

Study Session

3

2018 SBC 201 Chapter 6 Types of Construction

OBJECTIVE: To gain an understanding of how a building is classified as a specific type of construction, based on the construction materials and the various building elements' resistance to fire.

REFERENCE: Chapter 6, 2018 *Saudi Building Code*

- KEY POINTS:**
- What do the various types of construction indicate?
 - How are the required fire-resistance ratings of building elements determined?
 - Why are exterior walls regulated by additional criteria?
 - Why are exterior walls protected differently based on fire separation distance?
 - At what minimum distance is the protection of exterior walls unnecessary?
 - Which types of materials are required to be used as building elements of a Type I or II building?
 - How do the two different categories of Type I construction differ in fire protection? Type II construction?
 - Which types of materials are required for use in the exterior walls of a Type III structure? In the interior building elements?
 - What is another name for Type IV construction?
 - How shall exterior walls be constructed? Interior building elements?
 - What are the minimum construction details for columns used in a building of Type IV construction?
 - In Type IV buildings, what is the minimum size of heavy-timber members used in the floor and roof framing? Floors? Roofs? Partitions?
 - Where the minimum dimensions for Type IV solid sawn members are prescribed, how are the equivalent sizes established for glued laminated members?
 - Which requirements apply to cross-laminated timber used as a Type IV member?
 - Type V buildings may be constructed of which building materials?

KEY POINTS:
(Cont'd)

- How does a Type VA building differ from a Type VB building?
- In noncombustible Type I and II buildings, where may fire-retardant-treated wood be used?
- Which specific allowances are provided for combustible materials in Type I and Type II buildings?
- What are the limitations for the use of fire-retardant-treated wood in the roof construction of noncombustible buildings? In nonbearing partitions? In nonbearing exterior walls?
- Which building elements are considered primary structural frame elements for the determination of fire resistance? Secondary members?
- When are bracing members considered part of the structural frame?
- Under which conditions may the required fire resistance of roof supports be reduced?
- At what height may the required fire resistance of roof construction be eliminated? In which occupancies is the elimination not applicable?
- For which building elements are heavy-timber members and 1-hour fire-resistance-rated construction interchangeable?
- Does a sprinkler system affect a building's type of construction classification?
- How are interior nonbearing walls regulated for fire resistance based on construction type? Exterior nonbearing walls?

Code Text: *Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five construction types defined in Sections 602.2 through 602.5.*

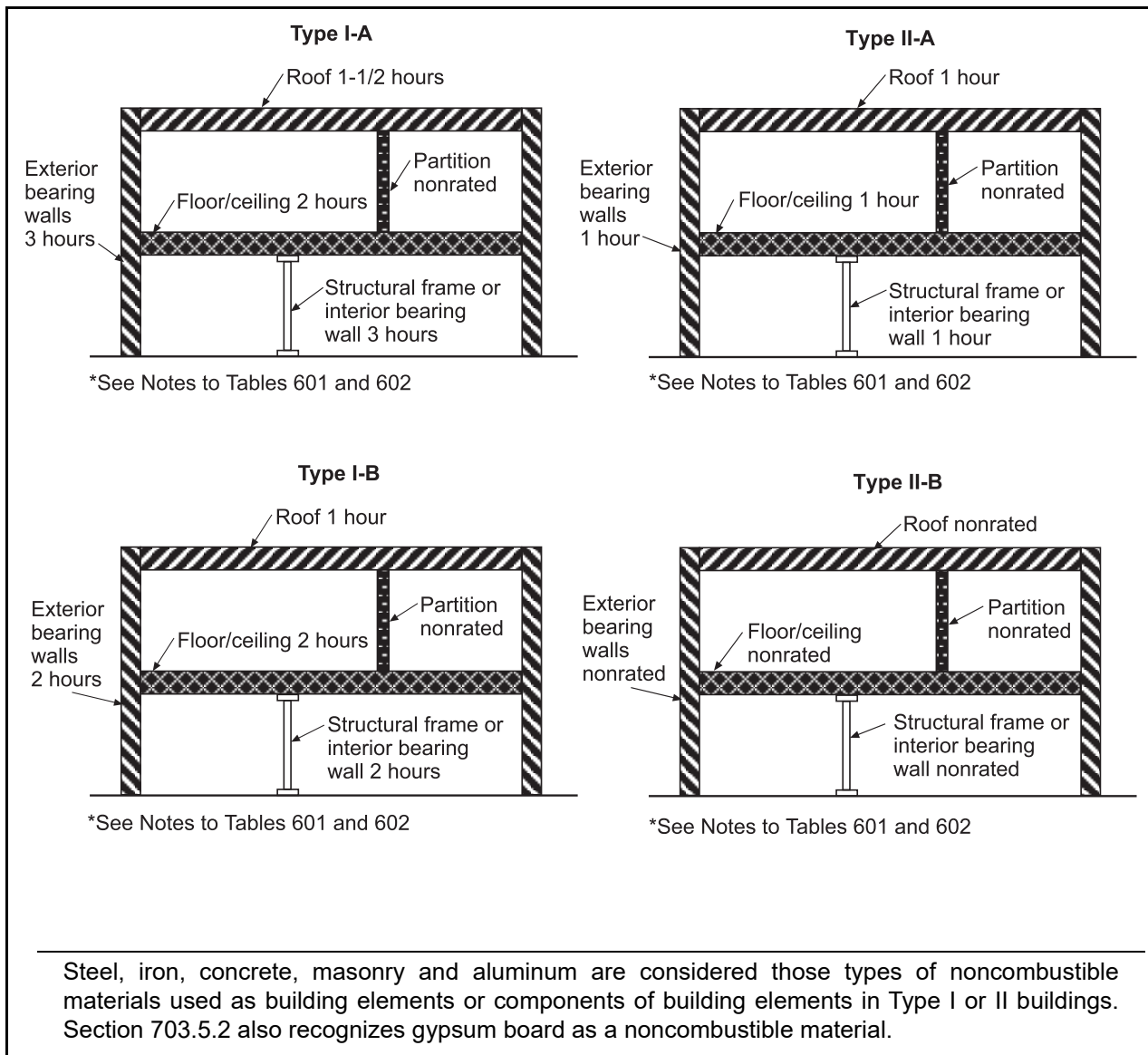
Discussion and Commentary: There are two major groupings based on the construction materials: noncombustible construction (Types I and II) and noncombustible or combustible construction (Types III, IV and V). These groupings are divided into two more categories: protected, where the major structural elements are provided with some degree of fire resistance, and unprotected, where no fire protection of the building elements is typically mandated. Protected construction is further distinguished in Type I buildings where the required protection for many structural elements exceeds a 1-hour fire-resistance rating.

Noncombustible	Exterior and interior (bearing or nonbearing) walls, floors, roofs and structural elements are to be of noncombustible materials	I	A	B
		II	A	B
Noncombustible or combustible	Exterior walls are to be of noncombustible materials	III	A	B
		IV	HT	
	V	A	B	

It is the intent of the *Saudi Building Code* that each building be classified as a single type of construction. The construction materials and the degree to which such materials are protected determine the classification based on the criteria of Table 601 and Chapter 6.

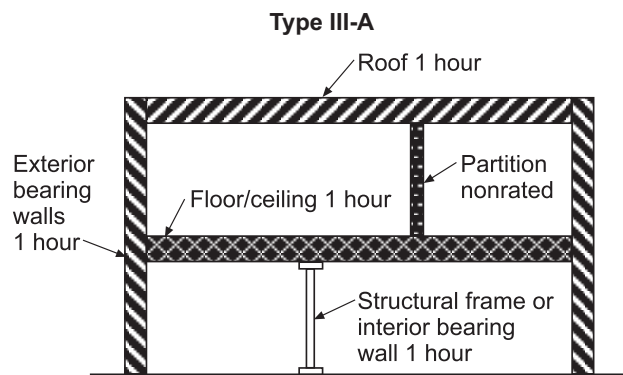
Code Text: *Types I and II construction are those types of construction in which the building elements listed in Table 601 are of noncombustible materials, except as permitted in Section 603 and elsewhere in the SBC 201.*

Discussion and Commentary: Type I buildings are noncombustible, and the building elements are also provided with a mandated degree of fire resistance. This type of construction requires the highest level of fire protection specified in the code. Type II buildings are also of noncombustible construction; however, the level of fire resistance is usually less than that required for Type I structures. Buildings of Type II construction may have a limited degree of fire resistance (Type IIA) or no fire resistance whatsoever (Type IIB). There are limited allowances for the use of fire-retardant-treated wood in nonbearing partitions, nonbearing exterior walls and roof construction.

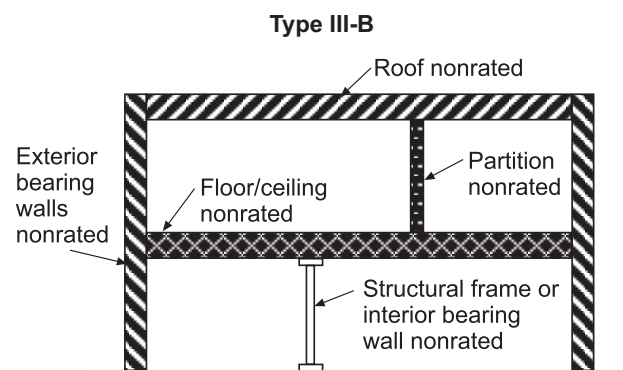


Code Text: *Type III construction is that type of construction in which the exterior walls are of non-combustible materials and the interior building elements are of any material permitted by the SBC 201. Fire-retardant-treated wood framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour rating or less.*

Discussion and Commentary: Type III buildings are considered combustible buildings and are either protected or unprotected. This building type was developed out of the necessity to prevent conflagrations in heavily built-up areas where buildings were erected side-by-side in congested downtown business districts. To limit the spread of fire from building to building, exterior walls were required to be of both noncombustible and fire-resistant construction.



*See Notes to Tables 601 and 602



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Historically referred to as "ordinary masonry construction," Type III buildings usually consist of concrete or masonry exterior walls with wood floor and roof systems. However, the SBC 201 permits such walls to contain fire-retardant-treated wood as an element of the exterior wall construction.

Topic: Type IV Construction

Category: Types of Construction

Reference: SBC 201-602.4, 602.4.1

Subject: Construction Classification

Code Text: *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 Section 602.4 and 2304.11. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies with a 2-hour rating or less.*

Discussion and Commentary: Referred to as “heavy-timber,” buildings of Type IV construction are essentially Type III buildings with an interior of timber members. To conform to Type IV construction, building members must be of substantial thickness. Given the characteristics of massive wood members, there is little chance for sudden structural collapse during or after a fire.

