *guest rooms*
- Motels (nontransient) with five or fewer *guest rooms*

310.4.1 Care facilities within a dwelling

Five or fewer *persons* receiving care within a single-family *dwelling* are permitted to comply with the *IRC* provided an *automatic sprinkler system* per NFPA 13D or *P2904* is installed.

310.4.2 Lodging houses

Owner-occupied with five or fewer guest rooms are permitted to comply with the IRC, provided an automatic sprinkler system in accordance with P2904 is installed

More than five but not more than 16 *persons*, excluding staff, who reside on a *24-hour basis* in a supervised residential environment and receive *custodial care*:

- Alcohol and drug centers
- Assisted living facilities
- Congregate care facilities
- Group homes
- Halfway houses
- Residential board and care facilities
- Social rehabilitation facilities

Condition 1

All *persons* receiving *custodial care*, without any assistance, are capable of responding to an emergency situation to complete *building* evacuation.

Condition 2

Any persons receiving custodial care require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

Storage Occupancy Group S-1

Moderate-hazard Storage.

Uses that are not classified as group H or S-2

- Aircraft hangers
- Baskets
- Beverages over 20% alcohol
- Cordage
- Furniture
- Grains
- Leather
- Lithium-ion or lithium metal batteries
- Motor vehicle repair garages
- Self service storage facilities
- Tires

Storage Occupancy Group S-2

Low-hazard Storage.

Noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping

- Beverages up to 20% alcohol
- Chalk and crayons
- Ivory
- Public parking garages
- Stoves

Utility and Misc Group U

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 hazard incidental to their occupancy.

- Barns
- Fences taller than 7'
- Sheds
- Retaining walls
- Towers

Type of Construction

A buildings construction type is defined by

Are the key construction elements combustible or non-combustible

and

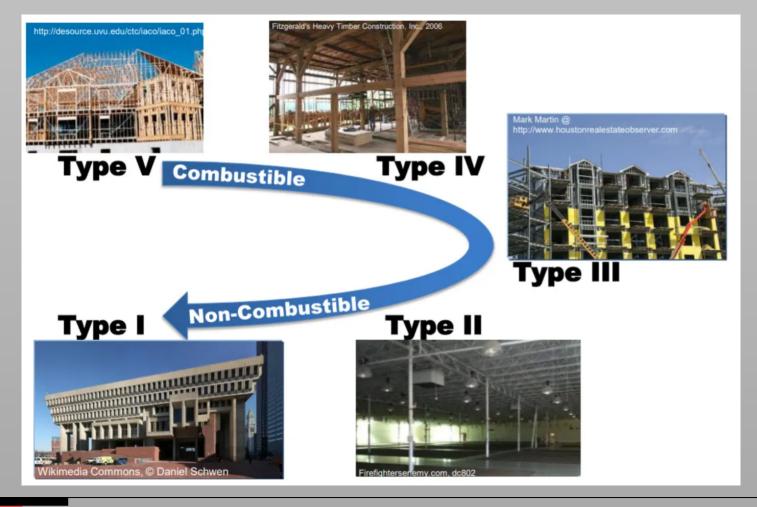
Are the key construction elements protected from fire and to what extent.

Type of Construction

Key construction elements are

- Primary Structural Frame
- Interior and Exterior Bearing Walls
- Floor Construction
- Roof Construction

Types of Construction



Types of Construction

For a very long time there have been 9 construction types.

2021 IBC introduced 3 new construction types. So now we have 12.

Construction type	Fire Rating	Materials
Type I	IA + IB	Non-Combustible
Type II	IIA + IIB	Non-Combustible
Type III	IIIA + IIIB	Non-Combustible Exterior Walls
Type IV	IVA, IVB, IVC, IVHT	Combustible Mostly
Type V	VA + VB	Combustible

Table 601 2020 MBC

BUILDING ELEMENT	TYPE I			TYPE II		E III	TYPE IV	TYP	EV
BOILDING ELEMENT	Α	В	Α	В	Α	В	нт	Α	В
Primary structural frame ^f (see <u>Section 202</u>)	3 ^{a, b}	2 ^{a, b}	1 ^b	0	1 ^b	0	НТ	1 ^b	0
Bearing walls Exterior ^{e, f} Interior	3 3 ^a	2 2 ^a	1	0	2	2	2 1/HT	1	0
Nonbearing walls and partitions Exterior	See <u>Table 602</u>								
Nonbearing walls and partitions Interior ^d	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 ¹ / ₂ ^b	1 ^{b,c}	1 ^{b,c}	0c	1 ^{b,c}	0	HT	1 ^{b,c}	0

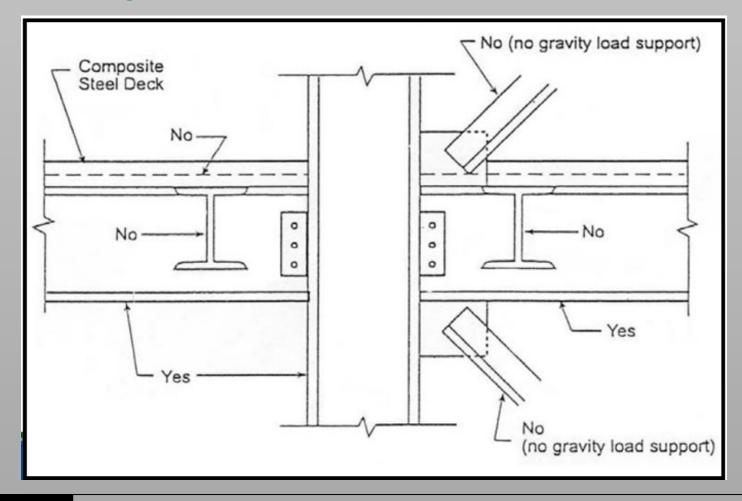
Table 601 2024 IBC

BUILDING ELEMENT		TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	Α	В	Α	В	Α	В	Α	В	С	нт	Α	В	
Primary structural frame ^f (see <u>Section 202</u>)	3 ^{a, b}	2 ^{a, b,} c	1 ^{b,} c	0c	1 ^{b,} c	0	3 ^a	2 ^a	2 ^a	НТ	1 ^{b,} c	0	
Bearing walls		'											
Exterior ^{e, f}	3	2	1	0	2	2	3	2	2	2	1	0	
Interior	3 ^a	2 ^a	1	0	1	0	3	2	2	1/HT ^g	1	0	
Nonbearing walls and partitions Exterior						S	See <u>Tab</u>	ole 70	<u>5.5</u>				
Nonbearing walls and partitions Interior ^d	0	0	0	0	0	0	0	0	0	See <u>Section</u> 2304.11.2	0	0	
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	НТ	1	0	
Roof construction and associated secondary structural members (see Section 202)	1 ¹ / ₂ ^b	1 ^{b, c}	1 ^{b,} c	0 ^c	1 ^{b,} c	0	11/2	1	1	НТ	1 ^{b,} c	0	

Primary Structural Frame

- 1. The columns.
- 2. Structural members having direct connections to the columns, including girders, beams, trusses and spandrels.
- 3. Members of the floor construction and roof construction having direct connections to the columns.
- 4. Bracing members that are essential to the vertical stability of the primary structural frame under gravity loading shall be considered part of the primary structural frame whether or not the bracing member carries gravity *loads*.

Primary Structural Frame



Building Height and Area

Tables 504.3, 504.4 and 506.2 are used in establishing "equivalent risk" offsetting a building's inherent fire hazard represented by occupancy Group with materials and fire resistance

As the size of the building increases, either in height or area, the number of acceptable construction types is reduced

Building Area Table 506.2

OCCUPANCY	CEE	TYPE OF CONSTRUCTION											
OCCUPANCY	SEE	TYPE I		TYPE II		TYP	E III	TYPE IV	TYPE V				
CLASSIFICATION	FOOTNOTES	Α	В	Α	В	Α	В	HT	Α	В			
	NS	UL	UL	15,500	8,500	14,000	8,500	15,000	11,500	5,500			
A-1	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			
A-3	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-4	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												
A-5	S1	UL	UL	UL	UL	UL	UL	UL	UL	UL			
	SM												
	NS	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000			
В	S1	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000			
	SM	UL	UL	112,500	69,000	85,500	57,000	108,000	54,000	27,000			
	NS	UL	UL	26,500	14,500	23,500	14,500	25,500	18,500	9,500			
E	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			

Building Area Frontage Increase

506.3.3 Amount of increase.

The area factor increase based on frontage shall be determined in accordance with Equation 5-5:

$$I_f = [F/P - 0.25] W/30$$

 I_f = Area factor increase due to frontage.

F = Building perimeter that fronts on a *public way* or open space having minimum distance of 20 feet (6096 mm).

P = Perimeter of entire building (feet).

W = Width of public way or open space (feet) in accordance with Section 506.3.2.

Building Area Total

506.2.1 Single-occupancy, one-story buildings.

The allowable area of a single-occupancy building with no more than one *story above* grade plane shall be determined in accordance with Equation 5-1:

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

 A_a = Allowable area (square feet).

 A_t = Tabular allowable area factor (NS, S1, S13R or S13D value, as applicable) in accordance with Table 506.2.

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

 I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

Building Area Total

506.2.1 Single-occupancy, Multistory buildings.

Allowable area of a single-occupancy building more than one story above grade plane

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

- A_a = Allowable area (square feet).
- A_t = Tabular allowable area factor (NS, S1, S13R or S13D value, as applicable) in accordance with Table 506.2.
- NS = Tabular allowable area factor in accordance with Table 506.2 for nonsprinklered building (regardless of whether the building is sprinklered).
- I_f = 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 *NFPA 13R*, 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 $S_a = 1$

Building Area Table 506.2

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION										
		TYPE I		TYPE II		TYP	E III	II TYPE IV		E V		
		Α	В	Α	В	А	В	HT	Α	В		
R-2	NS 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	36,500	21,000		

NFPA 13R building max Type IIIB

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

$$64,000 = [16,000 + 0] \times 4$$

NFPA 13 building max Type IIIB Multi story

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

$$144,000 = [48,000 + 0] \times 3$$

Bldg height in feet Table 504.3

00011511101	TYPE OF CONSTRUCTION												
OCCUPANCY CLASSIFICATION	SEE	TYPE I		TYF	PE II	TYP	E III	TYPE IV	TYPE V				
CLASSIFICATION	FOOTNOTES	А	В	А	В	А	В	HT	А	В			
A, B, E, F, M, S, U	NS b	UL	160	65	55	65	55	65	50	40			
A, B, E, F, IVI, 3, U	S	UL	180	85	75	85	75	85	70	60			
H-1, H-2, H-3, H-5	NS c	UL	160	65	55	65	55	65	50	40			
11 1, 11 2, 11 3, 11 3	S	OL	100	05	33	03	33	03	30	40			
H-4	NS c	UL	160	65	55	65	55	65	50	40			
11-4	S	UL	180	85	75	85	75	85	70	60			
I-1 Condition 1, I-3	NS e	UL	160	65	55	65	55	65	50	40			
1-1 Condition 1, 1-3	S	UL	180	85	75	85	75	85	70	60			
I-1 Condition 2, I-2	NS e, f	UL	160	65	55	65	55	65	50	40			
1-1 Condition 2, 1-2	S	UL	180	85	55	0.5	55	0.5	30	40			
I-4	NS g	UL	160	65	55	65	55	65	50	40			
1-4	S	UL	180	85	75	85	75	85	70	60			
	NS	UL	160	65	55	65	55	65	50	40			
R ^h	S13D	60	60	60	60	60	60	60	50	40			
n.	S13R	60	60	60	60	60	60	60	60	60			
	S	UL	180	85	75	85	75	85	70	60			

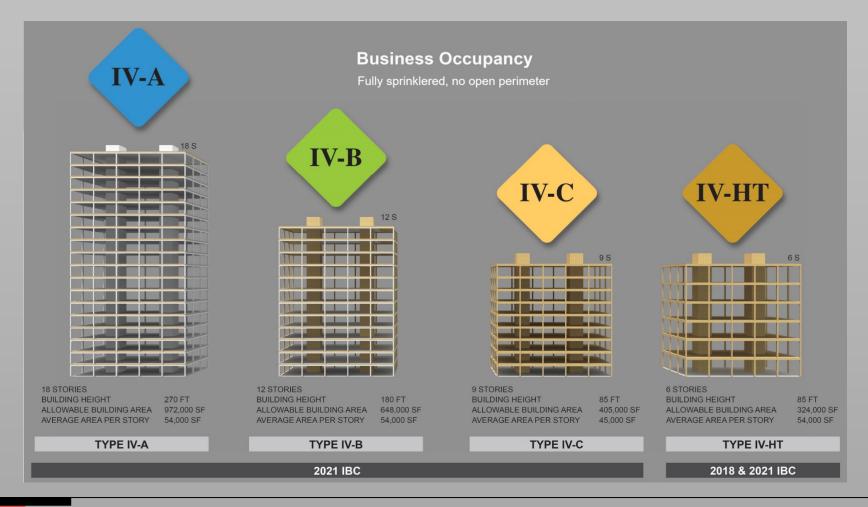
Bldg height Definition

The vertical distance from *grade* plane to the average height of the highest roof surface.

Bldg Height in Stories Table 504.4

				TYPE OF	CONSTR	JCTION				
OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYF	PΕΙ	TYP	E II	TYP	E III	TYPE IV TYPE		PE V
CE (33)116/ (11014	SEE FOOTNOTES	А	В	Α	В	Α	В	HT	Α	В
A-1	NS	UL	5	3	2	3	2	3	2	1
H-1	S	UL	6	4	3	4	3	4	3	2
A-2	NS	UL	11	3	2	3	2	3	2	1
A-2	S	UL	12	4	3	4	3	4	3	2
A-3	NS	UL	11	3	2	3	2	3	2	1
A-3	S	UL	12	4	3	4	3	4	3	2
A-4	NS	UL	11	3	2	3	2	3	2	1
A 4	S	UL	12	4	3	4	3	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	UL	UL	UL
A-3	S	UL	UL	UL	UL	UL	UL	UL	UL	UL
В	NS	UL	11	5	3	5	3	5	3	2
5	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

Type IV Construction



Is there anything I did not cover??

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Shameless plug

Annual Institute for Building Officials

Jan 13-30, 2025

Heritage Center of Brooklyn Center

https://ccaps.umn.edu/annual-institute-building-officials

ICC Region III Annual Educational Institute

Feb 10-Feb 14, 2025

Minneapolis Marriot Northwest

https://www.iccsafe.org/professional-development/education/upper-great-plains-region-iii-educational-institute/