CHAPTER 6
TYPES OF CONSTRUCTION

SECTION 601
GENERAL

601.1 Scope. The provisions of this chapter shall control the classification of buildings as to type of construction.

SECTION 602
CONSTRUCTION CLASSIFICATION

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified as Type I, II, III, IV, or V construction, in one of the five construction types defined in Sections 602.2 through 602.5. The building elements shall be constructed of materials as required for the type of construction in accordance with Section 602.1.1 through 602.1.5 and shall have a fire-resistance rating not less than that specified in Table 601. Exterior walls shall have a fire-resistance rating not less than that specified in Table 602. Where required to have a fire-resistance rating by Table 601, building elements shall comply with the applicable provisions of Section 703.2. The protection of openings, ducts and air transfer openings in building elements shall not be required unless required by other provisions of this code.

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.

602.2 Type I and II Construction. Types I and II construction are those types of construction in which the building elements listed in Table 601 are noncombustible materials, except as permitted in Section 603 and elsewhere in this code. Combustible materials are permitted when in accordance with Section 602.2 and elsewhere in this code.

602.3 Type III. Type III construction is that type of construction in which the exterior walls are noncombustible materials and the interior building elements are of any material permitted by this code. Combustible materials in exterior walls are permitted when in accordance with Section 602.2 and elsewhere in this code.

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 and Section 2304.10. Exterior walls complying with Section 602.4.1 or 602.4.2 shall also be permitted. Minimum solid sawn nominal dimensions are required for structures built using Type IV construction (HT) in accordance with this section. For glued-laminated members and Structural Composite Lumber (SCL) 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. Cross laminated timber (CLT) dimensions used in this section are actual dimensions. Combustible materials in exterior walls are permitted when in accordance with Section 602.2 and elsewhere in this code.

602.4.1 Fire retardant treated wood in exterior walls. Fire retardant treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies with a 2-hour rating or less.

602.4.2 Cross-laminated timber in exterior walls. Cross-laminated timber complying with Section 2303.1.4 shall be permitted within exterior wall assemblies with a 2-hour rating or less, provided the exterior surface of the cross-laminated timber is protected by one the following:

1. Fire retardant treated wood sheathing complying with 2303.2 and not less than 15/32 inch (12 mm) thick;
2. Gypsum board not less than ½ inch (12.7 mm) thick; or
3. A noncombustible material.

602.4.3 602.1.4.1 Columns. Wood columns shall be sawn or glued laminated and shall be not less than 8 inches (203 mm), nominal, in any dimension where supporting floor loads and not less than 6 inches (152 mm) nominal in width and not less than 8 inches (203 mm) nominal in depth where supporting roof and ceiling loads only. Columns shall be continuous or superimposed and connected in an approved manner. Protection in accordance with Section 704.2 is not required.

602.4.4 602.1.4.2 Floor framing. Wood beams and girders shall be of sawn or glued-laminated timber and shall be not less than 6 inches (152 mm) nominal in width and not less than 10 inches (254 mm) nominal in depth. Framed sawn or glued-laminated timber arches, which spring from the floor line and support floor loads, shall be not less than 8 inches (203 mm) nominal in any dimension. Framed timber trusses supporting floor loads shall have members of not less than 8 inches (203 mm) nominal in any dimension.

602.4.5 602.1.4.3 Roof framing. Wood-frame or glued-laminated arches for roof construction, which spring from the floor line or from grade and do not support floor loads, shall have members not less than 6 inches (152 mm) nominal in width and have not less than 8 inches (203 mm) nominal in depth for the lower half of the height and not less than 6 inches (152 mm) nominal in depth for the upper half. Framed or glued-laminated arches for roof construction that spring from the top of walls or wall abutments, framed timber trusses and other roof framing, which do not support floor loads, shall have members not less than 4 inches (102 mm) nominal in width and not less than 6 inches (152 mm) nominal in depth. Spaced members shall be permitted to be composed of two or more pieces not less than 3 inches (76 mm) nominal in thickness where blocked solidly throughout their intervening spaces or where spaces are tightly closed by a continuous wood cover plate of not less than 2 inches (51 mm) nominal in thickness secured to the underside of the members. Splice plates shall be not less than 3 inches (76 mm) nominal in thickness. Where protected by approved automatic sprinklers under the roof deck, framing members shall be not less than 3 inches (76 mm) nominal in width.

602.4.6 602.1.4.4 Floors. Floors shall be without concealed spaces. Wood floors shall be constructed in accordance with 602.4.6.1 or 602.4.6.2.

602.4.6.4 602.1.4.4.1 Sawn or glued-laminated planks floors. Sawn or glue-laminated plank floors shall:

1. Sawn or glued-laminated planks, splined or tongue-and-groove, of not less than 3 inches (76 mm) nominal in thickness covered with 1-inch (25 mm) nominal dimension tongue-and-groove
flooring, laid crosswise or diagonally, 15/32-inch (12 mm) wood structural panel or 0.5-inch (12.7 mm) particleboard; or

2. Planks not less than 4 inches (102 mm) nominal in width set on edge close together and well spiked and covered with 1-inch (25 mm) nominal dimension flooring or 15/32-inch (12 mm) wood structural panel or 0.5-inch (12.7 mm) particleboard.

The lumber shall be laid so that no continuous line of joints will occur except at points of support. Floors shall not extend closer than 1/2 inch (12.7 mm) to walls. Such ½-inch (12.7 mm) space shall be covered by a molding fastened to the wall and so arranged that it will not obstruct the swelling or shrinkage movements of the floor. Corbelling of masonry walls under the floor shall be permitted to be used in place of molding.

602.4.6.2 602.1.4.4.2 Cross-laminated timber floors. Cross laminated timber shall be not less than 4 inches (102 mm) in thickness. It shall be continuous from support to support and mechanically fastened to one another. Cross laminated timber shall be permitted to be connected to walls without a shrinkage gap providing swelling or shrinking is considered in the design. Corbelling of masonry walls under the floor shall be permitted to be used.

602.4.7 602.1.4.5 Roofs. Roofs shall be without concealed spaces and wood roof decks shall be sawn or glued laminated, splined or tongue-and-groove plank, not less than 2 inches (51 mm) nominal in thickness; 11/8-inch-thick (32 mm) wood structural panel (exterior glue); planks not less than 3 inches (76 mm) nominal in width, set on edge close together and laid as required for floors; or of cross laminated timber. Other types of decking shall be permitted to be used if providing equivalent fire resistance and structural properties.

Cross laminated timber roofs shall be not less than 3 inch (76 mm) nominal in thickness and shall be continuous from support to support and mechanically fastened to one another.

602.4.8 Partitions and walls. Partitions and walls shall comply with 602.4.8.1 or 602.4.8.2.

602.4.8.1 602.1.4.6 Interior walls and partitions. Interior walls and partitions shall be of solid wood construction formed by not less than two layers of 1-inch (25 mm) matched boards or laminated construction 4 inches (102 mm) thick, or of 1-hour fire-resistance-rated construction.

602.4.8.2 Exterior walls. Exterior walls shall be one of the following:

1. Noncombustible materials; or
2. Not less than 6 inches (152 mm) in thickness and constructed of one of the following:
   2.1 Fire retardant treated wood in accordance with 2303.2 and complying with 602.4.1 or
   2.2 Cross laminated timber complying with 602.4.2.

602.4.9 602.1.4.7 Exterior structural members. Where a horizontal separation of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes shall be permitted to be used externally.

602.5 602.1.5 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.

602.2 Allowable uses of combustible materials. Building elements in Type I and II Construction and exterior walls in Types III and IV Construction shall be permitted to be constructed of combustible materials in accordance with the following applications:

1. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted as follows:
1.1. Nonbearing partitions where the required fire-resistance rating is 2 hours or less.

1.2. Nonbearing exterior walls where fire-resistance rated construction is not required.

1.3. Roof construction, including girders, trusses, framing and decking.

**Exception:** In buildings of Type IA construction exceeding two stories above grade plane, fire-retardant-treated wood is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

1.4 In exterior wall assemblies for Type III construction where the fire-resistance rating of the wall assemblies are 2 hours or less.

1.5 In exterior wall assemblies for Type IV construction where the fire-resistance rating of the wall assemblies are 2 hours or less and the thickness is not less than 6 inches.

2. In Type IV Construction, Cross-laminated timber complying with Section 2303.1.4 shall be permitted within exterior wall assemblies with a 2-hour rating or less, provided the exterior surface of the cross-laminated timber is protected by one the following:

   2.1. Fire retardant treated wood sheathing complying with 2303.2 and not less than 15/32 inch (12 mm) thick;
   2.2. Gypsum board not less than ½ inch (12.7 mm) thick; or
   2.3. A noncombustible material.

3. Millwork such as doors, door frames, window sashes and frames.

4. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.

5. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a corridor serving an occupant load of 30 or more shall be permitted to be constructed of fire-retardant-treated wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.

6. Stages and platforms constructed in accordance with Sections 410.3 and 410.4, respectively.

6. Blocking such as for handrails, millwork, cabinets and window and door frames.

7. Mastics and caulking materials applied to provide flexible seals between components of exterior wall construction.

8. Heavy timber as permitted by Note c to Table 601 and Sections 602.1.4.5 and 1406.3.

9. Aggregates, component materials and admixtures as permitted by Section 703.2.2.

10. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of fire-resistance tests in accordance with Section 703.2 and installed in accordance with Sections 1705.13 and 1705.14, respectively.

11. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.

12. Wall construction of freezers and coolers of less than 1000 square feet (92.9 m²) in floor area, lined on both sides with noncombustible materials and the building is protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
SECTION 603
COMBUSTIBLE MATERIAL IN TYPE I AND II CONSTRUCTION

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. Fire-retardant-treated wood shall be permitted in:
   1.1. Nonbearing partitions where the required fire-resistance rating is 2 hours or less.
   1.2. Nonbearing exterior walls where fire-resistance rated construction is not required.
   1.3. Roof construction, including girders, trusses, framing and decking.

   Exception: In buildings of Type IA construction exceeding two stories above grade plane, fire-retardant-treated wood is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

2. Thermal and acoustical insulation, other than foam plastics, having a flame spread index of not more than 25.

   Exceptions:
   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a flame spread index of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a flame spread index of not more than 200.
   3. Foam plastics in accordance with Chapter 26.
   4. Roof coverings that have an A, B or C classification.
   5. Interior floor finish and floor covering materials installed in accordance with Section 804.
   6. Millwork such as doors, door frames, window sashes and frames.
   7. Interior wall and ceiling finishes installed in accordance with Sections 801 and 803.
   8. Trim installed in accordance with Section 806.
   9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
   10. Finish flooring installed in accordance with Section 805.
   11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a corridor serving an occupant load of 30 or more shall be permitted to be constructed of fire-retardant-treated wood, 1-hour fire-resistance rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
   12. Stages and platforms constructed in accordance with Sections 410.3 and 410.4, respectively.
13. Combustible exterior wall coverings, balconies and similar projections and bay or oriel windows in accordance with Chapter 14.

14. Blocking such as for handrails, millwork, cabinets and window and door frames.


16. Mastics and caulking materials applied to provide flexible seals between components of exterior wall construction.

17. Exterior plastic veneer installed in accordance with Section 2605.2.

18. Nailing or furring strips as permitted by Section 803.11.

19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.7 and 1406.3.

20. Aggregates, component materials and admixtures as permitted by Section 703.2.2.

21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of fire-resistance tests in accordance with Section 703.2 and installed in accordance with Sections 1705.13 and 1705.14, respectively.

22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.

23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.

24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.

25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.

26. Wall construction of freezers and coolers of less than 1000 square feet (92.9 m²), in size, lined on both sides with noncombustible materials and the building is protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

603.1.1 Ducts. The use of nonmetallic ducts shall be permitted where installed in accordance with the limitations of the International Mechanical Code.

603.1.2 Piping. The use of combustible piping materials shall be permitted where installed in accordance with the limitations of the International Mechanical Code and the International Plumbing Code.

603.1.3 Electrical. The use of electrical wiring methods with combustible insulation, tubing, raceways and related components shall be permitted where installed in accordance with the limitations of this code.

<table>
<thead>
<tr>
<th>TABLE 601</th>
</tr>
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<tbody>
<tr>
<td><strong>FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)</strong></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>BUILDING ELEMENT</th>
<th>TYPE I</th>
<th>TYPE II</th>
<th>TYPE III</th>
<th>TYPE IV</th>
<th>TYPE V</th>
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<td>1</td>
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<td>Bearing walls</td>
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<td>1</td>
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<td>2</td>
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<td>Interior</td>
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<td>1</td>
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<td>1</td>
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<tr>
<td>Nonbearing walls and partitions</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

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*Note: See Table 602 for nonbearing walls and partitions.*
Exterior

Nonbearing walls and partitions [Interior]\[d\] 0 0 0 0 0 0 See Section 602.4.8 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) 1½b 1b,c 1b,c 0c 1b,c 0 HT 1b,c 0

(No proposed changes to footnotes)

(No proposed changes to text not shown.)

**Reason:** The purpose of this code change proposal is to remove the extraneous, unnecessary information from Chapter 6 that only serves to confuse users of this Code. Section 603 provides an incomplete laundry list of combustible materials that are allowed in Types I and II construction. However, Section 602.2 states that the building elements of buildings of Type I and II construction are required to be noncombustible except as permitted in Section 603, and elsewhere in this code. Of the 29 items listed in Section 603, only 12 of them are materials that could be components of the building elements in Table 601. The remaining materials listed are also discussed in detail in other parts of the code regarding the limitations of their use in various types of construction. For instance, roof coverings are listed in item no. 4, that have a Class A, B, or C classification. Section 1505 provides in detail where roof coverings of different classifications are required in various types of construction. Why then, is this provision contained in Section 603? Roof coverings are not part of a building element listed in Table 601. Item no. 4 in Section 603.1 tells the user of the code nothing. Are the items in Section 603 the only combustible materials allowed in Types I and II Construction? This is a frequently confused point. For instance, Photovoltaic Rooftop materials are permitted, as stated in Section 1510. But they are not listed in Section 603. Are they therefore only allowed in Types III, IV, and V construction? With this in mind, Section 603 is proposed for deletion, and only the items in Section 603 that can be part of the structural elements in Table 601 are listed in Section 602.2. Here are the items that are moved from Section 603 to Section 602:

1. *Fire-retardant-treated wood.* *(Item 1)*

6. Millwork such as doors, door frames, window sashes and frames. *(Item 2)*

9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases. *(Item 3)*

11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated wood*, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height. *(Item 4)*

12. Stages and platforms constructed in accordance with Sections 410.3 and 410.4, respectively. *(Item 5)*
14. Blocking such as for handrails, millwork, cabinets and window and door frames. *(Item 6)*

16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction. *(Item 7)*

19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.7 and 1406.3. *(Item 8)*

20. Aggregates, component materials and admixtures as permitted by Section 703.2.2. *(Item 9)*

21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire-resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.13 and 1705.14, respectively. *(Item 10)*

22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714. *(Item 11)*

23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715. *(Item 12)*