RB48-13
Previous BCAC item

R301.2.2 Seismic provisions. The seismic provisions of this code shall apply as follows:

1. *Townhouses* in Seismic Design Categories C, D0, D1 and D2 shall be constructed in accordance with the requirements of this section and other seismic requirements of this code.

2. Detached one- and two-family *dwellings* in Seismic Design Categories, D0, D1 and D2 shall be constructed in accordance with the requirements of this section and other seismic requirements of this code.

3. ~~**R301.2.2.4 Seismic Design Category E.**~~ Buildings in Seismic Design Category E shall be designed to resist seismic loads in accordance with the *International Building Code*, except where the seismic design category is reclassified to a lower seismic design category in accordance with Section R301.2.2.1. Components of buildings not required to be designed to resist seismic loads shall be constructed in accordance with the provisions of this code.

R301.2.2.1 Determination of seismic design category. (No changes to section)

~~**R301.2.2.2 Seismic Design Category C.** Structures assigned to Seismic Design Category C shall conform to the requirements of this section.~~

R301.2.2.2 ~~**R301.2.2.2.1**~~ **Weights of materials.** (No other changes to section)

R301.2.2.3 ~~**R301.2.2.2.2**~~ **Stone and masonry veneer.** Anchored stone and masonry veneer shall comply with the requirements of Sections R702.1 and R703.

R301.2.2.4 ~~**R301.2.2.2.3**~~ **Masonry construction.** Masonry construction shall comply with the requirements of Section R606.12. Masonry construction in Seismic Design Categories D0 and D1 shall comply with the requirements of Section R606.12.1. Masonry construction in Seismic Design Category D2 shall comply with the requirements of Section R606.12.4.

R301.2.2.5 Concrete construction. Buildings with exterior above-*grade* concrete walls shall comply with PCA 100 or shall be designed in accordance with ACI 318.

> **Exception:** Detached one- and two-family *dwellings* in Seismic Design Category C with exterior above *grade* concrete walls shall be permitted to comply with the requirements of Section R608.

~~**R301.2.2.2.4 Concrete construction.** Detached one- and two-family *dwellings* with exterior above *grade* concrete walls shall comply with the requirements of Section R608, PCA 100 or shall be designed in accordance with ACI 318. *Townhouses* with above-*grade* exterior concrete walls shall comply with the requirements of PCA 100 or shall be designed in accordance with ACI 318.~~

R301.2.2.6 ~~**R301.2.2.2.5**~~ **Irregular buildings.** The seismic provisions of this code shall not be used for irregular structures located in Seismic Design Categories C, D0, D1 and D2. A building or portion of a building shall be considered to be irregular where one or more of the ~~following~~ conditions defined in Sections R301.2.2.6.1 through R301.2.2.6.7 occur: Irregular portions of structures shall be designed in accordance with accepted engineering practice to the extent the irregular features affect the performance of the remaining structural system. Where the forces associated with the irregularity are resisted by a structural system designed in accordance with accepted engineering practice, design of the remainder of the building shall be permitted using the provisions of this code. ~~A building or portion of a building shall be considered to be irregular where one or more of the following conditions occur:~~

~~1.~~ **R301.2.2.6.1 Shear wall or braced wall offsets out of plane.** Where exterior shear wall lines or braced wall panels are not in one plane vertically from the foundation to the uppermost story in which they are required.

Exception: For wood light-frame construction, floors with cantilevers or setbacks not exceeding four times the nominal depth of the wood floor joists are permitted to support braced wall panels that are out of plane with braced wall panels below provided that:

1. Floor joists are nominal 2 inches by 10 inches (51 mm by 254 mm) or larger and spaced not more than 16 inches (406 mm) on center.

2. The ratio of the back span to the cantilever is not less than 2 to 1.

3. Floor joists at ends of braced wall panels are doubled.

4. For wood-frame construction, a continuous rim joist is connected to ends of cantilever joists. When spliced, the rim joists shall be spliced using a galvanized metal tie not less than 0.058 inch (1.5 mm) (16 gage) and 11/2 inches (38 mm) wide fastened with six 16d nails on each side of the splice or a block of the same size as the rim joist of sufficient length to fit securely between the joist space at which the splice occurs fastened with eight 16d nails on each side of the splice; and

5. Gravity loads carried at the end of cantilevered joists are limited to uniform wall and roof loads and the reactions from headers having a span of 8 feet (2438 mm) or less.

~~2.~~ **R301.2.2.6.2 Lateral support of roofs and floors.** Where a section of floor or roof is not laterally supported by shear walls or braced wall lines on all edges.

Exception: Portions of floors that do not support shear walls or braced wall panels above, or roofs, shall be permitted to extend not more than 6 feet (1829 mm) beyond a shear wall or braced wall line.

~~3.~~ **R301.2.2.6.2 Shear wall or braced wall offsets in plane.** Where the end of a braced wall panel occurs over an opening in the wall below and ends at a horizontal distance greater than 1 foot (305 mm) from the edge of the opening. This provision is applicable to shear walls and braced wall panels offset in plane and to braced wall panels offset out of plane as permitted by the exception to Section R301.2.2.6.1 ~~Item 1~~.

Exception: For wood light-frame wall construction, one end of a braced wall panel shall be permitted to extend more than 1 foot (305 mm) over an opening not more than 8 feet (2438 mm) in width in the wall below provided that the opening includes a header in accordance with the following:

1. The building width, loading condition and framing member species limitations of Table R602.7(1) shall apply; and

2. Not less than one 2 × 12 or two 2 × 10 for an opening not more than 4 feet (1219 mm) wide; or

3. Not less than two 2 × 12 or three 2 × 10 for an opening not more than 6 feet (1829 mm) in width; or

4. Not less than three 2 × 12 or four 2 × 10 for an opening not more than 8 feet (2438 mm) in width; and

5. The entire length of the braced wall panel does not occur over an opening in the wall below.

~~4.~~ **R301.2.2.6.4 Floor and roof openings.** Where an opening in a floor or roof exceeds the lesser of 12 feet (3658 mm) or 50 percent of the least floor or roof dimension.

~~5.~~ **R301.2.2.6.5 Floor level offsets.** Where portions of a floor level are vertically offset.

Exceptions:

1. Framing supported directly by continuous foundations at the perimeter of the building.

2. For wood light-frame construction, floors shall be permitted to be vertically offset when the floor framing is lapped or tied together as required by Section R502.6.1.

~~6.~~ **R301.2.2.6.6 Perpendicular shear walls and wall bracing.** Where shear walls and braced wall lines do not occur in two perpendicular directions.

~~7.~~ **R301.2.2.6.7 Wall bracing in stories containing masonry or concrete construction.** Where stories above grade plane partially or completely braced by wood wall framing in accordance with Section R602 or cold-formed steel wall framing in accordance with Section R603 include masonry or concrete construction. Where this irregularity applies, the entire story shall be designed in accordance with accepted engineering practice.

Exception: Fireplaces, chimneys and masonry veneer as permitted by this code.

~~**R301.2.2.3 Seismic Design Categories D0, D1 and D2.** Structures assigned to Seismic Design Categories D0, D1 and D2 shall conform to the requirements for Seismic Design Category C and the additional requirements of this section.~~

R301.2.2.7 ~~R301.2.2.3.1~~ Height limitations. ~~Wood-framed buildings shall be limited to three stories above *grade plane* or the limits given in Table R602.10.3(3). Cold-formed, steel-framed buildings shall be limited to less than or equal to three stories above *grade plane* in accordance with AISI S230.~~ Mezzanines as defined in Section R202 that comply with Section R325 shall not be considered as stories. Structural insulated panel buildings shall be limited to two stories above *grade plane*.

~~**R301.2.2.3.2 Stone and masonry veneer.** Anchored stone and masonry veneer shall comply with the requirements of Sections R702.1 and R703.~~

~~**R301.2.2.3.3 Masonry construction.** Masonry construction in Seismic Design Categories D0 and D1 shall comply with the requirements of Section R606.12.1. Masonry construction in Seismic Design Category D2 shall comply with the requirements of Section R606.12.4.~~

~~**R301.2.2.3.4 Concrete construction.** Buildings with exterior above-*grade* concrete walls shall comply with PCA 100 or shall be designed in accordance with ACI 318.~~

R301.2.2.8 ~~R301.2.2.3.5~~ Cold-formed steel framing in Seismic Design Categories D0, D1 and D2. In Seismic Design Categories D0, D1 and D2 in addition to the requirements of this code, cold-formed steel framing shall comply with the requirements of AISI S230.

R301.2.2.9 ~~R301.2.2.3.6~~ Masonry chimneys. In Seismic Design Categories D0, D1 and D2, m~~M~~asonry chimneys shall be reinforced and anchored to the building in accordance with Sections R1003.3 and R1003.4.

R301.2.2.10 ~~R301.2.2.3.7~~ Anchorage of water heaters. In Seismic Design Categories D0, D1 and D2, w~~W~~ater heaters shall be anchored against movement and overturning in accordance with Section M1307.2.

Reason: The purpose of this code change is to reorganize the seismic provisions of Chapter 3. Builders in regions of the country where seismic design is required have expressed confusion regarding the requirements and limitations of Section R301.2.2. The key changes are as follows:

1. The opening paragraph of R301.2.2 tells you how the seismic provisions of the IRC apply to detached dwellings and townhouses in SDC C, D0, D1 and D2, but say nothing about SDC E. It is not until you get to R301.2.2.4 at the end of the section that you are told to go to the IBC for dwellings in SDC E, unless the alternative SDC determinations apply. This change proposes to relocate Section R301.2.2.4 to a new Item #3 under R301.2.2 so all of the SDC's of interest are addressed up front.

2. After the requirements for determining SDC, R301.2.2 is currently divided into requirements applicable to SDC C, then additional requirements applicable to SDC D0, D1 and D2, followed by the provision on SDC E. This change proposes to organize the provisions by type of construction or type of limitation instead of by SDC. By doing so, sections on stone and masonry veneer, masonry construction, and concrete construction that are somewhat or entirely duplicative can be combined. Also, this will promote the weight and irregularity limits up one level.

3. The irregular building provisions have been a source of confusion because they are currently provided as a number list of conditions that knock you out of the IRC, with exceptions that allow you to stay in the IRC but that themselves contain numbered lists! This code change creates new subsections for each irregularity, eliminating one set of numbered lists.

4. The height limitations are simplified. There is no need to restate for wood and cold-formed steel buildings the limit of 3 stories above grade plane, which simply reflects the IRC scope in Section R101.2. The mezzanine and SIP provisions are retained.