

CONSTRUCTION TYPES

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Construction Type

A construction type is based on how the building is constructed. The requirements are found in Chapter 6 of the International Building Code. Most people will relate the Construction Type to the materials used for constructing a building. But, it is a little more than that. The little more is called combustibility and fire resistance.

There are a total of nine types of construction that span from noncombustible types to combustible types of construction, with varying degrees of each in between that are based on fire resistance. Table 601, Fire Resistance Rating Requirements for Building Elements, shows each of the types with their respective fire resistance requirements for building elements. These building elements include the structural frame, bearing walls, nonbearing walls, floors and roofs. The only exception is for nonbearing interior walls, which have no fire resistance requirements unless they are required to be fire resistive by other sections of the code.

Table 601—Fire Resistance Rating Requirements for Building Elements (Hours)

Building Element	Type I		Type II		Type III		Type IV	Type V	
	A	B	A ^d	B	A ^d	B	HT	A ^d	B
Primary Structural Frame ^g	3 ^a	2 ^a	1	0	1	0	HT	1	0
Bearing Walls Exterior ^{f, g}	3	2	1	0	2	2	2	1	0
Bearing Walls Interior	3 ^a	2 ^a	1	0	1	0	1/HT	1	0
Nonbearing Walls and Partitions—Exterior	See Table 602								
Nonbearing Walls and Partitions—Interior ^e	0	0	0	0	0	0	See 602.4.6	0	0
Floor Construction and Associated Secondary Members	2	2	1	0	1	0	HT	1	0
Roof Construction and Associated Secondary Members	1 ^{1/2} ^b	1 ^c	1 ^{b, c}	0 ^c	1 ^{b, c}	0	HT	1 ^{b, c}	0

- a. Roof supports: Fire resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- b. 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 occupancies.
- c. In all occupancies, heavy timber shall be allowed where a 1 hour or less fire resistance rating is required.
- d. 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.
- e. Not less than the fire-resistance rating required by other sections of this code.
- f. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
- g. Not less than the fire-resistance rating as referenced in Section 704.10

The nine Types of Construction are:

- ◆ Types IA and IB Types IIA and IIB Types IIIA and IIIB
- ◆ Type IV Types VA and VB

Construction Types IA and IB are considered noncombustible and fire resistive. The most significant difference between Type IA and IB is the level of fire resistance required for the building elements, with IA having a higher fire resistance. Since both types are noncombustible, they only permit noncombustible materials. Noncombustible materials are determined through ASTM E 136 for basic, or elementary materials and ASTM E 84 for composite materials.

Construction Types IIA and IIB are also noncombustible, but have little to no fire resistance. Determination of whether or not a material is noncombustible is the same for Type I construction. Type IIA has a minimum of 1 hour fire resistance throughout. Type IIB, although noncombustible, has no requirements for fire resistance, unless required by other sections of the code. The 2012 IBC defines Types I and II thusly:

2012 IBC Section 602.2—Types I and II: Types I and II construction are those types of construction in which the building elements listed in Table 601 are of noncombustible materials, except as permitted in Section 603 and elsewhere in this code.

Construction Types IIIA and IIIB are considered combustible. Being a combustible construction type, Type III construction permits the use of wood framing. Type III construction, like Type II construction, has little to no fire resistance. Type IIIA requires 1 hour fire resistance throughout except that exterior bearing walls require no less than 2 hour fire resistive construction. Type IIIB has no fire resistance requirements, except for exterior bearing walls, which has the same requirements as Type IIIA. The 2012 IBC defines Type III thusly:

2012 IBC Section 602.3—Type III: Type III construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material permitted by this code. Fire retardant treated wood framing complying with Section 2302.2 shall be permitted within exterior wall assemblies of a 2 hour rating or less.

Construction Type IV is unique. It is a combustible construction type, but it is limited to heavy timber construction. Although it is considered a combustible construction type, the exterior walls are required to be of noncombustible construction. Heavy timber construction includes columns not less than 8 inches thick, and floor and roof framing not less than 6 inches thick. Floors and roofs have thicker than normal construction consisting of varying layers of materials that build up to a deck of 3 to 4 inches thick. The 2012 IBC defines Type IV construction thusly:

2012 IBC Section 602.4—Type IV: Type IV construction (Heavy Timber, HT) is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid or laminated wood without concealed spaces. The details of Type IV construction shall comply with the provisions of this section. Fire Retardant Treated Wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies with a two hour rating or less. Minimum solid sawn nominal dimensions are required for structures built using Type IV construction (HT). For glued-laminated members the equivalent net finished width and depths corresponding to the minimum nominal width and depths of solid sawn lumber are required as specified in Table 602.4.

Table 602.4 Wood Member Size Equivalencies			
Minimum Nominal Solid Sawn Size		Minimum Glued Laminated Net Size	
Width, Inch	Depth, Inch	Width, Inch	Depth, Inch
8	8	6 ³ / ₄	8 ¹ / ₄
6	10	5	10 ¹ / ₂
6	8	5	8 ¹ / ₄
6	6	5	6
4	6	3	6 ⁷ / ₈

Table 602—Fire-Resistance Rating for Exterior Walls Based on Fire Separation Distance^{a, e, h}

Fire Separation Distance = X (feet)	Type of Construction	Occupancy Group H ^f	Occupancy Group F-1, M, S-1 ^g	Occupancy Group A, B, E, F-2, I, R, S-2 ^g , U ^b
X < 5 ^c	All	3	2	1
5 ≤ X < 10	IA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA and IB	2	1	1 ^d
	IIB and VB	1	0	0
	Others	1	1	1 ^d
X ≥ 30	All	0	0	0

- Load-bearing exterior walls shall comply with the fire-resistance rating requirements of Table 601.
- For special requirements for Group U occupancies, see Section 406.3.
- See Section 706.1.1 for party walls.
- Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
- The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and story in which the wall is located.
- For special requirements for Group H occupancies, see Section 415.5.
- For special requirements for Group S aircraft hangars, see Section 412.4.1.
- Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.

Lastly, Types VA and VB are also combustible construction, but each is slightly less fire-resistive than the Type III construction types. For example, the exterior bearing wall fire resistance is reduced to 1 hour for Type VA and no fire resistance for Type VB. The 2012 IBC defines Types VA and VB thusly:

2012 IBC Section 602.5—Type V: Type V construction is that type of construction in which the structural elements, exterior walls and interior walls are of any materials permitted by this code.

It is important to understand that a noncombustible building could still be classified as a Type III or V building. This is clearly stated in Section 602.1.1 of the 2012 IBC:

2012 IBC Section 602.1.1—Minimum Requirements: A building or portion thereof shall not be required to conform to the details of a type of construction higher than that type which meets the minimum requirements based on occupancy even though certain features of such a building actually conform to a higher type of construction.

In other words, if an entire building, or part of it, is designed to the requirements of a Type IIA construction (concrete frame and masonry walls), but the actual height, allowable area, and occupancy housed would only require the building to be classified as a Type IIIB, then the building will not be required to meet all of the detailed requirements for the Type IIA construction.

In addition to the fire-resistance ratings indicated in Table 601, nonbearing exterior walls are required to comply with the hourly fire-resistance requirements of Table 602, Fire-Resistance Rating Requirements for Exterior Walls Based on Fire Separation Distance. As the title states, the requirements are based on the fire separation distance between the wall and the nearest lot line, street centerline, or an imaginary line between two buildings on the same lot. This table also begins to incorporate occupancies into the mix when determining the fire-resistance. For example, a Group M (Mercantile) occupancy with a nonbearing wall that is 20 feet from the lot line, and using Type IIA construction, is required to have a fire-resistance rating of not less than 1-hour. If it were Type IIB construction or more than 30 feet from the lot line, it would have no requirement for fire-resistance.

In Table 601, there's a footnote that permits the substitution of the 1-hour fire-resistive construction (excluding exterior walls) with the installation of an automatic sprinkler system in Construction Types IIA, IIIA, and VA. There is a catch, though...if the sprinkler is required by another section of the code, then this substitution can not be used; nor can it be used if the sprinkler system is used for an area increase.

Additionally, there's a footnote that permits the use of fire-retardant-treated wood in Type I and II roof construction (including girders and trusses) as long as the building is:

- 1) Two stories or less in height
- 2) Type II construction over two stories
- 3) Type I construction over two stories and the vertical distance from the upper floor to the roof is 20 feet or more.

Construction Types and Occupancy Groups establish the foundation upon which the majority of the Building Code is built. Occupancy Groups drive egress, floor area and building height among other requirements. Construction Types also affect building materials, floor area, building height and many other requirements.

CITY OF REPUBLIC

The Community Development Department is made up of five full-time employees including a Planning Department Director, Administrative Assistant, Principal Planner, Building Inspector, and Code Compliance Official. Our office is located at 204 North Main Street. The goal of the department is to serve the citizens of Republic through pursuance, guidance, and assistance in the development of the City. This is accomplished through marketing and strategic planning accompanied by oversight and enforcement of the City's Building Codes, Zoning Codes and Subdivision Regulations.

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COMMUNITY DEVELOPMENT DEPARTMENT

