

Brown Street Garage Code Review

48 Brown Street, Portland, Maine 04101
June 13, 2017

BUILDING INFORMATION

Construction Classification: Type IIB Construction

Garage Type: Open garage design

Fire Protection: Dry standpipes in stair towers with 4" storz connection at each level of garage

CLASSIFICATION OF USE AND OCCUPANCY

International Building Code- 2006

Section 302.1: Use Group S-2 (Open or Enclosed Parking Garage)

NFPA 101- Life Safety Code- 2006

Section 6.1: Storage Occupancy (Low & Ordinary Hazard) Motor Vehicle Parking Garage

Section 6.1.14.1.3: Where incidental to another occupancy, areas used for mercantile, business, or storage use shall be subject to the Code requirements of the predominant occupancy.

NFPA 88A- National Fire Code- 2008

Section 3.3.2.3: The occupancy classification the parking garage shall be Open Parking Garage as defined by Section 4.7.1.

SPECIAL REQUIREMENTS BASED ON USE AND OCCUPANCY

International Building Code- 2006

Section 406.2.1: Parking garage shall be classified as open, as defined in Section 406.3.

Section 406.2.2: Clear height of 7 feet shall be maintained in all vehicle and pedestrian travel areas on all floors. Van accessible spaces required per Section 1106.5 shall conform to ICC A117.1.

Section 406.2.3: Guards shall be provided in accordance with Section 1013 at all areas where vertical distance to the ground of any opening exceeds 30 inches.

Section 406.2.4: Vehicle barriers designed per Section 1607.7 shall be provided, except at access points. Barriers not less than 2 feet high shall be provided at the end of drive lanes where floor elevations differ by more than 1 foot.

Section 406.2.5: Vehicle ramps that are utilized for circulation as well as for parking shall not exceed a slope of 1:15.

Section 406.2.6: Parking surfaces shall be of concrete, except at ground level, where asphalt is allowed as an alternate.

Section 406.2.7 (via Section 508.3): Parking garages shall be separated from other occupancies according to Section 508.3.

Section 406.2.8: Connection of the garage to any room with a fuel-fired appliance shall be by means of a vestibule providing a two-doorway separation, unless the appliances ignition source is 18 inches above the floor.

Section 406.3.3.1: Openings of at least 20% of perimeter wall area shall be uniformly distributed on two or more sides.

Section 406.3.4: Mixed uses are allowed in conformance with Sections 508.3, 406.3.13, 509.3, 509.4, and 509.7.

Section 406.3.13: Vehicle repair work, parking of busses and trucks, and closing required openings in exterior walls are not allowed.

NFPA 88A- National Fire Code- 2008

Section 4.3.1: Floor surfaces shall be of noncombustible material.

Section 4.3.1.2: Floors at grade are allowed to be of asphalt.

Section 4.3.2: Floors shall be graded and equipped with drains.

CONSTRUCTION CLASSIFICATION

International Building Code- 2006

Section 406.3.3: Open parking garages shall be of Type I, II, or IV Construction.

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

BUILDING ELEMENT	TYPE I		TYPE II	
	A	B	A*	B
Structural frame ^a	3 ^b	2 ^b	1	0
Bearing walls				
Exterior ^e	3	2	1	0
Interior	3 ^b	2 ^b	1	0
Nonbearing walls and partitions	See Table 602			
Exterior	See Table 602			
Interior ^d	0	0	0	0
Floor construction				
Including supporting beams and joists	2	2	1	0
Roof construction				
Including supporting beams and joists	1 1/2 ^c	1 ^{c, d}	1 ^{c, d}	0 ^d

For SI: 1 foot = 304.8 mm.

- a. The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. The members of floor or roof panels which have no connection to the columns shall be considered secondary members and not a part of the structural frame.
- b. Roof supports: Fire-resistance ratings of structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- c. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
- d. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
- e. An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.
- f. Not less than the fire-resistance rating required by other sections of this code.
- g. Not less than the fire-resistance rating based on fire separation distance (see Table 602).

**TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE^{a, *}**

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP M	OCCUPANCY GROUP A, B, S-2
X < 5 ^c	All	2	1
5 ≤ X < 10	IA Others	2 1	1 1
10 ≤ X < 30	IA, IB IIB, VB Others	1 0 1	1 ^d 0 1 ^d
X ≥ 30	All	0	0

For SI: 1 foot = 304.8 mm.

- a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
- b. For special requirements for Group U occupancies see Section 406.1.2.
- c. See Section 705.1.1 for party walls.
- d. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
- e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.

Section 4.7.2: Open Parking Garages shall be of Type I or Type II construction.

GENERAL BUILDING HEIGHTS & AREA LIMITATIONS

International Building Code- 2006

Section 406.3.5: Area and height allowances for open parking occupancies shall be per Chapter 5 and Section 508.3 for S-2 occupancies.

Section 503.1 (via Table 503):

**TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS^a
Height limitations shown as stories and feet above grade plane.
Area limitations as determined by the definition of "Area, building," per story**

GROUP	HGT(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	
A-2	S	UL	11	3	2	3	2	3	2	1	
	A	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000	
B	S	UL	11	5	4	5	4	5	3	2	
	A	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000	
S-2 ^{b,c}	S	UL	11	5	4	4	4	5	4	2	
	A	UL	79,000	39,000	26,000	39,000	26,000	38,500	21,000	13,500	
M	S	UL	11	4	4	4	4	4	3	1	
	A	UL	UL	21,500	12,500	18,500	12,500	20,500	14,000	9,000	

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².
 UL = Unlimited, NP = Not permitted.
 a. See the following sections for general exceptions to Table 503:
 1. Section 504.2, Allowable height increase due to automatic sprinkler system installation.
 2. Section 506.2, Allowable area increase due to street frontage.
 3. Section 506.3, Allowable area increase due to automatic sprinkler system installation.
 4. Section 507, Unlimited area buildings.
 b. For open parking structures, see Section 406.3.
 c. For private garages, see Section 406.1.
 d. See Section 415.5 for limitations.

BUILDING HEIGHTS & AREA MODIFICATIONS

International Building Code- 2006

Section 504.2: Where a building is equipped with an automatic sprinkler system, the maximum building height may be increased by 20 feet or 1 story.

Section 506.2: Frontage Increase = [building perimeter fronting open space / total building frontage - 0.25] width of open space / 30

Section 506.3: Sprinkler system provided throughout increases allowed area by 200% for buildings with more than 1 story above grade. Area increase not allowed in conjunction with fire rating reduction.

FIRE SEPARATION REQUIREMENTS

International Building Code- 2006

Section 406.3.7: Exterior walls and openings shall comply with Tables 601 and 602. The distance to adjacent lot line shall be per Table 602 and Section 704.

Section 508.2: Spaces which are incidental to the main occupancy shall be separated or the building shall be classified as mixed occupancy. Those separation requirements include; Furnace or Boiler Room require 1-hour separation requirement or sprinkler; Storage Rooms over 100 sf require 1-hour separation or sprinkler; Waste and linen collection rooms require 1-hour separation or sprinkler.

Section 508.3.3.1: Separated Occupancies- each fire area shall comply with the occupancy classification of that area.

Section 508.3.3.2: Allowable Area- at each floor, the building area shall be such that the sum of the ratios of the actual floor area of each occupancy divided by the allowable area shall not exceed one.

Section 508.3.3.3: Allowable Height- the height of each fire area shall be measured from grade, inclusive of intervening fire areas.

NFPA 88A- National Fire Code- 2008

Section 4.1.2: Parts of a parking garage located within 10 feet of from another building shall be separated by a 2-hour rating, except pedestrian bridges.

Section 4.1.4: Portions of a parking garage under another use shall extend rating requirements of other use to all principal supporting members of all floors.

Section 4.6.1: Vertical openings connecting four or more floors shall be enclosed with a 2-hour fire resistance rating.

Section 4.7.1.1: Each parking level shall have wall openings 1.4 sq ft in area per linear foot of perimeter.