

CHAPTER 5

GENERAL BUILDING LIMITATIONS

780 CMR 501.0 GENERAL

501.1 Scope: The provisions of 780 CMR 5 control the *height* and *area* of all structures hereafter erected, and *additions* to existing structures based on the type of construction, use group, frontage on open space providing exposure protection and access to structures for fire-fighting purposes, and the presence of an *automatic sprinkler system*.

780 CMR 502.0 DEFINITIONS

502.1 General: The following words and terms shall, for the purposes of 780 CMR 5 and as used elsewhere in 780 CMR, have the meanings shown herein.

Area, building: The *area* included within surrounding exterior walls (or exterior walls and fire walls) exclusive of vent *shafts* and *courts*. Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above.

Basement: That portion of a building which is partly or completely below grade (see "*Story above grade*").

Grade plane: A reference plane representing the average of finished ground level adjoining the building at all exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the *lot line* or, where the *lot line* is more than six feet (1829 mm) from the building, between the building and a point six feet (1829 mm) from the building.

Height

Building: The vertical distance from *grade plane* to the average height of the highest roof surface.
Story: The vertical distance from top to top of two successive tiers of beams or finished floor surfaces; and, for the topmost story, from the top of the *floor finish* to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.

Mezzanine: An intermediate level or levels between the floor and ceiling of any story with an aggregate floor area of not more than of the area of the room in which the level or levels are located (see 780 CMR 505.0).

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 (also see "*Mezzanine*").

Story above grade: Any story having its finished floor surface entirely above grade except that a *basement* shall be considered as a story above grade where the finished surface of the floor above the *basement* is:

1. More than six feet (1829 mm) above *grade plane*;

2. More than six feet (1829 mm) above the finished ground level for more than 50% of the total building perimeter; or

3. More than 12 feet (3658 mm) above the finished ground level at any point.

780 CMR 503.0 GENERAL HEIGHT AND AREA LIMITATIONS

503.1 General: The *heights* and *areas* of all buildings and structures between exterior walls or between exterior walls and *fire walls*, shall be governed by the type of construction and the use group classification as defined in 780 CMR 3 and 6 and shall not exceed the limitations fixed in Table 503, except as specifically modified by 780 CMR 5 and the following sections:

Section	Subject
402.7	Covered mall buildings
403.3.3.1	High-rise buildings
414.2	Airport traffic control towers
416.3	HPM facilities
418.3.1.1	Grain elevators
426.0	Bulk Merchandizing Retail Buildings
3103.3.5	Membrane structures

503.1.1 Special industrial occupancies: All buildings and structures designed to house low-hazard industrial processes that require large *areas* and unusual *heights* to accommodate craneways or special machinery and equipment, including, among others, rolling mills, structural metal fabrication shops and foundries, or the production and distribution of electric, gas or steam power, shall be exempt from the *height* and *area* limitations of Table 503.

503.1.2 Open parking structures: Open parking structures shall conform to the *height* and *area* limitations specified in 780 CMR 406.4.

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503.1.3 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 height of each building and the aggregate area of all buildings are within the limitations of Table 503 as modified by 780 CMR 504.0 and 506.0. The provisions of 780 CMR applicable to the aggregate building shall be applicable to each building.

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Table 503
HEIGHT AND AREA LIMITATIONS OF BUILDINGS

Height limitations of buildings (shown in upper figure as stories and feet above grade plane)ⁿ, and area limitations of one- or two-story buildings facing on one street or public space not less than 30 feet wide (shown in lower figure as area in square feet per floorⁿ). See Note a.

Table notes appear immediately following table. N.P. = Not Permitted; N.L. = Not Limited

USE GROUPS	Type of Construction									
	Noncombustible					Noncombustible/ Combustible		Combustible		
	Type 1		Type 2			Type 3		Type 4	Type 5	
	Protected Note b		Protected		Unpro- tected	Pro- tected	Unpro- tected	Heavy timber	Pro- tected	Unpro- tected
	1A	1B	2A	2B	2C	3A	3B	4	5A	5B
A-1 Assembly; theaters	N.L.	N.L.	5 St. 65' 19,950	3 St. 40' 13,125	2 St. 30' 8,400	3 St. 40' 11,550	2 St. 30' 8,400	3 St. 40' 12,600	1 St. 20' 8,925	1 St. 20' 4,200
A-2 Assembly; night clubs and similar uses	N.L.	N.L. 7,200	3 St. 40' 5,700	2 St. 30' 3,750	1 St. 20' 2,400	2 St. 30' 3,300	1 St. 20' 2,400	2 St. 30' 3,600	1 St. 20' 2,550	1 St. 20' 1,200
A-3 Assembly; lecture halls, recre- ation centers, terminals, restaurants other than night clubs	N.L.	N.L.	5 St. 65' 19,950	3 St. 40' 13,125	2 St. 30' 8,400	3 St. 40' 11,550	2 St. 30' 8,400	3 St. 40' 12,600	1 St. 20' 8,925	1 St. 20' 4,200
A-4 Assembly; churches	Note c	N.L.	5 St. 65' 34,200	3 St. 40' 22,500	2 St. 30' 14,400	3 St. 40' 19,800	2 St. 30' 14,400	3 St. 40' 21,600	1 St. 20' 15,300	1 St. 20' 7,200
B Business		N.L.	7 St. 85' 34,200	5 St. 65' 22,500	3 St. 40' 14,400	4 St. 50' 19,800	3 St. 40' 14,400	5 St. 65' 21,600	3 St. 40' 15,300	2 St. 30' 7,200
E Educational	Note c	N.L.	5 St. 65' 34,200	3 St. 40' 22,500	2 St. 30' 14,400	3 St. 40' 19,800	2 St. 30' 14,400	3 St. 40' 21,600	1 St. 20' 15,300	1 St. 20' 7,200
F-1 Factory and industrial Moderate		N.L.	6 St. 75' 22,800	4 St. 50' 15,000	2 St. 30' 9,600	3 St. 40' 13,200	2 St. 30' 9,600	4 St. 50' 14,400	2 St. 30' 10,200	1 St. 20' 4,800
F-2 Factory and Industrial low	Note h	N.L.	7 St. 85' 34,200	5 St. 65' 22,500	3 St. 40' 14,400	4 St. 50' 19,800	3 St. 40' 14,400	5 St. 65' 21,600	3 St. 40' 15,300	2 St. 30' 7,200
H-1 High hazard, detonaton hazards Notes e, i, k, l		1 St.20' 16,800	1 St. 20' 14,400	1 St. 20' 11,400	1 St. 20' 7,500	1 St. 20' 4,800	1 St. 20' 6,600	1 St. 20' 4,800	1 St. 20' 7,200	1 St. 20' 5,100
H-2 High Hazard deflagration hazards Note e,i,j,l		5 St. 65' 16,800	3 St. 40' 14,400	3 St. 40' 11,400	2 St. 30' 7,500	1 St. 20' 4,800	2 St. 30' 6,600	1 St. 20' 4,800	2 St. 30' 7,200	1 St. 20' 5,100
H-3 High Hazard physical hazards	Note e,l	7 St. 85' 33,600	7 St. 85' 28,800	6 St. 75' 22,800	4 St. 50' 15,000	2 St. 30' 9,600	3 St. 40' 13,200	2 St. 30' 9,600	4 St. 50' 14,400	2 St. 30' 10,200
H-4 High Hazard health hazards		7 St. 85' N.L.	7 St. 85' N.L.	7 St. 85' 34,200	5 St. 65' 22,500	3 St. 40' 14,400	4 St. 50' 19,800	3 St. 40' 14,400	5 St. 65' 21,600	3 St. 40' 15,300
I-1 Institutional, residential care		N.L.		9 St.100' 19,950	4 St. 50' 13,125	3 St. 40' 8,200	4 St. 50' 11,550	3 St. 40' 8,400	4 St.50' 12,600	3 St. 40' 8,925
I-2 Institutional, incapacitated	Note m	N.L.		4 St. 50' 17,100	2 St. 30' 11,250	1 St. 20' 7,200	1 St. 20' 9,900		1 St. 20' 10,800	1 St. 20' 7,650
I-3 Institutional, restrained		N.L.		4 St. 50' 14,250	2 St. 30' 9,375	1 St. 20' 6,000	2 St. 30' 8,250	1 St. 20' 6,000	2 St. 30' 9,000	1 St. 20' 6,375
M Mercantile		N.L.		6 St. 75' 22,800	4 St. 50' 15,000	2 St. 30' 9,600	3 St. 40' 13,200	2 St. 30' 9,600	4 St. 50' 14,400	2 St. 30' 10,200
R-1 Residential, hotels		N.L.		9 St.100' 22,800	4 St. 50' 15,000	3 St. 40' 9,600	4 St. 50' 13,200	3 St. 40' 9,600	4 St. 50' 14,400	3 St. 40' 10,200
R-2 Residential, multi-family		N.L.		9 St.100' 22,800	4 St. 50' Note f	3 St. 40' 9,600	4 St. 50' Note f	3 St. 40' 9,600	4 St. 50' 14,400	3 St. 40' 10,200
R-3 Residential, multiple single family		N.L.		4 St. 50' 22,800	4 St. 50' 15,000	3 St. 40' 9,600	4 St. 50' 13,200	3 St. 40' 9,600	4 St. 50' 14,400	3 St. 40' 10,200
S-1 Storage, moderate		N.L.		5 St. 65' 19,950	4 St. 50' 13,125	2 St. 30' 8,400	3 St. 40' 11,550	2 St. 30' 8,400	4 St. 50' 12,600	2 St. 30' 8,925
S-2 Storage, low	Note g	N.L.		7 St. 85'	5 St. 65'	3 St. 40'	4 St. 50'	3 St. 40'	5 St. 65'	3 St. 40'

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			34,200	22,500	14,400	19,800	14,400	21,600	15,300	7,200
U Utility, miscellaneous	N.L.	N.L.								

Notes applicable to Table 503:

- Note a. See the following sections for general exceptions to Table 503:
- 780 CMR 504.2 Allowable height increase due to automatic sprinkler system installation.
 - 780 CMR 506.2 Allowable area increase due to street frontage.
 - 780 CMR 506.3 Allowable area increase due to automatic fire suppression system installation.
 - 780 CMR 506.4 Allowable area reduction for multi-story buildings.
 - 780 CMR 507.0 Unlimited area one-story buildings.
- Note b.** Buildings of Type 1 construction permitted to be of unlimited tabular heights and areas are not subject to special requirements that allow increased heights and areas for other types of construction (see 780 CMR 503.1.4).
- Note c.** For height exceptions for auditoriums in occupancies in Use Groups A-4 and E, see 780 CMR 504.3.
- Note d.** For height exceptions for day care centers in buildings of Type 5 construction, see 780 CMR 504.4.
- Note e.** For exceptions to height and area limitations of buildings for Use Group H, see 780 CMR 4 governing the specific use groups.
- Note f.** For exceptions to height of buildings for Use Group R-2 of Types 2B and 3A construction, see 780 CMR 504.6 and 504.7.
- Note g.** For height and area exceptions for open parking structures, see 780 CMR 406.0.
- Note h.** For exceptions to height and area limitations for special industrial occupancies, see 780 CMR 503.1.1.
- Note i.** Occupancies in Use Groups H-1 and H-2 shall not be permitted below grade.
- Note j.** Rooms and areas of Use group H-2 containing pyrophoric materials shall not be permitted in buildings of Type 3, 4, or 5 construction.
- Note k.** Occupancies in Use Group H-1 are required to be detached one-story buildings (see 780 CMR 707.1.1).
- Note l.** For exceptions to height for buildings with occupancies in Use Group H, see 780 CMR 504.5
- Note m.** *Hospitals, other than college or school infirmaries, shall be constructed of Type 1-B or higher construction.*
- Note n.** 1 foot = 304.8 mm; 1 square foot = 0.093 m²

503.1.4 Type 1 construction: Buildings of Type 1 construction which are permitted to be of unlimited tabular *heights* and *areas* by Table 503, are not subject to the special requirements that allow increased *heights* and *areas* for other types of construction.

503.2 Area limitations: The *area* limitations specified in Table 503 shall apply to the maximum horizontally projected area of all buildings fronting on a street or a public space not less than 30 feet (9144 mm) in width with access from a public street.

503.3 Height limitations: The *height* in feet and the number of *stories above grade* specified in Table 503 shall apply to all buildings and to all separate parts of a building that are enclosed within *fire walls* complying with the provisions of 780 CMR 7. A *basement* shall be considered as a *story above grade* where the finished surface of the floor above the *basement* is more than six feet (1829 mm) above *grade plane*; or more than six feet (1829 mm) above the finished ground level for more than 50% of the total building perimeter; or more than 12 feet (3658 mm) above the finished ground level at any point.

780 CMR 504.0 HEIGHT
MODIFICATIONS

504.1 General: The provisions of 780 CMR 504.0 shall modify the *height* limitations of Table 503 as herein specified.

504.2 Automatic sprinkler systems: Where a building is equipped throughout with an automatic sprinkler system in accordance with 780 CMR 906.2.1, the building height limitation specified in Table 503 shall be increased one story and 20 feet (6096 mm). This increase shall not apply to buildings of Types 2C, 3A, 4 and 5A construction with an occupancy in Use Group I-2, or to buildings with an occupancy in Use Group H-1, H-2 or H-3. The building height limitations for buildings with an occupancy in Use Group R specified in Table 503 shall be increased one story and 20 feet (6096mm) where the building is equipped throughout with an automatic sprinkler system installed in accordance with 780 CMR 906.2.2 and the system is supervised in accordance with 780 CMR 923.1, method 1, 2 or

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3, but not to exceed a height of four stories or 60 feet (18288 mm).

504.3 Auditoriums: The maximum *height* of auditoriums in Use Groups A-4 and E shall be 65 feet (19812 mm) in buildings of Type 2B, 3A, 4 or 5A construction and 45 feet (13716 mm) in buildings of Type 2C, 3B or 5B construction.

504.4 Day care centers: The *height* limitations of Table 503 for day care centers classified as Use Group E, in buildings of Type 5 construction, shall

504.6 Type 3A construction: The *height* limitation for buildings of Type 3A construction with occupancies in Use Group R-2 shall be increased to six stories and 75 feet (22860 mm) where the first floor above the *basement* has a fireresistance rating of not less than three hours and the floor *area* is subdivided by two-hour fireresistance rated *fire walls* into *fire areas* of not more than 3,000 square feet (279 m²).

504.7 Type 2B construction: The *height* limitation for buildings of Type 2B construction with occupancies in Use Group R-2 shall be increased to nine stories and 100 feet (30480 mm) where the building is separated by not less than 50 feet (15240 mm) from any other building on the *lot* and from *interior lot lines*, the *exits* are segregated in a *fire area* enclosed by a two-hour fireresistance rated *fire wall* and the first floor construction has a fireresistance rating of not less than 1½ hours.

780 CMR 505.0 MEZZANINES

505.1 General: A *mezzanine* or mezzanines in compliance with 780 CMR 505.0 shall be considered a portion of the floor below. Such *mezzanines* shall not contribute to the *building area* as regulated by 780 CMR 503.2. Such *mezzanines* shall not contribute to the number of stories as regulated by 780 CMR 503.3. The area of the *mezzanine* shall be included in determining the *fire area*.

505.2 Area limitation: The aggregate area of a *mezzanine* or *mezzanines* within a room shall not exceed $\frac{1}{4}$ of the area of that room. The enclosed portions of rooms shall not be included in a determination of the size 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 area of the room.

Exception: The aggregate area of *mezzanines* in buildings and structures of Type 1 or 2 construction for special industrial occupancies in accordance with 780 CMR 503.1.1 shall not exceed $\frac{1}{4}$ of the area of that room.

be increased one story and 20 feet (6096 mm) provided that the total occupant load is less than 50 persons.

504.5 High-hazard use groups: Buildings and structures with an occupancy in Use Group H that requires unusual *heights* necessary to accommodate special manufacturing processes and equipment shall be exempt from the tabular *height* limitations, in feet, of Table 503.

505.3 Egress: Each occupant of a *mezzanine* shall have access to at least two independent *means of egress* where such spaces require two *means of egress* in accordance with 780 CMR 1017.2. Where a *stairway* provides a means of *exit access* from a *mezzanine*, the maximum travel distance required by 780 CMR 1017.2 shall be measured to the bottom of the *stairway*.

505.4 Openness: A *mezzanine* shall be open and unobstructed to the room in which such *mezzanine* is located except for walls not more than 42 inches (1067 mm) high, columns and posts.

Exceptions

1. *Mezzanines* or portions thereof are not required to be open to the room in which the *mezzanines* are located, provided that the occupant load of the aggregate area of the enclosed space does not exceed ten.
2. A *mezzanine* having two or more *means of egress* is not required to be open to the room in which the *mezzanine* is located, if at least one of the *means of egress* provides direct access to an *exit* from the *mezzanine* level.

780 CMR 506.0 AREA MODIFICATIONS

506.1 General: The provisions of 780 CMR 506.0 shall modify the *area* limitations of Table 503 as herein specified.

506.2 Street frontage increase: Where a building or structure has more than 25% of the building perimeter fronting on a street or other unoccupied space, the *area* limitations specified in Table 503 shall be increased 2% for each 1% of such excess frontage. The unoccupied space shall be on the same *lot* or dedicated for public use, shall not be less than 30 feet (9144 mm) in width and shall have access from a street by a posted fire lane not less than 18 feet (5486 mm) in width.

506.3 Automatic sprinkler system: Where a building, other than those with an occupancy in Use

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Group H-1, H-2 or H-3, is equipped throughout with an *automatic sprinkler system* installed in accordance with 780 CMR 906.2.1, the *area* limitation specified in Table 503 shall be increased 200% for one-and two-story buildings and 100% for buildings more than two stories in *height*.

506.4 Multistory buildings: The *area* limitations for buildings two stories in *height* shall be the same as the area limitations provided in Table 503 for one-story buildings. In buildings over two stories in *height*, the *area* limitations of Table 503 for one-story buildings shall be reduced as specified in Table 506.4.

Table 506.4
REDUCTION OF AREA LIMITATIONS

Number of stories	Type of Construction		
	1A & 1B	2A	2B, 2C, 3A, 3B, 4, 5A, 5B
1	None	None	None
2	None	None	None
3	None	5%	20%
4	None	10%	20%
5	None	15%	30%
6	None	20%	40%
7	None	25%	50%
8	None	30%	60%
9	None	35%	70%
10	None	40%	80%

780 CMR 507.0 UNLIMITED AREAS

507.1 One-story buildings: For all occupancies other than Use Groups A-1, A-2, A-4, A-5, E, H, I-1, I-3 and R, the *area* of buildings that do not exceed one story and 85 feet (25908 mm) in *height*, other than buildings of Type 5 construction, shall not be limited, provided that the building is equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1; and the building is isolated as specified in 780 CMR 507.2. Buildings with an occupancy in Use Group I-2 shall not be constructed of Type 3B construction. ***Except as modified by 780 CMR 9, fire areas*** of Use Group E are permitted in unlimited area buildings in accordance with 780 CMR 507.1.1. ***Except as modified by 780 CMR 9, fire areas*** of Use Groups H-2, H-3 and H-4 are permitted in unlimited area buildings in accordance with 780 CMR 507.1.2. *Bulk Merchandising Retail Buildings* designed, constructed and operated in accordance with 780 CMR 426.0 shall be permitted to be constructed of unlimited area.”

Exceptions:

- Buildings and structures of special industrial occupancies in accordance with 780 CMR 503.1.1 shall be exempt from the above *height* limitations and *fire separation distance* requirements, and the *automatic fire suppression system* shall not be provided where such installations will be detrimental or dangerous to the specific occupancy as approved by the code official. Where located with a *fire separation distance* of less than 30 feet (9144 mm), the exterior walls of such buildings shall be *protected* or constructed to provide a fireresistance rating of not less than two hours.
- An *automatic fire suppression system* shall not be required for buildings of Type 2 or Type 4

construction which are occupied exclusively for the storage of noncombustible materials that are not packed or crated in combustible materials.

3. Buildings and structures of Types 1 and 2 construction for rack storage facilities which do not have access by the public shall not be limited in *height* provided that such buildings conform to the requirements of 780 CMR 507.1 and NFIPA 231 C listed in ***Appendix A***.

4. The *automatic sprinkler system* shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities, in occupancies in Use Group A-3 provided that:

- Exit* doors directly to the outside are provided for all occupants of the participant sport areas; and
- The building is equipped with a fire protective signaling system with manual fire alarm boxes installed in accordance with 780 CMR 917.0.

507.1.1 School buildings: For occupancies in Use Group E, one-story buildings of Type 2, 3A or 4 construction shall not be limited in *area* where a direct *exit* to the outside of the building is provided from each classroom and the building is equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1. Exterior walls on all sides of such buildings shall comply with 780 CMR 507.2.

507.1.2 High-hazard use groups: Use Group H-2, H-3 and H-4 *fire areas* shall be permitted in occupancies in Use Groups F and S ***except as modified by 780 CMR 9***, and in lecture halls and laboratories in Use Groups A-3, B, E and I-2 in accordance with the limitations of 780 CMR 507.1. *Fire areas* located at the perimeter of the building shall not exceed the area limitations specified in Table 503 as modified by 780 CMR 506.2, based upon the percentage of the perimeter of the *fire area* that fronts on a street or other unoccupied space. Interior *fire areas* shall not exceed 25% of the area limitations specified in Table 503. Fireresistance rating requirements of *fire separation assemblies* shall be in accordance with Table 313.1.2.

507.2 Exterior walls: The minimum fireresistance rating of exterior walls of one-story buildings of unlimited area shall be determined by the use group and the *fire separation distance* as specified in Table 507.2, but shall not be less than the fireresistance rating required by Table 602 for the type of construction. The entire perimeter of one-story

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unlimited *area* buildings shall have a minimum *fire separation distance* of 30 feet (9144 mm).
Exception: The minimum *fire separation distance* of 30 feet (9144 mm) shall not apply to a wall facing another building on the same *lot*, provided that:

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1. Such wall is constructed as a *fire wall* in accordance with 780 CMR 707.0;

2. The length of the *fire wall* does not exceed 25% of the total perimeter of the unlimited area building;

3. The adjacent building has a minimum *fire separation distance* of 30 feet (9144 mm) on all sides, except for the side that faces the unlimited area building; and

4. The adjacent building is equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1.
- 507.2.1 Opening protective:** Openings in exterior walls required by Table 507.2 to have a fire resistance rating of three hours or more shall be *protected* with fire assemblies having a fire resistance rating of not less than three hours.

Openings in exterior walls required by Table

507.2 to have a fire resistance rating of two hours shall be *protected* with fire assemblies having a fire protection rating of not less than 1½ hours.

Table 507.2
MINIMUM FIRE RESISTANCE RATING
OF EXTERIOR WALLS

Use Group	Fireresistance rating (hours) based on fire separation distance ^a	
	30 Feet or greater but less than 50 feet	50 feet or greater
E	1½	0
A-3, B, F-2, I-2, S-2	2	0
F-1, M, S-1	3	0

Note a. 1 foot = 304.8 mm.