

open to the main structure. The sunroom fenestration complies with additional requirements for water penetration resistance, air infiltration resis-

tance and thermal performance. The space is habitable and conditioned.

**TABLE R301.2(1)
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA^{g, h}**

COUNTY	GROUND SNOW LOAD ^a = 36 psf (Roof snow load = 25 psf) below elevation shown (feet)	ULTIMATE DESIGN WIND SPEED	SEISMIC DESIGN CATEGORY	SUBJECT TO DAMAGE		
				Weathering ^d	Frost line depth (inches)	Decay
Baker	3,200	Note b	Note c	Severe	24	Slight
Benton	400	Note b	Note c	Moderate	12	Moderate
Clackamas	500	Note b	Note c	Moderate	12	Moderate
Clatsop	400	Note b	Note c	Moderate	12	Moderate
Columbia	400	Note b	Note c	Moderate	12	Moderate
Coos	400	Note b	Note c	Moderate	12	Moderate
Crook	4,100	Note b	Note c	Severe	18	Slight
Curry	400	Note b	Note c	Moderate	12	Moderate
Deschutes	4,000	Note b	Note c	Severe	18	Slight
Douglas	1,500	Note b	Note c	Moderate	18	Moderate
Gilliam	3,000			Severe	24	Moderate
S.45.5°N		Note b	Note c			
N.45.5°N		Note b	Note c			
Grant	4,100	Note b	Note c	Severe	24	Slight
Harney	4,100	Note b	Note c	Severe	24	Moderate
Hood River	Note e	Note b	Note c	Severe	24	Moderate
Jackson	2,000	Note b	Note c	Moderate	18 ^f	Slight
Jefferson	4,100	Note b	Note c	Severe	18	Moderate
Josephine	4,100	Note b	Note c	Moderate	18 ^f	Moderate
Klamath	4,000	Note b	Note c	Severe	24	Moderate
Lake	4,200	Note b	Note c	Severe	24	Slight
Lane	500	Note b	Note c	Moderate	12	Moderate
Lincoln	400	Note b	Note c	Moderate	12	Moderate
Linn	700	Note b	Note c	Moderate	12	Moderate
Malheur	3,400	Note b	Note c	Severe	24	Slight
Marion	500	Note b	Note c	Moderate	12	Moderate
Morrow	3,000			Severe	24	Slight
S.45.5°N		Note b	Note c			
N.45.5°		Note b	Note c			
Multnomah	500	Note b	Note c	Moderate	18	Moderate
Polk	400	Note b	Note c	Moderate	12	Moderate
Sherman	2,000			Severe	24	Slight
S.45.5°N		Note b	Note c			
N.45.5°N		Note b	Note c			
Tillamook	400	Note b	Note c	Moderate	12	Moderate
Umatilla	3,000			Severe	24	Slight
S.45.5°N		Note b	Note c			
N.45.5°N ^j		Note b	Note c			
Union	3,000	Note b	Note c	Severe	24	Slight
Wallowa	3,000	Note b	Note c	Severe	24	Slight
Wasco	2,000			Severe	24	Slight
S.45.5°N		Note b	Note c			
N.45.5°N		Note b	Note c			
Washington	400	Note b	Note c	Moderate	12	Moderate
Wheeler	4,100	Note b	Note c	Severe	24	Slight
Yamhill	400	Note b	Note c	Moderate	12	Moderate

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 m², 1 pound per square foot = 0.0479 kN/m².

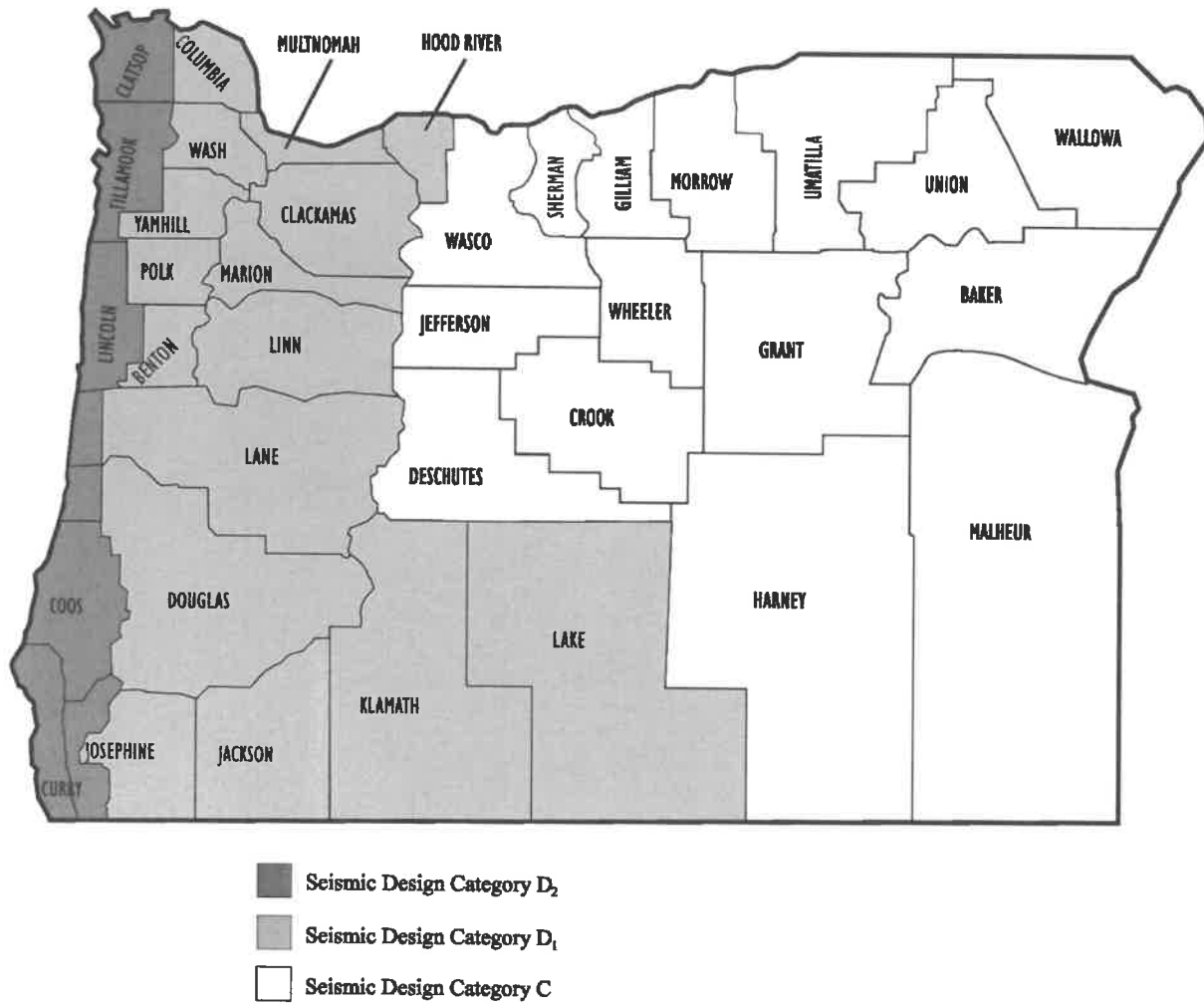
- a. For locations with elevation higher than the listed values or for a possible reduction in minimum design roof snow load from 25 psf to 20 psf, refer to the Snow Load Analysis for Oregon (including the ground snow load maps) published by the Structural Engineers Association of Oregon in 2007, in conjunction with the 2010 Oregon Snow Load Map update and Interim Guidelines for Snow Load Determination for the State of Oregon, published in 2011.
- b. Refer to Figure R301.2(4) for mapped Ultimate Design Wind Speeds. Wind exposure category shall be determined on a site-specific basis in accordance with Section R301.2.1.4.
- c. Refer to Figure R301.2(2) for mapped Seismic Design Categories.
- d. A severe classification is where weather conditions result in significant snowfall combined with extended periods during which there is little or not natural thawing causing de-icing salts to be used extensively.
- e. For elevations below 500 feet, the ground snow load is 70 psf. Above 500 feet, see Note a.
- f. The frost line depth below 2,500 feet in Jackson and Josephine Counties is 12 inches.
- g. See Sections R301.2.4 and R322 for establishment of flood hazard design criteria.
- h. See Section R327 for establishment of wildfire hazard design criteria.

TABLE R301.2(2)
DESIGN WIND LOADS (pounds per square foot)

EXPOSURE CLASSIFICATION ^b	ULTIMATE DESIGN WIND SPEED ^a	BUILDING HEIGHT ^{c, f}					
		One Story		Two Story		Three Story	
		Walls	Roof Uplift ^d	Walls	Roof Uplift ^d	Walls	Roof Uplift ^d
B	120	NA ^e	NA ^e	NA ^c	NA	NA ^e	NA ^e
	135	NA ^c	NA ^e	NA ^e	NA	NA ^e	20
C	110	NA ^e	NA	NA ^c	NA	NA ^e	NA
	120	NA ^e	20	NA ^e	22	NA ^e	25
	135	NA ^c	26	NA ^c	28	NA ^e	31
D	110	NA ^e	20	NA ^e	22	NA ^e	24
	120	NA ^e	27	NA ^e	28	NA ^e	31
	135	32	37	36	40	39	43

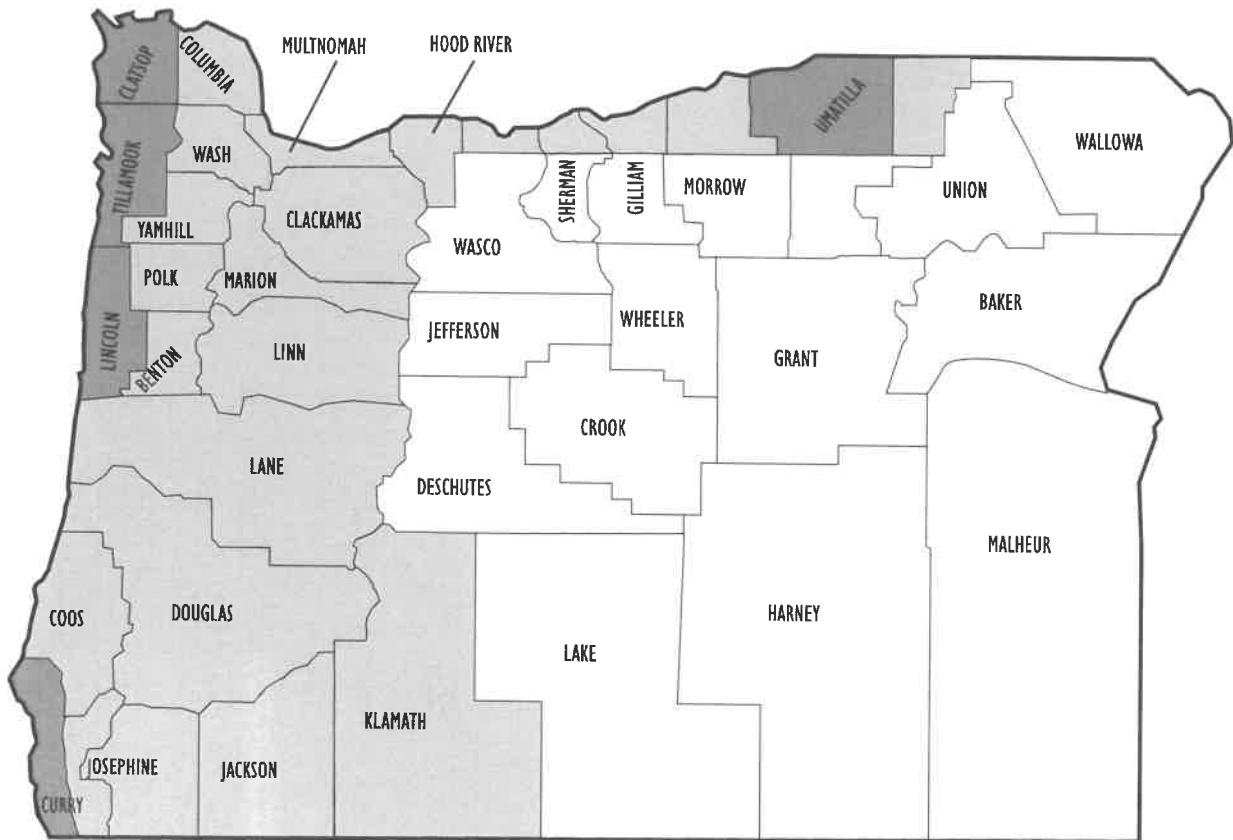
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 47.88 Pa, 1 mile per hour = 0.44 m/s.

- a. Ultimate design wind speeds are shown in miles per hour at 33 feet above ground.
- b. Exposure classification to be determined using Section R301.2.1.3.
- c. Building heights used to determine design wind loads are: One story = 20 feet, Two story = 30 feet and Three story = 50 feet.
- d. Uplift loads act normal to the roof or overhang.
- e. NA = No design is required in accordance with Sections R602.3 and R802.11.
- f. Buildings over 50 feet in height, or with unusual construction or geometric shapes, with overhanging eave projections greater than 24 inches, or located in special wind regions or localities, shall be designed in accordance with the provisions in the *Building Code*.

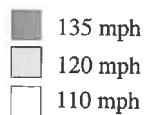


The boundary of Seismic Design Category D₂ in Douglas and Lane Counties is that land which lies westerly of Range 10 west of the Willamette Meridian.

FIGURE R301.2(2)
OREGON SEISMIC DESIGN CATEGORIES-SITE CLASS D



- a. All areas with full exposure to ocean winds shall be designed 135 mph areas.
- b. Areas in Hood River and Multnomach Counties with full exposure to Columbia River Gorge winds shall be designed 135 mph areas.



For SI: 1 mile per hour = 0.44 m/s.

**FIGURE R301.2(4)^{a, b}
OREGON DESIGN WIND SPEEDS**

R301.2.1.2 Wind speed conversion. Where referenced documents are based on nominal design wind speeds and do not provide the means for conversion between ultimate design wind speeds and nominal design wind speeds, the ultimate design wind speeds, V_{ult} , of Figure R301.2(4) shall be converted to nominal design wind speeds, V_{asd} , using Table R301.2.1.2.

R301.2.1.3 Exposure category. For each wind direction considered, an exposure category that adequately reflects the characteristics of ground surface irregularities shall be determined for the site at which the building or structure is to be constructed. For a site located in the transition zone between categories, the category resulting in the largest wind forces shall apply. Account shall be taken of variations in ground surface roughness that arise from natural topography and vegetation as well as from constructed features. For any given wind direction, the exposure in which a specific building or other structure is sited shall be assessed as being one of the following categories:

1. Exposure B. Urban and suburban areas, wooded areas or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger. Exposure B shall be assumed unless the site meets the definition of another type exposure.
2. Exposure C. Open terrain with scattered obstructions, including surface undulations or other irregularities, having heights generally less than 30 feet (9144 mm) extending more than 1,500 feet (457 m) from the building site in any quadrant. This exposure shall also apply to any building located within Exposure B type terrain where the building is directly adjacent to open areas of Exposure C type terrain in any quadrant for a distance of more than 600 feet (183 m). This category includes flat, open country and grasslands.
3. Exposure D. Flat, unobstructed areas exposed to wind flowing over open water, smooth mud flats, salt flats and unbroken ice for a distance of not less than 5,000 feet (1524 m). This exposure shall apply only to those buildings and other structures exposed to the wind coming from over the unobstructed area. Exposure D extends downwind from the edge of the unobstructed area a distance of 600 feet (183 m) or 20 times the height of the building or structure, whichever is greater.

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

1. Townhouses in Seismic Design Categories C, D₁ and D₂.

2. Detached one- and two-family dwellings in Seismic Design Categories D₁ and D₂.

R301.2.2.1 Determination of seismic design category. Buildings shall be assigned a seismic design category in accordance with Table R301.2(1).

R301.2.2.1.1 Alternate determination of seismic design category. The seismic design categories and corresponding short-period design spectral response accelerations, S_{DS} shown in Figure R301.2(2) are based on soil Site Class D, as defined in Section 1613.3.2 of the *Building Code*. If soil conditions are other than Site Class D, the short-period design spectral response accelerations, S_{DS} , for a site can be determined in accordance with Section 1613.3 of the *Building Code*. The value of S_{DS} determined in accordance with Section 1613.3 of the *Building Code* is permitted to be used to set the seismic design category in accordance with Table R301.2.2.1.1.

**TABLE R301.2.2.1.1
SEISMIC DESIGN CATEGORY DETERMINATION**

CALCULATED S_{DS}	SEISMIC DESIGN CATEGORY
$S_{DS} \leq 0.17g$	A
$0.17g < S_{DS} \leq 0.33g$	B
$0.33g < S_{DS} \leq 0.50g$	C
$0.50g < S_{DS} \leq 0.83g$	D ₁
$0.83g < S_{DS} \leq 1.25g$	D ₂
$1.25g < S_{DS}$	E

R301.2.2.1.2 Alternative determination of Seismic Design Category E. Buildings located in Seismic Design Category E in accordance with Figure R301.2(2) are permitted to be reclassified as being in Seismic Design Category D₂ provided that one of the following is done:

1. A more detailed evaluation of the seismic design category is made in accordance with the provisions and maps of the *Building Code*. Buildings located in Seismic Design Category E in accordance with Table R301.2.2.1.1, but located in Seismic Design Category D in accordance with the *Building Code*, shall be permitted to be designed using the Seismic Design Category D₂ requirements of this code.
2. Buildings located in Seismic Design Category E that conform to the following additional restrictions are permitted to be constructed in accordance with the provisions for Seismic Design Category D₂ of this code:

**TABLE R301.2.1.2
WIND SPEED CONVERSIONS^a**

V_{ult} (mph)	110	115	120	130	135	140	150	160	170	180	190
V_{asd} (mph)	85	89	93	101	105	108	116	124	132	139	147

For SI: 1 mile per hour = 0.447 m/s.

a. Linear interpolation is permitted.

- 2.1. All exterior shear wall lines or *braced wall panels* are in one plane vertically from the foundation to the uppermost story.
- 2.2. Floors shall not cantilever past the exterior walls.
- 2.3. The building is within the requirements of Section R301.2.2.2.5 for being considered as regular.

R301.2.2.2 Seismic limitations. The following limitations apply to buildings in all Seismic Design Categories regulated by the seismic provisions of this code.

R301.2.2.2.1 Weights of materials. Average dead loads shall not exceed 15 pounds per square foot (720 Pa) for the combined roof and ceiling assemblies (on a horizontal projection) or 15 pounds per square foot (720 Pa) for floor assemblies, except as further limited by Section R301.2.2. Dead loads for walls above *grade* shall not exceed:

1. Fifteen pounds per square foot (720 Pa) for exterior light-frame wood walls.
2. Fourteen pounds per square foot (670 Pa) for exterior light-frame cold-formed steel walls.
3. Ten pounds per square foot (480 Pa) for interior light-frame wood walls.
4. Five pounds per square foot (240 Pa) for interior light-frame cold-formed steel walls.
5. Eighty pounds per square foot (3830 Pa) for 8-inch-thick (203 mm) masonry walls.
6. Eighty-five pounds per square foot (4070 Pa) for 6-inch-thick (152 mm) concrete walls.
7. Ten pounds per square foot (480 Pa) for SIP walls.

Exceptions:

1. Roof and ceiling dead loads greater than 15 psf, but not exceeding 25 pounds per square foot (1190 Pa) shall be permitted provided that the wall bracing amounts in Section R602.10.3 are increased in accordance with Table R602.10.3(4).
2. Light-frame walls with stone or masonry veneer shall be permitted in accordance with the provisions of Sections R702.1 and R703.
3. Fireplaces and chimneys shall be permitted in accordance with Chapter 10.

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.

R301.2.2.2.3 Masonry construction. Masonry construction shall comply with the requirements of Section R606.12.

R301.2.2.2.4 Concrete construction. Detached one- and two-family *dwelling*s 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.

R301.2.2.2.5 Irregular buildings. The seismic provisions of this code shall not be used for irregular structures located in Seismic Design Categories C, D₁ and D₂. 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. 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 1½ 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 uni-

form wall and roof loads and the reactions from headers having a span of 8 feet (2438 mm) or less.

2. 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. 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 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. Where openings in the floor or roof diaphragms having a maximum dimension of greater than 50 percent of the distance between lines of bracing or an area greater than 25 percent of the area between orthogonal pairs of braced wall lines are present, the structure shall be considered to be irregular.
5. 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. Where shear walls and *braced wall lines* do not occur in two perpendicular directions.

7. 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 D₁ and D₂. Structures assigned to Seismic Design Categories D₁ and D₂ shall conform to the requirements for Seismic Design Category C and the additional requirements of this section.

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 Category 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.

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

R301.2.2.3.6 Masonry chimneys. Masonry chimneys shall be reinforced and anchored to the building in accordance with Sections R1003.3 and R1003.4.