9-18-13

ORDINANCE NO. 29164

An ordinance amending Chapter 57, "Dallas One-and Two-Family Dwelling Code," of the Dallas City Code, as amended; adopting with certain changes the 2012 Edition of the International Residential Code of the International Code Council, Inc.; regulating the construction, enlargement, alteration, repair, demolition, use, and maintenance of construction, plumbing, mechanical, and electrical work in the city on one- and two-family dwellings; providing a penalty not to exceed $2,000; providing a saving clause; providing a severability clause; and providing an effective date.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF DALLAS:

SECTION 1. That Chapter 57, "Dallas One- and Two-Family Dwelling Code," of the Dallas City Code, as amended, is amended by adopting the 2012 Edition of the International Residential Code of the International Code Council, Inc. (which is attached as Exhibit A and made a part of this ordinance), with the following amendments:

1. Page xvii, "Legislation," is deleted.

2. Section R101, "General," of Chapter 1, "Scope and Administration," of the 2012 International Residential Code is amended to read as follows:

**"SECTION R101**
**GENERAL**

**R101.1 Title.** These provisions shall be known as the *Dallas* [~~*Residential Code for*~~] *One-and Two-F*[*f*]*amily Dwelling*[~~*s*~~] *Code* [~~of [**NAME OF JURISDICTION**]~~], and shall be cited as such and will be referred to herein as "this code."

**R101.2 Scope.** The provisions of the *Dallas* [~~*International Residential Code for*~~] *One-and Two-F[f]amily Dwelling*[~~s~~] *Code* shall apply to the construction, *alteration*, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings, townhomes and townhouses not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures*.

**Exceptions:**

1. Live/work units complying with the requirements of Section 419 of the *Dallas* [~~*International*~~] *Building Code* shall be permitted to be built as one- and two-family *dwellings*, townhomes, or townhouses. Fire suppression required by Section 419.5 of the *Dallas* [~~*International*~~] *Building Code* when constructed under the *Dallas* [~~*International Residential Code for*~~] *One- and Two-F[f]amily Dwelling*[~~s~~] *Code* shall conform to Section P2904.

2. Owner-occupied lodging houses with five or fewer guestrooms shall be permitted to be constructed in accordance with the *Dallas* [~~*International Residential Code for*~~] *One- and Two-F[f]amily Dwelling*[~~s~~] *Code* when the total building area is not greater than 7,500 square feet or equipped with a fire sprinkler system in accordance with Section P2904.

**R101.3 Intent.** The purpose of this code is to establish minimum requirements to safeguard the public safety, health and general welfare through affordability, structural strength, means of egress facilities, stability, sanitation, light and ventilation, energy conservation and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations."

3. Subsection R102.2, "Other Laws," of Section R102, "Applicability," of Chapter 1, "Scope and Administration," of the 2012 International Residential Code is amended to read as follows:

"**R102.2 Other laws.** The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law. In addition, except as otherwise provided in this chapter, all of the provisions of Chapter 52, "Administrative Procedures for the Construction Codes," of the *Dallas City Code* apply to this code."

4. Subsection R102.4, "Referenced Codes and Standards," of Section R102, "Applicability," of Chapter 1, "Scope and Administration," of the 2012 International Residential Code is amended to read as follows:

"**102.4 Referenced codes and standards.** The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference only when such codes and standards have been specifically adopted by the city of Dallas. Whenever amendments have been adopted to the referenced codes and standards, each reference to said code and standard shall be considered to reference the amendments as well. Any reference made to NFPA 70 or the *ICC Electrical Code* means the *Dallas Electrical Code* as adopted. References to the *International Building Code*, the *International Mechanical Code*, the *International Plumbing Code*, the *International Fire Code*, the *International Energy Conservation Code*, the *International Fuel Gas Code*, the *International Existing Building Code* and the *International Green Construction Code* mean the *Dallas Building Code*, the *Dallas Mechanical Code*, the *Dallas Plumbing Code*, the *Dallas Fire Code*, the *Dallas Energy Conservation Code*, the *Dallas Fuel Gas* Code, the *Dallas Existing Building* Code and the *Dallas Green Construction Code* respectively. Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code apply [~~as further regulated in Sections R102.4.1 and R102.4.2~~].

**Exception:** Where enforcement of a code provision would violate the conditions of the *listing* of the *equipment* or *appliance*, the conditions of the *listing* and manufacturer's instructions shall apply.

[~~**R102.4.1 Differences.** Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.~~

~~**R102.4.2 Provisions in referenced codes and standards.** Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over other provisions in the referenced code or standard.~~]"

5. Subsection R102.7, "Existing Structures," of Section R102, "Applicability," of Chapter 1, "Scope and Administration," of the 2012 International Residential Code is amended to read as follows:

"**R102.7 Existing structures.** The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, Chapter 27, "Minimum Urban Rehabilitation Standards," of the *Dallas City* [~~*International Property Maintenance*~~] *Code* or the *Dallas* [~~*International*~~] *Fire Code*, or as is deemed necessary by the *building official* for the general safety and welfare of the occupants and the public.

**R102.7.1 Additions, alternations or repairs.** *Additions*, *alterations* or repairs to any structure shall conform to the requirements for a new structure without requiring the existing structure to comply with all of the requirements of this code, unless otherwise stated. *Additions*, *alterations* or repairs shall not cause an existing structure to become unsafe or adversely affect the performance of the building. All newly constructed elements, components, structures and portions thereof, systems and spaces shall comply with the requirements of this code."

6. Section R103, "Department of Building Safety," of Chapter 1, "Scope and Administration," of the 2012 International Residential Code is deleted and replaced with a new Section R103, "Construction Documents," to read as follows:

**"SECTION R103**
**CONSTRUCTION DOCUMENTS**

**R103.1 Information on construction documents.** Construction documents shall be drawn upon suitable material. Electronic media documents are permitted to be submitted when approved by the *building official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the *building official*. Where required by the *building official*, all braced wall lines shall be identified on the construction documents and all pertinent information, including, but not limited to, bracing methods, location and length of braced wall panels, foundation requirements of braced wall panels at the top and bottom, shall be provided.

**R103.2 Manufacturer's installation instructions.** Manufacture's installation instructions, as required by this code, shall be available on the job site at the time of inspection."

7. Section R104, "Duties and Powers of the Building Official"; Section R105, "Permits"; Section R106, "Construction Documents"; Section R107, "Temporary Structures and Uses"; Section R108, "Fees"; Section R109, "Inspections"; Section R110, "Certificate of Occupancy"; Section R111, "Service Utilities"; Section R112, "Board of Appeals"; Section R113, "Violations"; and Section R114, "Stop Work Order," of Chapter 1, "Scope and Administration," of the 2012 International Residential Code are deleted.

8. Section R202, "Definitions," of Chapter 2, "Definitions," of the 2012 International Residential Code is amended by alphabetically adding or amending the following definitions to read as follows:

"**COMMERCIAL DWELLING SITE.** Three or more *dwelling units* on a *lot.*

**ENERGY SYSTEMS LABORATORY.** An agency established by the Texas Legislature to assist communities in evaluating code amendments to the energy provisions of the *International Residential Code* and the *International Energy Conservation Code* which now define the minimum energy efficiency standards for the State of Texas.

**FIRE WALL.** A fire-resistance-rated wall having protected openings, which restricts the spread of fire and extends continuously from the foundation to or through the roof, with sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall. Fire walls required by this code shall comply with the provisions of Section 706 of the *Dallas Building Code.*

**FLOOR AREA.** The area included within the surrounding *exterior walls* of a building or portion thereof, exclusive of vent shafts and courts. The floor area of a building, or portion thereof, not provided with surrounding *exterior walls* shall be the usable area under the horizontal projection of the roof or floor above.

**GLAZING AREA.** Total [~~The interior surface~~] area of the [~~all~~] glazed fenestration, measured using the rough opening and including [~~the area of~~] sash, curbing or other framing elements, that enclose *conditioned space*. Glazing area i[~~I~~]ncludes the area of glazed fenestration assemblies in walls bounding conditioned *basements*. For doors where the daylight opening area is less than 50 percent of the door area, the glazing area is the daylight opening area. For all other doors, the glazing area is the rough opening area for the door including the door and the frame.

**GREEN BUILDING.** Structures and their surrounding landscapes designed, constructed and maintained to decrease energy and water usage and costs, to improve the efficiency and longevity of building systems and to decrease the burdens imposed on the environment and public health.

**GREEN BUILT TEXAS.** An initiative of the Homebuilders Association of Greater Dallas that provides climate-specific guidelines and verification systems for residential and multifamily *green buildings.*

**GREEN BUILT TEXAS-CERTIFIABLE.** A *proposed project* that is not required to be registered with the Home Builders Association of Greater Dallas, but is planned, designed and constructed to meet or exceed a certified rating using version 2.0 of the *Green Built Texas* rating system.

**LEED.** The Leadership in Energy and Environmental Design *green building* rating systems are nationally accepted standards for *green buildings* developed by the *USGBC.*

**LEED-CERTIFIABLE.** A *proposed project* that is not required to be registered with the *USGBC*, but is planned, designed and constructed to meet or exceed a certified rating using LEED NC (new construction) version 2.2 to present, LEED CS (core and shell) version 2.0 to present, LEED CI (commercial interiors) version 2.0 to present, LEED for schools version 2007, LEED for healthcare, LEED for retail version 2 or LEED for homes.

**MULTIPLE DWELLING UNIT.** Any structure or portion thereof that contains more than one *dwelling unit.*

**OCCUPIED SPACE**. The total area of all buildings or structures on any *lot* or parcel of ground projected on a horizontal plane, excluding permitted projections as allowed by this code. Any space that could be assumed to be occupiable shall not be exempt from the requirements of this code by designing the space without means of egress, light, or ventilation.

**PROPOSED PROJECT.** For purposes of the *green building* program, the erection of any new structure for which a person, firm or corporation is required to obtain a building permit.

**TOWNHOME.** A *dwelling* located on a single-family or duplex *dwelling* site and constructed in a group of abutting structures separated by property lines with each *dwelling* extending from its foundation to its roof and with a *yard* or public way on at least two sides.

**TOWNHOUSE.** A *multiple* [~~single-family~~] *dwelling unit* located on a *commercial dwelling site* and constructed with a maximum [~~in a group~~] of two [~~three or more attached~~] units located between *exterior walls* or *fire walls* complying with Section 706 of the *Dallas Building Code* in which each unit extends from foundation to roof and with a *yard* or public way on at least two sides.

**TOWNHOUSING.** A multiple *dwelling unit* located on a *commercial dwelling site* with more than two units between *exterior walls* or *fire walls* complying with Section 706 of the *Dallas Building Code* in which each unit extends from foundation to roof and with a *yard* or public way on at least two sides.

**USGBC.** The U.S. Green Building Council, a nonprofit organization comprised of leaders from the building industry formed to encourage sustainability by promoting buildings that are environmentally responsible, profitable and healthy places to live and work."

9. Subsection R301.1, "Application," of Section R301, "Design Criteria," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R301.1 Application.** Buildings and structures, and all parts thereof, shall be constructed to safely support all loads, including dead loads, live loads, roof loads, flood loads, snow loads, wind loads and seismic loads as prescribed by this code. The construction of buildings and structures in accordance with the provisions of this code shall result in a system that provides a complete load path that meets all requirements for the transfer of all loads from their point of origin through the load-resisting elements to the foundation. Buildings and structures constructed as prescribed by this code are deemed to comply with the requirements of this section.

**R301.1.1 Alterative provisions.** As an alternative to the requirements in Section R301.1 the following standards are permitted subject to the limitations of this code and the limitations therein. Where engineered design is used in conjunction with these standards, the design shall comply with the *Dallas* [~~*International*~~] *Building Code.*

1. AF&PA *Wood Frame Construction Manual* (WFCM).

2. AISI *Standard for Cold-Formed Steel Framing—Prescriptive Method for One- and Two-Family Dwellings* (AISI S230).

3. ICC *Standards on the Design and Construction of Log Structures* (ICC 400).

**R301.1.2 Construction systems.** The requirements of this code are based on platform and balloon-frame construction for light-frame buildings. The requirements for concrete and masonry buildings are based on a balloon framing system. Other framing systems must have equivalent detailing to ensure force transfer, continuity and compatible deformations.

**R301.1.3 Engineered design.** When a building of otherwise conventional construction contains structural elements exceeding the limits of Section R301 or otherwise not conforming to this code, these elements shall be designed in accordance with accepted engineering practice. The extent of such design need only demonstrate compliance of nonconventional elements with other applicable provisions and shall be compatible with the performance of the conventional framed system. Engineered design in accordance with the *Dallas* [~~*International*~~] *Building Code* is permitted for all buildings and structures, and parts thereof, included in the scope of this code.

**R301.1.4 Elevators.** The provisions of Section R321 shall apply to the design, construction, installation, operation, alteration and repair of elevators, dumbwaiters, escalators and moving walks and their hoistways.

**R301.1.5 Fire protection provisions.** In addition to the requirements of Section R313, an automatic sprinkler system must be installed when required by the *Dallas Fire Code.*

**R301.1.6 Draftstop requirements.** Draftstopping must be installed in accordance with Section 302.12.

**R301.1.7 Security.** Chapter 41 of the *Dallas Building Code* (minimum standards for building security) applies to dwellings governed by this code.

**R301.1.8 Unity agreements.** The dissolution of common boundary lines for purposes of this code may be executed in accordance with Chapter 42 of the *Dallas Building Code*.

**R301.1.9 Special inspections.** The provisions of Chapter 17 of the *Dallas Building Code* apply to dwellings governed by this code.

**R301.1.10 Sound transmission ratings.** The sound transmission ratings of the wall assemblies between each *dwelling unit* of a two-family *dwelling*, a *townhome* or *townhouse* must comply with Appendix K."

10. Table R301.2(1), "Climatic and Geographic Design Criteria," of Subsection R301.2, "Climatic and Geographic Design Criteria," of Section R301, "Design Criteria," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

## "TABLE R301.2(1)
## CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

| GROUND SNOW LOAD | WIND DESIGN | | SEISMIC DESIGN CATEGORY[f] | SUBJECT TO DAMAGE FROM | | | WINTER DESIGN TEMP[e] | ICE BARRIER UNDERLAYMENT REQUIRED[h] | FLOOD HAZARDS[g] | AIR FREEZING INDEX[i] | MEAN ANNUAL TEMP[j] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Speed[d] (mph) | Topographic effects[k] | | Weathering[a] | Frost line depth[b] | Termite[c] | | | | | |
| 5 lb/ft$^2$ | 90 (3-sec-gust/75 fastest mile | No | A | moderate | 6" | very heavy | 22° F | No | local codes | 150 | 64.9° F |

For SI: 1 pound per square foot = 0.0479 kPa, 1 mile per hour = 0.447 m/s.

a. Weathering may require a higher strength concrete or grade of masonry than necessary to satisfy the requirements of this code. The weathering column shall be filled in with the weathering index (i.e., "negligible," "moderate" or "severe") for concrete as determined by the Weathering Probability Map [Figure R301.2(3)]. The grade of masonry units shall be determined from ASTM C 34, C 55, C 62, C 73, C 90, C 129, C 145, C 216 or C 652.

b. The frost line depth may require deeper footings than indicated in Figure R403.1(1). The jurisdiction shall fill in the frost line depth column with the minimum depth of footing below finish grade.

c. The jurisdiction shall fill in this part of the table to indicate the need for protection depending on whether there has been a history of local subterranean termite damage.

d. The jurisdiction shall fill in this part of the table with the wind speed from the basic wind speed map [Figure R301.2(4)A]. Wind exposure category shall be determined on a site-specific basis in accordance with Section R301.2.1.4.

e. The outdoor design dry-bulb temperature shall be selected from the columns of 97 ½-percent values for winter from Appendix D of the *International Plumbing Code*. Deviations from the Appendix D temperatures shall be permitted to reflect local climates or local weather experience as determined by the building official.

f. The jurisdiction shall fill in this part of the table with the seismic design category determined from Section R301.2.2.1.

g. The jurisdiction shall fill in this part of the table with (a) the date of the jurisdiction's entry into the National Flood Insurance Program (date of adoption of the first code or ordinance for management of flood hazard areas), (b) the date(s) of the Flood Insurance Study and (c) the panel numbers and dates of all currently effective FIRMS and FBFMs or other flood hazard map adopted by the authority having jurisdiction, as amended.

h. In accordance with Sections R905.2.7.1, R905.4.3.1, R905.5.3.1, R905.6.3.1, R905.7.3.1 and R905.8.3.1, when there has been a history of local damage from the effects of ice damming, the jurisdiction shall fill in this part of the table with "YES." Otherwise, the jurisdiction shall fill in this part of the table with "NO."

i. The jurisdiction shall fill in this part of the table with the 100-year return period air freezing index (BF-days) from Figure R403.3(2) or from the 100-year (99 percent) value on the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)" at www.ncdc.noaa.gov/fpsf.html.

j. The jurisdiction shall fill in this part of the table with the mean annual temperature from the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)" at www.ncdc.noaa.gov/fpsf.html.

k. In accordance with Section R301.2.1.5, where there is local historical data documenting structural damage to buildings due to topographic wind speed-up effects, the jurisdiction shall fill in this part of the table with "YES." Otherwise, the jurisdiction shall indicate "NO" in this part of the table."

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11. Subsection R302.1, "Exterior Walls," of Section R302, "Fire-Resistant Construction," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R302.1 Exterior walls.** Construction, projections, openings and penetrations of *exterior walls* of *dwellings* and accessory buildings shall comply with Table R302.1(1); or *dwellings* equipped throughout with an *automatic sprinkler system* installed in accordance with Section P2904 shall comply with Table R302.1(2).

**Exceptions:**

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance.*

2. Walls of *dwellings* and *accessory structures* located on the same *lot.*

3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits are not required to provide wall protection based on location on the *lot.* Projections beyond the *exterior wall* shall not extend over the *lot line* unless allowed under the *Dallas Development Code* and other applicable city ordinances.

4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).

5. Foundation vents installed in compliance with this code are permitted.

6. Carports open on all sides and constructed entirely of noncombustible materials may be constructed within 0 feet of the property line without fire-resistive construction or opening protection when the location of such is approved as required by other city ordinances. Projections beyond the exterior wall may not extend over the *lot line* unless allowed under the *Dallas Development Code* and other applicable city ordinances."

12. Subsection R302.2, "Townhouses," of Section R302, "Fire-Resistant Construction," of Chapter 3, "Building Planning," of the 2012 International Residential Code is retitled as Subsection R302.2, "Townhousing," and amended to read as follows:

"**R302.2 Townhousing** [~~**Townhouses**~~]. Each *townhousing* unit [~~*townhouse*~~] shall be considered an independent unit [~~a separate building~~] and shall be separated by fire-resistance-rated wall assemblies meeting the requirements of Section R302.1 for external walls.

**Exception:** A common 2-hour fire-resistance-rated wall assembly or 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 when equipped with an automatic sprinkler system installed throughout is permitted for townhousing [~~townhouses~~] if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations, if allowed by the *Dallas Development Code,* shall be installed in accordance with the *Dallas Electrical Code* [~~Chapters 34 through 43~~]. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.

**R302.2.1 Townhouses.** Each *townhouse* is considered an independent unit and must be separated by fire-resistance-rated wall assemblies meeting the requirements of Section R302.1 for exterior walls.

> **Exception:** Two 1-hour fire-resistance-rated wall assemblies tested in accordance with ASTM E 119 or UL 263 are permitted. The walls must be rated for fire exposure from both sides and must terminate horizontally and vertically in accordance with Section 706 of the *Dallas Building Code*. Electrical installations must be installed in accordance with the *Dallas Electrical Code*. Penetrations of electrical outlet boxes must be in accordance with Section R302.4.

**R302.2.2 Townhomes.** Each *townhome* is considered a separate building and must be separated by fire-resistance-rated wall assemblies meeting the requirements of Section R302.1 for exterior walls.

> **Exception:** A common 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 is permitted for townhomes if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall must be rated for fire exposure from both sides and must extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations, if allowed by the *Dallas Development Code*, must be installed in accordance with the *Dallas Electrical Code*. Penetrations of electrical outlet boxes must be in accordance with Section R302.4. Use of this provision requires a deed restriction in accordance with the *Dallas Development Code.*

**R302.2.3 Continuity.** The fire-resistance-rated wall or assembly separating dwellings covered by this subsection [~~*townhouses*~~] shall be continuous from the foundation to the underside of the roof sheathing, deck or slab. The fire-resistance rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached enclosed *accessory structures*.

**R302.2.4[~~2~~] Parapets.** Parapets constructed in accordance with Section R302.2.3 shall be constructed for dwellings covered by this subsection [~~*townhouses*~~] as an extension of exterior walls or common walls in accordance with the following:

1. Where roof surfaces adjacent to the wall or walls are at the same elevation, the parapet shall extend not less than 30 inches (762 mm) above the roof surfaces.

2. Where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is not more than 30 inches (762 mm) above the lower roof, the parapet shall extend not less than 30 inches (762 mm) above the lower roof surface.

   **Exception:** A parapet is not required in the two cases above when the roof is covered with a minimum class C roof covering, and the roof decking or sheathing is of noncombustible materials or *approved* fire-retardant-treated wood for a distance of 4 feet (1219 mm) on each side of the wall or walls, or one layer of 5/8-inch (15.9 mm) Type X gypsum board is installed directly beneath the roof decking or sheathing, supported by a minimum of nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members, for a minimum distance of 4 feet (1219 mm) on each side of the wall or walls and there are no openings or penetrations in the roof within 4 feet (1219 mm) of the common walls.

3. A parapet is not required where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is more than 30 inches (762 mm) above the lower roof. The common wall construction from the lower roof to the underside of the higher roof deck shall have not less than a 1-hour fire-resistance rating. The wall shall be rated for exposure from both sides.

**R302.2.5[~~3~~] Parapet construction.** Parapets shall have the same fire-resistance rating as that required for the supporting wall or walls. On any side adjacent to a roof surface, the parapet shall have noncombustible faces for the uppermost 18 inches (457 mm), to include counterflashing and coping materials. Where the roof slopes toward a parapet at slopes greater than 2 units vertical in 12 units horizontal (16.7-percent slope), the parapet shall extend to the same height as any portion of the roof within a distance of 3 feet (914 mm), but in no case shall the height be less than 30 inches (762 mm).

**R302.2.6[4] Structural independence.** Each individual *townhousing* unit, *townhouse* and *townhome* shall be structurally independent.

**Exceptions:**

1. Foundations supporting *exterior walls* or common walls for *townhousing* and *townhouses*. The foundations for *townhomes* must be physically separable from contiguous *townhomes* in the event of removal of a *townhome*. Each common or party wall must be governed by a set of deed restrictions, stipulating that if a *townhome* unit is removed, the party wall stays with the remaining *townhome*.

2. Structural roof and wall sheathing from each unit may fasten to the common wall framing.

3. Nonstructural wall and roof coverings.

4. Flashing at termination of roof covering over common wall.

5. *Townhousing, t*[~~T~~]*ownhouses* and *townhomes* separated by a common [~~1-hour~~] fire-resistance-rated wall as provided in Section R302.2."

13. Subsection R302.3, "Two-Family Dwellings," of Section R302, "Fire-Resistant Construction," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R302.3 Two-family dwellings.** *Dwelling units* in two-family dwellings shall be separated from each other by wall and/or floor assemblies having not less than a 1-hour fire-resistance rating when tested in accordance with ASTM E 119 or UL 263. Fire-resistance-rated floor/ceiling and wall assemblies shall extend to and be tight against the *exterior wall*, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.

**Exceptions:**

1. A fire-resistance rating of ½ hour shall be permitted in buildings equipped throughout with an automatic sprinkler system in accordance with NFPA 13.

2. Wall assemblies need not extend through *attic* spaces when the ceiling is protected by not less than 5/8-inch (15.9 mm) Type X gypsum board and an *attic* draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the *dwellings*. The structural framing supporting the ceiling shall also be protected by not less than ½-inch (12.7 mm) gypsum board or equivalent.

3. Two-family *dwelling units* that are also divided by a property line through the structure must be separated as required for *townhomes*.

**R302.3.1 Supporting construction.** When floor assemblies are required to be fire-resistance rated by Section R302.3, the supporting construction of such assemblies shall have an equal or greater fire-resistance rating."

14. Paragraph R302.5.1, "Opening Protection," of Subsection R302.5, "Dwelling/Garage Opening/Penetration Protection," of Section R302, "Fire-Resistant Construction," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R302.5.1 Opening protection.** Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with solid wood doors not less than 1 3/8 inches (35 mm) in thickness, solid or honey-comb-core steel doors not less than 1 3/8 inches (35 mm) thick, or 20-minute fire-rated doors[~~, equipped with a self-closing device~~]."

15. Subsection R302.12, "Draftstopping," of Section R302, "Fire-Resistant Construction," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R302.12 Draftstopping.** In combustible construction where there is usable space both above and below the concealed space of a floor/ceiling assembly, draftstops shall be installed so that the area of the concealed space does not exceed 1,000 square feet (92.9 $m^2$). Draftstopping shall divide the concealed space into approximately equal areas. Where the assembly is enclosed by a floor membrane above and a ceiling membrane below, draftstopping shall be provided in floor/ceiling assemblies under the following circumstances:

1. Ceiling is suspended under the floor framing.

2. Floor framing is constructed of truss-type open-web or perforated members.

**Exception:** When the entire building, including within the floor-ceiling assembly, is protected by an approved automatic sprinkler system, the floor-ceiling assembly is not required to be subdivided.

**R302.12.1 Materials.** Draftstopping materials shall not be less than ½-inch (12.7 mm) gypsum board, 3/8-inch (9.5 mm) wood structural panels or other *approved* materials adequately supported. Draftstopping shall be installed parallel to the floor framing members unless otherwise *approved* by the *building official*. The integrity of the draftstops shall be maintained.

**R302.12.2 Draftstopping attics.** Draftstopping shall be installed in attics and concealed roof spaces, such that any horizontal area does not exceed 9,000 square feet (836.13 $m^2$).

**Exception:** When the entire building, including the attic spaces, is protected by an *approved* automatic sprinkler system, the attic is not required to be subdivided."

16. Subsection R303.3, "Bathrooms," of Section R303, "Light, Ventilation and Heating," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R303.3 Bathrooms.** Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet (0.3 $m^2$), one-half of which must be openable.

**Exception:** The glazed areas shall not be required where artificial light and a local exhaust system are provided. The minimum local exhaust rates shall be determined in accordance with Section M1507. Exhaust air from the space shall be exhausted directly to the outdoors unless the space contains only a water closet, a lavatory or a combination thereof which may be ventilated with an *approved* mechanical recirculating fan or similar device designed to remove odors from the air."

17. Subparagraph R311.7.5.1, "Risers," of Paragraph R311.7.5, "Stair Treads and Risers," of Subsection R311.7, "Stairways," of Section R311, "Means of Egress," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R311.7.5.1 Risers.** The maximum riser height shall be 7¾ inches (196 mm). The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Risers shall be vertical or sloped from the underside of the nosing of the tread above at an angle not more than 30 degrees (0.51 rad) from the vertical. Open risers are permitted provided that the opening between treads does not permit the passage of a 4-inch-diameter (102 mm) sphere.

**Exceptions:**

1. The opening between adjacent treads is not limited on stairs with a total rise of 30 inches (762 mm) or less.

2. Private steps and stairways serving an occupant load of less than 10 and stairways to unoccupied roofs may be constructed with an 8-inch maximum riser height."

18. Subparagraph R311.7.5.2, "Treads," of Paragraph R311.7.5, "Stair Treads and Risers," of Subsection R311.7, "Stairways," of Section R311, "Means of Egress," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R311.7.5.2 Treads.** The minimum tread depth shall be 10 inches (254 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).

**Exception:** Private steps and stairways serving an occupant load of less than 10 and stairways to unoccupied roofs may be constructed with a 9-inch minimum tread depth.

**R311.7.5.2.1 Winder treads.** Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline. Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point within the clear width of the stair. Within any flight of stairs, the largest winder tread depth at the walkline shall not exceed the smallest winder tread by more than 3/8 inch (9.5 mm). Consistently shaped winders at the walkline shall be allowed within the same flight of stairs as rectangular treads and do not have to be within 3/8 inch (9.5 mm) of the rectangular tread depth."

19. Section R313, "Automatic Fire Sprinkler Systems," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**SECTION R313**
**AUTOMATIC FIRE SPRINKLER SYSTEMS**

**R313.1 Townhouse automatic fire sprinkler systems.** An automatic residential fire sprinkler system shall be installed in *townhouses*.

**Exceptions:**

1. The floor area of an existing unsprinklered *townhouse* greater than 7,500 square feet (696.77 $m^2$) and not housing a Group H occupancy may be increased by not more than 25 percent of the existing floor area (92.90 $m^2$). Only one increase in floor area is permitted under this exception.

2. New *townhouses* that are separated into fire areas no greater than 7,500 square feet (696.77 $m^2$) by the use of 2-hour-rated *fire walls*. Horizontal assemblies may not be used to satisfy this requirement. [~~An automatic residential fire sprinkler system shall not be required when *additions* or *alterations* are made to existing *townhouses* that do not have an automatic residential fire sprinkler system installed.~~]

**R313.1.1 Design and installation.** Automatic residential fire sprinkler systems for *townhouses* shall be designed and installed in accordance with Section P2904 or NFPA 13D.

**R313.2 One- and two-family dwellings automatic fire systems.** An automatic residential fire sprinkler system shall be installed in one- and two-family *dwellings*.

**Exceptions:**

1. The floor area of an existing unsprinklered building greater than 7,500 square feet (696.77 $m^2$) and not housing a Group H occupancy may be increased by not more than 25 percent of the existing floor area (92.90 $m^2$). Only one increase in the floor area is permitted under this exception.

2. New *dwellings* that are separated into fire areas no greater than 7,500 square feet (696.77 $m^2$) by the use of 2-hour rated *fire walls*. Horizontal assemblies may not be used to satisfy this requirement. [~~An automatic residential fire sprinkler system shall not be required for *additions* or *alterations* to existing buildings that are not already provided with an automatic residential sprinkler system.~~]

**R313.2.1 Design and installation.** Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.

**R313.3 Townhome automatic fire sprinkler systems.** An automatic residential fire sprinkler system must be installed in *townhomes*.

**Exceptions:**

1. The floor area of an existing unsprinklered *townhome* greater than 7,500 square feet (696.77 $m^2$) and not housing a Group H occupancy may be increased by not more than 25 percent of the existing floor area (92.90 $m^2$). Only one increase in floor area is permitted under this exception.

2. New *townhomes* that are separated into fire areas no greater than 7,500 square feet (696.77 $m^2$) by the use of 2-hour rated fire walls. Horizontal assemblies may not be used to satisfy this requirement.

**R313.3.1 Design and installation.** Automatic residential fire sprinkler systems for *townhomes* must be designed and installed in accordance with Section P2904 and NFPA 13D.

**R313.4 Townhousing automatic fire sprinkler systems.** An automatic residential fire sprinkler system must be installed in *townhousing*.

**Exception:** The floor area of an existing unsprinklered *townhousing* building greater than 7,500 square feet (696.77 $m^2$) and not housing a Group H occupancy may be increased by not more than 1,000 square feet (92.90 $m^2$). Only one increase in floor area is permitted under this exception.

**R313.4.1 Design and installation.** Automatic residential fire sprinkler systems for *townhouses* shall be designed and installed in accordance with NFPA 13R."

20. Subsection R314.4, "Power Source," of Section R314, "Smoke Alarms," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R314.4 Power source.** Smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

**Exceptions:**

1. Smoke alarms shall be permitted to be battery operated when installed in buildings without commercial power.

2. Hard wiring of smoke alarms in existing areas shall not be required where the *alterations* or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure[~~, unless there is an *attic*, crawl space or *basement* available which could provide access for hard wiring without the removal of interior finishes~~]."

21. Subsection R314.5, "Interconnection," of Section R314, "Smoke Alarms," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R314.5 Interconnection.** Where more than one smoke alarm is required to be installed within an individual dwelling unit in accordance with Section R314.3, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

**Exception:** Interconnection of smoke alarms in existing areas shall not be required where alterations or repairs do not result in removal of interior wall or ceiling finishes exposing the structure[~~, unless there is an attic, crawl space or basement available which could provide access for interconnection without the removal of interior finishes~~]."

22. Subsection R317.1, "Location Required," of Section R317, "Protection of Wood and Wood Based Products Against Decay," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R317.1 Location required.** Protection of wood and wood based products from decay shall be provided in the following locations by the use of naturally durable wood or wood that is preservative-treated in accordance with AWPA U1 for the species, product, preservative and end use. Preservatives shall be listed in Section 4 of AWPA U1.

1. Wood joists or the bottom of a wood structural floor when closer than 18 inches (457 mm) or wood girders when closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation.

2. All wood framing members that rest on concrete or masonry exterior foundation walls and are less than 8 inches (203 mm) from the exposed ground.

3. Sills and sleepers on a concrete or masonry slab that is in direct contact with the ground unless separated from such slab by an impervious moisture barrier.

4. The ends of wood girders entering exterior masonry or concrete walls having clearances of less than ½ inch (12.7 mm) on tops, sides and ends.

5. Wood siding, sheathing and wall framing on the exterior of a building having a clearance of less than 6 inches (152 mm) from the ground or less than 2 inches (51 mm) measured vertically from concrete steps, porch slabs, patio slabs, and similar horizontal surfaces exposed to the weather.

6. Wood structural members supporting moisture-permeable floors or roofs that are exposed to the weather, such as concrete or masonry slabs, unless separated from such floors or roofs by an impervious moisture barrier.

7. Wood furring strips or other wood framing members attached directly to the interior of exterior masonry walls or concrete walls below *grade* except where an *approved* vapor retarder is applied between the wall and the furring strips or framing members.

8. When the bottoms of wood structural floor elements, including joists, girders and subfloor, are less than 8 inches (203 mm) above the horizontal projection of the outside ground level and extend toward the outside ground beyond the plane represented by the interior face of the foundation wall studs, such elements shall be approved naturally durable or preservative-treated wood.

**R317.1.1 Field treatment.** Field-cut ends, notches and drilled holes of preservative-treated wood shall be treated in the field in accordance with AWPA M4.

**R317.1.2 Ground contact.** All wood in contact with the ground, embedded in concrete in direct contact with the ground or embedded in concrete exposed to the weather that supports permanent structures intended for human occupancy shall be *approved* pressure-preservative-treated wood suitable for ground contact use, except untreated wood may be used where entirely below groundwater level or continuously submerged in fresh water.

**R317.1.3 Geographical areas.** In geographical areas where experience has demonstrated a specific need, *approved* naturally durable or pressure-preservative-treated wood shall be used for those portions of wood members that the form the structural supports of buildings, balconies, porches or similar permanent building appurtenances when those members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering that would prevent moisture or water accumulation on the surface or at joints between members. Depending on local experience, such members may include:

1. Horizontal members such as girders, joists and decking.
2. Vertical members such as posts, poles and columns.
3. Both horizontal and vertical members.

**R317.1.4 Wood columns.** Wood columns shall be *approved* wood of natural wood decay resistance or *approved* pressure-preservative-treated wood.

**Exceptions:**

1. Columns exposed to the weather or in *basements* when supported by concrete piers or metal pedestals projecting 1 inch (25.4 mm) above a concrete floor or 6 inches (152 mm) above exposed earth and the earth is covered by an *approved* impervious moisture barrier.
2. Columns in enclosed crawl spaces or unexcavated areas located within the periphery of the building when supported by a concrete pier or metal pedestal at a height more than 8 inches (203 mm) from exposed earth and the earth is covered by an impervious moisture barrier.

**R317.1.5 Exposed glued-laminated timbers.** The portions of glued-laminated timbers that form the structural supports of a building or other structure and are exposed to weather and not properly protected by a roof, eave or similar covering shall be pressure treated with preservative, or be manufactured from naturally durable or preservative treated wood."

23. Section R320, "Accessibility," of Chapter 3, "Building Planning," of the 2012 International Residential Code is deleted.

24. Subsection R321.1, "Elevators," of Section R321, "Elevators and Platform Lifts," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R321.1 Elevators.** Where provided, passenger elevators, limited-use/limited-application elevators or private residence elevators shall comply with ASME A17.1.

**Exception:** The appendices of ASME A17.1—2010 do not apply. The building owner shall be responsible for the safe operation and maintenance of each elevator, dumbwaiter, escalator or moving walk installation and shall cause periodic inspections, test and maintenance to be made on such conveyance."

25. Subsection R322.1, "General," of Section R322, "Flood-Resistant Construction," of Chapter 3, "Building Planning," of the 2012 International Residential Code is amended to read as follows:

"**R322.1 General.** Buildings and structures constructed in whole or in part in flood hazard areas (including A or V Zones) as established in Table R301.2(1), shall be designed and constructed in accordance with the provisions contained in this section. Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24.

**Exception:** Buildings and structures permitted to be located, designed and constructed in the flood plain areas in accordance with the regulations of the *Dallas Development Code.*

**R322.1.1 Alternative provisions.** As an alternative to the requirements in Section R322.3 for buildings and structures located in whole or in part in coastal high-hazard areas (V Zones) and Coastal A Zones, if delineated, ASCE 24 is permitted subject to the limitations of this code and the limitations therein.

**R322.1.2 Structural systems.** All structural systems of all buildings and structures shall be designed, connected and anchored to resist flotation, collapse or permanent lateral movement due to structural loads and stresses from flooding equal to the design flood elevation.

**R322.1.3 Flood-resistant construction.** All buildings and structures erected in areas prone to flooding shall be constructed by methods and practices that minimize flood damage.

**R322.1.4 Establishing the design flood elevation.** The design flood elevation shall be used to define flood hazard areas. At a minimum, the design flood elevation is the higher of:

1. The base flood elevation at the depth of peak elevation of flooding (including wave height) which has a 1 percent (100-year flood) or greater chance of being equaled or exceeded in any given year; or

2. The elevation of the design flood associated with the area designated on a flood hazard map adopted by the community, or otherwise legally designated.

**R322.1.4.1 Determination of design flood elevations.** If design flood elevations are not specified, the *building official* is authorized to require the applicant to:

1. Obtain and reasonably use data available from a federal, state or other source; or

2. Determine the design flood elevation in accordance with accepted hydrologic and hydraulic engineering practices used to define special flood hazard areas. Determinations shall be undertaken by a registered *design professional* who shall document that the technical methods used reflect currently accepted engineering practice. Studies, analyses and computations shall be submitted in a sufficient detail to allow thorough review and approval.

**R322.1.4.2 Determination of impacts.** In riverine flood hazard areas where design flood elevations are specified but floodways have not been designated, the applicant shall demonstrate that the effect of the proposed buildings and structures on design flood elevations, including fill, when combined with all other existing and anticipated flood hazard area encroachments, will not increase the design flood elevation more than 1 foot (305 mm) at any point within the jurisdiction.

**R322.1.5 Lowest floor.** The lowest floor shall be the floor of the lowest enclosed area, including *basement*, but excluding any unfinished flood-resistant enclosure that is useable solely for vehicle parking, building access or limited storage provided that such enclosure is not built so as to render the building or structure in violation of this section.

**R322.1.6 Protection of mechanical and electrical systems.** Electrical systems, *equipment* and components; heating, ventilating, air conditioning; plumbing *appliances* and plumbing fixtures; *duct systems*; and other service *equipment* shall be located at or above the elevation required in Section R322.2 (flood hazard areas including A Zones) or R322.3 (coastal high-hazard areas including V Zones). If replaced as part of a substantial improvement, electrical systems, *equipment* and components; heating, ventilating, air conditioning and plumbing *appliances* and plumbing fixtures; *duct systems*; and other service *equipment* shall meet the requirements of this section. Systems, fixtures, and *equipment* and components shall not be mounted on or penetrate through walls intended to break away under flood loads.

**Exception:** Locating electrical systems, *equipment* and components; heating, ventilating, air conditioning; plumbing *appliances* and plumbing fixtures; *duct systems*; and other service *equipment* is permitted below the elevation required in Section R322.2 (flood hazard areas including A Zones) or R322.3 (coastal high-hazard areas including V Zones) provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation in accordance with ASCE 24. Electrical wiring systems are permitted to be located below the required elevation provided they conform to the provisions of the electrical part of this code for wet locations.

**R322.1.7 Protection of water supply and sanitary sewer systems.** New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems in accordance with the plumbing provisions of this code. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into systems and discharges from systems into floodwaters in accordance with the plumbing provisions of this code [~~and Chapter 3 of the *International Private Sewage Disposal Code*~~].

**R322.1.8 Flood-resistant materials.** Building materials used below the elevation required in Section R322.2 (flood hazard areas including A Zones) or R322.3 (coastal high-hazard areas including V-Zones) shall comply with the following:

1. All wood, including floor sheathing, shall be pressure-preservative-treated in accordance with AWPA U1 for the species, product, preservative and end use or be the decay-resistant heartwood of redwood, black locust or cedars. Preservatives shall be listed in Section 4 of AWPA U1.

2. Materials and installation methods used for flooring and interior and *exterior walls* and wall coverings shall conform to the provisions of FEMA/FIA-TB-2.

**R322.1.9 Industrialized housing** [~~**Manufactured homes**~~]. New or replacement industrialized homes [~~*manufactured homes*~~] shall be elevated in accordance with Section R322.2 (flood hazard areas including A Zones) or Section R322.3 in coastal high-hazard areas (V Zones). The foundation [~~anchor and tie-down~~] requirements of Sections AE604 and AE605 of Appendix E shall apply. The foundation and anchorage of industrialized homes [~~*manufactured homes*~~] to be located in identified floodways shall be designed and constructed in accordance with the applicable provisions of the *Dallas Building Code* [~~ASCE 24~~].

**R322.1.10 As-built elevation documentation.** A registered *design professional* shall prepare and seal documentation of the elevations specified in Section R322.2 or R322.3."

26. Chapter 3, "Building Planning," of the 2012 International Residential Code is amended by adding a new Section 324, "Aircraft Noise Attenuation Requirements," to read as follows:

"SECTION 324
AIRCRAFT NOISE ATTENUATION REQUIREMENTS

**324.1 Definitions.** The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

**A-WEIGHTED SOUND LEVEL.** An A-weighted sound level is a sound level occurring in the 1,000 to 6,000 Hz frequency range that is increased by 10 dB if the noise event occurs between 10:00 p.m. and 7:00 a.m. The A-weighted sound level reflects the greater intrusiveness of sounds that the ear perceives as louder compared to other frequencies. "dBA" or "dB(A)" indicate a sound level measurement has been A-weighted.

**DAY-NIGHT AVERAGE SOUND LEVEL.** The day-night average sound level is the noise exposure in areas around airports (abbreviated as "DNL" in text and "$L_{dn}$" in equations). DNL is a measure of the average A-weighted sound level of all aircraft flights occurring in a 24-hour period.

**324.2 Aircraft noise zone.** All land within a DNL noise contour of 65 dBA or greater, as shown on the aircraft noise maps available for review at the Division of Building Inspection is subject to these regulations. A building that is only partly located within an aircraft noise zone is also subject to these regulations.

**324.3 Noise insulation.**

**324.3.1 Certification of plans prior to issuance of building permit.** A registered Texas engineer who has demonstrable knowledge of acoustical engineering shall certify that the plans and specifications comply with the noise insulation standards of Section 324.3.2. The *building official* shall not issue a building permit for any building within an aircraft noise zone unless the plans and specifications for the building meet the noise insulation standards of Section 324.3.2.

**Exception:** The plans and specifications may be prepared and certified by a member of the National Council of Acoustical Consultants or another organization approved by the *building official.*

**324.3.2 Noise insulation standards.** New buildings must be constructed with sound insulation or other means to achieve a DNL of 45 dBA or less inside the building. If the cost of modifications to an existing building is 75 percent or more of the total assessed improvement value of the site, the building must also meet this standard. Garages and similar accessory buildings that do not include living space are exempt from this requirement."

27. Chapter 3, "Building Planning," of the 2012 International Residential Code is amended by adding a new Section 325, "Green Building Program," to read as follows:

## "SECTION 325
## GREEN BUILDING PROGRAM

**325.1 Purpose.** The purpose of this section is to establish *green building* standards to help reduce the use of natural resources, create a healthier and more sustainable living environment and minimize the negative environmental impacts of development in Dallas and the North Texas region.

**325.2 All new construction.** All *proposed projects* must:

1. meet the minimum requirements of ICC 700;

2. meet the prescriptive requirements of Section 325.5;

3. be *LEED-certifiable* under the LEED for homes standard;

4. be *Green Built Texas-certifiable*; or

5. meet an equivalent minimum *green building* standard certification level as determined by the *building official.*

Formal certification by the *USGBC*, *Green Built Texas* or an equivalent entity is not required.

**325.3 LEED.** For *proposed projects* utilizing LEED for homes, the point total must include 1 point under the water efficiency credit titled "Indoor Water Use."

**325.4 Green Built Texas.** For *proposed projects* utilizing the *Green Built Texas* standards, energy use requirements must be met by:

1. Providing an International Code Compliance Calculator (IC3)-Energy Systems Laboratory certificate to the *building official* showing energy consumption that meets the minimum requirements of Chapter 11 of this code or Chapter 4 of the *Dallas Energy Conservation Code;* or

2. A HERS index of 85 or less.

**325.5 Prescriptive requirements.**

**325.5.1 Storm water.** For all *proposed projects*, lots must be designed so that at least 70 percent of the built environment, not including any area under a roof, is permeable or designed to capture water runoff for infiltration onsite. The following areas may be counted toward the 70 percent requirement:

1. Vegetative landscape such as grass, trees and shrubs.

2. Permeable paving, installed by an experienced professional. Permeable paving must include porous above-ground materials, such as open pavers and engineered products, and a 6-inch porous sub-base. The base layer must be designed to ensure proper drainage from the home.

3. Impermeable surfaces that are designed to direct all runoff toward an appropriate permanent infiltration feature such as a vegetated swale, onsite rain garden or rainwater cistern.

**325.5.2 Water efficiency.**

**325.5.2.1 New construction.** *Proposed projects* must:

1. Utilize drip irrigation emitters for all bedding areas of an approved landscape plan, and

2. Meet water reduction strategies that include installing high-efficiency (low-flow) fixtures or fittings which meet at least three of the following requirements:

2.1. The average flow rate for all lavatory faucets must be less than or equal to 2.0 gallons per minute.

2.2. The average flow rate for all shower heads must be less than or equal to 2.0 gallons per minute.

2.3. The average flow rate for all toilets must be:

2.3.1. Less than or equal to 1.3 gallons per flush;

2.3.2. Be dual flush and meet the requirements of ASME A 112.19.14; or

2.3.3. Meet the U.S. Environmental Protection Agency Water Sense specification and be certified and labeled correctly.

2.4. Utilize ENERGY STAR labeled dishwashers that use 6.0 gallons or less per cycle.

2.5. Utilize ENERGY STAR labeled clothes washers with a modified energy factor (MEF) greater than or equal to 2.0 and a water factor (WF) of less than 5.

**325.5.2.2 Additions to existing one- and two-family dwellings.** Additions to existing one- and two-family *dwellings* must meet at least two of the following water reduction strategies:

1. The average flow rate for all lavatory faucets must be less than or equal to 2.0 gallons per minute.

2. The average flow rate for all shower heads must be less than or equal to 2.0 gallons per minute.

3. The average flow rate for all toilets must be:

   3.1. Less than or equal to 1.3 gallons per flush;

   3.2. Be dual flush and meet the requirements of ASME A 112.19.14; or

   3.3. Meet the U.S. Environmental Protection Agency Water Sense specification and be certified and labeled correctly.

**325.5.3 Energy efficiency.** All *proposed projects* must:

1. Meet the performance requirements of ENERGY STAR for Homes to achieve a HERS rating of 75; or

2. Achieve energy efficiency 15 percent above the requirements of the *Dallas Energy Conservation Code* using the IC3 calculator.

**325.5.4 Heat island mitigation.** *Proposed projects* shall install an ENERGY STAR qualified roof on all roofs with a slope of 2:12 or greater.

**Exception:** A vegetated roof may installed subject to approval by the *building official.*

**325.5.5 Indoor air quality.**

**325.5.5.1 HVAC.** For *proposed projects*, all air-handling equipment and ductwork must be outside the fire-rated envelope of the garage.

**325.5.5.2 Minimize pollutants from the garage.** For *proposed projects*, surfaces between conditioned space and an attached garage must be tightly sealed.

**325.5.5.2.1 Conditioned spaces above a garage.**

1. All penetrations must be sealed.

2. All floor and ceiling joist bays must be sealed.

3. The walls and ceilings of conditioned spaces above a garage must be painted.

**325.5.5.2.2 Conditioned spaces next to a garage.**

1. All penetrations must be sealed.

2. All doors must be weather stripped.

3. All cracks at the base of the wall must be sealed.

**325.5.5.2.3 Air filters.**

1. For *proposed projects*, air filters must be installed with a minimum reporting value (MERV) equal to or greater than 8.

2. For *proposed projects*, air handlers must be able to maintain adequate air pressure and air flow.

3. For *proposed projects*, air filter housings must be airtight to prevent bypass or leakage."

28. Subsection R401.2, "Requirements," of Section R401, "General," of Chapter 4, "Foundations," of the 2012 International Residential Code is amended to read as follows:

"**R401.2 Requirements.** Foundation construction shall be capable of accommodating all loads according to Section R301 and of transmitting the resulting loads to the supporting soil. Fill soils that support footings and foundations shall be designed, installed and tested in accordance with accepted engineering practice. Gravel fill used as footings for wood and precast concrete foundations shall comply with Section R403. Every foundation or footing, or any sized addition to an existing post-tension foundation, regulated by this code must be designed and sealed by an engineer registered in the State of Texas."

29. Paragraph R403.1.1, "Minimum Size," of Subsection R403.1, "General," of Section R403, "Footings," of Chapter 4, "Foundations," of the 2012 International Residential Code is amended to read as follows:

"**R403.1.1 Minimum size.** The m[~~M~~]inimum width, W, and thickness, T, [~~sizes~~] for concrete [~~and masonry~~] footings shall be in accordance with [~~as set forth in~~] Table R403.1(1) through R403.1(3) and Figure R403.1(1). The footing width[~~, W,~~] shall be based on the load-bearing value of the soil in accordance with Table R401.4.1. [~~Spread footings shall be at least 6 inches (152 mm) in thickness, T.~~] Footing projections, P, shall be at least 2 inches (51 mm) and shall not exceed the thickness of the footing. Footing thickness and projection for fireplaces shall be in accordance with Section R1001.2. The size of footings supporting piers and columns shall be based on the tributary load and allowable soil pressure in

accordance with Table R401.4.1. Footings for wood foundations shall be in accordance with the details set forth in Section R403.2, and Figures R403.1(2) and R403.1(3)."

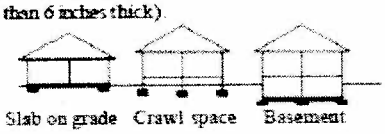
30. Table R403.1, "Minimum Width of Concrete, Precast or Masonry Footings (Inches)," of Subsection R403.1, "General," of Section R403, "Footings," of Chapter 4, "Foundations," of the 2012 International Residential Code is deleted.

31. Subsection R403.1, "General," of Section R403, "Footings," of Chapter 4, "Foundations," of the 2012 International Residential Code is amended by adding a new Table R403.1(1), "Minimum Width and Thickness for Concrete Footings for Light Frame Construction," to read as follows:

"TABLE R403.1(1)
MINIMUM WIDTH AND THICKNESS FOR CONCRETE
FOOTINGS FOR LIGHT FRAME CONSTRUCTION

| Snow Load or Roof Live Load | Story and Type of Structure with Light Frame | Load-Bearing Value of Soil (psf) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 |
| 20 psf | 1 story – slab on grade | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 18 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – slab on grade | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 16 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – plus basement | 22 x 6 | 16 x 6 | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – slab on grade | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – with crawl space | 19 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – plus basement | 25 x 8 | 19 x 6 | 15 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| 30 psf | 1 story – slab on grade | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 19 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – slab on grade | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 17 x 6 | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – plus basement | 23 x 6 | 17 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – slab on grade | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – with crawl space | 20 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – plus basement | 26 x 8 | 20 x 6 | 16 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| 50 psf | 1 story – slab on grade | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 16 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 21 x 6 | 16 x 6 | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – slab on grade | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 19 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – plus basement | 25 x 7 | 19 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – slab on grade | 17 x 6 | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – with crawl space | 22 x 6 | 17 x 6 | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – plus basement | 28 x 9 | 21 x 6 | 17 x 6 | 14 x 6 | 12 x 6 | 12 x 6 |
| 70 psf | 1 story – slab on grade | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 18 x 6 | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 24 x 7 | 18 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – slab on grade | 16 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 21 x 6 | 16 x 6 | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – plus basement | 27 x 9 | 20 x 6 | 16 x 6 | 14 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – slab on grade | 19 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – with crawl space | 25 x 7 | 18 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – plus basement | 30 x 10 | 23 x 6 | 18 x 6 | 15 x 6 | 13 x 6 | 12 x 6 |

1. Interpolation allowed. Extrapolation is not allowed
2. Based on 32 foot wide house with load bearing center wall that carries half of the tributary attic and floor framing. For every 2 feet of adjustment to the width of the house add or subtract 2 inches of footing width and 1 inch of footing thickness (but not less than 6 inches thick).



Slab on grade Crawl space Basement

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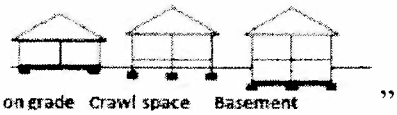
32. Subsection R403.1, "General," of Section R403, "Footings," of Chapter 4, "Foundations," of the 2012 International Residential Code is amended by adding a new Table R403.1(2), "Minimum Width and Thickness for Concrete Footings for Light Frame Construction With Brick Veneer," to read as follows:

**"TABLE R403.1(2)**
**MINIMUM WIDTH AND THICKNESS FOR CONCRETE FOOTINGS FOR LIGHT FRAME CONSTRUCTION WITH BRICK VENEER**

| Snow Load or Roof Live Load | Story and Type of Structure with Light Frame | Load-Bearing Value of Soil (psf) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 |
| 20 psf | 1 story – slab on grade | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 21 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – slab on grade | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 20 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – plus basement | 26 x 8 | 20 x 6 | 16 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – slab on grade | 20 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – with crawl space | 26 x 8 | 19 x 6 | 15 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – plus basement | 32 x 11 | 24 x 7 | 19 x 6 | 16 x 6 | 14 x 6 | 12 x 6 |
| 30 psf | 1 story – slab on grade | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 16 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 22 x 6 | 16 x 6 | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – slab on grade | 16 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 22 x 6 | 16 x 6 | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – plus basement | 27 x 9 | 21 x 6 | 16 x 6 | 14 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – slab on grade | 21 x 6 | 16 x 6 | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – with crawl space | 27 x 8 | 20 x 6 | 16 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – plus basement | 33 x 11 | 24 x 7 | 20 x 6 | 16 x 6 | 14 x 6 | 12 x 6 |
| 50 psf | 1 story – slab on grade | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 18 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 24 x 7 | 18 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – slab on grade | 18 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 24 x 7 | 18 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – plus basement | 29 x 10 | 22 x 6 | 18 x 6 | 15 x 6 | 13 x 6 | 12 x 6 |
| | 3 story – slab on grade | 24 x 7 | 18 x 6 | 13 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – with crawl space | 29 x 9 | 22 x 6 | 17 x 6 | 14 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – plus basement | 35 x 12 | 26 x 8 | 21 x 6 | 17 x 6 | 15 x 6 | 13 x 6 |
| 70 psf | 1 story – slab on grade | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 20 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 26 x 8 | 20 x 6 | 16 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – slab on grade | 20 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 26 x 8 | 19 x 6 | 15 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – plus basement | 32 x 11 | 24 x 7 | 19 x 6 | 16 x 6 | 14 x 6 | 12 x 6 |
| | 3 story – slab on grade | 26 x 8 | 19 x 6 | 15 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – with crawl space | 31 x 11 | 23 x 7 | 19 x 6 | 16 x 6 | 13 x 6 | 12 x 6 |
| | 3 story – plus basement | 37 x 13 | 28 x 9 | 22 x 6 | 18 x 6 | 16 x 6 | 14 x 6 |

1. Interpolation allowed. Extrapolation is not allowed
2. Based on 32 foot wide house with load bearing center wall that carries half of the tributary attic and floor framing. For every 2 feet of adjustment to the width of the house add or subtract 2 inches of footing width and 1 inch of footing thickness (but not less than 6 inches thick).

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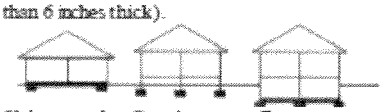
33. Subsection R403.1, "General," of Section R403, "Footings," of Chapter 4, "Foundations," of the 2012 International Residential Code is amended by adding a new Table R403.1(3), "Minimum Width and Thickness for Concrete Footings With Cast-In-Place Concrete or Full Masonry Wall Construction," to read as follows:

**"TABLE R403.1(3)**
**MINIMUM WIDTH AND THICKNESS FOR CONCRETE FOOTINGS WITH CAST-IN-PLACE CONCRETE OR FULL MASONRY WALL CONSTRUCTION**

| Snow Load or Roof Live Load | Story and Type of Structure with Light Frame | Load-Bearing Value of Soil (psf) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 |
| 20 psf | 1 story – slab on grade | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 19 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 25 x 8 | 19 x 6 | 15 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – slab on grade | 23 x 7 | 18 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 29 x 9 | 22 x 6 | 17 x 6 | 14 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – plus basement | 35 x 12 | 26 x 8 | 21 x 6 | 17 x 6 | 15 x 6 | 13 x 6 |
| | 3 story – slab on grade | 32 x 11 | 24 x 7 | 19 x 6 | 16 x 6 | 14 x 6 | 12 x 6 |
| | 3 story – with crawl space | 38 x 14 | 28 x 9 | 23 x 6 | 19 x 6 | 16 x 6 | 14 x 6 |
| | 3 story – plus basement | 43 x 17 | 33 x 11 | 26 x 8 | 22 x 6 | 19 x 6 | 16 x 6 |
| 30 psf | 1 story – slab on grade | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 20 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 26 x 8 | 20 x 6 | 16 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – slab on grade | 24 x 7 | 18 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 30 x 10 | 22 x 6 | 18 x 6 | 15 x 6 | 13 x 6 | 12 x 6 |
| | 2 story – plus basement | 36 x 13 | 27 x 8 | 21 x 6 | 18 x 6 | 15 x 6 | 13 x 6 |
| | 3 story – slab on grade | 33 x 12 | 25 x 7 | 20 x 6 | 17 x 6 | 14 x 6 | 12 x 6 |
| | 3 story – with crawl space | 39 x 14 | 29 x 9 | 23 x 7 | 19 x 6 | 17 x 6 | 14 x 6 |
| | 3 story – plus basement | 44 x 17 | 33 x 12 | 27 x 8 | 22 x 6 | 19 x 6 | 17 x 6 |
| 50 psf | 1 story – slab on grade | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 19 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 23 x 7 | 18 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – slab on grade | 21 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 25 x 8 | 19 x 6 | 15 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – plus basement | 30 x 10 | 23 x 6 | 18 x 6 | 15 x 6 | 13 x 6 | 12 x 6 |
| | 3 story – slab on grade | 27 x 8 | 20 x 6 | 20 x 6 | 13 x 6 | 12 x 6 | 12 x 6 |
| | 3 story – with crawl space | 32 x 11 | 24 x 7 | 19 x 6 | 16 x 6 | 14 x 6 | 12 x 6 |
| | 3 story – plus basement | 36 x 13 | 27 x 9 | 22 x 6 | 18 x 6 | 16 x 6 | 14 x 6 |
| 70 psf | 1 story – slab on grade | 19 x 6 | 14 x 6 | 12 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – with crawl space | 25 x 7 | 18 x 6 | 15 x 6 | 12 x 6 | 12 x 6 | 12 x 6 |
| | 1 story – plus basement | 30 x 10 | 23 x 6 | 18 x 6 | 15 x 6 | 13 x 6 | 12 x 6 |
| | 2 story – slab on grade | 29 x 9 | 22 x 6 | 17 x 6 | 14 x 6 | 12 x 6 | 12 x 6 |
| | 2 story – with crawl space | 34 x 12 | 26 x 8 | 21 x 6 | 17 x 6 | 15 x 6 | 13 x 6 |
| | 2 story – plus basement | 40 x 15 | 30 x 10 | 24 x 7 | 20 x 6 | 17 x 6 | 15 x 6 |
| | 3 story – slab on grade | 38 x 14 | 28 x 9 | 23 x 6 | 19 x 6 | 16 x 6 | 14 x 6 |
| | 3 story – with crawl space | 43 x 16 | 32 x 11 | 26 x 8 | 21 x 6 | 18 x 6 | 16 x 6 |
| | 3 story – plus basement | 49 x 19 | 37 x 13 | 29 x 10 | 24 x 7 | 21 x 6 | 18 x 6 |

1. Interpolation allowed. Extrapolation is not allowed

2. Based on 32 foot wide house with load bearing center wall that carries half of the tributary attic and floor framing. For every 2 feet of adjustment to the width of the house add or subtract 2 inches of footing width and 1 inch of footing thickness (but not less than 6 inches thick).



Slab on grade Crawl space Basement

"

34. Paragraph R403.1.4, "Minimum Depth," of Subsection R403.1, "General," of Section R403, "Footings," of Chapter 4, "Foundations," of the 2012 International Residential Code is amended to read as follows:

"**R403.1.4 Minimum depth.** All exterior footings shall be placed at least 12 inches (305 mm) below the undisturbed ground surface. Where applicable, the depth of footings shall also conform to Sections R403.1.4.1 through R403.1.4.2.

**Exception:** A one-story wood or metal-frame building not used for human occupancy and not over 400 square feet (37.2 $m^2$) in floor area may be constructed with walls supported on a wood foundation plate when approved by the *building official.*

**R403.1.4.1 Frost protection.** Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extended below the frost line specified in Table R301.2(1);
2. Constructing in accordance with Section R403.3;
3. Constructing in accordance with ASCE 32; or
4. Erected on solid rock.

**Exceptions:**

1. Protection of freestanding *accessory structures* with an area of 600 square feet (56 $m^2$) or less, of light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.
2. Protection of freestanding *accessory structures* with an area of 400 square feet (37 $m^2$) or less, of other than light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.
3. Decks not supported by a dwelling need not be provided with footings that extend below the frost line.

Footings shall not bear on frozen soil unless the frozen condition is permanent.

**R403.1.4.2 Seismic conditions.** In Seismic Design Categories $D_0$, $D_1$ and $D_2$, interior footings supporting bearing or bracing walls and cast monolithically with a slab on *grade* shall extend to a depth of not less than 12 inches (305 mm) below the top of the slab."

35. Subsection R408.7, "Flood Resistance," of Section R408, "Under-Floor Space," of Chapter 4, "Foundations," of the 2012 International Residential Code is amended to read as follows:

"**R408.7 Flood resistance.** For buildings located in flood hazard areas as established in Table R301.2(1):

1. Walls enclosing the under-floor space shall be provided with flood openings in accordance with Section R322.2.2.

   **Exception:** Walls that meet the requirements of the floodplain regulations of the *Dallas Development Code.*

2. The finished ground level of the under-floor space shall be equal to or higher than the outside finished ground level on at least one side.

   **Exceptions:**

   1. Under-floor spaces that meet the requirements of FEMA/FIA TB 11-1.

   2. Under-floor spaces that meet the requirements of the floodplain regulations of the *Dallas Development Code.*"

36. Table R502.3.1(1), "Floor Joist Spans For Common Lumber Species," of Paragraph R502.3.1, "Sleeping Areas and Attic Joists," of Subsection R502.3, "Allowable Joist Spans," of Section R502, "Wood Floor Framing," of Chapter 5, "Floors," of the 2012 International Residential Code is amended to read as follows:

**TABLE R502.3.1(1)**
**FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES**
**(Residential sleeping areas, live load = 30 psf, L/Δ = 360)[a]**

| JOIST SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | DEAD LOAD = 20 psf | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum floor joist spans | | | | | | | |
| | | | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) |
| 12 | Douglas fir-larch | SS | 12-6 | 16-6 | 21-0 | 25-7 | 12-6 | 16-6 | 21-0 | 25-7 |
| | Douglas fir-larch | #1 | 12-0 | 15-10 | 20-3 | 24-8 | 12-0 | 15-7 | 19-0 | 22-0 |
| | Douglas fir-larch | #2 | 11-10 | 15-7 | 19-10 | 23-0 | 11-6 | 14-7 | 17-9 | 20-7 |
| | Douglas fir-larch | #3 | 9-8 | 12-4 | 15-0 | 17-5 | 8-8 | 11-0 | 13-5 | 15-7 |
| | Hem-fir | SS | 11-10 | 15-7 | 19-10 | 24-2 | 11-10 | 15-7 | 19-10 | 24-2 |
| | Hem-fir | #1 | 11-7 | 15-3 | 19-5 | 23-7 | 11-7 | 15-2 | 18-6 | 21-6 |
| | Hem-fir | #2 | 11-0 | 14-6 | 18-6 | 22-6 | 11-0 | 14-4 | 17-6 | 20-4 |
| | Hem-fir | #3 | 9-8 | 12-4 | 15-0 | 17-5 | 8-8 | 11-0 | 13-5 | 15-7 |
| | Southern pine | SS | 12-3 | 16-2 | 20-8 | 25-1 | 12-3 | 16-2 | 20-8 | 25-1 |
| | Southern pine | #1 | 12-0 11-10 | 15-10 15-7 | 20-3 19-10 | 24-8 24-2 | 12-0 11-10 | 15-10 15-7 | 20-3 18-7 | 24-8 22-0 |
| | Southern pine | #2 | 11-10 11-3 | 15-7 14-11 | 19-10 18-1 | 24-2 21-4 | 11-10 10-9 | 15-7 13-8 | 18-7 16-2 | 21-9 19-1 |
| | Southern pine | #3 | 10-5 9-2 | 13-3 11-6 | 15-8 14-0 | 18-8 16-6 | 9-4 8-2 | 11-11 10-3 | 14-0 12-6 | 16-8 14-9 |
| | Spruce-pine-fir | SS | 11-7 | 15-3 | 19-5 | 23-7 | 11-7 | 15-3 | 19-5 | 23-7 |
| | Spruce-pine-fir | #1 | 11-3 | 14-11 | 19-0 | 23-0 | 11-3 | 14-7 | 17-9 | 20-7 |
| | Spruce-pine-fir | #2 | 11-3 | 14-11 | 19-0 | 23-0 | 11-3 | 14-7 | 17-9 | 20-7 |
| | Spruce-pine-fir | #3 | 9-8 | 12-4 | 15-0 | 17-5 | 8-8 | 11-0 | 13-5 | 15-7 |
| 16 | Douglas fir-larch | SS | 11-4 | 15-0 | 19-1 | 23-3 | 11-4 | 15-0 | 19-1 | 23-0 |
| | Douglas fir-larch | #1 | 10-11 | 14-5 | 18-5 | 21-4 | 10-8 | 13-6 | 16-5 | 19-1 |
| | Douglas fir-larch | #2 | 10-9 | 14-1 | 17-2 | 19-11 | 9-11 | 12-7 | 15-5 | 17-10 |
| | Douglas fir-larch | #3 | 8-5 | 10-8 | 13-0 | 15-1 | 7-6 | 9-6 | 11-8 | 13-6 |
| | Hem-fir | SS | 10-9 | 14-2 | 18-0 | 21-11 | 10-9 | 14-2 | 18-0 | 21-11 |
| | Hem-fir | #1 | 10-6 | 13-10 | 17-8 | 20-9 | 10-4 | 13-1 | 16-0 | 18-7 |
| | Hem-fir | #2 | 10-0 | 13-2 | 16-10 | 19-8 | 9-10 | 12-5 | 15-2 | 17-7 |
| | Hem-fir | #3 | 8-5 | 10-8 | 13-0 | 15-1 | 7-6 | 9-6 | 11-8 | 13-6 |
| | Southern pine | SS | 11-2 | 14-8 | 18-9 | 22-10 | 11-2 | 14-8 | 18-9 | 22-10 |
| | Southern pine | #1 | 10-11 10-9 | 14-5 14-2 | 18-5 18-0 | 22-5 21-4 | 10-11 10-9 | 14-5 13-9 | 17-11 16-1 | 21-4 19-1 |
| | Southern pine | #2 | 10-9 10-3 | 14-2 13-3 | 18-0 15-8 | 21-1 18-6 | 10-6 9-4 | 13-6 11-10 | 16-1 14-0 | 18-10 16-6 |
| | Southern pine | #3 | 9-0 7-11 | 11-6 10-10 | 13-7 12-1 | 16-2 14-4 | 8-1 7-1 | 10-3 8-11 | 12-3 10-10 | 14-6 12-10 |
| | Spruce-pine-fir | SS | 10-6 | 13-10 | 17-8 | 21-6 | 10-6 | 13-10 | 17-8 | 21-4 |
| | Spruce-pine-fir | #1 | 10-3 | 13-6 | 17-2 | 19-11 | 9-11 | 12-7 | 15-5 | 17-10 |
| | Spruce-pine-fir | #2 | 10-3 | 13-6 | 17-2 | 19-11 | 9-11 | 12-7 | 15-5 | 17-10 |
| | Spruce-pine-fir | #3 | 8-5 | 10-8 | 13-0 | 15-1 | 7-6 | 9-6 | 11-8 | 13-6 |

*(continued)*

**TABLE R502.3.1(1)—continued**
**FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES**
**(Residential sleeping areas, live load = 30 psf, L/Δ = 360)[a]**

| JOIST SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | DEAD LOAD = 20 psf | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum floor joist spans | | | | | | | |
| | | | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) |
| 19.2 | Douglas fir-larch | SS | 10-8 | 14-1 | 18-0 | 21-10 | 10-8 | 14-1 | 18-0 | 21-0 |
| | Douglas fir-larch | #1 | 10-4 | 13-7 | 16-9 | 19-6 | 9-8 | 12-4 | 15-0 | 17-5 |
| | Douglas fir-larch | #2 | 10-1 | 12-10 | 15-8 | 18-3 | 9-1 | 11-6 | 14-1 | 16-3 |
| | Douglas fir-larch | #3 | 7-8 | 9-9 | 11-10 | 13-9 | 6-10 | 8-8 | 10-7 | 12-4 |
| | Hem-fir | SS | 10-1 | 13-4 | 17-0 | 20-8 | 10-1 | 13-4 | 17-0 | 20-7 |
| | Hem-fir | #1 | 9-10 | 13-0 | 16-4 | 19-0 | 9-6 | 12-0 | 14-8 | 17-0 |
| | Hem-fir | #2 | 9-5 | 12-5 | 15-6 | 17-1 | 8-11 | 11-4 | 13-10 | 16-1 |
| | Hem-fir | #3 | 7-8 | 9-9 | 11-10 | 13-9 | 6-10 | 8-8 | 10-7 | 12-4 |
| | Southern pine | SS | 10-6 | 13-10 | 17-8 | 21-6 | 10-6 | 13-10 | 17-8 | 21-6 |
| | Southern pine | #1 | ~~10-4~~ 10-1 | ~~13-7~~ 13-4 | ~~17-4~~ 16-5 | ~~21-1~~ 19-6 | ~~10-4~~ 9-11 | ~~13-7~~ 12-7 | ~~16-4~~ 14-8 | ~~19-6~~ 17-5 |
| | Southern pine | #2 | ~~10-1~~ 9-6 | ~~13-4~~ 12-1 | ~~16-8~~ 14-4 | ~~19-3~~ 16-10 | ~~9-6~~ 8-6 | ~~12-4~~ 10-10 | ~~14-8~~ 12-10 | ~~17-2~~ 15-1 |
| | Southern pine | #3 | ~~8-3~~ 7-3 | ~~10-6~~ 9-1 | ~~12-8~~ 11-0 | ~~14-9~~ 13-1 | ~~7-4~~ 6-5 | ~~9-5~~ 8-2 | ~~11-1~~ 9-10 | ~~13-2~~ 11-8 |
| | Spruce-pine-fir | SS | 9-10 | 13-0 | 16-7 | 20-2 | 9-10 | 13-0 | 16-7 | 19-6 |
| | Spruce-pine-fir | #1 | 9-8 | 12-9 | 15-8 | 18-3 | 9-1 | 11-6 | 14-1 | 16-3 |
| | Spruce-pine-fir | #2 | 9-8 | 12-9 | 15-8 | 18-3 | 9-1 | 11-6 | 14-1 | 16-3 |
| | Spruce-pine-fir | #3 | 7-8 | 9-9 | 11-10 | 13-9 | 6-10 | 8-8 | 10-7 | 12-4 |
| 24 | Douglas fir-larch | SS | 9-11 | 13-1 | 16-8 | 20-3 | 9-11 | 13-1 | 16-2 | 18-9 |
| | Douglas fir-larch | #1 | 9-7 | 12-4 | 15-0 | 17-5 | 8-8 | 11-0 | 13-5 | 15-7 |
| | Douglas fir-larch | #2 | 9-1 | 11-6 | 14-1 | 16-3 | 8-1 | 10-3 | 12-7 | 14-7 |
| | Douglas fir-larch | #3 | 6-10 | 8-8 | 10-7 | 12-4 | 6-2 | 7-9 | 9-6 | 11-0 |
| | Hem-fir | SS | 9-4 | 12-4 | 15-9 | 19-2 | 9-4 | 12-4 | 15-9 | 18-5 |
| | Hem-fir | #1 | 9-2 | 12-0 | 14-8 | 17-0 | 8-6 | 10-9 | 13-1 | 15-2 |
| | Hem-fir | #2 | 8-9 | 11-4 | 13-10 | 16-1 | 8-0 | 10-2 | 12-5 | 14-4 |
| | Hem-fir | #3 | 6-10 | 8-8 | 10-7 | 12-4 | 6-2 | 7-9 | 9-6 | 11-0 |
| | Southern pine | SS | 9-9 | 12-10 | 16-5 | 19-11 | 9-9 | 12-10 | 16-5 | ~~19-11~~ 19-8 |
| | Southern pine | #1 | ~~9-7~~ 9-4 | ~~12-7~~ 12-4 | ~~16-1~~ 14-8 | ~~19-6~~ 17-5 | ~~9-7~~ 8-10 | ~~12-4~~ 11-3 | ~~14-7~~ 13-1 | ~~17-5~~ 15-7 |
| | Southern pine | #2 | ~~9-4~~ 8-6 | ~~12-4~~ 10-10 | ~~14-8~~ 12-10 | ~~17-2~~ 15-1 | ~~8-6~~ 7-7 | ~~11-0~~ 9-8 | ~~13-1~~ 11-5 | ~~15-5~~ 13-6 |
| | Southern pine | #3 | ~~7-4~~ 6-5 | ~~9-5~~ 8-2 | ~~11-1~~ 9-10 | ~~13-2~~ 11-8 | ~~6-7~~ 5-9 | ~~8-5~~ 7-3 | ~~9-11~~ 8-10 | ~~11-10~~ 10-5 |
| | Spruce-pine-fir | SS | 9-2 | 12-1 | 15-5 | 18-9 | 9-2 | 12-1 | 15-0 | 17-5 |
| | Spruce-pine-fir | #1 | 8-11 | 11-6 | 14-1 | 16-3 | 8-1 | 10-3 | 12-7 | 14-7 |
| | Spruce-pine-fir | #2 | 8-11 | 11-6 | 14-1 | 16-3 | 8-1 | 10-3 | 12-7 | 14-7 |
| | Spruce-pine-fir | #3 | 6-10 | 8-8 | 10-7 | 12-4 | 6-2 | 7-9 | 9-6 | 11-0 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

**Note:** Check sources for availability of lumber in lengths greater than 20 feet.

a. Dead load limits for townhouses in Seismic Design Category C and all structures in Seismic Design Categories $D_0$, $D_1$ and $D_2$ shall be determined in accordance with Section R301.2.2.2.1.

37. Table R502.3.1(2), "Floor Joist Spans For Common Lumber Species," of Paragraph R502.3.1, "Sleeping Areas and Attic Joists," of Subsection R502.3, "Allowable Joist Spans," of Section R502, "Wood Floor Framing," of Chapter 5, "Floors," of the 2012 International Residential Code is amended to read as follows:

**TABLE R502.3.1(2)**
**FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES**
**(Residential living areas, live load = 40 psf, L/Δ = 360)[b]**

| JOIST SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | DEAD LOAD = 20 psf | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum floor joist spans | | | | | | | |
| | | | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) |
| 12 | Douglas fir-larch | SS | 11-4 | 15-0 | 19-1 | 23-3 | 11-4 | 15-0 | 19-1 | 23-3 |
| | Douglas fir-larch | #1 | 10-11 | 14-5 | 18-5 | 22-0 | 10-11 | 14-2 | 17-4 | 20-1 |
| | Douglas fir-larch | #2 | 10-9 | 14-2 | 17-9 | 20-7 | 10-6 | 13-3 | 16-3 | 18-10 |
| | Douglas fir-larch | #3 | 8-8 | 11-0 | 13-5 | 15-7 | 7-11 | 10-0 | 12-3 | 14-3 |
| | Hem-fir | SS | 10-9 | 14-2 | 18-0 | 21-11 | 10-9 | 14-2 | 18-0 | 21-11 |
| | Hem-fir | #1 | 10-6 | 13-10 | 17-8 | 21-6 | 10-6 | 13-10 | 16-11 | 19-7 |
| | Hem-fir | #2 | 10-0 | 13-2 | 16-10 | 20-4 | 10-0 | 13-1 | 16-0 | 18-6 |
| | Hem-fir | #3 | 8-8 | 11-0 | 13-5 | 15-7 | 7-11 | 10-0 | 12-3 | 14-3 |
| | Southern pine | SS | 11-2 | 14-8 | 18-9 | 22-10 | 11-2 | 14-8 | 18-9 | 22-10 |
| | Southern pine | #1 | 10-11 10-9 | 14-5 14-2 | 18-5 18-0 | 22-5 21-11 | 10-11 10-9 | 14-5 14-2 | 18-5 16-11 | 22-5 20-1 |
| | Southern pine | #2 | 10-9 10-3 | 14-2 13-6 | 18-0 16-2 | 21-9 19-1 | 10-9 9-10 | 14-2 12-6 | 16-11 14-9 | 19-10 17-5 |
| | Southern pine | #3 | 9-4 8-2 | 11-11 10-3 | 14-0 12-6 | 16-8 14-9 | 8-6 7-5 | 10-10 9-5 | 12-10 11-5 | 15-3 13-6 |
| | Spruce-pine-fir | SS | 10-6 | 13-10 | 17-8 | 21-6 | 10-6 | 13-10 | 17-8 | 21-6 |
| | Spruce-pine-fir | #1 | 10-3 | 13-6 | 17-3 | 20-7 | 10-3 | 13-3 | 16-3 | 18-10 |
| | Spruce-pine-fir | #2 | 10-3 | 13-6 | 17-3 | 20-7 | 10-3 | 13-3 | 16-3 | 18-10 |
| | Spruce-pine-fir | #3 | 8-8 | 11-0 | 13-5 | 15-7 | 7-11 | 10-0 | 12-3 | 14-3 |
| 16 | Douglas fir-larch | SS | 10-4 | 13-7 | 17-4 | 21-1 | 10-4 | 13-7 | 17-4 | 21-0 |
| | Douglas fir-larch | #1 | 9-11 | 13-1 | 16-5 | 19-1 | 9-8 | 12-4 | 15-0 | 17-5 |
| | Douglas fir-larch | #2 | 9-9 | 12-7 | 15-5 | 17-10 | 9-1 | 11-6 | 14-1 | 16-3 |
| | Douglas fir-larch | #3 | 7-6 | 9-6 | 11-8 | 13-6 | 6-10 | 8-8 | 10-7 | 12-4 |
| | Hem-fir | SS | 9-9 | 12-10 | 16-5 | 19-11 | 9-9 | 12-10 | 16-5 | 19-11 |
| | Hem-fir | #1 | 9-6 | 12-7 | 16-0 | 18-7 | 9-6 | 12-0 | 14-8 | 17-0 |
| | Hem-fir | #2 | 9-1 | 12-0 | 15-2 | 17-7 | 8-11 | 11-4 | 13-10 | 16-1 |
| | Hem-fir | #3 | 7-6 | 9-6 | 11-8 | 13-6 | 6-10 | 8-8 | 10-7 | 12-4 |
| | Southern pine | SS | 10-2 | 13-4 | 17-0 | 20-9 | 10-2 | 13-4 | 17-0 | 20-9 |
| | Southern pine | #1 | 9-11 9-9 | 13-1 12-10 | 16-9 16-1 | 20-4 19-1 | 9-11 9-9 | 13-1 12-7 | 16-1 14-8 | 19-6 17-5 |
| | Southern pine | #2 | 9-9 9-4 | 12-10 11-10 | 16-1 14-0 | 18-10 16-6 | 9-6 8-6 | 12-4 10-10 | 14-8 12-10 | 17-2 15-1 |
| | Southern pine | #3 | 8-1 7-1 | 10-3 8-11 | 12-2 10-10 | 14-6 12-10 | 7-1 6-5 | 9-5 8-2 | 11-1 9-10 | 13-3 11-8 |
| | Spruce-pine-fir | SS | 9-6 | 12-7 | 16-0 | 19-6 | 9-6 | 12-7 | 16-0 | 19-6 |
| | Spruce-pine-fir | #1 | 9-4 | 12-3 | 15-5 | 17-10 | 9-1 | 11-6 | 14-1 | 16-3 |
| | Spruce-pine-fir | #2 | 9-4 | 12-3 | 15-5 | 17-10 | 9-1 | 11-6 | 14-1 | 16-3 |
| | Spruce-pine-fir | #3 | 7-6 | 9-6 | 11-8 | 13-6 | 6-10 | 8-8 | 10-7 | 12-4 |

*(continued)*

TABLE R502.3.1(2)—continued
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES
(Residential living areas, live load = 40 psf, L/Δ = 360)[b]

| JOIST SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | DEAD LOAD = 20 psf | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum floor joist spans | | | | | | | |
| | | | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) | (ft - in.) |
| 19.2 | Douglas fir-larch | SS | 9-8 | 12-10 | 16-4 | 19-10 | 9-8 | 12-10 | 16-4 | 19-2 |
| | Douglas fir-larch | #1 | 9-4 | 12-4 | 15-0 | 17-5 | 8-10 | 11-3 | 13-8 | 15-11 |
| | Douglas fir-larch | #2 | 9-1 | 11-6 | 14-1 | 16-3 | 8-3 | 10-6 | 12-10 | 14-10 |
| | Douglas fir-larch | #3 | 6-10 | 8-8 | 10-7 | 12-4 | 6-3 | 7-11 | 9-8 | 11-3 |
| | Hem-fir | SS | 9-2 | 12-1 | 15-5 | 18-9 | 9-2 | 12-1 | 15-5 | 18-9 |
| | Hem-fir | #1 | 9-0 | 11-10 | 14-8 | 17-0 | 8-8 | 10-11 | 13-4 | 15-6 |
| | Hem-fir | #2 | 8-7 | 11-3 | 13-10 | 16-1 | 8-2 | 10-4 | 12-8 | 14-8 |
| | Hem-fir | #3 | 6-10 | 8-8 | 10-7 | 12-4 | 6-3 | 7-11 | 9-8 | 11-3 |
| | Southern pine | SS | 9-6 | 12-7 | 16-0 | 19-6 | 9-6 | 12-7 | 16-0 | 19-6 |
| | Southern pine | #1 | ~~9-4~~9-2 | ~~12-4~~12-1 | ~~15-9~~14-8 | ~~19-2~~17-5 | ~~9-4~~9-0 | ~~12-4~~11-5 | ~~14-11~~13-5 | ~~17-9~~15-11 |
| | Southern pine | #2 | ~~9-2~~8-6 | ~~12-1~~10-10 | ~~14-8~~12-10 | ~~17-2~~15-1 | ~~8-8~~7-9 | ~~11-3~~9-10 | ~~13-5~~11-8 | ~~15-8~~13-9 |
| | Southern pine | #3 | ~~7-4~~6-5 | ~~9-5~~8-2 | ~~11-1~~9-10 | ~~13-2~~11-8 | ~~6-9~~5-11 | ~~8-7~~7-5 | ~~10-1~~9-0 | ~~12-1~~10-8 |
| | Spruce-pine-fir | SS | 9-0 | 11-10 | 15-1 | 18-4 | 9-0 | 11-10 | 15-1 | 17-9 |
| | Spruce-pine-fir | # | 8-9 | 11-6 | 14-1 | 16-3 | 8-3 | 10-6 | 12-10 | 14-10 |
| | Spruce-pine-fir | #2 | 8-9 | 11-6 | 14-1 | 16-3 | 8-3 | 10-6 | 12-10 | 14-10 |
| | Spruce-pine-fir | #3 | 6-10 | 8-8 | 10-7 | 12-4 | 6-3 | 7-11 | 9-8 | 11-3 |
| 24 | Douglas fir-larch | SS | 9-0 | 11-11 | 15-2 | 18-5 | 9-0 | 11-11 | 14-9 | 17-1 |
| | Douglas fir-larch | #1 | 8-8 | 11-0 | 13-5 | 15-7 | 7-11 | 10-0 | 12-3 | 14-3 |
| | Douglas fir-larch | #2 | 8-1 | 10-3 | 12-7 | 14-7 | 7-5 | 9-5 | 11-6 | 13-4 |
| | Douglas fir-larch | #3 | 6-2 | 7-9 | 9-6 | 11-0 | 5-7 | 7-1 | 8-8 | 10-1 |
| | Hem-fir | SS | 8-6 | 11-3 | 14-4 | 17-5 | 8-6 | 11-3 | 14-4 | 16-10[a] |
| | Hem-fir | #1 | 8-4 | 10-9 | 13-1 | 15-2 | 7-9 | 9-9 | 11-11 | 13-10 |
| | Hem-fir | #2 | 7-11 | 10-2 | 12-5 | 14-4 | 7-4 | 9-3 | 11-4 | 13-1 |
| | Hem-fir | #3 | 6-2 | 7-9 | 9-6 | 11-0 | 5-7 | 7-1 | 8-8 | 10-1 |
| | Southern pine | SS | 8-10 | 11-8 | 14-11 | 18-1 | 8-10 | 11-8 | 14-11 | ~~18-1~~18-0 |
| | Southern pine | #1 | ~~8-8~~8-6 | ~~11-5~~11-3 | ~~14-7~~13-1 | ~~17-5~~15-7 | ~~8-8~~8-1 | ~~11-3~~10-3 | ~~13-4~~12-0 | ~~15-11~~14-3 |
| | Southern pine | #2 | ~~8-6~~7-7 | ~~11-0~~9-8 | ~~13-1~~11-5 | ~~15-5~~13-6 | ~~7-9~~7-0 | ~~10-0~~8-10 | ~~12-0~~10-5 | ~~14-0~~12-4 |
| | Southern pine | #3 | ~~6-7~~5-9 | ~~8-5~~7-3 | ~~9-11~~8-10 | ~~11-10~~10-5 | ~~6-0~~5-3 | ~~7-8~~6-8 | ~~9-1~~8-1 | ~~10-9~~9-6 |
| | Spruce-pine-fir | SS | 8-4 | 11-0 | 14-0 | 17-0 | 8-4 | 11-0 | 13-8 | 15-11 |
| | Spruce-pine-fir | #1 | 8-1 | 10-3 | 12-7 | 14-7 | 7-5 | 9-5 | 11-6 | 13-4 |
| | Spruce-pine-fir | #2 | 8-1 | 10-3 | 12-7 | 14-7 | 7-5 | 9-5 | 11-6 | 13-4 |
| | Spruce-pine-fir | #3 | 6-2 | 7-9 | 9-6 | 11-0 | 5-7 | 7-1 | 8-8 | 10-1 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

Note: Check sources for availability of lumber in lengths greater than 20 feet.

a. End bearing length shall be increased to 2 inches.

b. Dead load limits for townhouses in Seismic Design Category C and all structures in Seismic Design Categories $D_0$, $D_1$, and $D_2$ shall be determined in accordance with Section R301.2.2.2.1.

38. Footnote b to Table R502.3.3(1), "Cantilever Spans for Floor Joists Supporting Light-Frame Exterior Bearing Wall and Roof Only," of Paragraph R502.3.3, "Floor Cantilevers," of Subsection R502.3, "Allowable Joist Spans," of Section R502, "Wood Floor Framing," of Chapter 5, "Floors," of the 2012 International Residential Code is amended to read as follows:

"b. Spans based on minimum design properties for No. 2 Grade lumber of Douglas fir-larch, hem-fir[~~, southern pine~~] and spruce-pine-fir for repetitive (three or more) members. No. 1 or better grade lumber must be used for southern pine."

39. Footnote a Table R502.3.3(2), "Cantilever Spans for Floor Joists Supporting Exterior Balcony," of Paragraph R502.3.3, "Floor Cantilevers," of Subsection R502.3, "Allowable Joist Spans," of Section R502, "Wood Floor Framing," of Chapter 5, "Floors," of the 2012 International Residential Code is amended to read as follows:

"a. Spans are based on minimum design properties for No. 2 Grade lumber of fir-larch, hem-fir[~~, southern pine~~] and spruce-pine-fir for repetitive (three or more) members. No. 1 or better grade lumber must be used for southern pine."

40. Table R502.5(1), "Girder Spans and Header Spans for Exterior Bearing Walls," of Subsection R502.3, "Allowable Girder Spans," of Section R502, "Wood Floor Framing," of Chapter 5, "Floors," of the 2012 International Residential Code is amended to read as follows:

**TABLE R502.5(1)**
**GIRDER SPANS[a,b] AND HEADER SPANS[a,b] FOR EXTERIOR BEARING WALLS**
**(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir[b] and required number of jack studs)**

| GIRDERS AND HEADERS SUPPORTING | SIZE | GROUND SNOW LOAD (psf)[c] | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 30 | | | | | | 50 | | | | | | 70 | | | | | |
| | | Building width[d] (feet) | | | | | | | | | | | | | | | | | |
| | | 20 | | 28 | | 36 | | 20 | | 28 | | 36 | | 20 | | 28 | | 36 | |
| | | Span | NJ[e] | Span | NJ[e] | Span | NJ[e] | Span | NJ[e] | Span | NJ[e] | Span | NJ[e] | Span | NJ[e] | Span | NJ[e] | Span | NJ[e] |
| Roof and ceiling | 2-2 × 4 | 3-6 | 1 | 3-2 | 1 | 2-10 | 1 | 3-2 | 1 | 2-9 | 1 | 2-6 | 1 | 2-10 | 1 | 2-6 | 1 | 2-3 | 1 |
| | 2-2 × 6 | 5-5 | 1 | 4-8 | 1 | 4-2 | 1 | 4-8 | 1 | 4-1 | 1 | 3-8 | 2 | 4-2 | 1 | 3-8 | 2 | 3-3 | 2 |
| | 2-2 × 8 | 6-10 | 1 | 5-11 | 2 | 5-4 | 2 | 5-11 | 2 | 5-2 | 2 | 4-7 | 2 | 5-4 | 2 | 4-7 | 2 | 4-1 | 2 |
| | 2-2 × 10 | 8-5 | 2 | 7-3 | 2 | 6-6 | 2 | 7-3 | 2 | 6-3 | 2 | 5-7 | 2 | 6-6 | 2 | 5-7 | 2 | 5-0 | 2 |
| | 2-2 × 12 | 9-9 | 2 | 8-5 | 2 | 7-6 | 2 | 8-5 | 2 | 7-3 | 2 | 6-6 | 2 | 7-6 | 2 | 6-6 | 2 | 5-10 | 3 |
| | 3-2 × 8 | 8-4 | 1 | 7-5 | 1 | 6-8 | 1 | 7-5 | 1 | 6-5 | 2 | 5-9 | 2 | 6-8 | 1 | 5-9 | 2 | 5-2 | 2 |
| | 3-2 × 10 | 10-6 | 1 | 9-1 | 2 | 8-2 | 2 | 9-1 | 2 | 7-10 | 2 | 7-0 | 2 | 8-2 | 2 | 7-0 | 2 | 6-4 | 2 |
| | 3-2 × 12 | 12-2 | 2 | 10-7 | 2 | 9-5 | 2 | 10-7 | 2 | 9-2 | 2 | 8-2 | 2 | 9-5 | 2 | 8-2 | 2 | 7-4 | 2 |
| | 4-2 × 8 | 9-2 | 1 | 8-4 | 1 | 7-8 | 1 | 8-4 | 1 | 7-5 | 1 | 6-8 | 1 | 7-8 | 1 | 6-8 | 1 | 5-11 | 2 |
| | 4-2 × 10 | 11-8 | 1 | 10-6 | 1 | 9-5 | 2 | 10-6 | 1 | 9-1 | 2 | 8-2 | 2 | 9-5 | 2 | 8-2 | 2 | 7-3 | 2 |
| | 4-2 × 12 | 14-1 | 1 | 12-2 | 2 | 10-11 | 2 | 12-2 | 2 | 10-7 | 2 | 9-5 | 2 | 10-11 | 2 | 9-5 | 2 | 8-5 | 2 |
| Roof, ceiling and one center-bearing floor | 2-2 × 4 | 3-1 | 1 | 2-9 | 1 | 2-5 | 1 | 2-9 | 1 | 2-5 | 1 | 2-2 | 1 | 2-7 | 1 | 2-3 | 1 | 2-0 | 1 |
| | 2-2 × 6 | 4-6 | 1 | 4-0 | 1 | 3-7 | 2 | 4-1 | 1 | 3-7 | 2 | 3-3 | 2 | 3-9 | 2 | 3-3 | 2 | 2-11 | 2 |
| | 2-2 × 8 | 5-9 | 2 | 5-0 | 2 | 4-6 | 2 | 5-2 | 2 | 4-6 | 2 | 4-1 | 2 | 4-9 | 2 | 4-2 | 2 | 3-9 | 2 |
| | 2-2 × 10 | 7-0 | 2 | 6-2 | 2 | 5-6 | 2 | 6-4 | 2 | 5-6 | 2 | 5-0 | 2 | 5-9 | 2 | 5-1 | 2 | 4-7 | 3 |
| | 2-2 × 12 | 8-1 | 2 | 7-1 | 2 | 6-5 | 2 | 7-4 | 2 | 6-5 | 2 | 5-9 | 3 | 6-8 | 2 | 5-10 | 3 | 5-3 | 3 |
| | 3-2 × 8 | 7-2 | 1 | 6-3 | 2 | 5-8 | 2 | 6-5 | 2 | 5-8 | 2 | 5-1 | 2 | 5-11 | 2 | 5-2 | 2 | 4-8 | 2 |
| | 3-2 × 10 | 8-9 | 2 | 7-8 | 2 | 6-11 | 2 | 7-11 | 2 | 6-11 | 2 | 6-3 | 2 | 7-3 | 2 | 6-4 | 2 | 5-8 | 2 |
| | 3-2 × 12 | 10-2 | 2 | 8-11 | 2 | 8-0 | 2 | 9-2 | 2 | 8-0 | 2 | 7-3 | 2 | 8-5 | 2 | 7-4 | 2 | 6-7 | 2 |
| | 4-2 × 8 | 8-1 | 1 | 7-3 | 1 | 6-7 | 1 | 7-5 | 1 | 6-6 | 1 | 5-11 | 2 | 6-10 | 1 | 6-0 | 2 | 5-5 | 2 |
| | 4-2 × 10 | 10-1 | 1 | 8-10 | 2 | 8-0 | 2 | 9-1 | 2 | 8-0 | 2 | 7-2 | 2 | 8-4 | 2 | 7-4 | 2 | 6-7 | 2 |
| | 4-2 × 12 | 11-9 | 2 | 10-3 | 2 | 9-3 | 2 | 10-7 | 2 | 9-3 | 2 | 8-4 | 2 | 9-8 | 2 | 8-6 | 2 | 7-7 | 2 |
| Roof, ceiling and one clear span floor | 2-2 × 4 | 2-8 | 1 | 2-4 | 1 | 2-1 | 1 | 2-7 | 1 | 2-3 | 1 | 2-0 | 1 | 2-5 | 1 | 2-1 | 1 | 1-10 | 1 |
| | 2-2 × 6 | 3-11 | 1 | 3-5 | 2 | 3-0 | 2 | 3-10 | 2 | 3-4 | 2 | 3-0 | 2 | 3-6 | 2 | 3-1 | 2 | 2-9 | 2 |
| | 2-2 × 8 | 5-0 | 2 | 4-4 | 2 | 3-10 | 2 | 4-10 | 2 | 4-2 | 2 | 3-9 | 2 | 4-6 | 2 | 3-11 | 2 | 3-6 | 2 |
| | 2-2 × 10 | 6-1 | 2 | 5-3 | 2 | 4-8 | 2 | 5-11 | 2 | 5-1 | 2 | 4-7 | 3 | 5-6 | 2 | 4-9 | 2 | 4-3 | 3 |
| | 2-2 × 12 | 7-1 | 2 | 6-1 | 3 | 5-5 | 3 | 6-10 | 2 | 5-11 | 3 | 5-4 | 3 | 6-4 | 3 | 5-6 | 3 | 5-0 | 3 |
| | 3-2 × 8 | 6-3 | 2 | 5-5 | 2 | 4-10 | 2 | 6-1 | 2 | 5-3 | 2 | 4-8 | 2 | 5-7 | 2 | 4-11 | 2 | 4-5 | 2 |
| | 3-2 × 10 | 7-7 | 2 | 6-7 | 2 | 5-11 | 2 | 7-5 | 2 | 6-5 | 2 | 5-9 | 2 | 6-10 | 2 | 6-0 | 2 | 5-4 | 2 |
| | 3-2 × 12 | 8-10 | 2 | 7-8 | 2 | 6-10 | 2 | 8-7 | 2 | 7-5 | 2 | 6-8 | 2 | 7-11 | 2 | 6-11 | 2 | 6-3 | 2 |
| | 4-2 × 8 | 7-2 | 1 | 6-3 | 2 | 5-7 | 2 | 7-0 | 1 | 6-1 | 2 | 5-5 | 2 | 6-6 | 1 | 5-8 | 2 | 5-1 | 2 |
| | 4-2 × 10 | 8-9 | 2 | 7-7 | 2 | 6-10 | 2 | 8-7 | 2 | 7-5 | 2 | 6-7 | 2 | 7-11 | 2 | 6-11 | 2 | 6-2 | 2 |
| | 4-2 × 12 | 10-2 | 2 | 8-10 | 2 | 7-11 | 2 | 9-11 | 2 | 8-7 | 2 | 7-8 | 3 | 9-3 | 2 | 8-0 | 2 | 7-2 | 2 |
| Roof, ceiling and two center-bearing floors | 2-2 × 4 | 2-7 | 1 | 2-3 | 1 | 2-0 | 1 | 2-6 | 1 | 2-2 | 1 | 1-11 | 1 | 2-4 | 1 | 2-0 | 1 | 1-9 | 1 |
| | 2-2 × 6 | 3-9 | 2 | 3-3 | 2 | 2-11 | 2 | 3-8 | 2 | 3-2 | 2 | 2-10 | 2 | 3-5 | 2 | 3-0 | 2 | 2-8 | 2 |
| | 2-2 × 8 | 4-9 | 2 | 4-2 | 2 | 3-9 | 2 | 4-7 | 2 | 4-0 | 2 | 3-8 | 2 | 4-4 | 2 | 3-9 | 2 | 3-5 | 2 |
| | 2-2 × 10 | 5-9 | 2 | 5-1 | 2 | 4-7 | 3 | 5-8 | 2 | 4-11 | 2 | 4-5 | 3 | 5-3 | 2 | 4-7 | 3 | 4-3 | 3 |
| | 2-2 × 12 | 6-8 | 2 | 5-10 | 3 | 5-3 | 3 | 6-6 | 2 | 5-9 | 3 | 5-2 | 3 | 6-1 | 3 | 5-4 | 3 | 4-10 | 3 |
| | 3-2 × 8 | 5-11 | 2 | 5-2 | 2 | 4-8 | 2 | 5-9 | 2 | 5-1 | 2 | 4-7 | 2 | 5-5 | 2 | 4-9 | 2 | 4-3 | 2 |
| | 3-2 × 10 | 7-3 | 2 | 6-4 | 2 | 5-8 | 2 | 7-1 | 2 | 6-2 | 2 | 5-7 | 2 | 6-7 | 2 | 5-9 | 2 | 5-3 | 2 |
| | 3-2 × 12 | 8-5 | 2 | 7-4 | 2 | 6-7 | 2 | 8-2 | 2 | 7-2 | 2 | 6-5 | 3 | 7-6 | 2 | 6-9 | 2 | 6-1 | 3 |
| | 4-2 × 8 | 6-10 | 1 | 6-0 | 2 | 5-5 | 2 | 6-8 | 1 | 5-10 | 2 | 5-3 | 2 | 6-3 | 2 | 5-6 | 2 | 4-11 | 2 |
| | 4-2 × 10 | 8-4 | 2 | 7-4 | 2 | 6-7 | 2 | 8-2 | 2 | 7-2 | 2 | 6-5 | 2 | 7-7 | 2 | 6-8 | 2 | 6-0 | 2 |
| | 4-2 × 12 | 9-8 | 2 | 8-6 | 2 | 7-8 | 2 | 9-5 | 2 | 8-3 | 2 | 7-5 | 2 | 8-10 | 2 | 7-9 | 2 | 7-0 | 3 |
| Roof, ceiling, and two clear span floors | 2-2 × 4 | 2-1 | 1 | 1-8 | 1 | 1-6 | 2 | 2-0 | 1 | 1-8 | 1 | 1-5 | 2 | 2-0 | 1 | 1-8 | 1 | 1-5 | 2 |
| | 2-2 × 6 | 3-1 | 2 | 2-8 | 2 | 2-4 | 2 | 3-0 | 2 | 2-7 | 2 | 2-3 | 2 | 2-11 | 2 | 2-7 | 2 | 2-3 | 2 |
| | 2-2 × 8 | 3-10 | 2 | 3-4 | 2 | 3-0 | 3 | 3-10 | 2 | 3-4 | 2 | 2-11 | 3 | 3-9 | 2 | 3-3 | 2 | 2-11 | 3 |

*(continued)*

**TABLE R502.5(1)—continued**
**GIRDER SPANS[a,b] AND HEADER SPANS[a,b] FOR EXTERIOR BEARING WALLS**
**(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir[b] and required number of jack studs)**

| GIRDERS AND HEADERS SUPPORTING | SIZE | GROUND SNOW LOAD (psf)[e] | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 30 | | | | | | 50 | | | | | | 70 | | | | | |
| | | Building width[c] (feet) | | | | | | | | | | | | | | | | | |
| | | 20 | | 28 | | 36 | | 20 | | 28 | | 36 | | 20 | | 28 | | 36 | |
| | | Span | NJ[d] | Span | NJ[d] | Span | NJ[d] | Span | NJ[d] | Span | NJ[d] | Span | NJ[d] | Span | NJ[d] | Span | NJ[d] | Span | NJ[d] |
| Roof, ceiling, and two clear span floors | 2-2 × 10 | 4-9 | 2 | 4-1 | 3 | 3-8 | 3 | 4-8 | 2 | 4-0 | 3 | 3-7 | 3 | 4-7 | 3 | 4-0 | 3 | 3-6 | 3 |
| | 2-2 × 12 | 5-6 | 3 | 4-9 | 3 | 4-3 | 3 | 5-5 | 3 | 4-8 | 3 | 4-2 | 3 | 5-4 | 3 | 4-7 | 3 | 4-1 | 4 |
| | 3-2 × 8 | 4-10 | 2 | 4-2 | 2 | 3-9 | 2 | 4-9 | 2 | 4-1 | 2 | 3-8 | 2 | 4-8 | 2 | 4-1 | 2 | 3-8 | 2 |
| | 3-2 × 10 | 5-11 | 2 | 5-1 | 2 | 4-7 | 3 | 5-10 | 2 | 5-0 | 2 | 4-6 | 3 | 5-9 | 2 | 4-11 | 2 | 4-5 | 3 |
| | 3-2 × 12 | 6-10 | 2 | 5-11 | 3 | 5-4 | 3 | 6-9 | 2 | 5-10 | 3 | 5-3 | 3 | 6-8 | 2 | 5-9 | 3 | 5-2 | 3 |
| | 4-2 × 8 | 5-7 | 2 | 4-10 | 2 | 4-4 | 2 | 5-6 | 2 | 4-9 | 2 | 4-3 | 2 | 5-5 | 2 | 4-8 | 2 | 4-2 | 2 |
| | 4-2 × 10 | 6-10 | 2 | 5-11 | 2 | 5-3 | 2 | 6-9 | 2 | 5-10 | 2 | 5-2 | 2 | 6-7 | 2 | 5-9 | 2 | 5-1 | 2 |
| | 4-2 × 12 | 7-11 | 2 | 6-10 | 2 | 6-2 | 3 | 7-9 | 2 | 6-9 | 2 | 6-0 | 3 | 7-8 | 2 | 6-8 | 2 | 5-11 | 3 |

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. Spans are given in feet and inches.

b. ~~Tabulated values assume #2 grade lumber.~~ Spans are based on minimum design properties for No. 2 Grade lumber of Douglas fir-larch, hem-fir, and spruce-pine-fir. No. 1 or better grade lumber shall be used for southern pine.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

e. Use 30 psf ground snow load for cases in which ground snow load is less than 30 psf and the roof live load is equal to or less than 20 psf.

41. Table R502.5(2), "Girder Spans and Header Spans for Exterior Bearing Walls," of Subsection R502.3, "Allowable Girder Spans," of Section R502, "Wood Floor Framing," of Chapter 5, "Floors," of the 2012 International Residential Code is amended to read as follows:

**TABLE R502.5(2)**
**GIRDER SPANS[a,b] AND HEADER SPANS[a,b] FOR INTERIOR BEARING WALLS**
**(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir[b] and required number of jack studs)**

| HEADERS AND GIRDERS SUPPORTING | SIZE | BUILDING Width[c] (feet) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 20 | | 28 | | 36 | |
| | | Span | NJ[d] | Span | NJ[d] | Span | NJ[d] |
| [e] | 2-2 × 4 | 3-1 | 1 | 2-8 | 1 | 2-5 | 1 |
| | 2-2 × 6 | 4-6 | 1 | 3-11 | 1 | 3-6 | 1 |
| | 2-2 × 8 | 5-9 | 1 | 5-0 | 2 | 4-5 | 2 |
| | 2-2 × 10 | 7-0 | 2 | 6-1 | 2 | 5-5 | 2 |
| | 2-2 × 12 | 8-1 | 2 | 7-0 | 2 | 6-3 | 2 |
| One floor only | 3-2 × 8 | 7-2 | 1 | 6-3 | 1 | 5-7 | 2 |
| | 3-2 × 10 | 8-9 | 1 | 7-7 | 2 | 6-9 | 2 |
| | 3-2 × 12 | 10-2 | 2 | 8-10 | 2 | 7-10 | 2 |
| | 4-2 × 8 | 9-0 | 1 | 7-8 | 1 | 6-9 | 1 |
| | 4-2 × 10 | 10-1 | 1 | 8-9 | 1 | 7-10 | 2 |
| | 4-2 × 12 | 11-9 | 1 | 10-2 | 2 | 9-1 | 2 |
| | 2-2 × 4 | 2-2 | 1 | 1-10 | 1 | 1-7 | 1 |
| | 2-2 × 6 | 3-2 | 2 | 2-9 | 2 | 2-5 | 2 |
| | 2-2 × 8 | 4-1 | 2 | 3-6 | 2 | 3-2 | 2 |
| | 2-2 × 10 | 4-11 | 2 | 4-3 | 2 | 3-10 | 3 |
| | 2-2 × 12 | 5-9 | 2 | 5-0 | 3 | 4-5 | 3 |
| Two floors | 3-2 × 8 | 5-1 | 2 | 4-5 | 2 | 3-11 | 2 |
| | 3-2 × 10 | 6-2 | 2 | 5-4 | 2 | 4-10 | 2 |
| | 3-2 × 12 | 7-2 | 2 | 6-3 | 2 | 5-7 | 3 |
| | 4-2 × 8 | 6-1 | 1 | 5-3 | 2 | 4-8 | 2 |
| | 4-2 × 10 | 7-2 | 2 | 6-2 | 2 | 5-6 | 2 |
| | 4-2 × 12 | 8-4 | 2 | 7-2 | 2 | 6-5 | 2 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Spans are given in feet and inches.

b. ~~Tabulated values assume #2 grade lumber.~~ Spans are based on minimum design properties for No. 2 Grade lumber of Douglas fir-larch, hem-fir, and spruce-pine-fir. No. 1 or better grade lumber shall be used for southern pine.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

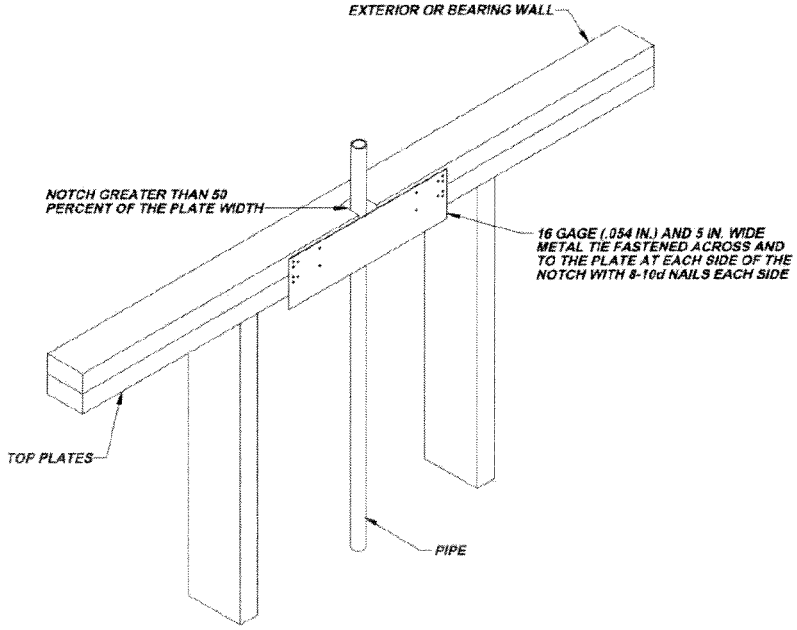
42. Paragraph R602.6.1, "Drilling and Notching of Top Plate," of Subsection R602.6, "Drilling and Notching of Studs," of Section R602, "Wood Wall Framing," of Chapter 6, "Wall Construction," of the 2012 International Residential Code is amended to read as follows:

"**R602.6.1 Drilling and notching of top plate.** When piping or ductwork is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 percent of its width, a galvanized metal tie not less than 0.054 inch thick (1.37 mm) (16 ga) and 5 [~~1½~~] inches (127 [~~38~~] mm) wide shall be fastened across and to the plate at each side of the opening with not less than eight 10d (0.148 inch diameter) having a minimum length of 1½ inches (38 mm) at each side or equivalent. Fasteners will be offset to prevent splitting of the top plate material. The metal tie must extend a minimum of 6 inches past the opening. See Figure R602.6.1.

**Exception:** When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing."

43. Figure R602.6.1, "Top Plate Framing to Accommodate Piping," of Subsection R602.6, "Drilling and Notching of Studs," of Section R602, "Wood Wall Framing," of Chapter 6, "Wall Construction," of the 2012 International Residential Code is deleted and replaced with a new Figure R602.6.1, "Top Plate Framing to Accommodate Piping," to read as follows:

"**FIGURE R602.6.1**
**TOP PLATE FRAMING TO ACCOMMODATE PIPING**




44. Table R602.7.1, "Spans for Minimum No. 2 Grade Single Header," of Subsection R602.7, "Headers," of Section R602, "Wood Wall Framing," of Chapter 6, "Wall Construction," of the 2012 International Residential Code is amended to read as follows:

**TABLE R602.7.1**
**SPANS FOR MINIMUM No.2 GRADE SINGLE HEADER[a, b, c, f]**

| SINGLE HEADERS SUPPORTING | SIZE | WOOD SPECIES | GROUND SNOW LOAD (psf) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ≤ 20[d] | | | 30 | | | 50 | | |
| | | | Building Width (feet)[e] | | | | | | | | |
| | | | 20 | 28 | 36 | 20 | 28 | 36 | 20 | 28 | 36 |
| Roof and ceiling | 2 × 8 | Spruce-Pine-Fir | 4-10 | 4-2 | 3-8 | 4-3 | 3-8 | 3-3 | 3-7 | 3-0 | 2-8 |
| | | Hem-Fir | 5-1 | 4-4 | 3-10 | 4-6 | 3-10 | 3-5 | 3-9 | 3-2 | 2-10 |
| | | Douglas-Fir or No. 1 Grade Southern Pine | 5-3 | 4-6 | 4-0 | 4-7 | 3-11 | 3-6 | 3-10 | 3-3 | 2-11 |
| | 2 × 10 | Spruce-Pine-Fir | 6-2 | 5-3 | 4-8 | 5-5 | 4-8 | 4-2 | 4-6 | 3-11 | 3-1 |
| | | Hem-Fir | 6-6 | 5-6 | 4-11 | 5-8 | 4-11 | 4-4 | 4-9 | 4-1 | 3-7 |
| | | Douglas-Fir or No. 1 Grade Southern Pine | 6-8 | 5-8 | 5-1 | 5-10 | 5-0 | 4-6 | 4-11 | 4-2 | 3-9 |
| | 2 × 12 | Spruce-Pine-Fir | 7-6 | 6-5 | 5-9 | 6-7 | 5-8 | 4-5 | 5-4 | 3-11 | 3-1 |
| | | Hem-Fir | 7-10 | 6-9 | 6-0 | 6-11 | 5-11 | 5-3 | 5-9 | 4-8 | 3-8 |
| | | Douglas-Fir or No. 1 Grade Southern Pine | 8-1 | 6-11 | 6-2 | 7-2 | 6-1 | 5-5 | 5-11 | 5-1 | 4-6 |
| Roof, ceiling and one center-bearing floor | 2 × 8 | Spruce-Pine-Fir | 3-10 | 3-3 | 2-11 | 3-9 | 3-3 | 2-11 | 3-5 | 2-11 | 2-7 |
| | | Hem-Fir | 4-0 | 3-5 | 3-1 | 3-11 | 3-5 | 3-0 | 3-7 | 3-0 | 2-8 |
| | | Douglas-Fir or No. 1 Grade Southern Pine | 4-1 | 3-7 | 3-2 | 4-1 | 3-6 | 3-1 | 3-8 | 3-2 | 2-9 |
| | 2 × 10 | Spruce-Pine-Fir | 4-11 | 4-2 | 3-8 | 4-10 | 4-1 | 3-6 | 4-4 | 3-7 | 2-10 |
| | | Hem-Fir | 5-1 | 4-5 | 3-11 | 5-0 | 4-4 | 3-10 | 4-6 | 3-11 | 3-4 |
| | | Douglas-Fir or No. 1 Grade Southern Pine | 5-3 | 4-6 | 4-1 | 5-2 | 4-5 | 4-0 | 4-8 | 4-0 | 3-7 |
| | 2 × 12 | Spruce-Pine-Fir | 5-8 | 4-2 | 3-4 | 5-5 | 4-0 | 3-6 | 4-9 | 3-6 | 2-10 |
| | | Hem-Fir | 5-11 | 4-11 | 3-11 | 5-10 | 4-9 | 4-2 | 5-5 | 4-2 | 3-4 |
| | | Douglas-Fir or No. 1 Grade Southern Pine | 6-1 | 5-3 | 4-8 | 6-0 | 5-2 | 4-10 | 5-7 | 4-10 | 4-3 |
| Roof, ceiling and one clear span floor | 2 × 8 | Spruce-Pine-Fir | 3-5 | 2-11 | 2-7 | 3-4 | 2-11 | 2-7 | 3-3 | 2-10 | 2-6 |
| | | Hem-Fir | 3-7 | 3-1 | 2-9 | 3-6 | 3-0 | 2-8 | 3-5 | 2-11 | 2-7 |
| | | Douglas-Fir or No. 1 Grade Southern Pine | 3-8 | 3-2 | 2-10 | 3-7 | 3-1 | 2-9 | 3-6 | 3-0 | 2-9 |
| | 2 × 10 | Spruce-Pine-Fir | 4-4 | 3-7 | 2-10 | 4-3 | 3-6 | 2-9 | 4-2 | 3-4 | 2-7 |
| | | Hem-Fir | 4-7 | 3-11 | 3-5 | 4-6 | 3-10 | 3-3 | 4-4 | 3-9 | 3-1 |
| | | Douglas-Fir or No. 1 Grade Southern Pine | 4-8 | 4-0 | 3-7 | 4-7 | 4-0 | 3-6 | 4-6 | 3-10 | 3-5 |
| | 2 × 12 | Spruce-Pine-Fir | 4-11 | 3-7 | 2-10 | 4-9 | 3-6 | 2-9 | 4-6 | 3-4 | 2-7 |
| | | Hem-Fir | 5-6 | 4-3 | 3-5 | 5-6 | 4-2 | 3-3 | 5-4 | 3-11 | 3-1 |
| | | Douglas-Fir or No. 1 Grade Southern Pine | 5-8 | 4-11 | 4-4 | 5-7 | 4-10 | 4-3 | 5-6 | 4-8 | 4-2 |

For SI: 1 inch=25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. Spans are given in feet and inches.

b. Table is based on a maximum roof-ceiling dead load of 15 psf.

c. The header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header in lieu of the required jack stud.

d. The 20 psf ground snow load condition shall apply only when the roof pitch is 9:12 or greater. In conditions where the ground snow load is 30 psf or less and the roof pitch is less than 9:12, use the 30 psf ground snow load condition.

e. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

f. The header shall bear on a minimum of one jack stud at each end.

45. Subparagraph R703.7.4.1, "Size and Spacing," of Paragraph R703.7.4, "Anchorage," of Subsection R703.7, "Stone and Masonry Veneer, General," of Section R703, "Exterior Covering," of Chapter 7, "Wall Covering," of the 2012 International Residential Code is amended to read as follows:

"**R703.7.4.1 Size and spacing.** Veneer ties, if strand wire, shall not be less in thickness than No. 9 U.S. gage [(0.148 inch) (4 mm)] wire and shall have a hook embedded in the mortar joint, or if sheet metal, shall be not less than No. 22 U.S. gage by [(0.0299 inch) (0.76 mm)] 7/8 inch (22 mm) corrugated. Each tie shall be support not more than 2.67 square feet (0.25 $m^2$) of wall area and shall be spaced not more than 32 inches (813 mm) on center horizontally and 24 inches (635 mm) on center vertically. In stud framed exterior walls, all ties must be anchored to studs as follows:

1. When studs are 16 inches (407 mm) on center, stud ties must be spaced no further apart than 24 inches (737 mm) vertically starting approximately 12 inches (381 mm) from the foundation; or

2. When studs are 24 inches (610 mm) on center, stud ties must be spaced no further apart than 16 inches (483 mm) vertically starting approximately 8 inches (254 mm) from the foundation.

**Exception:** In Seismic Design Category $D_0$, $D_1$ or $D_2$ or townhouses in Seismic Design Category C or in wind areas of more than 30 pounds per square foot pressure (1.44kPa), each tie shall support not more than 2 square feet (0.2 $m^2$) of wall area.

**R703.7.4.1.1 Veneer ties around wall openings.** Additional metal ties shall be provided around all wall openings greater than 16 inches (406 mm) in either dimension. Metal ties around the perimeter of openings shall be spaced not more than 3 feet (9144 mm) on center and placed within 12 inches (305 mm) of the wall opening."

46. Table R802.4(1), "Ceiling Joist Spans for Common Lumber Species," of Subsection R802.4, "Allowable Ceiling Joist Spans," of Section R802, "Wood Roof Framing," of Chapter 8, "Roof-Ceiling Construction," of the 2012 International Residential Code is amended to read as follows:

**TABLE R802.4(1)**
**CEILING JOIST SPANS FOR COMMON LUMBER SPECIES**
**(Uninhabitable attics without storage, live load = 10 psf, L/Δ = 240)**

| CEILING JOIST SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 5 psf | | | |
|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 |
| | | | Maximum ceiling joist spans | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 12 | Douglas fir-larch | SS | 13-2 | 20-8 | Note a | Note a |
| | Douglas fir-larch | #1 | 12-8 | 19-11 | Note a | Note a |
| | Douglas fir-larch | #2 | 12-5 | 19-6 | 25-8 | Note a |
| | Douglas fir-larch | #3 | 10-10 | 15-10 | 20-1 | 24-6 |
| | Hem-fir | SS | 12-5 | 19-6 | 25-8 | Note a |
| | Hem-fir | #1 | 12-2 | 19-1 | 25-2 | Note a |
| | Hem-fir | #2 | 11-7 | 18-2 | 24-0 | Note a |
| | Hem-fir | #3 | 10-10 | 15-10 | 20-1 | 24-6 |
| | Southern pine | SS | 12-11 | 20-3 | Note a | Note a |
| | Southern pine | #1 | ~~12-8~~ 12-5 | ~~19-11~~ 19-6 | ~~Note a~~ 25-8 | Note a |
| | Southern pine | #2 | ~~12-5~~ 11-10 | ~~19-6~~ 18-8 | ~~25-8~~ 24-7 | Note a |
| | Southern pine | #3 | ~~11-6~~ 10-1 | ~~17-0~~ 14-11 | ~~21-8~~ 18-9 | ~~25-7~~ 22-9 |
| | Spruce-pine-fir | SS | 12-2 | 19-1 | 25-2 | Note a |
| | Spruce-pine-fir | #1 | 11-10 | 18-8 | 24-7 | Note a |
| | Spruce-pine-fir | #2 | 11-10 | 18-8 | 24-7 | Note a |
| | Spruce-pine-fir | #3 | 10-10 | 15-10 | 20-1 | 24-6 |
| 16 | Douglas fir-larch | SS | 11-11 | 18-9 | 24-8 | Note a |
| | Douglas fir-larch | #1 | 11-6 | 18-1 | 23-10 | Note a |
| | Douglas fir-larch | #2 | 11-3 | 17-8 | 23-0 | Note a |
| | Douglas fir-larch | #3 | 9-5 | 13-9 | 17-5 | 21-3 |
| | Hem-fir | SS | 11-3 | 17-8 | 23-4 | Note a |
| | Hem-fir | #1 | 11-0 | 17-4 | 22-10 | Note a |
| | Hem-fir | #2 | 10-6 | 16-6 | 21-9 | Note a |
| | Hem-fir | #3 | 9-5 | 13-9 | 17-5 | 21-3 |
| | Southern pine | SS | 11-9 | 18-5 | 24-3 | Note a |
| | Southern pine | #1 | ~~11-6~~ 11-3 | ~~18-1~~ 17-8 | ~~23-10~~ 23-4 | Note a |
| | Southern pine | #2 | ~~11-3~~ 10-9 | ~~17-8~~ 16-11 | ~~23-4~~ 21-7 | ~~Note a~~ 25-7 |
| | Southern pine | #3 | ~~10-0~~ 8-9 | ~~14-9~~ 12-11 | ~~18-9~~ 16-3 | ~~22-2~~ 19-9 |
| | Spruce-pine-fir | SS | 11-0 | 17-4 | 22-10 | Note a |
| | Spruce-pine-fir | #1 | 10-9 | 16-11 | 22-4 | Note a |
| | Spruce-pine-fir | #2 | 10-9 | 16-11 | 22-4 | Note a |
| | Spruce-pine-fir | #3 | 9-5 | 13-9 | 17-5 | 21-3 |

*(continued)*

TABLE R802.4(1)—continued
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
(Uninhabitable attics without storage, live load = 10 psf, L/Δ = 240)

| CEILING JOIST SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 5 psf | | | |
|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 |
| | | | Maximum ceiling joist spans | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 19.2 | Douglas fir-larch | SS | 11-3 | 17-8 | 23-3 | Note a |
| | Douglas fir-larch | #1 | 10-10 | 17-0 | 22-5 | Note a |
| | Douglas fir-larch | #2 | 10-7 | 16-7 | 21-0 | 25-8 |
| | Douglas fir-larch | #3 | 8-7 | 12-6 | 15-10 | 19-5 |
| | Hem-fir | SS | 10-7 | 16-8 | 21-11 | Note a |
| | Hem-fir | #1 | 10-4 | 16-4 | 21-6 | Note a |
| | Hem-fir | #2 | 9-11 | 15-7 | 20-6 | 25-3 |
| | Hem-fir | #3 | 8-7 | 12-6 | 15-10 | 19-5 |
| | Southern -pine | SS | 11-0 | 17-4 | 22-10 | Note a |
| | Southern pine | #1 | ~~10-10~~ 10-7 | ~~17-0~~ 16-8 | ~~22-5~~ 22-0 | Note a |
| | Southern pine | #2 | ~~10-7~~ 10-2 | ~~16-8~~ 15-7 | ~~21-11~~ 19-8 | ~~Note a~~ 23-5 |
| | Southern pine | #3 | ~~9-1~~ 8-0 | ~~13-6~~ 11-9 | ~~17-2~~ 14-10 | ~~20-3~~ 18-0 |
| | Spruce-pine-fir | SS | 10-4 | 16-4 | 21-6 | Note a |
| | Spruce-pine-fir | #1 | 10-2 | 15-11 | 21-0 | 25-8 |
| | Spruce-pine-fir | #2 | 10-2 | 15-11 | 21-0 | 25-8 |
| | Spruce-pine-fir | #3 | 8-7 | 12-6 | 15-10 | 19-5 |
| 24 | Douglas fir-larch | SS | 10-5 | 16-4 | 21-7 | Note a |
| | Douglas fir-larch | #1 | 10-0 | 15-9 | 20-1 | 24-6 |
| | Douglas fir-larch | #2 | 9-10 | 14-10 | 18-9 | 22-11 |
| | Douglas fir-larch | #3 | 7-8 | 11-2 | 14-2 | 17-4 |
| | Hem-fir | SS | 9-10 | 15-6 | 20-5 | Note a |
| | Hem-fir | #1 | 9-8 | 15-2 | 19-7 | 23-11 |
| | Hem-fir | #2 | 9-2 | 14-5 | 18-6 | 22-7 |
| | Hem-fir | #3 | 7-8 | 11-2 | 14-2 | 17-4 |
| | Southern pine | SS | 10-3 | 16-1 | 21-2 | Note a |
| | Southern pine | #1 | ~~10-0~~ 9-10 | ~~15-9~~ 15-6 | ~~20-10~~ 20-5 | ~~Note a~~ 24-0 |
| | Southern pine | #2 | ~~9-10~~ 9-3 | ~~15-6~~ 13-11 | ~~20-1~~ 17-7 | ~~23-11~~ 20-11 |
| | Southern pine | #3 | ~~8-2~~ 7-2 | ~~12-0~~ 10-6 | ~~15-4~~ 13-3 | ~~18-1~~ 16-1 |
| | Spruce-pine-fir | SS | 9-8 | 15-2 | 19-11 | 25-5 |
| | Spruce-pine-fir | #1 | 9-5 | 14-9 | 18-9 | 22-11 |
| | Spruce-pine-fir | #2 | 9-5 | 14-9 | 18-9 | 22-11 |
| | Spruce-pine-fir | #3 | 7-8 | 11-2 | 14-2 | 17-4 |

Check sources for availability of lumber in lengths greater than 20 feet.
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kPa.
a. Span exceeds 26 feet in length.

47. Table R802.4(2), "Ceiling Joist Spans for Common Lumber Species," of Subsection R802.4, "Allowable Ceiling Joist Spans," of Section R802, "Wood Roof Framing," of Chapter 8, "Roof-Ceiling Construction," of the 2012 International Residential Code is amended to read as follows:

**TABLE R802.4(2)**
**CEILING JOIST SPANS FOR COMMON LUMBER SPECIES**
**(Uninhabitable attics with limited storage, live load = 20 psf, L/Δ = 240)**

| CEILING JOIST SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | |
|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 |
| | | | Maximum ceiling joist spans | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 12 | Douglas fir-larch | SS | 10-5 | 16-4 | 21-7 | Note a |
| | Douglas fir-larch | #1 | 10-0 | 15-9 | 20-1 | 24-6 |
| | Douglas fir-larch | #2 | 9-10 | 14-10 | 18-9 | 22-11 |
| | Douglas fir-larch | #3 | 7-8 | 11-2 | 14-2 | 17-4 |
| | Hem-fir | SS | 9-10 | 15-6 | 20-5 | Note a |
| | Hem-fir | #1 | 9-8 | 15-2 | 19-7 | 23-11 |
| | Hem-fir | #2 | 9-2 | 14-5 | 18-6 | 22-7 |
| | Hem-fir | #3 | 7-8 | 11-2 | 14-2 | 17-4 |
| | Southern pine | SS | 10-3 | 16-1 | 21-2 | Note a |
| | Southern pine | #1 | ~~10-0~~ 9-10 | ~~13-9~~ 15-6 | ~~20-10~~ 20-5 | ~~Note a~~ 24-0 |
| | Southern pine | #2 | ~~9-10~~ 9-3 | ~~15-6~~ 13-11 | ~~20-4~~ 17-7 | ~~23-11~~ 20-11 |
| | Southern pine | #3 | ~~8-2~~ 7-2 | ~~12-0~~ 10-6 | ~~15-4~~ 13-3 | ~~18-1~~ 16-1 |
| | Spruce-pine-fir | SS | 9-8 | 15-2 | 19-11 | 25-5 |
| | Spruce-pine-fir | #1 | 9-5 | 14-9 | 18-9 | 22-11 |
| | Spruce-pine-fir | #2 | 9-5 | 14-9 | 18-9 | 22-11 |
| | Spruce-pine-fir | #3 | 7-8 | 11-2 | 14-2 | 17-4 |
| 16 | Douglas fir-larch | SS | 9-6 | 14-11 | 19-7 | 25-0 |
| | Douglas fir-larch | #1 | 9-1 | 13-9 | 17-5 | 21-3 |
| | Douglas fir-larch | #2 | 8-9 | 12-10 | 16-3 | 19-10 |
| | Douglas fir-larch | #3 | 6-8 | 9-8 | 12-4 | 15-0 |
| | Hem-fir | SS | 8-11 | 14-1 | 18-6 | 23-8 |
| | Hem-fir | #1 | 8-9 | 13-5 | 16-10 | 20-8 |
| | Hem-fir | #2 | 8-4 | 12-8 | 16-0 | 19-7 |
| | Hem-fir | #3 | 6-8 | 9-8 | 12-4 | 15-0 |
| | Southern pine | SS | 9-4 | 14-7 | 19-3 | 24-7 |
| | Southern pine | #1 | ~~9-1~~ 8-11 | ~~14-4~~ 14-0 | ~~18-11~~ 17-9 | ~~23-1~~ 20-9 |
| | Southern pine | #2 | ~~8-11~~ 8-0 | ~~13-6~~ 12-0 | ~~17-5~~ 15-3 | ~~20-9~~ 18-1 |
| | Southern pine | #3 | ~~7-1~~ 6-2 | ~~10-5~~ 9-2 | ~~13-3~~ 11-6 | ~~15-6~~ 14-0 |
| | Spruce-pine-fir | SS | 8-9 | 13-9 | 18-1 | 23-1 |
| | Spruce-pine-fir | #1 | 8-7 | 12-10 | 16-3 | 19-10 |
| | Spruce-pine-fir | #2 | 8-7 | 12-10 | 16-3 | 19-10 |
| | Spruce-pine-fir | #3 | 6-8 | 9-8 | 12-4 | 15-0 |

*(continued)*

TABLE R802.4(2)—continued
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
(Uninhabitable attics with limited storage, live load = 20 psf, L/Δ = 240)

| CEILING JOIST SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | |
|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 |
| | | | Maximum ceiling joist spans | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 19.2 | Douglas fir-larch | SS | 8-11 | 14-0 | 18-5 | 23-4 |
| | Douglas fir-larch | #1 | 8-7 | 12-6 | 15-10 | 19-5 |
| | Douglas fir-larch | #2 | 8-0 | 11-9 | 14-10 | 18-2 |
| | Douglas fir-larch | #3 | 6-1 | 8-10 | 11-3 | 13-8 |
| | Hem-fir | SS | 8-5 | 13-3 | 17-5 | 22-3 |
| | Hem-fir | #1 | 8-3 | 12-3 | 15-6 | 18-11 |
| | Hem-fir | #2 | 7-10 | 11-7 | 14-8 | 17-10 |
| | Hem-fir | #3 | 6-1 | 8-10 | 11-3 | 13-8 |
| | Southern pine | SS | 8-9 | 13-9 | ~~18-1~~ 18-2 | 23-1 |
| | Southern pine | #1 | ~~8-7~~ 8-5 | ~~13-6~~ 12-9 | ~~17-9~~ 16-2 | ~~21-3~~ 18-11 |
| | Southern pine | #2 | ~~8-5~~ 7-4 | ~~12-3~~ 11-0 | ~~15-10~~ 13-11 | ~~18-11~~ 16-6 |
| | Southern pine | #3 | ~~6-5~~ 5-8 | ~~9-6~~ 8-4 | ~~12-1~~ 10-6 | ~~14-4~~ 12-9 |
| | Spruce-pine-fir | SS | 8-3 | 12-11 | 17-1 | 21-8 |
| | Spruce-pine-fir | #1 | 8-0 | 11-9 | 14-10 | 18-2 |
| | Spruce-pine-fir | #2 | 8-0 | 11-9 | 14-10 | 18-2 |
| | Spruce-pine-fir | #3 | 6-1 | 8-10 | 11-3 | 13-8 |
| 24 | Douglas fir-larch | SS | 8-3 | 13-0 | 17-1 | 20-11 |
| | Douglas fir-larch | #1 | 7-8 | 11-2 | 14-2 | 17-4 |
| | Douglas fir-larch | #2 | 7-2 | 10-6 | 13-3 | 16-3 |
| | Douglas fir-larch | #3 | 5-5 | 7-11 | 10-0 | 12-3 |
| | Hem-fir | SS | 7-10 | 12-3 | 16-2 | 20-6 |
| | Hem-fir | #1 | 7-6 | 10-11 | 13-10 | 16-11 |
| | Hem-fir | #2 | 7-1 | 10-4 | 13-1 | 16-0 |
| | Hem-fir | #3 | 5-5 | 7-11 | 10-0 | 12-3 |
| | Southern pine | SS | 8-1 | 12-9 | 16-10 | 21-6 |
| | Southern pine | #1 | ~~8-0~~ 7-8 | ~~12-6~~ 11-5 | ~~16-10~~ 14-6 | ~~18-10~~ 16-11 |
| | Southern pine | #2 | ~~7-8~~ 6-7 | ~~11-0~~ 9-10 | ~~14-3~~ 12-6 | ~~16-11~~ 14-9 |
| | Southern pine | #3 | ~~5-9~~ 5-1 | ~~8-6~~ 7-5 | ~~10-10~~ 9-5 | ~~12-10~~ 11-5 |
| | Spruce-pine-fir | SS | 7-8 | 12-0 | 15-10 | 19-5 |
| | Spruce-pine-fir | #1 | 7-2 | 10-6 | 13-3 | 16-3 |
| | Spruce-pine-fir | #2 | 7-2 | 10-6 | 13-3 | 16-3 |
| | Spruce-pine-fir | #3 | 5-5 | 7-11 | 10-0 | 12-3 |

Check sources for availability of lumber in lengths greater than 20 feet.
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kPa.
a. Span exceeds 26 feet in length.

48. Table R802.5.1(1), "Rafter Spans for Common Lumber Species," of Subsection R802.5, "Allowable Rafter Spans," of Section R802, "Wood Roof Framing," of Chapter 8, "Roof-Ceiling Construction," of the 2012 International Residential Code is amended to read as follows:

TABLE R802.5.1(1)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Roof live load=20 psf, ceiling not attached to rafters, L/Δ = 180)

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 12 | Douglas fir-larch | SS | 11-6 | 18-0 | 23-9 | Note b | Note b | 11-6 | 18-0 | 23-5 | Note b | Note b |
| | Douglas fir-larch | #1 | 11-1 | 17-4 | 22-5 | Note b | Note b | 10-6 | 15-4 | 19-5 | 23-9 | Note b |
| | Douglas fir-larch | #2 | 10-10 | 16-7 | 21-0 | 25-8 | Note b | 9-10 | 14-4 | 18-2 | 22-3 | 25-9 |
| | Douglas fir-larch | #3 | 8-7 | 12-6 | 15-10 | 19-5 | 22-6 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 |
| | Hem-fir | SS | 10-10 | 17-0 | 22-5 | Note b | Note b | 10-10 | 17-0 | 22-5 | Note b | Note b |
| | Hem-fir | #1 | 10-7 | 16-8 | 21-10 | Note b | Note b | 10-3 | 14-11 | 18-11 | 23-2 | Note b |
| | Hem-fir | #2 | 10-1 | 15-11 | 20-8 | 25-3 | Note b | 9-8 | 14-2 | 17-11 | 21-11 | 25-5 |
| | Hem-fir | #3 | 8-7 | 12-6 | 15-10 | 19-5 | 22-6 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 |
| | Southern pine | SS | 11-3 | 17-8 | 23-4 | Note b | Note b | 11-3 | 17-8 | 23-4 | Note b | Note b |
| | Southern pine | #1 | 11-1 | 10-10 | 17-4 | 17-0 | 22-11 | 22-5 | Note b | Note b | 11-1 | 10-6 | 17-3 | 15-8 | 21-9 | 19-10 | 25-10 | 23-2 | Note b |
| | Southern pine | #2 | 10-10 | 10-4 | 17-0 | 15-7 | 22-5 | 19-8 | Note b | 23-5 | Note b | 10-6 | 9-0 | 15-1 | 13-6 | 19-5 | 17-1 | 23-2 | 20-3 | Note b | 23-10 |
| | Southern pine | #3 | 9-1 | 8-0 | 13-6 | 11-9 | 17-2 | 14-10 | 20-3 | 18-0 | 24-1 | 21-8 | 7-11 | 6-11 | 11-8 | 10-2 | 14-10 | 12-10 | 17-6 | 15-7 | 20-11 | 18-6 |
| | Spruce-pine-fir | SS | 10-7 | 16-8 | 21-11 | Note b | Note b | 10-7 | 16-8 | 21-9 | Note b | Note b |
| | Spruce-pine-fir | #1 | 10-4 | 16-3 | 21-0 | 25-8 | Note b | 9-10 | 14-4 | 18-2 | 22-3 | 25-9 |
| | Spruce-pine-fir | #2 | 10-4 | 16-3 | 21-0 | 25-8 | Note b | 9-10 | 14-4 | 18-2 | 22-3 | 25-9 |
| | Spruce-pine-fir | #3 | 8-7 | 12-6 | 15-10 | 19-5 | 22-6 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 |
| 16 | Douglas fir-larch | SS | 10-5 | 16-4 | 21-7 | Note b | Note b | 10-5 | 16-0 | 20-3 | 24-9 | Note b |
| | Douglas fir-larch | #1 | 10-0 | 15-4 | 19-5 | 23-9 | Note b | 9-1 | 13-3 | 16-10 | 20-7 | 23-10 |
| | Douglas fir-larch | #2 | 9-10 | 14-4 | 18-2 | 22-3 | 25-9 | 8-6 | 12-5 | 15-9 | 19-3 | 22-4 |
| | Douglas fir-larch | #3 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 | 6-5 | 9-5 | 11-11 | 14-6 | 16-10 |
| | Hem-fir | SS | 9-10 | 15-6 | 20-5 | Note b | Note b | 9-10 | 15-6 | 19-11 | 24-4 | Note b |
| | Hem-fir | #1 | 9-8 | 14-11 | 18-11 | 23-2 | Note b | 8-10 | 12-11 | 16-5 | 20-0 | 23-3 |
| | Hem-fir | #2 | 9-2 | 14-2 | 17-11 | 21-11 | 25-5 | 8-5 | 12-3 | 15-6 | 18-11 | 22-0 |
| | Hem-fir | #3 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 | 6-5 | 9-5 | 11-11 | 14-6 | 16-10 |
| | Southern pine | SS | 10-3 | 16-1 | 21-2 | Note b | Note b | 10-3 | 16-1 | 21-2 | Note b | 25-7 | Note b |
| | Southern pine | #1 | 10-0 | 9-10 | 15-9 | 15-6 | 20-10 | 19-10 | 25-10 | 23-2 | Note b | 10-0 | 9-1 | 15-0 | 13-7 | 18-10 | 17-2 | 22-4 | 20-1 | Note b | 23-10 |
| | Southern pine | #2 | 9-10 | 9-0 | 15-1 | 13-6 | 19-5 | 17-1 | 23-2 | 20-3 | Note b | 23-10 | 9-1 | 7-9 | 13-0 | 11-8 | 16-10 | 14-9 | 20-1 | 17-6 | 23-7 | 20-8 |
| | Southern pine | #3 | 7-11 | 6-11 | 11-8 | 10-2 | 14-10 | 12-10 | 17-6 | 15-7 | 20-11 | 18-6 | 6-10 | 6-0 | 10-1 | 8-10 | 12-10 | 11-2 | 15-2 | 13-6 | 18-1 | 16-0 |
| | Spruce-pine-fir | SS | 9-8 | 15-2 | 19-11 | 25-5 | Note b | 9-8 | 14-10 | 18-10 | 23-0 | Note b |
| | Spruce-pine-fir | #1 | 9-5 | 14-4 | 18-2 | 22-3 | 25-9 | 8-6 | 12-5 | 15-9 | 19-3 | 22-4 |
| | Spruce-pine-fir | #2 | 9-5 | 14-4 | 18-2 | 22-3 | 25-9 | 8-6 | 12-5 | 15-9 | 19-3 | 22-4 |
| | Spruce-pine-fir | #3 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 | 6-5 | 9-5 | 11-11 | 14-6 | 16-10 |
| 19.2 | Douglas fir-larch | SS | 9-10 | 15-5 | 20-4 | 25-11 | Note b | 9-10 | 14-7 | 18-6 | 22-7 | Note b |
| | Douglas fir-larch | #1 | 9-5 | 14-0 | 17-9 | 21-8 | 25-2 | 8-4 | 12-2 | 15-4 | 18-9 | 21-9 |
| | Douglas fir-larch | #2 | 8-11 | 13-1 | 16-7 | 20-3 | 23-6 | 7-9 | 11-4 | 14-4 | 17-7 | 20-4 |
| | Douglas fir-larch | #3 | 6-9 | 9-11 | 12-7 | 15-4 | 17-9 | 5-10 | 8-7 | 10-10 | 13-3 | 15-5 |
| | Hem-fir | SS | 9-3 | 14-7 | 19-2 | 24-6 | Note b | 9-3 | 14-4 | 18-2 | 22-3 | 25-9 |
| | Hem-fir | #1 | 9-1 | 13-8 | 17-4 | 21-1 | 24-6 | 8-1 | 11-10 | 15-0 | 18-4 | 21-3 |
| | Hem-fir | #2 | 8-8 | 12-11 | 16-4 | 20-0 | 23-2 | 7-8 | 11-2 | 14-2 | 17-4 | 20-1 |
| | Hem-fir | #3 | 6-9 | 9-11 | 12-7 | 15-4 | 17-9 | 5-10 | 8-7 | 10-10 | 13-3 | 15-5 |
| | Southern pine | SS | 9-8 | 15-2 | 19-11 | 25-5 | Note b | 9-8 | 15-2 | 19-11 | 25-5 | 25-6 | Note b |
| | Southern pine | #1 | 9-4 | 9-3 | 14-10 | 14-3 | 19-7 | 18-1 | 23-7 | 21-2 | Note b | 25-2 | 9-3 | 8-4 | 13-8 | 12-4 | 17-2 | 15-8 | 20-5 | 18-3 | 21-4 | 21-9 |
| | Southern pine | #2 | 9-3 | 8-2 | 13-9 | 12-3 | 17-9 | 15-7 | 21-2 | 18-6 | 24-10 | 21-9 | 8-4 | 7-1 | 11-11 | 10-8 | 15-4 | 13-6 | 18-4 | 16-0 | 21-6 | 18-10 |
| | Southern pine | #3 | 7-3 | 6-4 | 10-8 | 9-4 | 13-7 | 11-9 | 16-0 | 14-3 | 19-1 | 16-10 | 6-3 | 5-6 | 9-3 | 8-1 | 11-9 | 10-2 | 13-10 | 12-4 | 16-6 | 14-7 |
| | Spruce-pine-fir | SS | 9-1 | 14-3 | 18-9 | 23-11 | Note b | 9-1 | 13-7 | 17-2 | 21-0 | 24-4 |
| | Spruce-pine-fir | #1 | 8-10 | 13-1 | 16-7 | 20-3 | 23-6 | 7-9 | 11-4 | 14-4 | 17-7 | 20-4 |
| | Spruce-pine-fir | #2 | 8-10 | 13-1 | 16-7 | 20-3 | 23-6 | 7-9 | 11-4 | 14-4 | 17-7 | 20-4 |
| | Spruce-pine-fir | #3 | 6-9 | 9-11 | 12-7 | 15-4 | 17-9 | 5-10 | 8-7 | 10-10 | 13-3 | 15-5 |

(continued)

TABLE R802.5.1(1)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Roof live load=20 psf, ceiling not attached to rafters, L/Δ = 180)

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 24 | Douglas fir-larch | SS | 9-1 | 14-4 | 18-10 | 23-4 | Note b | 8-11 | 13-1 | 16-7 | 20-3 | 23-5 |
| | Douglas fir-larch | #1 | 8-7 | 12-6 | 15-10 | 19-5 | 22-6 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 |
| | Douglas fir-larch | #2 | 8-0 | 11-9 | 14-10 | 18-2 | 21-0 | 6-11 | 10-2 | 12-10 | 15-8 | 18-3 |
| | Douglas fir-larch | #3 | 6-1 | 8-10 | 11-3 | 13-8 | 15-11 | 5-3 | 7-8 | 9-9 | 11-10 | 13-9 |
| | Hem-fir | SS | 8-7 | 13-6 | 17-10 | 22-9 | Note b | 8-7 | 12-10 | 16-3 | 19-10 | 23-0 |
| | Hem-fir | #1 | 8-4 | 12-3 | 15-6 | 18-11 | 21-11 | 7-3 | 10-7 | 13-5 | 16-4 | 19-0 |
| | Hem-fir | #2 | 7-11 | 11-7 | 14-8 | 17-10 | 20-9 | 6-10 | 10-0 | 12-8 | 15-6 | 17-11 |
| | Hem-fir | #3 | 6-1 | 8-10 | 11-3 | 13-8 | 15-11 | 5-3 | 7-8 | 9-9 | 11-10 | 13-9 |
| | Southern pine | SS | 8-11 | 14-1 | 18-6 | 23-8 | Note b | 8-11 | ~~14-1~~13-10 | ~~18-6~~17-6 | ~~22-1~~20-10 | ~~Note b~~ 24-8 |
| | Southern pine | #1 | ~~8-9~~ 8-7 | ~~13-9~~12-9 | ~~17-9~~16-2 | ~~21-1~~18-11 | ~~25-2~~22-6 | ~~8-3~~ 7-5 | ~~12-3~~11-1 | ~~15-4~~14-0 | ~~18-3~~16-5 | ~~21-9~~19-6 |
| | Southern pine | #2 | ~~8-7~~ 7-4 | ~~12-3~~11-0 | ~~15-10~~13-11 | ~~18-11~~16-6 | ~~22-2~~19-6 | ~~7-5~~ 6-4 | ~~10-8~~9-6 | ~~13-9~~12-1 | ~~16-5~~14-4 | ~~19-3~~16-10 |
| | Southern pine | #3 | ~~6-5~~ 5-8 | ~~9-6~~8-4 | ~~12-1~~10-6 | ~~14-4~~12-9 | ~~17-1~~15-1 | ~~5-7~~ 4-11 | ~~8-3~~7-3 | ~~10-6~~9-1 | ~~12-5~~11-0 | ~~14-9~~13-1 |
| | Spruce-pine-fir | SS | 8-5 | 13-3 | 17-5 | 21-8 | 25-2 | 8-4 | 12-2 | 15-4 | 18-9 | 21-9 |
| | Spruce-pine-fir | #1 | 8-0 | 11-9 | 14-10 | 18-2 | 21-0 | 6-11 | 10-2 | 12-10 | 15-8 | 18-3 |
| | Spruce-pine-fir | #2 | 8-0 | 11-9 | 14-10 | 18-2 | 21-0 | 6-11 | 10-2 | 12-10 | 15-8 | 18-3 |
| | Spruce-pine-fir | #3 | 6-1 | 8-10 | 11-3 | 13-8 | 15-11 | 5-3 | 7-8 | 9-9 | 11-10 | 13-9 |

Check sources for availability of lumber in lengths greater than 20 feet.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

| $H_C/H_R$ | Rafter Span Adjustment Factor |
|---|---|
| 1/3 | 0.67 |
| 1/4 | 0.76 |
| 1/5 | 0.83 |
| 1/6 | 0.90 |
| 1/7.5 or less | 1.00 |

where:

$H_C$ = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

$H_R$ = Height of roof ridge measured vertically above the top of the rafter support walls.

b. Span exceeds 26 feet in length.

49. Table R802.5.1(2), "Rafter Spans for Common Lumber Species," of Subsection R802.5, "Allowable Rafter Spans," of Section R802, "Wood Roof Framing," of Chapter 8, "Roof-Ceiling Construction," of the 2012 International Residential Code is amended to read as follows:

**TABLE R802.5.1(2)**
**RAFTER SPANS FOR COMMON LUMBER SPECIES**
**(Roof live load=20 psf, ceiling attached to rafters, L/Δ = 240)**

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 12 | Douglas fir-larch | SS | 10-5 | 16-4 | 21-7 | Note b | Note b | 10-5 | 16-4 | 21-7 | Note b | Note b |
| | Douglas fir-larch | #1 | 10-0 | 15-9 | 20-10 | Note b | Note b | 10-0 | 15-4 | 19-5 | 23-9 | Note b |
| | Douglas fir-larch | #2 | 9-10 | 15-6 | 20-5 | 25-8 | Note b | 9-10 | 14-4 | 18-2 | 22-3 | 25-9 |
| | Douglas fir-larch | #3 | 8-7 | 12-6 | 15-10 | 19-5 | 22-6 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 |
| | Hem-fir | SS | 9-10 | 15-6 | 20-5 | Note b | Note b | 9-10 | 15-6 | 20-5 | Note b | Note b |
| | Hem-fir | #1 | 9-8 | 15-2 | 19-11 | 25-5 | Note b | 9-8 | 14-11 | 18-11 | 23-2 | Note b |
| | Hem-fir | #2 | 9-2 | 14-5 | 19-0 | 24-3 | Note b | 9-2 | 14-2 | 17-11 | 21-11 | 25-5 |
| | Hem-fir | #3 | 8-7 | 12-6 | 15-10 | 19-5 | 22-6 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 |
| | Southern pine | SS | 10-3 | 16-1 | 21-2 | Note b | Note b | 10-3 | 16-1 | 21-2 | Note b | Note b |
| | Southern pine | #1 | ~~10-0~~ 9-10 | ~~15-9~~ 15-6 | ~~20-10~~ 20-5 | Note b | Note b | ~~10-0~~ 9-10 | ~~15-9~~ 15-6 | ~~20-10~~ 19-10 | ~~25-10~~ 23-2 | Note b |
| | Southern pine | #2 | ~~9-10~~ 9-5 | ~~15-6~~ 14-9 | ~~20-5~~ 19-6 | ~~Note b~~ 23-5 | Note b | ~~9-10~~ 9-0 | ~~15-1~~ 13-6 | ~~19-5~~ 17-1 | ~~23-3~~ 20-3 | ~~Note b~~ 23-10 |
| | Southern pine | #3 | ~~9-1~~ 8-0 | ~~13-6~~ 11-9 | ~~17-2~~ 14-10 | ~~20-3~~ 18-0 | ~~24-1~~ 21-4 | ~~7-11~~ 6-11 | ~~11-8~~ 10-2 | ~~14-10~~ 12-10 | ~~17-6~~ 15-7 | ~~20-11~~ 18-6 |
| | Spruce-pine-fir | SS | 9-8 | 15-2 | 19-11 | 25-5 | Note b | 9-8 | 15-2 | 19-11 | 25-5 | Note b |
| | Spruce-pine-fir | #1 | 9-5 | 14-9 | 19-6 | 24-10 | Note b | 9-5 | 14-4 | 18-2 | 22-3 | 25-9 |
| | Spruce-pine-fir | #2 | 9-5 | 14-9 | 19-6 | 24-10 | Note b | 9-5 | 14-4 | 18-2 | 22-3 | 25-9 |
| | Spruce-pine-fir | #3 | 8-7 | 12-6 | 15-10 | 19-5 | 22-6 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 |
| 16 | Douglas fir-larch | SS | 9-6 | 14-11 | 19-7 | 25-0 | Note b | 9-6 | 14-11 | 19-7 | 24-9 | Note b |
| | Douglas fir-larch | #1 | 9-1 | 14-4 | 18-11 | 23-9 | Note b | 9-1 | 13-3 | 16-10 | 20-7 | 23-10 |
| | Douglas fir-larch | #2 | 8-11 | 14-1 | 18-2 | 22-3 | 25-9 | 8-6 | 12-3 | 15-9 | 19-3 | 22-4 |
| | Douglas fir-larch | #3 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 | 6-3 | 9-5 | 11-11 | 14-6 | 16-10 |
| | Hem-fir | SS | 8-11 | 14-1 | 18-6 | 23-8 | Note b | 8-11 | 14-1 | 18-6 | 23-8 | Note b |
| | Hem-fir | #1 | 8-9 | 13-9 | 18-1 | 23-1 | Note b | 8-9 | 12-11 | 16-5 | 20-0 | 23-3 |
| | Hem-fir | #2 | 8-4 | 13-1 | 17-3 | 21-11 | 25-5 | 8-4 | 12-3 | 15-6 | 18-11 | 22-0 |
| | Hem-fir | #3 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 | 6-5 | 9-5 | 11-11 | 14-6 | 16-10 |
| | Southern pine | SS | 9-4 | 14-7 | 19-3 | 24-7 | Note b | 9-4 | 14-7 | 19-3 | 24-7 | Note b |
| | Southern pine | #1 | ~~9-1~~ 8-11 | ~~13-9~~ 14-1 | ~~18-11~~ 18-6 | ~~24-1~~ 23-2 | Note b | ~~9-1~~ 8-11 | ~~13-9~~ 13-7 | ~~18-10~~ 17-2 | ~~22-4~~ 20-1 | ~~Note b~~ 23-10 |
| | Southern pine | #2 | ~~8-11~~ 8-7 | ~~14-1~~ 13-5 | ~~18-6~~ 17-1 | ~~23-2~~ 20-3 | ~~Note b~~ 23-10 | ~~8-11~~ 7-9 | ~~13-0~~ 11-8 | ~~16-10~~ 14-9 | ~~20-1~~ 17-6 | ~~23-2~~ 20-8 |
| | Southern pine | #3 | ~~7-11~~ 6-11 | ~~11-8~~ 10-2 | ~~14-10~~ 12-10 | ~~17-6~~ 15-7 | ~~20-11~~ 18-6 | ~~6-10~~ 6-0 | ~~10-1~~ 8-10 | ~~12-10~~ 11-2 | ~~15-2~~ 13-6 | ~~18-1~~ 16-0 |
| | Spruce-pine-fir | SS | 8-9 | 13-9 | 18-1 | 23-1 | Note b | 8-9 | 13-9 | 18-1 | 23-0 | Note b |
| | Spruce-pine-fir | #1 | 8-7 | 13-5 | 17-9 | 22-3 | 25-9 | 8-6 | 12-5 | 15-9 | 19-3 | 22-4 |
| | Spruce-pine-fir | #2 | 8-7 | 13-5 | 17-9 | 22-3 | 25-9 | 8-6 | 12-5 | 15-9 | 19-3 | 22-4 |
| | Spruce-pine-fir | #3 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 | 6-5 | 9-5 | 11-11 | 14-6 | 16-10 |
| 19.2 | Douglas fir-larch | SS | 8-11 | 14-0 | 18-5 | 23-7 | Note b | 8-11 | 14-0 | 18-5 | 22-7 | Note b |
| | Douglas fir-larch | #1 | 8-7 | 13-6 | 17-9 | 21-8 | 25-2 | 8-4 | 12-2 | 15-4 | 18-9 | 21-9 |
| | Douglas fir-larch | #2 | 8-5 | 13-1 | 16-7 | 20-3 | 23-6 | 7-9 | 11-4 | 14-4 | 17-7 | 20-4 |
| | Douglas fir-larch | #3 | 6-9 | 9-11 | 12-7 | 15-4 | 17-9 | 5-10 | 8-7 | 10-10 | 13-3 | 15-5 |
| | Hem-fir | SS | 8-5 | 13-3 | 17-5 | 22-3 | Note b | 8-5 | 13-3 | 17-5 | 22-3 | 25-9 |
| | Hem-fir | #1 | 8-3 | 12-11 | 17-1 | 21-1 | 24-6 | 8-1 | 11-10 | 15-0 | 18-4 | 21-3 |
| | Hem-fir | #2 | 7-10 | 12-4 | 16-3 | 20-0 | 23-2 | 7-8 | 11-2 | 14-2 | 17-4 | 20-1 |
| | Hem-fir | #3 | 6-9 | 9-11 | 12-7 | 15-4 | 17-9 | 5-10 | 8-7 | 10-10 | 13-3 | 15-5 |

*(continued)*

**TABLE R802.5.1(2)—continued**
**RAFTER SPANS FOR COMMON LUMBER SPECIES**
**(Roof live load=20 psf, ceiling attached to rafters, L/Δ = 240)**

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 19.2 | Southern pine | SS | 8-9 | 13-9 | ~~18-1~~ 18-2 | 23-1 | Note b | 8-9 | 13-9 | ~~18-1~~ 18-2 | 23-1 | Note b |
| | Southern pine | #1 | ~~8-7~~ 8-5 | ~~13-6~~ 13-3 | ~~17-9~~ 17-5 | ~~22-8~~ 21-2 | ~~Note b~~ 25-2 | ~~8-7~~ 8-4 | ~~13-6~~ 12-4 | ~~17-3~~ 15-8 | ~~20-5~~ 18-4 | ~~24-4~~ 21-9 |
| | Southern pine | #2 | ~~8-5~~ 8-1 | ~~13-3~~ 12-3 | ~~17-5~~ 15-7 | ~~21-3~~ 18-6 | ~~24-10~~ 21-9 | ~~8-4~~ 7-1 | ~~11-11~~ 10-8 | ~~15-1~~ 13-6 | ~~18-1~~ 16-0 | ~~21-6~~ 18-10 |
| | Southern pine | #3 | ~~7-3~~ 6-4 | ~~10-8~~ 9-4 | ~~13-7~~ 11-9 | ~~16-0~~ 14-3 | ~~19-1~~ 16-10 | ~~6-3~~ 5-6 | ~~9-3~~ 8-1 | ~~11-9~~ 10-2 | ~~13-10~~ 12-4 | ~~16-6~~ 14-7 |
| | Spruce-pine-fir | SS | 8-3 | 12-11 | 17-1 | 21-9 | Note b | 8-3 | 12-11 | 17-1 | 21-0 | 24-4 |
| | Spruce-pine-fir | #1 | 8-1 | 12-8 | 16-7 | 20-3 | 23-6 | 7-9 | 11-4 | 14-4 | 17-7 | 20-4 |
| | Spruce-pine-fir | #2 | 8-1 | 12-8 | 16-7 | 20-3 | 23-6 | 7-9 | 11-4 | 14-4 | 17-7 | 20-4 |
| | Spruce-pine-fir | #3 | 6-9 | 9-11 | 12-7 | 15-4 | 17-9 | 5-10 | 8-7 | 10-10 | 13-3 | 15-5 |
| 24 | Douglas fir-larch | SS | 8-3 | 13-0 | 17-2 | 2 1-10 | Note b | 8-3 | 13-0 | 16-7 | 20-3 | 23-5 |
| | Douglas fir-larch | #1 | 8-0 | 12-6 | 15-10 | 19-5 | 22-6 | 7-5 | 10-10 | 13-9 | 16-9 | 19-6 |
| | Douglas fir-larch | #2 | 7-10 | 11-9 | 14-10 | 18-2 | 21-0 | 6-11 | 10-2 | 12-10 | 15-8 | 18-3 |
| | Douglas fir-larch | #3 | 6-1 | 8-10 | 11-3 | 13-8 | 15-11 | 5-3 | 7-8 | 9-9 | 11-10 | 13-9 |
| | Hem-fir | SS | 7-10 | 12-3 | 16-2 | 20-8 | 25-1 | 7-10 | 12-3 | 16-2 | 19-10 | 23-0 |
| | Hem-fir | #1 | 7-8 | 12-0 | 15-6 | 18-11 | 21-11 | 7-3 | 10-7 | 13-5 | 16-4 | 19-0 |
| | Hem-fir | #2 | 7-3 | 11-5 | 14-8 | 17-10 | 20-9 | 6-10 | 10-0 | 12-8 | 15-6 | 17-11 |
| | Hem-fir | #3 | 6-1 | 8-10 | 11-3 | 13-8 | 15-11 | 5-3 | 7-8 | 9-9 | 11-10 | 13-9 |
| | Southern pine | SS | 8-1 | 12-9 | 16-10 | 21-6 | Note b | 8-1 | 12-9 | 16-10 | ~~21-6~~ 20-10 | ~~Note b~~ 24-8 |
| | Southern pine | #1 | ~~8-0~~ 7-10 | ~~12-6~~ 12-3 | ~~16-6~~ 16-2 | ~~21-1~~ 18-11 | ~~25-3~~ 22-6 | ~~8-0~~ 7-5 | ~~12-3~~ 11-1 | ~~15-4~~ 14-0 | ~~18-3~~ 16-5 | ~~21-9~~ 19-6 |
| | Southern pine | #2 | ~~7-10~~ 7-4 | ~~12-3~~ 11-0 | ~~15-10~~ 13-11 | ~~18-11~~ 16-6 | ~~22-3~~ 19-6 | ~~7-5~~ 6-1 | ~~10-8~~ 9-6 | ~~13-9~~ 12-1 | ~~16-5~~ 14-4 | ~~19-3~~ 16-10 |
| | Southern pine | #3 | ~~6-5~~ 5-8 | ~~9-6~~ 8-4 | ~~12-1~~ 10-6 | ~~14-6~~ 12-9 | ~~17-1~~ 15-1 | ~~5-7~~ 4-11 | ~~8-3~~ 7-3 | ~~10-6~~ 9-1 | ~~13-6~~ 11-9 | ~~14-9~~ 13-1 |
| | Spruce-pine-fir | SS | 7-8 | 12-0 | 15-10 | 20-2 | 24-7 | 7-8 | 12-0 | 15-4 | 18-9 | 21-9 |
| | Spruce-pine-fir | #1 | 7-6 | 11-9 | 14-10 | 18-2 | 21-0 | 6-11 | 10-2 | 12-10 | 15-8 | 18-3 |
| | Spruce-pine-fir | #2 | 7-6 | 11-9 | 14-10 | 18-2 | 21-0 | 6-11 | 10-2 | 12-10 | 15-8 | 18-3 |
| | Spruce-pine-fir | #3 | 6-1 | 8-10 | 11-3 | 13-8 | 15-11 | 5-3 | 7-8 | 9-9 | 11-10 | 13-9 |

Check sources for availability of lumber in lengths greater than 20 feet.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

| $H_c/H_R$ | Rafter Span Adjustment Factor |
|---|---|
| 1/3 | 0.67 |
| 1/4 | 0.76 |
| 1/5 | 0.83 |
| 1/6 | 0.90 |
| 1/7.5 or less | 1.00 |

where:

$H_c$ = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

$H_R$ = Height of roof ridge measured vertically above the top of the rafter support walls.

b. Span exceeds 26 feet in length.

50. Table R802.5.1(3), "Rafter Spans for Common Lumber Species," of Subsection R802.5, "Allowable Rafter Spans," of Section R802, "Wood Roof Framing," of Chapter 8, "Roof-Ceiling Construction," of the 2012 International Residential Code is amended to read as follows:

TABLE R802.5.1(3)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Ground snow load=30 psf, ceiling not attached to rafters, L/Δ = 180)

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 12 | Douglas fir-larch | SS | 10-0 | 15-9 | 20-9 | Note b | Note b | 10-0 | 15-9 | 20-1 | 24-6 | Note b |
| | Douglas fir-larch | #1 | 9-8 | 14-9 | 18-8 | 22-9 | Note b | 9-0 | 13-2 | 16-8 | 20-4 | 23-7 |
| | Douglas fir-larch | #2 | 9-5 | 13-9 | 17-5 | 21-4 | 24-8 | 8-5 | 12-4 | 15-7 | 19-1 | 22-1 |
| | Douglas fir-larch | #3 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 | 6-4 | 9-4 | 11-9 | 14-5 | 16-8 |
| | Hem-fir | SS | 9-6 | 14-10 | 19-7 | 25-0 | Note b | 9-6 | 14-10 | 19-7 | 24-1 | Note b |
| | Hem-fir | #1 | 9-3 | 14-4 | 18-2 | 22-2 | 25-9 | 8-9 | 12-10 | 16-3 | 19-10 | 23-0 |
| | Hem-fir | #2 | 8-10 | 13-7 | 17-2 | 21-0 | 24-4 | 8-4 | 12-2 | 15-4 | 18-9 | 21-9 |
| | Hem-fir | #3 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 | 6-4 | 9-4 | 11-9 | 14-5 | 16-8 |
| | Southern pine | SS | 9-10 | 15-6 | 20-5 | Note b | Note b | 9-10 | 15-6 | 20-5 | Note b 25-4 | Note b |
| | Southern pine | #1 | 9-8 9-6 | 15-2 14-10 | 20-0 19-0 | 24-9 22-3 | Note b | 9-8 9-0 | 14-10 13-5 | 18-8 17-0 | 22-3 19-11 | Note b 23-7 |
| | Southern pine | #2 | 9-6 8-7 | 14-5 12-11 | 18-8 16-4 | 22-3 19-5 | Note b 22-10 | 9-0 7-8 | 12-11 11-7 | 16-8 14-8 | 19-11 17-4 | 23-4 20-5 |
| | Southern pine | #3 | 7-7 6-7 | 11-3 9-9 | 14-3 12-4 | 16-10 15-0 | 20-0 17-9 | 6-9 5-11 | 10-0 8-9 | 12-9 11-0 | 15-1 13-5 | 17-11 15-10 |
| | Spruce-pine-fir | SS | 9-3 | 14-7 | 19-2 | 24-6 | Note b | 9-3 | 14-7 | 18-8 | 22-9 | Note b |
| | Spruce-pine-fir | #1 | 9-1 | 13-9 | 17-5 | 21-4 | 24-8 | 8-5 | 12-4 | 15-7 | 19-1 | 22-1 |
| | Spruce-pine-fir | #2 | 9-1 | 13-9 | 17-5 | 21-4 | 24-8 | 8-5 | 12-4 | 15-7 | 19-1 | 22-1 |
| | Spruce-pine-fir | #3 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 | 6-4 | 9-4 | 11-9 | 14-5 | 16-8 |
| 16 | Douglas fir-larch | SS | 9-1 | 14-4 | 18-10 | 23-9 | Note b | 9-1 | 13-9 | 17-5 | 21-3 | 24-8 |
| | Douglas fir-larch | #1 | 8-9 | 12-9 | 16-2 | 19-9 | 22-10 | 7-10 | 11-5 | 14-5 | 17-8 | 20-5 |
| | Douglas fir-larch | #2 | 8-2 | 11-11 | 15-1 | 18-5 | 21-5 | 7-3 | 10-8 | 13-6 | 16-6 | 19-2 |
| | Douglas fir-larch | #3 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 | 5-6 | 8-1 | 10-3 | 12-6 | 14-6 |
| | Hem-fir | SS | 8-7 | 13-6 | 17-10 | 22-9 | Note b | 8-7 | 13-6 | 17-1 | 20-10 | 24-2 |
| | Hem-fir | #1 | 8-5 | 12-5 | 15-9 | 19-3 | 22-3 | 7-7 | 11-1 | 14-1 | 17-2 | 19-11 |
| | Hem-fir | #2 | 8-0 | 11-9 | 14-11 | 18-2 | 21-1 | 7-2 | 10-6 | 13-4 | 16-3 | 18-10 |
| | Hem-fir | #3 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 | 5-6 | 8-1 | 10-3 | 12-6 | 14-6 |
| | Southern pine | SS | 8-11 | 14-1 | 18-6 | 23-8 | Note b | 8-11 | 14-1 | 18-6 18-5 | 23-8 21-11 | Note b 25-11 |
| | Southern pine | #1 | 8-9 8-7 | 13-9 13-0 | 18-1 16-6 | 21-5 19-3 | 25-7 22-10 | 8-8 7-10 | 12-10 11-7 | 16-2 14-9 | 19-3 17-3 | 22-10 20-5 |
| | Southern pine | #2 | 8-7 7-6 | 12-6 11-2 | 16-2 14-2 | 19-3 16-10 | 22-7 19-10 | 7-10 6-8 | 11-2 10-0 | 14-5 12-8 | 17-3 15-1 | 20-3 17-9 |
| | Southern pine | #3 | 6-7 5-9 | 9-8 8-6 | 12-4 10-8 | 14-7 13-0 | 17-4 15-4 | 5-10 5-2 | 8-8 7-7 | 11-0 9-7 | 13-0 11-7 | 15-6 13-9 |
| | Spruce-pine-fir | SS | 8-5 | 13-3 | 17-5 | 22-1 | 25-7 | 8-5 | 12-9 | 16-2 | 19-9 | 22-10 |
| | Spruce-pine-fir | #1 | 8-2 | 11-11 | 15-1 | 18-5 | 21-5 | 7-3 | 10-8 | 13-6 | 16-6 | 19-2 |
| | Spruce-pine-fir | #2 | 8-2 | 11-11 | 15-1 | 18-5 | 21-5 | 7-3 | 10-8 | 13-6 | 16-6 | 19-2 |
| | Spruce-pine-fir | #3 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 | 5-6 | 8-1 | 10-3 | 12-6 | 14-6 |
| 19.2 | Douglas fir-larch | SS | 8-7 | 13-6 | 17-9 | 21-8 | 25-2 | 8-7 | 12-6 | 15-10 | 19-5 | 22-6 |
| | Douglas fir-larch | #1 | 7-11 | 11-8 | 14-9 | 18-0 | 20-11 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 |
| | Douglas fir-larch | #2 | 7-5 | 10-11 | 13-9 | 16-10 | 19-6 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 |
| | Douglas fir-larch | #3 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |
| | Hem-fir | SS | 8-1 | 12-9 | 16-9 | 21-4 | 24-8 | 8-1 | 12-4 | 15-7 | 19-1 | 22-1 |
| | Hem-fir | #1 | 7-9 | 11-4 | 14-4 | 17-7 | 20-4 | 6-11 | 10-2 | 12-10 | 15-8 | 18-2 |
| | Hem-fir | #2 | 7-4 | 10-9 | 13-7 | 16-7 | 19-3 | 6-7 | 9-7 | 12-2 | 14-10 | 17-3 |
| | Hem-fir | #3 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |

*(continued)*

**TABLE R802.5.1(3)—continued**
**RAFTER SPANS FOR COMMON LUMBER SPECIES**
**(Ground snow load=30 psf, ceiling not attached to rafters, L/Δ = 180)**

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 19.2 | Southern pine | SS | 8-5 | 13-3 | 17-5 | 22-3 | Note b | 8-5 | 13-3 | 17-5 16-10 | 22-9 20-0 | 25-9 21-7 |
| | Southern pine | #1 | 8-3 8-0 | 13-0 11-10 | 16-6 15-1 | 19-7 17-7 | 23-4 20-11 | 7-11 7-1 | 11-9 10-7 | 14-9 13-5 | 17-6 15-9 | 20-11 18-8 |
| | Southern pine | #2 | 7-11 6-10 | 11-5 10-2 | 14-9 12-11 | 17-7 15-4 | 20-7 18-1 | 7-1 6-1 | 10-3 9-2 | 13-2 11-7 | 15-9 13-9 | 18-5 16-2 |
| | Southern pine | #3 | 6-0 5-3 | 8-10 7-9 | 11-3 9-9 | 13-4 11-10 | 15-10 14-0 | 5-4 4-8 | 7-11 6-11 | 10-1 8-9 | 11-11 10-7 | 14-3 12-6 |
| | Spruce-pine-fir | SS | 7-11 | 12-5 | 16-5 | 20-2 | 23-4 | 7-11 | 11-8 | 14-9 | 18-0 | 20-11 |
| | Spruce-pine-fir | #1 | 7-5 | 10-11 | 13-9 | 16-10 | 19-6 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 |
| | Spruce-pine-fir | #2 | 7-5 | 10-11 | 13-9 | 16-10 | 19-6 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 |
| | Spruce-pine-fir | #3 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |
| 24 | Douglas fir-larch | SS | 7-11 | 12-6 | 15-10 | 19-5 | 22-6 | 7-8 | 11-3 | 14-2 | 17-4 | 20-1 |
| | Douglas fir-larch | #1 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 | 6-4 | 9-4 | 11-9 | 14-5 | 16-8 |
| | Douglas fir-larch | #2 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 | 5-11 | 8-8 | 11-0 | 13-6 | 15-7 |
| | Douglas fir-larch | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-6 | 6-7 | 8-4 | 10-2 | 11-10 |
| | Hem-fir | SS | 7-6 | 11-10 | 15-7 | 19-1 | 22-1 | 7-6 | 11-0 | 13-11 | 17-0 | 19-9 |
| | Hem-fir | #1 | 6-11 | 10-2 | 12-10 | 15-8 | 18-2 | 6-2 | 9-1 | 11-6 | 14-0 | 16-3 |
| | Hem-fir | #2 | 6-7 | 9-7 | 12-2 | 14-10 | 17-3 | 5-10 | 8-7 | 10-10 | 13-3 | 15-5 |
| | Hem-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-6 | 6-7 | 8-4 | 10-2 | 11-10 |
| | Southern pine | SS | 7-10 | 12-3 | 16-2 | 20-8 20-0 | 25-1 23-7 | 7-10 | 12-3 11-10 | 16-2 15-0 | 19-8 17-11 | 23-0 21-2 |
| | Southern pine | #1 | 7-8 7-1 | 11-9 10-7 | 14-9 13-5 | 17-6 15-9 | 20-11 18-8 | 7-1 6-4 | 10-6 9-6 | 13-2 12-0 | 15-8 14-1 | 18-8 16-8 |
| | Southern pine | #2 | 7-1 6-1 | 10-2 9-2 | 13-2 11-7 | 15-9 13-9 | 18-5 16-2 | 6-4 5-5 | 9-2 8-2 | 11-9 10-4 | 14-1 12-3 | 16-6 14-6 |
| | Southern pine | #3 | 5-4 4-8 | 7-11 6-11 | 10-1 8-9 | 11-11 10-7 | 14-3 12-6 | 4-9 4-2 | 7-1 6-2 | 9-0 7-10 | 10-8 9-6 | 12-8 11-2 |
| | Spruce-pine-fir | SS | 7-4 | 11-7 | 14-9 | 18-0 | 20-11 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 |
| | Spruce-pine-fir | #1 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 | 5-11 | 8-8 | 11-0 | 13-6 | 15-7 |
| | Spruce-pine-fir | #2 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 | 5-11 | 8-8 | 11-0 | 13-6 | 15-7 |
| | Spruce-pine-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-6 | 6-7 | 8-4 | 10-2 | 11-10 |

Check sources for availability of lumber in lengths greater than 20 feet.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below.

| $H_C/H_R$ | Rafter Span Adjustment Factor |
|---|---|
| 1/3 | 0.67 |
| 1/4 | 0.76 |
| 1/5 | 0.83 |
| 1/6 | 0.90 |
| 1/7.5 or less | 1.00 |

where:

$H_C$ = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

$H_R$ = Height of roof ridge measured vertically above the top of the rafter support walls.

b. Span exceeds 26 feet in length.

51. Table R802.5.1(4), "Rafter Spans for Common Lumber Species," of Subsection R802.5, "Allowable Rafter Spans," of Section R802, "Wood Roof Framing," of Chapter 8, "Roof-Ceiling Construction," of the 2012 International Residential Code is amended to read as follows:

TABLE R802.5.1(4)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Ground snow load=50 psf, ceiling not attached to rafters, L/Δ = 180)

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 12 | Douglas fir-larch | SS | 8-5 | 13-3 | 17-6 | 22-4 | 26-0 | 8-5 | 13-3 | 17-0 | 20-9 | 24-0 |
| | Douglas fir-larch | #1 | 8-2 | 12-0 | 15-3 | 18-7 | 21-7 | 7-7 | 11-2 | 14-1 | 17-3 | 20-0 |
| | Douglas fir-larch | #2 | 7-8 | 11-3 | 14-3 | 17-5 | 20-2 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 |
| | Douglas fir-larch | #3 | 5-10 | 8-6 | 10-9 | 13-2 | 15-3 | 5-5 | 7-10 | 10-0 | 12-2 | 14-1 |
| | Hem-fir | SS | 8-0 | 12-6 | 16-6 | 21-1 | 25-6 | 8-0 | 12-6 | 16-6 | 20-4 | 23-7 |
| | Hem-fir | #1 | 7-10 | 11-9 | 14-10 | 18-1 | 21-0 | 7-5 | 10-10 | 13-9 | 16-9 | 19-5 |
| | Hem-fir | #2 | 7-5 | 11-1 | 14-0 | 17-2 | 19-11 | 7-0 | 10-3 | 13-0 | 15-10 | 18-5 |
| | Hem-fir | #3 | 5-10 | 8-6 | 10-9 | 13-2 | 15-3 | 5-5 | 7-10 | 10-0 | 12-2 | 14-1 |
| | Southern pine | SS | 8-4 | 13-0 13-1 | 17-2 | 21-11 | Note b | 8-4 | 13-0 13-1 | 17-2 | 21-11 21-5 | Note b 25-3 |
| | Southern pine | #1 | 8-2 8-0 | 12-10 12-3 | 16-10 15-6 | 20-7 18-2 | 24-1 21-7 | 8-2 7-7 | 12-6 11-4 | 15-9 14-5 | 18-9 16-10 | 22-4 20-0 |
| | Southern pine | #2 | 8-0 7-0 | 11-9 10-6 | 15-3 13-4 | 18-2 15-10 | 21-3 18-8 | 7-7 6-6 | 10-11 9-9 | 14-1 12-4 | 16-10 14-8 | 19-9 17-3 |
| | Southern pine | #3 | 6-2 5-5 | 9-3 8-0 | 11-8 10-1 | 13-9 12-3 | 16-4 14-6 | 5-9 5-0 | 8-5 7-5 | 10-9 9-4 | 12-9 11-4 | 15-2 13-5 |
| | Spruce-pine-fir | SS | 7-10 | 12-3 | 16-2 | 20-8 | 24-1 | 7-10 | 12-3 | 15-9 | 19-3 | 22-4 |
| | Spruce-pine-fir | #1 | 7-8 | 11-3 | 14-3 | 17-5 | 20-2 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 |
| | Spruce-pine-fir | #2 | 7-8 | 11-3 | 14-3 | 17-5 | 20-2 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 |
| | Spruce-pine-fir | #3 | 5-10 | 8-6 | 10-9 | 13-2 | 15-3 | 5-5 | 7-10 | 10-0 | 12-2 | 14-1 |
| 16 | Douglas fir-larch | SS | 7-8 | 12-1 | 15-10 | 19-5 | 22-6 | 7-8 | 11-7 | 14-8 | 17-11 | 20-10 |
| | Douglas fir-larch | #1 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 | 6-7 | 9-8 | 12-2 | 14-11 | 17-3 |
| | Douglas fir-larch | #2 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 |
| | Douglas fir-larch | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-8 | 6-10 | 8-8 | 10-6 | 12-3 |
| | Hem-fir | SS | 7-3 | 11-5 | 15-0 | 19-1 | 22-1 | 7-3 | 11-5 | 14-5 | 17-8 | 20-5 |
| | Hem-fir | #1 | 6-11 | 10-2 | 12-10 | 15-8 | 18-2 | 6-5 | 9-5 | 11-11 | 14-6 | 16-10 |
| | Hem-fir | #2 | 6-7 | 9-7 | 12-2 | 14-10 | 17-3 | 6-1 | 8-11 | 11-3 | 13-9 | 15-11 |
| | Hem-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-8 | 6-10 | 8-8 | 10-6 | 12-3 |
| | Southern pine | SS | 7-6 | 11-10 | 15-7 | 19-11 | 24-3 23-7 | 7-6 | 11-10 | 15-7 | 19-11 18-6 | 23-10 21-10 |
| | Southern pine | #1 | 7-6 7-1 | 11-7 10-7 | 14-9 13-5 | 17-6 15-9 | 20-11 18-8 | 7-1 6-7 | 10-10 9-10 | 13-8 12-5 | 16-2 14-7 | 18-6 17-3 |
| | Southern pine | #2 | 7-1 6-1 | 10-3 9-2 | 13-2 11-7 | 15-9 13-9 | 18-6 16-2 | 6-7 5-8 | 9-6 8-5 | 12-2 10-9 | 14-3 12-9 | 17-1 15-0 |
| | Southern pine | #3 | 5-4 4-8 | 7-11 6-11 | 10-1 8-9 | 11-11 10-7 | 14-3 12-6 | 4-11 4-4 | 7-1 6-5 | 9-4 8-1 | 11-0 9-10 | 13-1 11-7 |
| | Spruce-pine-fir | SS | 7-1 | 11-2 | 14-8 | 18-0 | 20-11 | 7-1 | 10-9 | 13-8 | 15-11 | 19-4 |
| | Spruce-pine-fir | #1 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 |
| | Spruce-pine-fir | #2 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 |
| | Spruce-pine-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-8 | 6-10 | 8-8 | 10-6 | 12-3 |
| 19.2 | Douglas fir-larch | SS | 7-3 | 11-4 | 14-6 | 17-8 | 20-6 | 7-3 | 10-7 | 13-5 | 16-5 | 19-0 |
| | Douglas fir-larch | #1 | 6-6 | 9-6 | 12-0 | 14-8 | 17-1 | 6-0 | 8-10 | 11-2 | 13-7 | 15-9 |
| | Douglas fir-larch | #2 | 6-1 | 8-11 | 11-3 | 13-9 | 15-11 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 |
| | Douglas fir-larch | #3 | 4-7 | 6-9 | 8-6 | 10-5 | 12-1 | 4-3 | 6-3 | 7-11 | 9-7 | 11-2 |
| | Hem-fir | SS | 6-10 | 10-9 | 14-2 | 17-3 | 20-2 | 6-10 | 10-5 | 13-2 | 16-1 | 18-8 |
| | Hem-fir | #1 | 6-4 | 9-3 | 11-9 | 14-4 | 16-7 | 5-10 | 8-7 | 10-10 | 13-3 | 15-5 |
| | Hem-fir | #2 | 6-0 | 8-9 | 11-1 | 13-7 | 15-9 | 5-7 | 8-1 | 10-3 | 12-7 | 14-7 |
| | Hem-fir | #3 | 4-7 | 6-9 | 8-6 | 10-5 | 12-1 | 4-3 | 6-3 | 7-11 | 9-7 | 11-2 |

[a] Continued

**TABLE R802.5.1(4)**
**RAFTER SPANS FOR COMMON LUMBER SPECIES**
**(Ground snow load=50 psf, ceiling not attached to rafters, L/Δ = 180)**

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 19.2 | Southern pine | SS | 7-1 | 11-2 | 14-8 | 18-9 18-3 | 22-10 21-7 | 7-1 | 11-2 | 14-8 14-2 | 18-7 16-11 | 21-9 20-0 |
| | Southern pine | #1 | 7-0 6-6 | 10-8 9-8 | 13-5 12-3 | 16-0 14-4 | 19-1 17-1 | 6-8 6-0 | 9-11 9-0 | 12-5 11-4 | 14-10 13-4 | 17-8 15-9 |
| | Southern pine | #2 | 6-6 5-7 | 9-4 8-4 | 12-0 10-7 | 14-4 12-6 | 16-10 14-9 | 6-0 5-2 | 8-8 7-9 | 11-2 9-9 | 13-4 11-7 | 15-7 13-8 |
| | Southern pine | #3 | 4-11 4-3 | 7-3 6-4 | 9-2 8-0 | 10-10 9-8 | 12-11 11-5 | 4-6 4-0 | 6-8 5-10 | 8-6 7-4 | 10-1 8-11 | 12-0 10-7 |
| | Spruce-pine-fir | SS | 6-8 | 10-6 | 13-5 | 16-5 | 19-1 | 6-8 | 9-10 | 12-5 | 15-3 | 17-8 |
| | Spruce-pine-fir | #1 | 6-1 | 8-11 | 11-3 | 13-9 | 15-11 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 |
| | Spruce-pine-fir | #2 | 6-1 | 8-11 | 11-3 | 13-9 | 15-11 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 |
| | Spruce-pine-fir | #3 | 4-7 | 6-9 | 8-6 | 10-5 | 12-1 | 4-3 | 6-3 | 7-11 | 9-7 | 11-2 |
| 24 | Douglas fir-larch | SS | 6-8 | 10- | 13-0 | 15-10 | 18-4 | 6-6 | 9-6 | 12-0 | 14-8 | 17-0 |
| | Douglas fir-larch | #1 | 5-10 | 8-6 | 10-9 | 13-2 | 15-3 | 5-5 | 7-10 | 10-0 | 12-2 | 14-1 |
| | Douglas fir-larch | #2 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |
| | Douglas fir-larch | #3 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 | 3-10 | 5-7 | 7-1 | 8-7 | 10-0 |
| | Hem-fir | SS | 6-4 | 9-11 | 12-9 | 15-7 | 18-0 | 6-4 | 9-4 | 11-9 | 14-5 | 16-8 |
| | Hem-fir | #1 | 5-8 | 8-3 | 10-6 | 12-10 | 14-10 | 5-3 | 7-8 | 9-9 | 11-10 | 13-9 |
| | Hem-fir | #2 | 5-4 | 7-10 | 9-11 | 12-1 | 14-1 | 4-11 | 7-3 | 9-2 | 11-3 | 13-0 |
| | Hem-fir | #3 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 | 3-10 | 5-7 | 7-1 | 8-7 | 10-0 |
| | Southern pine | SS | 6-7 | 10-4 | 13-8 | 17-5 16-4 | 21-0 19-3 | 6-7 | 10-4 10-0 | 13-8 12-8 | 16-7 15-2 | 19-6 17-10 |
| | Southern pine | #1 | 6-5 5-10 | 9-7 8-8 | 12-9 11-0 | 14-4 12-10 | 17-1 15-3 | 6-0 5-5 | 8-10 8-0 | 11-2 10-2 | 13-3 11-11 | 15-9 14-1 |
| | Southern pine | #2 | 5-10 5-0 | 8-4 7-5 | 10-9 9-5 | 12-10 11-3 | 15-1 13-2 | 5-5 4-7 | 7-9 6-11 | 10-0 8-9 | 11-11 10-5 | 13-11 12-3 |
| | Southern pine | #3 | 4-4 3-10 | 6-5 5-8 | 8-3 7-1 | 9-9 8-8 | 11-7 10-3 | 4-1 3-6 | 6-0 5-3 | 7-7 6-7 | 9-0 8-0 | 10-8 9-6 |
| | Spruce-pine-fir | SS | 6-2 | 9-6 | 12-0 | 14-8 | 17-1 | 6-0 | 8-10 | 11-2 | 13-7 | 15-9 |
| | Spruce-pine-fir | #1 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |
| | Spruce-pine-fir | #2 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |
| | Spruce-pine-fir | #3 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 | 3-10 | 5-7 | 7-1 | 8-7 | 10-0 |

Check sources for availability of lumber in lengths greater than 20 feet.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

| $H_c/H_e$ | Rafter Span Adjustment Factor |
|---|---|
| 1/3 | 0.67 |
| 1/4 | 0.76 |
| 1/5 | 0.83 |
| 1/6 | 0.90 |
| 1/7.5 or less | 1.00 |

where:

$H_c$ = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

$H_e$ = Height of roof ridge measured vertically above the top of the rafter support walls.

b. Span exceeds 26 feet in length.

52. Table R802.5.1(5), "Rafter Spans for Common Lumber Species," of Subsection R802.5, "Allowable Rafter Spans," of Section R802, "Wood Roof Framing," of Chapter 8, "Roof-Ceiling Construction," of the 2012 International Residential Code is amended to read as follows:

TABLE R802.5.1(5)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Ground snow load=30 psf, ceiling attached to rafters, L/Δ = 240)

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 12 | Douglas fir-larch | SS | 9-1 | 14-4 | 18-10 | 24-1 | Note b | 9-1 | 14-4 | 18-10 | 24-1 | Note b |
| | Douglas fir-larch | #1 | 8-9 | 13-9 | 18-2 | 22-9 | Note b | 8-9 | 13-2 | 16-8 | 20-4 | 23-7 |
| | Douglas fir-larch | #2 | 8-7 | 13-6 | 17-5 | 21-4 | 24-8 | 8-5 | 12-4 | 15-7 | 19-1 | 22-1 |
| | Douglas fir-larch | #3 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 | 6-4 | 9-4 | 11-9 | 14-5 | 16-8 |
| | Hem-fir | SS | 8-7 | 13-6 | 17-10 | 22-9 | Note b | 8-7 | 13-6 | 17-10 | 22-9 | Note b |
| | Hem-fir | #1 | 8-5 | 13-3 | 17-5 | 22-2 | 25-9 | 8-5 | 12-10 | 16-3 | 19-10 | 23-0 |
| | Hem-fir | #2 | 8-0 | 12-7 | 16-7 | 21-0 | 24-4 | 8-0 | 12-2 | 15-4 | 18-9 | 21-9 |
| | Hem-fir | #3 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 | 6-4 | 9-4 | 11-9 | 14-5 | 16-8 |
| | Southern pine | SS | 8-11 | 14-1 | 18-6 | 23-8 | Note b | 8-11 | 14-1 | 18-6 | 23-8 | Note b |
| | Southern pine | #1 | 8-9 8-7 | 13-9 13-6 | 18-2 17-10 | 23-2 22-3 | Note b | 8-9 8-7 | 13-9 13-5 | 18-2 17-0 | 23-2 19-11 | Note b 23-7 |
| | Southern pine | #2 | 8-7 8-3 | 13-6 12-11 | 17-10 16-4 | 22-3 19-5 | Note b 22-10 | 8-7 7-8 | 12-11 11-7 | 16-8 14-8 | 19-11 17-4 | 22-4 20-5 |
| | Southern pine | #3 | 7-7 6-7 | 11-3 9-9 | 14-3 12-4 | 16-10 15-0 | 20-0 17-9 | 6-9 5-11 | 10-0 8-9 | 12-9 11-0 | 15-1 13-5 | 17-11 15-10 |
| | Spruce-pine-fir | SS | 8-5 | 13-3 | 17-5 | 22-3 | Note b | 8-5 | 13-3 | 17-5 | 22-3 | Note b |
| | Spruce-pine-fir | #1 | 8-3 | 12-11 | 17-0 | 21-4 | 24-8 | 8-3 | 12-4 | 15-7 | 19-1 | 22-1 |
| | Spruce-pine-fir | #2 | 8-3 | 12-11 | 17-0 | 21-4 | 24-8 | 8-3 | 12-4 | 15-7 | 19-1 | 22-1 |
| | Spruce-pine-fir | #3 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 | 6-4 | 9-4 | 11-9 | 14-5 | 16-8 |
| 16 | Douglas fir-larch | SS | 8-3 | 13-0 | 17-2 | 21-10 | Note b | 8-3 | 13-0 | 17-2 | 21-3 | 24-8 |
| | Douglas fir-larch | #1 | 8-0 | 12-6 | 16-2 | 19-9 | 22-10 | 7-10 | 11-5 | 14-5 | 17-8 | 20-5 |
| | Douglas fir-larch | #2 | 7-10 | 11-11 | 15-1 | 18-5 | 21-5 | 7-3 | 10-8 | 13-6 | 16-6 | 19-2 |
| | Douglas fir-larch | #3 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 | 5-6 | 8-1 | 10-3 | 12-6 | 14-6 |
| | Hem-fir | SS | 7-10 | 12-3 | 16-2 | 20-8 | 25-1 | 7-10 | 12-3 | 16-2 | 20-8 | 24-2 |
| | Hem-fir | #1 | 7-8 | 12-0 | 15-9 | 19-3 | 22-3 | 7-7 | 11-1 | 14-1 | 17-2 | 19-11 |
| | Hem-fir | #2 | 7-3 | 11-5 | 14-11 | 18-2 | 21-1 | 7-2 | 10-6 | 13-4 | 16-3 | 18-10 |
| | Hem-fir | #3 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 | 5-6 | 8-1 | 10-3 | 12-6 | 14-6 |
| | Southern pine | SS | 8-1 | 12-9 | 16-10 | 21-6 | Note b | 8-1 | 12-9 | 16-10 | 21-6 | Note b 25-11 |
| | Southern pine | #1 | 8-0 7-10 | 12-6 12-3 | 16-6 16-2 | 21-1 19-3 | 25-7 22-10 | 8-0 7-10 | 12-6 11-7 | 16-2 14-9 | 19-2 17-3 | 22-10 20-5 |
| | Southern pine | #2 | 7-10 7-6 | 12-3 11-2 | 16-2 14-2 | 19-3 16-10 | 22-7 19-10 | 7-10 6-8 | 11-2 10-0 | 14-5 12-8 | 17-3 15-1 | 20-5 17-9 |
| | Southern pine | #3 | 6-7 5-9 | 9-8 8-6 | 12-4 10-8 | 14-7 13-0 | 17-4 15-4 | 5-10 5-2 | 8-8 7-7 | 11-0 9-7 | 13-0 11-7 | 15-6 13-9 |
| | Spruce-pine-fir | SS | 7-8 | 12-0 | 15-10 | 20-2 | 24-7 | 7-8 | 12-0 | 15-10 | 19-9 | 22-10 |
| | Spruce-pine-fir | #1 | 7-6 | 11-9 | 15-1 | 18-5 | 21-5 | 7-3 | 10-8 | 13-6 | 16-6 | 19-2 |
| | Spruce-pine-fir | #2 | 7-6 | 11-9 | 15-1 | 18-5 | 21-5 | 7-3 | 10-8 | 13-6 | 16-6 | 19-2 |
| | Spruce-pine-fir | #3 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 | 5-6 | 8-1 | 10-3 | 12-6 | 14-6 |
| 19.2 | Douglas fir-larch | SS | 7-9 | 12-3 | 16-1 | 20-7 | 25-0 | 7-9 | 12-3 | 15-10 | 19-5 | 22-6 |
| | Douglas fir-larch | #1 | 7-6 | 11-8 | 14-9 | 18-0 | 20-11 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 |
| | Douglas fir-larch | #2 | 7-4 | 10-11 | 13-9 | 16-10 | 19-6 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 |
| | Douglas fir-larch | #3 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |
| | Hem-fir | SS | 7-4 | 11-7 | 15-3 | 19-5 | 23-7 | 7-4 | 11-7 | 15-3 | 19-1 | 22-1 |
| | Hem-fir | #1 | 7-2 | 11-4 | 14-4 | 17-7 | 20-4 | 6-11 | 10-2 | 12-10 | 15-8 | 18-2 |
| | Hem-fir | #2 | 6-10 | 10-9 | 13-7 | 16-7 | 19-3 | 6-7 | 9-7 | 12-2 | 14-10 | 17-3 |
| | Hem-fir | #3 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |

(continued)

TABLE R802.5.1(5)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Ground snow load=30 psf, ceiling attached to rafters, L/Δ = 240)

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 19.2 | Southern pine | SS | 7-8 | 12-0 | 15-10 | 20-2 | 24-7 | 7-8 | 12-0 | 15-10 | ~~20-2~~ 20-0 | ~~24-7~~ 23-7 |
| | Southern pine | #1 | ~~7-6~~ 7-4 | ~~11-9~~ 11-7 | ~~15-6~~ 15-1 | ~~19-7~~ 17-7 | ~~23-4~~ 20-11 | ~~7-6~~ 7-1 | ~~11-9~~ 10-7 | ~~14-9~~ 13-5 | ~~17-6~~ 15-9 | ~~20-11~~ 18-8 |
| | Southern pine | #2 | ~~7-4~~ 6-10 | ~~11-5~~ 10-2 | ~~14-9~~ 12-11 | ~~17-7~~ 15-4 | ~~20-7~~ 18-1 | ~~7-1~~ 6-1 | ~~10-2~~ 9-2 | ~~13-2~~ 11-7 | ~~15-9~~ 13-9 | ~~18-5~~ 16-2 |
| | Southern pine | #3 | ~~6-0~~ 5-3 | ~~8-10~~ 7-9 | ~~11-3~~ 9-9 | ~~13-4~~ 11-10 | ~~15-10~~ 14-0 | ~~5-4~~ 4-8 | ~~7-11~~ 6-11 | ~~10-1~~ 8-9 | ~~11-11~~ 10-7 | ~~14-2~~ 12-6 |
| | Spruce-pine-fir | SS | 7-2 | 11-4 | 14-11 | 19-0 | 23-1 | 7-2 | 11-4 | 14-9 | 18-0 | 20-11 |
| | Spruce-pine-fir | #1 | 7-0 | 10-11 | 13-9 | 16-10 | 19-6 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 |
| | Spruce-pine-fir | #2 | 7-0 | 10-11 | 13-9 | 16-10 | 19-6 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 |
| | Spruce-pine-fir | #3 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |
| 24 | Douglas fir-larch | SS | 7-3 | 11-4 | 15-0 | 19-1 | 22-6 | 7-3 | 11-3 | 14-2 | 17-4 | 20-1 |
| | Douglas fir-larch | #1 | 7-0 | 10-5 | 13-2 | 16-1 | 18-8 | 6-4 | 9-4 | 11-9 | 14-5 | 16-8 |
| | Douglas fir-larch | #2 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 | 5-11 | 8-8 | 11-0 | 13-6 | 15-7 |
| | Douglas fir-larch | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-6 | 6-7 | 8-4 | 10-2 | 11-10 |
| | Hem-fir | SS | 6-10 | 10-9 | 14-2 | 18-0 | 21-11 | 6-10 | 10-9 | 13-11 | 17-0 | 19-9 |
| | Hem-fir | #1 | 6-8 | 10-2 | 12-10 | 15-8 | 18-2 | 6-2 | 9-1 | 11-6 | 14-0 | 16-3 |
| | Hem-fir | #2 | 6-4 | 9-7 | 12-2 | 14-10 | 17-3 | 5-10 | 8-7 | 10-10 | 13-3 | 15-5 |
| | Hem-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-6 | 6-7 | 8-4 | 10-2 | 11-10 |
| | Southern pine | SS | 7-1 | 11-2 | 14-8 | 18-9 | 22-10 | 7-1 | 11-2 | 14-8 | ~~18-9~~ 17-11 | ~~22-10~~ 21-2 |
| | Southern pine | #1 | ~~7-0~~ 6-10 | ~~10-11~~ 10-7 | ~~14-5~~ 13-5 | ~~17-6~~ 15-9 | ~~20-11~~ 18-8 | ~~7-0~~ 6-4 | ~~10-6~~ 9-6 | ~~13-2~~ 12-0 | ~~15-8~~ 14-1 | ~~18-8~~ 16-8 |
| | Southern pine | #2 | ~~6-10~~ 6-1 | ~~10-2~~ 9-2 | ~~13-2~~ 11-7 | ~~15-9~~ 13-9 | ~~18-5~~ 16-2 | ~~6-4~~ 5-5 | ~~9-2~~ 8-2 | ~~11-9~~ 10-4 | ~~14-1~~ 12-3 | ~~16-6~~ 14-6 |
| | Southern pine | #3 | ~~5-4~~ 4-8 | ~~7-11~~ 6-11 | ~~10-1~~ 8-9 | ~~11-11~~ 10-7 | ~~14-2~~ 12-6 | ~~4-9~~ 4-2 | ~~7-1~~ 6-2 | ~~9-0~~ 7-10 | ~~10-8~~ 9-6 | ~~12-8~~ 11-2 |
| | Spruce-pine-fir | SS | 6-8 | 10-6 | 13-10 | 17-8 | 20-11 | 6-8 | 10-5 | 13-2 | 16-1 | 18-8 |
| | Spruce-pine-fir | #1 | 6-6 | 9-9 | 12-4 | 15-1 | 17-6 | 5-11 | 8-8 | 11-0 | 13-6 | 15-7 |
| | Spruce-pine-fir | #2 | 6-6 | 9-9 | 12-4 | 15-1 | 17-6 | 5-11 | 8-8 | 11-0 | 13-6 | 15-7 |
| | Spruce-pine-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-6 | 6-7 | 8-4 | 10-2 | 11-10 |

Check sources for availability of lumber in lengths greater than 20 feet.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

| $H_C/H_R$ | Rafter Span Adjustment Factor |
|---|---|
| 1/3 | 0.67 |
| 1/4 | 0.76 |
| 1/5 | 0.83 |
| 1/6 | 0.90 |
| 1/7.5 or less | 1.00 |

where:

$H_C$ = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

$H_R$ = Height of roof ridge measured vertically above the top of the rafter support walls

b. Span exceeds 26 feet in length.

53. Table R802.5.1(6), "Rafter Spans for Common Lumber Species," of Subsection R802.5, "Allowable Rafter Spans," of Section R802, "Wood Roof Framing," of Chapter 8, "Roof-Ceiling Construction," of the 2012 International Residential Code is amended to read as follows:

TABLE R802.5.1(6)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Ground snow load=50 psf, ceiling attached to rafters, L/Δ = 240)

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) |
| 12 | Douglas fir-larch | SS | 7-8 | 12-1 | 15-11 | 20-3 | 24-8 | 7-8 | 12-1 | 15-11 | 20-3 | 24-0 |
| | Douglas fir-larch | #1 | 7-5 | 11-7 | 15-3 | 18-7 | 21-7 | 7-5 | 11-2 | 14-1 | 17-3 | 20-0 |
| | Douglas fir-larch | #2 | 7-3 | 11-3 | 14-3 | 17-5 | 20-2 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 |
| | Douglas fir-larch | #3 | 5-10 | 8-6 | 10-9 | 13-2 | 15-3 | 5-5 | 7-10 | 10-0 | 12-2 | 14-1 |
| | Hem-fir | SS | 7-3 | 11-5 | 15-0 | 19-2 | 23-4 | 7-3 | 11-5 | 15-0 | 19-2 | 23-4 |
| | Hem-fir | #1 | 7-1 | 11-2 | 14-8 | 18-1 | 21-0 | 7-1 | 10-10 | 13-9 | 16-9 | 19-5 |
| | Hem-fir | #2 | 6-9 | 10-8 | 14-0 | 17-2 | 19-11 | 6-9 | 10-3 | 13-0 | 15-10 | 18-5 |
| | Hem-fir | #3 | 5-10 | 8-6 | 10-9 | 13-2 | 15-3 | 5-5 | 7-10 | 10-0 | 12-2 | 14-1 |
| | Southern pine | SS | 7-6 | 11-10 | 15-7 | 19-11 | 24-3 | 7-6 | 11-10 | 15-7 | 19-11 | 24-3 |
| | Southern pine | #1 | ~~7-6~~ 7-3 | ~~11-7~~ 11-5 | ~~15-4~~ 15-0 | ~~19-7~~ 18-2 | ~~23-9~~ 21-7 | ~~7-6~~ 7-3 | ~~11-7~~ 11-4 | ~~15-4~~ 14-5 | ~~18-9~~ 16-10 | ~~22-4~~ 20-0 |
| | Southern pine | #2 | ~~7-3~~ 6-11 | ~~11-5~~ 10-6 | ~~15-0~~ 13-4 | ~~18-3~~ 15-10 | ~~21-3~~ 18-8 | ~~7-2~~ 6-6 | ~~10-11~~ 9-9 | ~~14-1~~ 12-4 | ~~16-10~~ 14-8 | ~~19-9~~ 17-3 |
| | Southern pine | #3 | ~~6-2~~ 5-5 | ~~9-2~~ 8-0 | ~~11-8~~ 10-1 | ~~13-9~~ 12-3 | ~~16-4~~ 14-6 | ~~8-9~~ 5-0 | ~~8-5~~ 7-5 | ~~10-9~~ 9-4 | ~~12-9~~ 11-4 | ~~15-2~~ 13-5 |
| | Spruce-pine-fir | SS | 7-1 | 11-2 | 14-8 | 18-9 | 22-10 | 7-1 | 11-2 | 14-8 | 18-9 | 22-4 |
| | Spruce-pine-fir | #1 | 6-11 | 10-11 | 14-3 | 17-5 | 20-2 | 6-11 | 10-5 | 13-2 | 16-1 | 18-8 |
| | Spruce-pine-fir | #2 | 6-11 | 10-11 | 14-3 | 17-5 | 20-2 | 6-11 | 10-5 | 13-2 | 16-1 | 18-8 |
| | Spruce-pine-fir | #3 | 5-10 | 8-6 | 10-9 | 13-2 | 15-3 | 5-5 | 7-10 | 10-0 | 12-2 | 14-1 |
| 16 | Douglas fir-larch | SS | 7-0 | 11-0 | 14-5 | 18-5 | 22-5 | 7-0 | 11-0 | 14-5 | 17-11 | 20-10 |
| | Douglas fir-larch | #1 | 6-9 | 10-5 | 13-2 | 16-1 | 18-8 | 6-7 | 9-8 | 12-2 | 14-11 | 17-3 |
| | Douglas fir-larch | #2 | 6-7 | 9-9 | 12-4 | 15-1 | 17-6 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 |
| | Douglas fir-larch | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-8 | 6-10 | 8-8 | 10-6 | 12-3 |
| | Hem-fir | SS | 6-7 | 10-4 | 13-8 | 17-5 | 21-2 | 6-7 | 10-4 | 13-8 | 17-5 | 20-5 |
| | Hem-fir | #1 | 6-5 | 10-2 | 12-10 | 15-8 | 18-2 | 6-5 | 9-5 | 11-11 | 14-6 | 16-10 |
| | Hem-fir | #2 | 6-2 | 9-7 | 12-2 | 14-10 | 17-3 | 6-1 | 8-11 | 11-3 | 13-9 | 15-11 |
| | Hem-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-8 | 6-10 | 8-8 | 10-6 | 12-3 |
| | Southern pine | SS | 6-10 | 10-9 | 14-2 | 18-1 | 22-0 | 6-10 | 10-9 | 14-2 | 18-1 | ~~22-0~~ 21-10 |
| | Southern pine | #1 | ~~6-9~~ 6-7 | ~~10-7~~ 10-4 | ~~13-11~~ 13-5 | ~~17-6~~ 15-9 | ~~20-11~~ 18-8 | ~~6-9~~ 6-7 | ~~10-7~~ 9-10 | ~~13-8~~ 12-5 | ~~16-2~~ 14-7 | ~~19-4~~ 17-3 |
| | Southern pine | #2 | ~~6-7~~ 6-1 | ~~10-2~~ 9-2 | ~~13-2~~ 11-7 | ~~15-9~~ 13-9 | ~~18-5~~ 16-2 | ~~6-7~~ 5-8 | ~~9-5~~ 8-5 | ~~12-2~~ 10-9 | ~~14-7~~ 12-9 | ~~17-1~~ 15-0 |
| | Southern pine | #3 | ~~5-4~~ 4-8 | ~~7-11~~ 6-11 | ~~10-1~~ 8-9 | ~~11-11~~ 10-7 | ~~14-3~~ 12-6 | ~~4-11~~ 4-4 | ~~7-4~~ 6-5 | ~~9-4~~ 8-1 | ~~11-0~~ 9-10 | ~~13-1~~ 11-7 |
| | Spruce-pine-fir | SS | 6-5 | 10-2 | 13-4 | 17-0 | 20-9 | 6-5 | 10-2 | 13-4 | 16-8 | 19-4 |
| | Spruce-pine-fir | #1 | 6-4 | 9-9 | 12-4 | 15-1 | 17-6 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 |
| | Spruce-pine-fir | #2 | 6-4 | 9-9 | 12-4 | 15-1 | 17-6 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 |
| | Spruce-pine-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-8 | 6-10 | 8-8 | 10-6 | 12-3 |
| 19.2 | Douglas fir-larch | SS | 6-7 | 10-4 | 13-7 | 17-4 | 20-6 | 6-7 | 10-4 | 13-5 | 16-5 | 19-0 |
| | Douglas fir-larch | #1 | 6-4 | 9-6 | 12-0 | 14-8 | 17-1 | 6-0 | 8-10 | 11-2 | 13-7 | 15-9 |
| | Douglas fir-larch | #2 | 6-1 | 8-11 | 11-3 | 13-9 | 15-11 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 |
| | Douglas fir-larch | #3 | 4-7 | 6-9 | 8-6 | 10-5 | 12-1 | 4-3 | 6-3 | 7-11 | 9-7 | 11-2 |
| | Hem-fir | SS | 6-2 | 9-9 | 12-10 | 16-5 | 19-11 | 6-2 | 9-9 | 12-10 | 16-1 | 18-8 |
| | Hem-fir | #1 | 6-1 | 9-3 | 11-9 | 14-4 | 16-7 | 5-10 | 8-7 | 10-10 | 13-3 | 15-5 |
| | Hem-fir | #2 | 5-9 | 8-9 | 11-1 | 13-7 | 15-9 | 5-7 | 8-1 | 10-3 | 12-7 | 14-7 |
| | Hem-fir | #3 | 4-7 | 6-9 | 8-6 | 10-5 | 12-1 | 4-3 | 6-3 | 7-11 | 9-7 | 11-2 |

(continued)

TABLE R802.5.1(6)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Ground snow load=50 psf, ceiling attached to rafters, L/Δ = 240)

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) |
| 19.2 | Southern pine | SS | 6-5 | 10-2 | 13-4 | 17-0 | 20-9 | 6-5 | 10-2 | 13-4 | 17-0 16-11 | 20-9 20-0 |
| | Southern pine | #1 | 6-4 6-2 | 9-11 9-8 | 13-1 12-3 | 16-9 14-4 | 19-1 17-1 | 6-4 6-0 | 9-11 9-0 | 12-5 11-4 | 15-10 13-4 | 17-8 15-9 |
| | Southern pine | #2 | 6-2 5-7 | 9-4 8-4 | 12-0 10-7 | 14-4 12-6 | 16-10 14-9 | 6-0 5-2 | 8-8 7-9 | 11-2 9-9 | 13-4 11-7 | 15-7 13-8 |
| | Southern pine | #3 | 4-11 4-3 | 7-3 6-4 | 9-2 8-0 | 10-10 9-8 | 12-11 11-5 | 4-6 4-0 | 6-8 5-10 | 8-6 7-4 | 10-1 8-11 | 12-0 10-7 |
| | Spruce-pine-fir | SS | 6-1 | 9-6 | 12-7 | 16-0 | 19-1 | 6-1 | 9-6 | 12-5 | 15-3 | 17-8 |
| | Spruce-pine-fir | #1 | 5-11 | 8-11 | 11-3 | 13-9 | 15-11 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 |
| | Spruce-pine-fir | #2 | 5-11 | 8-11 | 11-3 | 13-9 | 15-11 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 |
| | Spruce-pine-fir | #3 | 4-7 | 6-9 | 8-6 | 10-5 | 12-1 | 4-3 | 6-3 | 7-11 | 9-7 | 11-2 |
| 24 | Douglas fir-larch | SS | 6-1 | 9-7 | 12-7 | 15-10 | 18-4 | 6-1 | 9-6 | 12-0 | 14-8 | 17-0 |
| | Douglas fir-larch | #1 | 5-10 | 8-6 | 10-9 | 13-2 | 15-3 | 5-5 | 7-10 | 10-0 | 12-2 | 14-1 |
| | Douglas fir-larch | #2 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |
| | Douglas fir-larch | #3 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 | 3-10 | 5-7 | 7-1 | 8-7 | 10-0 |
| | Hem-fir | SS | 5-9 | 9-1 | 11-11 | 15-2 | 18-0 | 5-9 | 9-1 | 11-9 | 14-5 | 15-11 |
| | Hem-fir | #1 | 5-8 | 8-3 | 10-6 | 12-10 | 14-10 | 5-3 | 7-8 | 9-9 | 11-10 | 13-9 |
| | Hem-fir | #2 | 5-4 | 7-10 | 9-11 | 12-1 | 14-1 | 4-11 | 7-3 | 9-2 | 11-3 | 13-0 |
| | Hem-fir | #3 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 | 3-10 | 5-7 | 7-1 | 8-7 | 10-0 |
| | Southern pine | SS | 6-0 | 9-5 | 12-5 | 15-10 | 19-3 | 6-0 | 9-5 | 12-5 | 15-10 15-2 | 19-3 17-10 |
| | Southern pine | #1 | 5-10 5-9 | 9-3 8-8 | 12-0 11-0 | 14-4 12-10 | 17-1 15-3 | 5-10 5-3 | 8-10 8-0 | 11-3 10-2 | 13-7 11-11 | 15-9 14-1 |
| | Southern pine | #2 | 5-9 5-0 | 8-4 7-5 | 10-9 9-5 | 12-10 11-3 | 15-1 13-2 | 5-5 4-7 | 7-9 6-11 | 10-0 8-9 | 11-11 10-5 | 13-11 12-3 |
| | Southern pine | #3 | 4-4 3-10 | 6-5 5-8 | 8-3 7-1 | 9-9 8-5 | 11-7 10-3 | 4-1 3-6 | 6-0 5-3 | 7-7 6-7 | 9-0 8-0 | 10-8 9-6 |
| | Spruce-pine-fir | SS | 5-8 | 8-10 | 11-8 | 14-8 | 17-1 | 5-8 | 8-10 | 11-2 | 13-7 | 15-9 |
| | Spruce-pine-fir | #1 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |
| | Spruce-pine-fir | #2 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 |
| | Spruce-pine-fir | #3 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 | 3-10 | 5-7 | 7-1 | 8-7 | 10-0 |

Check sources for availability of lumber in lengths greater than 20 feet.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

| $H_C/H_R$ | Rafter Span Adjustment Factor |
|---|---|
| 1/3 | 0.67 |
| 1/4 | 0.76 |
| 1/5 | 0.83 |
| 1/6 | 0.90 |
| 1/7.5 or less | 1.00 |

where:

$H_C$ = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

$H_R$ = Height of roof ridge measured vertically above the top of the rafter support walls.

54. Table R802.5.1(7), "Rafter Spans for 70 PSF Ground Snow Load," of Subsection R802.5, "Allowable Rafter Spans," of Section R802, "Wood Roof Framing," of Chapter 8, "Roof-Ceiling Construction," of the 2012 International Residential Code is amended to read as follows:

**TABLE R802.5.1(7)**
**RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD**
**(Ceiling not attached to rafters, L/Δ = 180)**

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum Rafter Spans[a] | | | | | | | | | |
| | | | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) |
| 12 | Douglas fir-larch | SS | 7-7 | 11-10 | 15-8 | 19-5 | 22-6 | 7-7 | 11-10 | 15-0 | 18-3 | 21-2 |
| | Douglas fir-larch | #1 | 7-1 | 10-5 | 13-2 | 16-1 | 18-8 | 6-8 | 9-10 | 12-5 | 15-2 | 17-7 |
| | Douglas fir-larch | #2 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 | 6-3 | 9-2 | 11-8 | 14-2 | 16-6 |
| | Douglas fir-larch | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-9 | 6-11 | 8-9 | 10-9 | 12-5 |
| | Hem-fir | SS | 7-2 | 11-3 | 14-9 | 18-10 | 22-1 | 7-2 | 11-3 | 14-8 | 18-0 | 20-10 |
| | Hem-fir | #1 | 6-11 | 10-2 | 12-10 | 15-8 | 18-2 | 6-6 | 9-7 | 12-1 | 14-10 | 17-2 |
| | Hem-fir | #2 | 6-7 | 9-7 | 12-2 | 14-10 | 17-3 | 6-2 | 9-1 | 11-5 | 14-0 | 16-3 |
| | Hem-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-9 | 6-11 | 8-9 | 10-9 | 12-5 |
| | Southern pine | SS | 7-5 | 11-8 | 15-4 | 19-7 | 23-10 23-7 | 7-5 | 11-8 | 15-4 | 19-7 18-10 | 23-10 22-3 |
| | Southern pine | #1 | 7-3 7-1 | 11-5 10-7 | 14-9 13-5 | 17-6 15-9 | 20-11 18-8 | 7-3 6-9 | 11-1 10-0 | 13-11 12-8 | 16-6 14-10 | 19-8 17-7 |
| | Southern pine | #2 | 7-1 6-1 | 10-2 9-2 | 13-2 11-7 | 15-9 13-9 | 18-5 16-2 | 6-8 5-9 | 9-7 8-7 | 12-2 10-11 | 14-10 12-11 | 17-5 15-3 |
| | Southern pine | #3 | 5-4 4-8 | 7-11 6-11 | 10-1 8-9 | 11-11 10-7 | 14-3 12-6 | 5-1 4-5 | 7-5 6-6 | 9-6 8-3 | 11-3 10-0 | 13-4 11-10 |
| | Spruce-pine-fir | SS | 7-0 | 11-0 | 14-6 | 18-0 | 20-11 | 7-0 | 11-0 | 13-11 | 17-0 | 19-8 |
| | Spruce-pine-fir | #1 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 | 6-3 | 9-2 | 11-8 | 14-2 | 16-6 |
| | Spruce-pine-fir | #2 | 6-8 | 9-9 | 12-4 | 15-1 | 17-6 | 6-3 | 9-2 | 11-8 | 14-2 | 16-6 |
| | Spruce-pine-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-9 | 6-11 | 8-9 | 10-9 | 12-5 |
| 16 | Douglas fir-larch | SS | 6-10 | 10-9 | 13-9 | 16-10 | 19-6 | 6-10 | 10-3 | 13-0 | 15-10 | 18-4 |
| | Douglas fir-larch | #1 | 6-2 | 9-0 | 11-5 | 13-11 | 16-2 | 5-10 | 8-6 | 10-9 | 13-2 | 15-3 |
| | Douglas fir-larch | #2 | 5-9 | 8-5 | 10-8 | 13-1 | 15-2 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 |
| | Douglas fir-larch | #3 | 4-4 | 6-4 | 8-1 | 9-10 | 11-5 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 |
| | Hem-fir | SS | 6-6 | 10-2 | 13-5 | 16-6 | 19-2 | 6-6 | 10-3 | 12-9 | 15-7 | 18-0 |
| | Hem-fir | #1 | 6-0 | 8-9 | 11-2 | 13-7 | 15-9 | 5-8 | 8-3 | 10-6 | 12-10 | 14-10 |
| | Hem-fir | #2 | 5-8 | 8-4 | 10-6 | 12-10 | 14-11 | 5-4 | 7-10 | 9-11 | 12-1 | 14-1 |
| | Hem-fir | #3 | 4-4 | 6-4 | 8-1 | 9-10 | 11-5 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 |
| | Southern pine | SS | 6-9 | 10-7 | 14-0 | 17-10 17-4 | 21-8 20-5 | 6-9 | 10-7 | 14-0 13-9 | 17-10 16-4 | 21-0 19-3 |
| | Southern pine | #1 | 6-7 6-2 | 10-3 9-2 | 13-9 11-8 | 16-0 13-8 | 18-1 16-2 | 6-5 5-10 | 9-7 8-8 | 12-9 11-0 | 14-4 12-10 | 17-1 15-3 |
| | Southern pine | #2 | 6-3 5-3 | 8-10 7-11 | 11-5 10-0 | 13-7 11-11 | 16-0 14-0 | 5-10 5-0 | 8-4 7-5 | 10-9 9-5 | 12-10 11-3 | 15-1 13-2 |
| | Southern pine | #3 | 4-8 4-1 | 6-10 6-0 | 8-9 7-7 | 10-4 9-2 | 12-3 10-10 | 4-4 3-10 | 6-5 5-8 | 8-3 7-1 | 9-9 8-8 | 11-7 10-3 |
| | Spruce-pine-fir | SS | 6-4 | 10-0 | 12-9 | 15-7 | 18-1 | 6-4 | 9-6 | 12-0 | 14-8 | 17-1 |
| | Spruce-pine-fir | #1 | 5-9 | 8-5 | 10-8 | 13-1 | 15-2 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 |
| | Spruce-pine-fir | #2 | 5-9 | 8-5 | 10-8 | 13-1 | 15-2 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 |
| | Spruce-pine-fir | #3 | 4-4 | 6-4 | 8-1 | 9-10 | 11-5 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 |
| 19.2 | Douglas fir-larch | SS | 6-5 | 9-11 | 12-7 | 15-4 | 17-9 | 6-5 | 9-4 | 11-10 | 14-5 | 16-9 |
| | Douglas fir-larch | #1 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 | 5-4 | 7-9 | 9-10 | 12-0 | 13-11 |
| | Douglas fir-larch | #2 | 5-3 | 7-8 | 9-9 | 11-11 | 13-10 | 5-0 | 7-3 | 9-2 | 11-3 | 13-0 |
| | Douglas fir-larch | #3 | 4-0 | 5-10 | 7-4 | 9-0 | 10-5 | 3-9 | 5-6 | 6-11 | 8-6 | 9-10 |
| | Hem-fir | SS | 6-1 | 9-7 | 12-4 | 15-1 | 17-4 | 6-1 | 9-2 | 11-8 | 14-2 | 15-5 |
| | Hem-fir | #1 | 5-6 | 8-0 | 10-2 | 12-5 | 14-5 | 5-2 | 7-7 | 9-7 | 11-8 | 13-7 |
| | Hem-fir | #2 | 5-2 | 7-7 | 9-7 | 11-9 | 13-7 | 4-11 | 7-2 | 9-1 | 11-1 | 12-10 |
| | Hem-fir | #3 | 4-0 | 5-10 | 7-4 | 9-0 | 10-5 | 3-9 | 5-6 | 6-11 | 8-6 | 9-10 |

*(continued)*

TABLE R802.5.1(7)—continued
RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD
(Ceiling not attached to rafters, L/Δ = 180)

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum Rafter Spans[a] | | | | | | | | | |
| | | | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) | (feet-inches) |
| 19.2 | Southern pine | SS | 6-4 | 10-0 | 13-2 | ~~16-9~~ 15-10 | ~~20-4~~ 18-8 | 6-4 | ~~10-0~~ 9-10 | ~~13-2~~ 12-6 | ~~16-5~~ 14-11 | ~~19-2~~ 17-7 |
| | Southern pine | #1 | ~~6-3~~ 5-8 | ~~9-3~~ 8-5 | ~~11-8~~ 10-8 | ~~13-10~~ 12-5 | ~~16-6~~ 14-9 | ~~5-11~~ 5-4 | ~~8-9~~ 7-11 | ~~11-0~~ 10-0 | ~~13-1~~ 11-9 | ~~15-7~~ 13-11 |
| | Southern pine | #2 | ~~5-7~~ 4-10 | ~~8-1~~ 7-3 | ~~10-5~~ 9-2 | ~~12-5~~ 10-10 | ~~14-7~~ 12-9 | ~~5-4~~ 4-6 | ~~7-7~~ 6-10 | ~~9-10~~ 8-8 | ~~11-9~~ 10-3 | ~~13-9~~ 12-1 |
| | Southern pine | #3 | ~~4-3~~ 3-8 | ~~6-3~~ 5-6 | ~~8-0~~ 6-11 | ~~9-5~~ 8-4 | ~~11-2~~ 9-11 | ~~4-0~~ 3-6 | ~~5-11~~ 5-2 | ~~7-6~~ 6-6 | ~~8-10~~ 7-11 | ~~10-7~~ 9-4 |
| | Spruce-pine-fir | SS | 6-0 | 9-2 | 11-8 | 14-3 | 16-6 | 5-11 | 8-8 | 11-0 | 13-5 | 15-7 |
| | Spruce-pine-fir | #1 | 5-3 | 7-8 | 9-9 | 11-11 | 13-10 | 5-0 | 7-3 | 9-2 | 11-3 | 13-0 |
| | Spruce-pine-fir | #2 | 5-3 | 7-8 | 9-9 | 11-11 | 13-10 | 5-0 | 7-3 | 9-2 | 11-3 | 13-0 |
| | Spruce-pine-fir | #3 | 4-0 | 5-10 | 7-4 | 9-0 | 10-5 | 3-9 | 5-6 | 6-11 | 8-6 | 9-10 |
| 24 | Douglas fir-larch | SS | 6-0 | 8-10 | 11-3 | 13-9 | 15-11 | 5-9 | 8-4 | 10-7 | 12-11 | 15-0 |
| | Douglas fir-larch | #1 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-9 | 6-11 | 8-9 | 10-9 | 12-5 |
| | Douglas fir-larch | #2 | 4-8 | 6-11 | 8-9 | 10-8 | 12-4 | 4-5 | 6-6 | 8-3 | 10-0 | 11-8 |
| | Douglas fir-larch | #3 | 3-7 | 5-2 | 6-7 | 8-1 | 9-4 | 3-4 | 4-11 | 6-3 | 7-7 | 8-10 |
| | Hem-fir | SS | 5-8 | 8-8 | 11-0 | 13-6 | 13-11 | 5-7 | 8-3 | 10-5 | 12-4 | 12-4 |
| | Hem-fir | #1 | 4-11 | 7-2 | 9-1 | 11-1 | 12-10 | 4-7 | 6-9 | 8-7 | 10-6 | 12-2 |
| | Hem-fir | #2 | 4-8 | 6-9 | 8-7 | 10-6 | 12-2 | 4-4 | 6-5 | 8-1 | 9-11 | 11-6 |
| | Hem-fir | #3 | 3-7 | 5-2 | 6-7 | 8-1 | 9-4 | 3-4 | 4-11 | 6-3 | 7-7 | 8-10 |
| | Southern pine | SS | 5-11 | 9-3 | ~~12-2~~ 11-11 | ~~15-7~~ 14-2 | ~~18-3~~ 16-8 | 5-11 | ~~9-3~~ 8-10 | ~~12-2~~ 11-2 | ~~14-8~~ 13-4 | ~~17-2~~ 15-9 |
| | Southern pine | #1 | ~~5-7~~ 5-0 | ~~8-3~~ 7-6 | ~~10-5~~ 9-6 | ~~12-5~~ 11-1 | ~~14-9~~ 13-2 | ~~5-3~~ 4-9 | ~~7-10~~ 7-1 | ~~9-10~~ 9-0 | ~~11-8~~ 10-6 | ~~13-11~~ 12-5 |
| | Southern pine | #2 | ~~5-0~~ 4-4 | ~~7-3~~ 6-5 | ~~9-4~~ 8-2 | ~~11-1~~ 9-9 | ~~13-0~~ 11-5 | ~~4-9~~ 4-1 | ~~6-10~~ 6-1 | ~~8-9~~ 7-9 | ~~10-6~~ 9-2 | ~~12-4~~ 10-9 |
| | Southern pine | #3 | ~~3-9~~ 3-4 | ~~5-7~~ 4-11 | ~~7-1~~ 6-2 | ~~8-5~~ 7-6 | ~~10-0~~ 8-10 | ~~3-7~~ 3-1 | ~~5-3~~ 4-7 | ~~6-9~~ 5-10 | ~~7-11~~ 7-1 | ~~9-5~~ 8-4 |
| | Spruce-pine-fir | SS | 5-6 | 8-3 | 10-5 | 12-9 | 14-9 | 5-4 | 7-9 | 9-10 | 12-0 | 12-11 |
| | Spruce-pine-fir | #1 | 4-8 | 6-11 | 8-9 | 10-8 | 12-4 | 4-5 | 6-6 | 8-3 | 10-0 | 11-8 |
| | Spruce-pine-fir | #2 | 4-8 | 6-11 | 8-9 | 10-8 | 12-4 | 4-5 | 6-6 | 8-3 | 10-0 | 11-8 |
| | Spruce-pine-fir | #3 | 3-7 | 5-2 | 6-7 | 8-1 | 9-4 | 3-4 | 4-11 | 6-3 | 7-7 | 8-10 |

Check sources for availability of lumber in lengths greater than 20 feet.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

| $H_c/H_e$ | Rafter Span Adjustment Factor |
|---|---|
| 1/3 | 0.67 |
| 1/4 | 0.76 |
| 1/5 | 0.83 |
| 1/6 | 0.90 |
| 1/7.5 or less | 1.00 |

where:

$H_c$ = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

$H_e$ = Height of roof ridge measured vertically above the top of the rafter support walls.

55. Table R802.5.1(8), "Rafter Spans for 70 PSF Ground Snow Load," of Subsection R802.5, "Allowable Rafter Spans," of Section R802, "Wood Roof Framing," of Chapter 8, "Roof-Ceiling Construction," of the 2012 International Residential Code is amended to read as follows:

TABLE R802.5.1(8)
RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD
(Ceiling attached to rafters, L/Δ = 240)

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 12 | Douglas fir-larch | SS | 6-10 | 10-9 | 14-3 | 18-2 | 22-1 | 6-10 | 10-9 | 14-3 | 18-2 | 21-2 |
| | Douglas fir-larch | #1 | 6-7 | 10-5 | 13-2 | 16-1 | 18-8 | 6-7 | 9-10 | 12-5 | 15-2 | 17-7 |
| | Douglas fir-larch | #2 | 6-6 | 9-9 | 12-4 | 15-1 | 17-6 | 6-3 | 9-2 | 11-8 | 14-2 | 16-6 |
| | Douglas fir-larch | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-9 | 6-11 | 8-9 | 10-9 | 12-5 |
| | Hem-fir | SS | 6-6 | 10-2 | 13-5 | 17-2 | 20-10 | 6-6 | 10-2 | 13-5 | 17-2 | 20-10 |
| | Hem-fir | #1 | 6-4 | 10-0 | 12-10 | 15-8 | 18-2 | 6-4 | 9-7 | 12-1 | 14-10 | 17-2 |
| | Hem-fir | #2 | 6-1 | 9-6 | 12-2 | 14-10 | 17-3 | 6-1 | 9-1 | 11-5 | 14-0 | 16-3 |
| | Hem-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-9 | 6-11 | 8-9 | 10-9 | 12-5 |
| | Southern pine | SS | 6-9 | 10-7 | 14-0 | 17-10 | 21-8 | 6-9 | 10-7 | 14-0 | 17-10 | 21-8 |
| | Southern pine | #1 | 6-7 6-6 | 10-5 10-2 | 13-8 13-5 | 17-6 15-9 | 20-11 18-8 | 6-7 6-6 | 10-5 10-0 | 12-8 12-8 | 16-6 14-10 | 19-8 17-7 |
| | Southern pine | #2 | 6-6 6-1 | 10-2 9-2 | 12-3 11-7 | 15-9 13-9 | 18-5 16-2 | 6-6 5-9 | 9-7 8-7 | 12-5 10-11 | 14-10 12-11 | 17-5 15-3 |
| | Southern pine | #3 | 5-4 4-8 | 7-11 6-11 | 10-1 8-9 | 11-11 10-7 | 14-3 12-6 | 5-1 4-5 | 7-5 6-6 | 9-6 8-3 | 11-5 10-0 | 13-1 11-10 |
| | Spruce-pine-fir | SS | 6-4 | 10-0 | 13-2 | 16-9 | 20-5 | 6-4 | 10-0 | 13-2 | 16-9 | 19-8 |
| | Spruce-pine-fir | #1 | 6-2 | 9-9 | 12-4 | 15-1 | 17-6 | 6-2 | 9-2 | 11-8 | 14-2 | 16-6 |
| | Spruce-pine-fir | #2 | 6-2 | 9-9 | 12-4 | 15-1 | 17-6 | 6-2 | 9-2 | 11-8 | 14-2 | 16-6 |
| | Spruce-pine-fir | #3 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-9 | 6-11 | 8-9 | 10-9 | 12-5 |
| 16 | Douglas fir-larch | SS | 6-3 | 9-10 | 12-11 | 16-6 | 19-6 | 6-3 | 9-10 | 12-11 | 15-10 | 18-4 |
| | Douglas fir-larch | #1 | 6-0 | 9-0 | 11-5 | 13-11 | 16-2 | 5-10 | 8-6 | 10-9 | 13-2 | 15-3 |
| | Douglas fir-larch | #2 | 5-9 | 8-5 | 10-8 | 13-1 | 15-2 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 |
| | Douglas fir-larch | #3 | 4-4 | 6-4 | 8-1 | 9-10 | 11-5 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 |
| | Hem-fir | SS | 5-11 | 9-3 | 12-2 | 15-7 | 18-11 | 5-11 | 9-3 | 12-2 | 15-7 | 18-0 |
| | Hem-fir | #1 | 5-9 | 8-9 | 11-2 | 13-7 | 15-9 | 5-8 | 8-3 | 10-6 | 12-10 | 14-10 |
| | Hem-fir | #2 | 5-6 | 8-4 | 10-6 | 12-10 | 14-11 | 5-4 | 7-10 | 9-11 | 12-1 | 14-1 |
| | Hem-fir | #3 | 4-4 | 6-4 | 8-1 | 9-10 | 11-5 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 |
| | Southern pine | SS | 6-1 | 9-7 | 12-8 | 16-2 | 19-8 | 6-1 | 9-7 | 12-8 | 16-2 | 19-8 19-3 |
| | Southern pine | #1 | 6-0 5-11 | 9-5 9-2 | 12-5 11-8 | 15-2 13-8 | 18-1 16-2 | 6-0 5-10 | 9-5 8-8 | 12-0 11-0 | 14-4 12-10 | 17-1 15-3 |
| | Southern pine | #2 | 5-11 5-3 | 8-10 7-11 | 11-5 10-0 | 13-7 11-11 | 16-0 14-0 | 5-10 5-0 | 8-4 7-5 | 10-9 9-5 | 12-10 11-3 | 15-1 13-2 |
| | Southern pine | #3 | 4-8 4-1 | 6-10 6-0 | 8-9 7-7 | 10-4 9-2 | 12-3 10-10 | 4-4 3-10 | 6-5 5-8 | 8-3 7-1 | 9-9 8-8 | 11-7 10-3 |
| | Spruce-pine-fir | SS | 5-9 | 9-1 | 11-11 | 15-3 | 18-1 | 5-9 | 9-1 | 11-11 | 14-8 | 17-1 |
| | Spruce-pine-fir | #1 | 5-8 | 8-5 | 10-8 | 13-1 | 15-2 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 |
| | Spruce-pine-fir | #2 | 5-8 | 8-5 | 10-8 | 13-1 | 15-2 | 5-5 | 7-11 | 10-1 | 12-4 | 14-3 |
| | Spruce-pine-fir | #3 | 4-4 | 6-4 | 8-1 | 9-10 | 11-5 | 4-1 | 6-0 | 7-7 | 9-4 | 10-9 |
| 19.2 | Douglas fir-larch | SS | 5-10 | 9-3 | 12-2 | 15-4 | 17-9 | 5-10 | 9-3 | 11-10 | 14-5 | 16-9 |
| | Douglas fir-larch | #1 | 5-7 | 8-3 | 10-5 | 12-9 | 14-9 | 5-4 | 7-9 | 9-10 | 12-0 | 13-11 |
| | Douglas fir-larch | #2 | 5-3 | 7-8 | 9-9 | 11-11 | 13-10 | 5-0 | 7-3 | 9-2 | 11-3 | 13-0 |
| | Douglas fir-larch | #3 | 4-0 | 5-10 | 7-4 | 9-0 | 10-5 | 3-9 | 5-6 | 6-11 | 8-6 | 9-10 |
| | Hem-fir | SS | 5-6 | 8-8 | 11-6 | 14-8 | 17-4 | 5-6 | 8-8 | 11-6 | 14-2 | 15-5 |
| | Hem-fir | #1 | 5-5 | 8-0 | 10-2 | 12-5 | 14-5 | 5-2 | 7-7 | 9-7 | 11-8 | 13-7 |
| | Hem-fir | #2 | 5-2 | 7-7 | 9-7 | 11-9 | 13-7 | 4-11 | 7-2 | 9-1 | 11-1 | 12-10 |
| | Hem-fir | #3 | 4-0 | 5-10 | 7-4 | 9-0 | 10-5 | 3-9 | 5-6 | 6-11 | 8-6 | 9-10 |

*(continued)*

TABLE R802.5.1(8)—continued
RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD
(Ceiling attached to rafters, L/Δ = 240)

| RAFTER SPACING (inches) | SPECIES AND GRADE | | DEAD LOAD = 10 psf | | | | | DEAD LOAD = 20 psf | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 | 2 × 4 | 2 × 6 | 2 × 8 | 2 × 10 | 2 × 12 |
| | | | Maximum rafter spans[a] | | | | | | | | | |
| | | | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) | (feet - inches) |
| 19.2 | Southern pine | SS | 5-9 | 9-1 | 11-11 | 15-3 | 18-6 | 5-9 | 9-1 | 11-11 | ~~15-3~~ 14-11 | ~~18-6~~ 17-7 |
| | Southern pine | #1 | ~~5-8~~ 5-6 | ~~8-11~~ 8-5 | ~~11-8~~ 10-8 | ~~13-10~~ 12-5 | ~~16-6~~ 14-9 | ~~5-8~~ 5-4 | ~~8-9~~ 7-11 | ~~11-9~~ 10-0 | ~~13-1~~ 11-9 | ~~15-7~~ 13-11 |
| | Southern pine | #2 | ~~5-6~~ 5-10 | ~~8-4~~ 7-3 | ~~10-5~~ 9-2 | ~~12-5~~ 10-10 | ~~14-7~~ 12-9 | ~~5-4~~ 4-6 | ~~7-7~~ 6-10 | ~~9-10~~ 8-8 | ~~11-9~~ 10-3 | ~~13-9~~ 12-1 |
| | Southern pine | #3 | ~~4-3~~ 3-8 | ~~6-3~~ 5-6 | ~~8-0~~ 6-11 | ~~9-5~~ 8-4 | ~~11-2~~ 9-11 | ~~4-0~~ 3-6 | ~~5-11~~ 5-2 | ~~7-6~~ 6-6 | ~~8-10~~ 7-11 | ~~10-7~~ 9-4 |
| | Spruce-pine-fir | SS | 5-5 | 8-6 | 11-3 | 14-3 | 16-6 | 5-5 | 8-6 | 11-0 | 13-5 | 15-7 |
| | Spruce-pine-fir | #1 | 5-3 | 7-8 | 9-9 | 11-11 | 13-10 | 5-0 | 7-3 | 9-2 | 11-3 | 13-0 |
| | Spruce-pine-fir | #2 | 5-3 | 7-8 | 9-9 | 11-11 | 13-10 | 5-0 | 7-3 | 9-2 | 11-3 | 13-0 |
| | Spruce-pine-fir | #3 | 4-0 | 5-10 | 7-4 | 9-0 | 10-5 | 3-9 | 5-6 | 6-11 | 8-6 | 9-10 |
| 24 | Douglas fir-larch | SS | 5-5 | 8-7 | 11-3 | 13-9 | 15-11 | 5-5 | 8-4 | 10-7 | 12-11 | 15-0 |
| | Douglas fir-larch | #1 | 5-0 | 7-4 | 9-4 | 11-5 | 13-2 | 4-9 | 6-11 | 8-9 | 10-9 | 12-5 |
| | Douglas fir-larch | #2 | 4-8 | 6-11 | 8-9 | 10-8 | 12-4 | 4-5 | 6-6 | 8-3 | 10-0 | 11-8 |
| | Douglas fir-larch | #3 | 3-7 | 5-2 | 6-7 | 8-1 | 9-4 | 3-4 | 4-11 | 6-3 | 7-7 | 8-10 |
| | Hem-fir | SS | 5-2 | 8-1 | 10-8 | 13-6 | 13-11 | 5-2 | 8-1 | 10-5 | 12-4 | 12-4 |
| | Hem-fir | #1 | 4-11 | 7-2 | 9-1 | 11-1 | 12-10 | 4-7 | 6-9 | 8-7 | 10-6 | 12-2 |
| | Hem-fir | #2 | 4-8 | 6-9 | 8-7 | 10-6 | 12-2 | 4-4 | 6-5 | 8-1 | 9-11 | 11-6 |
| | Hem-fir | #3 | 3-7 | 5-2 | 6-7 | 8-1 | 9-4 | 3-4 | 4-11 | 6-3 | 7-7 | 8-10 |
| | Southern pine | SS | 5-4 | 8-5 | 11-1 | 14-2 | ~~17-2~~ 16-8 | 5-4 | 8-5 | 11-1 | ~~14-2~~ 13-4 | ~~17-2~~ 15-9 |
| | Southern pine | #1 | ~~5-3~~ 5-0 | ~~8-3~~ 7-6 | ~~10-5~~ 9-6 | ~~12-5~~ 11-1 | ~~14-9~~ 13-2 | ~~5-3~~ 4-9 | ~~7-10~~ 7-1 | ~~9-10~~ 9-0 | ~~11-8~~ 10-6 | ~~13-11~~ 12-5 |
| | Southern pine | #2 | ~~5-0~~ 4-4 | ~~7-3~~ 6-3 | ~~9-4~~ 8-2 | ~~11-1~~ 9-9 | ~~13-0~~ 11-5 | ~~4-9~~ 4-1 | ~~6-10~~ 6-1 | ~~8-9~~ 7-9 | ~~10-6~~ 9-2 | ~~12-4~~ 10-9 |
| | Southern pine | #3 | ~~3-9~~ 3-4 | ~~5-7~~ 4-11 | ~~7-1~~ 6-2 | ~~8-6~~ 7-6 | ~~10-0~~ 8-10 | ~~3-7~~ 3-1 | ~~5-3~~ 4-7 | ~~6-9~~ 5-10 | ~~7-11~~ 7-1 | ~~9-5~~ 8-4 |
| | Spruce-pine-fir | SS | 5-0 | 7-11 | 10-5 | 12-9 | 14-9 | 5-0 | 7-9 | 9-10 | 12-0 | 12-11 |
| | Spruce-pine-fir | #1 | 4-8 | 6-11 | 8-9 | 10-8 | 12-4 | 4-5 | 6-6 | 8-3 | 10-0 | 11-8 |
| | Spruce-pine-fir | #2 | 4-8 | 6-11 | 8-9 | 10-8 | 12-4 | 4-5 | 6-6 | 8-3 | 10-0 | 11-8 |
| | Spruce-pine-fir | #3 | 3-7 | 5-2 | 6-7 | 8-1 | 9-4 | 3-4 | 4-11 | 6-3 | 7-7 | 8-10 |

Check sources for availability of lumber in lengths greater than 20 feet.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below.

| $H_C/H_R$ | Rafter Span Adjustment Factor |
|---|---|
| 1/3 | 0.67 |
| 1/4 | 0.76 |
| 1/5 | 0.83 |
| 1/6 | 0.90 |
| 1/10 or less | 1.00 |

where:

$H_C$ = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

$H_R$ = Height of roof ridge measured vertically above the top of the rafter support walls.

56. Subsection R902.1, "Roofing Covering Materials," of Section R902, "Roof Classification," of Chapter 9, "Roof Assemblies," of the 2012 International Residential Code is amended to read as follows:

"**902.1 Roofing covering materials.** Roofs shall be covered with materials as set forth in Sections R904 and R905. Class A, B or C roofing shall be installed [~~in areas designated by law as requiring their use or when the edge of the roof is less than 3 feet (914 mm) from a lot line~~]. Classes A, B and C roofing required by this section to be listed shall be tested in accordance with UL 790 or ASTM E 108.

**Exceptions:**

1. Class A roof assemblies include those with coverings of brick, masonry and exposed concrete roof deck.

2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on non-combustible decks.

3. Class A roof assemblies include minimum 16 oz/ft$^2$ copper sheets installed over combustible decks.

4. Non-classified roof coverings are permitted on one-story detached *accessory structures* used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 200 square feet (18.58 m$^2$)."

57. Subsection R907.1, "General," of Section R907, "Reroofing," of Chapter 9, "Roof Assemblies," of the 2012 International Residential Code is amended to read as follows:

"**R907.1 General.** Materials and methods of application used for re-covering or replacing an existing roof covering shall comply with the requirements of Chapter 9. All individual replacement shingles or shakes must comply with Section R902.1.

**Exception:** Reroofing shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section R905 for roofs that provide positive roof drainage."

58. Chapter 11 [RE], "Energy Efficiency," of the 2012 International Residential Code is deleted and replaced with Chapter 11, "Energy Efficiency," of the 2009 International Residential Code of the International Code Council, Inc. (which is attached as Exhibit B and made a part of this ordinance), with the following amendments:

A. Subsection N1101.2, "Compliance," of Section N1101, "General," of Chapter 11, "Energy Efficiency," of the 2009 International Residential Code is amended by adding a new Paragraph N1101.2.2, "Compliance Software Tools," to read as follows:

"**N1101.2.2 Compliance software tools.** Software tools used to demonstrate energy code compliance utilizing the UA alternative approach must be approved by the *building official.* The PNL program RES*check*™ is not acceptable for residential compliance.

**Exception:** When the RES*check*™ "UA Trade-off" compliance approach or the UA alternate compliance approach method is used, the compliance certificate must demonstrate that the maximum glazed area does not exceed 15 percent of the conditioned floor area."

B. Subsection N1102.1, "Insulation and Fenestration Criteria," of Section N1102, "Building Thermal Envelope," of Chapter 11, "Energy Efficiency," of the 2009 International Residential Code is amended to read as follows:

"**N1102.1 Insulation and fenestration criteria.** The *building thermal envelope* shall meet the requirements of Table N1102.1 based on the climate zone specified in Table N1101.2. The use of Tables N1102.1 and N1102.1.2 are limited to a maximum glazing area of 15 percent window area to floor area.

**N1102.1.1 *R*-value computation.** Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component *R*-value. The manufacturer's settled *R*-value shall be used for blown insulation. Computed *R*-values shall not include an *R*-value for other building materials or air films.

**N1102.1.2 *U*-factor alternative.** An assembly with a *U*-factor equal to or less than that specified in Table N1102.1.2 shall be permitted as an alternative to the *R*-value in Table N1102.1.

**N1102.1.3 Total UA alternative.** If the total *building thermal envelope* UA (sum of *U*-factor times assembly area) is less than or equal to the total UA resulting from using the *U*-factors in Table N1102.1.2, (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table N1102.1. The UA calculation shall be done using a method consistent with the ASHRAE *Handbook of Fundamentals* and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to UA compliance."

C. Subsection N1102.2, "Specific Insulation Requirements," of Section N1102, "Building Thermal Envelope," of Chapter 11, "Energy Efficiency," of the 2009 International Residential Code is amended by adding a new Paragraph N1102.2.12, "Insulation Installed in Walls," to read as follows:

"**N1102.2.12 Insulation installed in walls.** Insulation batts installed in walls must be totally surrounded by an enclosure on all sides consisting of framing lumber, gypsum, sheathing, wood structural panel sheathing or other equivalent material approved by the *building official*."

59. Paragraph M1305.1.3, "Appliances in Attics," of Subsection M1305.1, "Appliance Access for Inspection Service, Repair and Replacement," of Section M1305, "Appliance Access," of Chapter 13, "General Mechanical System Requirements," of the 2012 International Residential Code is amended to read as follows:

"**M1305.1.3 Appliances in attics.** *Attics* containing *appliances* requiring access shall be provided with an opening and a clear and unobstructed passageway large enough to allow removal of the largest *appliance*, but not less than 30 inches (762 mm) high and 22 inches (559 mm) wide and not more than 20 feet (6096 mm) long measured along the centerline of the passageway from the opening to the *appliance*. The passageway shall have continuous solid flooring in accordance with Chapter 5 not less than 24 inches (610 mm) wide. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present along all sides of the *appliance* where access is required. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm by 762 mm) or larger where such dimensions are not[~~, and~~] large enough to allow removal of the largest appliance. A walkway to an appliance must be rated as a floor as approved by the *building official*. As a minimum, provide one of the following for access to the attic space:

1. A permanent stair.

2. A pull down stair with a minimum 300 lb (136 kg) capacity.

3. An access door from an upper floor.

An access panel may be used in lieu of Items 1, 2 or 3 due to structural conditions with prior approval of the *building official*.

**Exceptions:**

1. The passageway and level service space are not required where the *appliance* can be serviced and removed through the required opening.

2. Where the passageway is unobstructed and not less than 6 feet (1829 mm) high and 22 inches (559 mm) wide for its entire length, the passageway shall be not more than 50 feet (15,250 mm) long.

**M1305.1.3.1 Electrical requirements.** A luminaire controlled by a switch located at the required passageway opening and a receptacle outlet shall be installed at or near the *appliance* location in accordance with Chapter 39."

60. Subparagraph M1305.1.4.3, "Electrical Requirements," of Paragraph M1305.1.4, "Appliances Under Floors," of Subsection M1305.1, "Appliance Access for Inspection Service, Repair and Replacement," of Section M1305, "Appliance Access," of Chapter 13, "General Mechanical System Requirements," of the 2012 International Residential Code is amended to read as follows:

"**M1305.1.4.3 Electrical requirements.** A luminaire controlled by a switch located at the required passageway opening and a receptacle outlet shall be installed at or near the *appliance* location in accordance with the *Dallas Electrical Code.* Low voltage wiring of 50 volts or less must be installed in a manner to prevent physical damage [~~Chapter 39~~]."

61. Subsection M1307.3, "Elevation of Ignition Source," of Section M1307, "Appliance Installation," of Chapter 13, "General Mechanical System Requirements," of the 2012 International Residential Code is amended to read as follows:

"**M1307.3 Elevation of ignition source.** Equipment and *a*[*A*]*ppliances* having an *ignition source* shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the floor in garages. For the purpose of this section, rooms or spaces that are not part of the living space of a *dwelling unit* and that communicate directly with a private garage through openings shall be considered to be part of the garage.

**Exceptions:**

1. Elevation of the ignition source is not required for appliances that are listed as flammable vapor ignition resistant.

2. Electric appliance or electric water heaters.

[~~**M1307.3.1 Protection from impact.** *Appliances* shall not be installed in a location subject to vehicle damage except where protected by *approved* barriers.~~]"

62. Section M1307, "Appliance Installation," of Chapter 13, "General Mechanical System Requirements," of the 2012 International Residential Code is amended by adding a new Subsection M1307.7, "Prohibited Locations," to read as follows:

"**M1307.7 Prohibited locations.** Fuel-fired appliances must not be located in, or obtain combustion air from, any of the following rooms or spaces:

1. Sleeping rooms.

2. Bathrooms.

3. Toilet rooms.

4. Storage closets.

**Exception:** This section does not apply to the following applications:

1. Direct-vent appliances that obtain all combustion air directly from outdoors.

2. Solid fuel-fired appliances, provided that the room is not a confined space and the building is not of unusually tight construction.

3. Appliances installed in a dedicated enclosure in which all combustion air is taken directly from the outdoors, in accordance with Chapter 7. Access to such enclosure must be through a solid door, weather-stripped in accordance with the exterior door leakage requirements of the *Dallas Energy Conservation Code* and equipped with an approved self-closing device."

63. Subsection M1401.4, "Exterior Installations," of Section M1401, "General," of Chapter 14, "Heating and Cooling Equipment and Appliances," of the 2012 International Residential Code is amended to read as follows:

"**M1401.4 Exterior installations.** *Equipment* and *appliances* installed outdoors shall be *listed* and *labeled* for outdoor installation. Supports and foundations shall prevent excessive vibration, settlement or movement of the *equipment*. Supports and foundations shall be in accordance with Section M1305.1.4.1.

**M1401.4.1 Side yard clearances.** A unitary air conditioning unit installed in a required side yard must comply with the requirements of Section 51A-4.402(a)(4) of the *Dallas Development Code.*

**M1401.4.2 Low voltage wiring.** Low voltage wiring of 50 volts or less must be installed in an approved manner as defined in the *Dallas Electrical Code* in order to prevent physical damage to the wiring."

64. Subsection M1411.3, "Condensate Disposal," of Section M1411, "Heating and Cooling Equipment," of Chapter 14, "Heating and Cooling Equipment and Appliances," of the 2012 International Residential Code is amended to read as follows:

"**M1411.3 Condensate disposal.** Condensate from all cooling coils or evaporators shall be conveyed from the drain pan outlet to an *approved* place of disposal. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than 1/8 unit vertical in 12 units horizontal (1-percent slope.) Condensate shall not discharge into a street, alley, sidewalk, rooftop or other areas so as to [~~where it would~~] cause a nuisance.

**M1411.3.1 Auxiliary and secondary drain systems.** In addition to the requirements of Section M1411.3, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil where damage to any building components could [~~will~~] occur as a result of overflow from the *equipment* drain pan or stoppage in the condensate drain piping. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than 1/8 unit vertical in 12 units horizontal (1-percent slope). Drain piping shall be a minimum of 3/4-inch (19 mm) nominal pipe size. One of the following methods shall be used:

1. An auxiliary drain pan with a separate drain shall be installed under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 1.5 inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Galvanized sheet steel pans shall have a minimum thickness of not less than 0.0236-inch (0.6010 mm) (No. 24 Gage). Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).

2. A separate overflow drain line shall be connected to the drain pan installed with the *equipment*. This overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection. However, the conspicuous point must not create a nuisance.

3. An auxiliary drain pan without a separate drain line shall be installed under the coils on which condensation will occur. This pan shall be equipped with a water level detection device conforming to UL 508 that will shut off the *equipment* served prior to overflow of the pan. The pan shall be equipped with a fitting to allow for drainage. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section. A water level detection device may be installed only with prior approval of the *building official.*

4. A water level detection device conforming to UL 508 shall be installed that will shut off the *equipment* served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line or the *equipment*-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan. A water level detection device may be installed only with prior approval of the *building official.*

**M1411.3.1.1 Water-level monitoring devices.** On down-flow units and all other coils that have no secondary drain or provisions to install a secondary or auxiliary drain pan, a water-level monitoring device shall be installed inside the primary drain pan. This device shall shut off the equipment served in the event that the primary drain becomes restricted. Devices shall not be installed in the drain line. A water level detection device may be installed only with prior approval of the *building official.*

**Exception:** Fuel-fired appliances that automatically shut down operation in the event of a stoppage in the condensate drainage system.

**M1411.3.2 Drain pipe materials and sizes.** Components of the condensate disposal system shall be cast iron, galvanized steel, copper, [~~polybutylene,~~] polyethylene, cross-linked polyethylene, ABS, CPVC or PVC pipe or tubing. All components shall be selected for the pressure, [~~and~~] temperature, and exposure rating of the installation. Joints and connections shall be made in accordance with [~~the materials specified in~~] Chapter 30. Condensate waste and drain line size shall be not less than 3/4-inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 307.2.2, "Condensate Drain Sizing," of the *Dallas Mechanical Code* [~~an *approved* method~~].

**M1411.3.3 Appliances, equipment and insulation in pans.** Where *appliances*, *equipment* or insulation are subject to water damage when auxiliary drain pans fill, those portions of the *appliances*, *equipment* and insulation shall be installed above the flood level rim of the pan. Supports located inside of the pan to support the *appliance* or *equipment* shall be water resistant and *approved*."

65. Subsection M1503.4, "Makeup Air Required," of Section M1503, "Range Hoods," of Chapter 15, "Exhaust Systems" of the 2012 International Residential Code is amended to read as follows:

"**M1503.4 Makeup air required.** Exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (0.19 $m^3/s$) shall be provided with makeup air at a rate approximately equal to the difference between the exhaust air rate and 400 cubic feet per minute (0.19 $m^3/s$). Such makeup air systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.

**Exception:** Where all appliances in the house are of sealed combustion, power-vent, unvented or electric, the exhaust hood system is permitted to exhaust up to 600 cubic feet per minute (0.28 $m^3/s$) without providing makeup air. Exhaust hood systems capable of exhausting in excess of 600 cubic feet per minute (0.28 $m^3/s$) must be provided with a makeup air rate approximately equal to the difference between the exhausted air rate and 600 cubic feet per minute (0.28 $m^3/s$)."

66. Subsection M1507.2, "Recirculation of Air," of Section M1507, "Mechanical Ventilation," of Chapter 15, "Exhaust Systems," of the 2012 International Residential Code is amended to read as follows:

"**M1507.2 Recirculation of air.** Exhaust air from bathrooms and toilet rooms shall not be recirculated within a residence or to another *dwelling unit* and shall be exhausted directly to the outdoors. Exhaust air from bathrooms and toilet rooms shall not discharge into an *attic*, crawl space or other areas inside the building.

**Exception:** Toilet rooms within private dwellings that contain only a water closet, lavatory or combination thereof may be ventilated with an approved mechanical recirculating fan or similar device designed to remove odors from the air."

67. Subsection M2005.2, "Prohibited Locations," of Section M2005, "Water Heaters," of Chapter 20, "Boilers and Water Heaters," of the 2012 International Residential Code is amended to read as follows:

"**M2005.2 Prohibited locations.** Fuel-fired water heaters shall not be installed in a room used as a storage closet. Water heaters located in a bedroom or bathroom shall be installed in a sealed enclosure so that *combustion air* will not be taken from the living space. Access to such enclosure may be from the bedroom or bathroom when through a solid door, weather-stripped in accordance with the exterior door air leakage requirements of the *Dallas Energy Conservation Code* and equipped with an approved self-closing device. Installation of direct-vent water heaters within an enclosure is not required.

**M2005.2.1 Water heater access.** Access to water heaters that are located in an *attic* or underfloor crawl space is permitted to be through a closet located in a sleeping room or bathroom where *ventilation* of those spaces is in accordance with this code."

68. Paragraph G2407.6.2 (304.6.2), "One-Permanent-Opening Method," of Subsection G2407.6 (304.6), "Outdoor Combustion Air," of Section G2407 (304), "Combustion, Ventilation and Dilution Air," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is deleted.

69. Subsection G2407.10 (304.10), "Louvers and Grilles," of Section G2407 (304), "Combustion, Ventilation and Dilution Air," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2407.10 (304.10) Louvers and grilles.** The required size of openings for *combustion*, ventilation and *dilution air* shall be based on the net free area of each opening. Where the free area through a design of louver, grille or screen is known, it shall be used in calculating the size opening required to provide the free area specified. Where the design and free area of louvers and grilles are not known, it shall be assumed that wood louvers will have 25-percent free area and metal louvers and grilles will have 50 [~~75~~]-percent free area. Screens shall have a mesh size not smaller than ¼ inch (6.4 mm). Nonmotorized louvers and grilles shall be fixed in the open position. Motorized louvers shall be interlocked with the *appliance* so that they are proven to be in the full open position prior to *main burner* ignition and during *main burner* operation. Means shall be provided to prevent the *main burner* from igniting if the louvers fail to open during *burner* start-up and to shut down the *main burner* if the louvers close during operation."

70. Subsection G2407.11 (304.11), "Combustion Air Ducts," of Section G2407 (304), "Combustion, Ventilation and Dilution Air," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2407.11 (304.11) Combustion air ducts.** *Combustion air* ducts shall comply with all of the following:

1. Ducts shall be constructed of galvanized steel complying with Chapter 16 or a material having equivalent corrosion resistance, strength and rigidity.

   **Exception:** Within dwelling[s] units, unobstructed stud and joist spaces shall not be prohibited from conveying *combustion air*, provided that not more than one required fireblock is removed.

2. Ducts shall terminate in an unobstructed space allowing free movement of *combustion air* to the *appliances*.

3. Ducts shall serve a single enclosure.

4. Ducts shall not serve both upper and lower *combustion air* openings where both such openings are used. The separation between ducts serving upper and lower *combustion air* openings shall be maintained to the source of *combustion air*.

5. Ducts shall not be screened where terminating in an attic space.

6. Horizontal upper *combustion air* ducts shall not slope downward toward the source of *combustion air*.

7. The remaining space surrounding a *chimney* liner, gas vent, special gas vent or plastic *piping* installed within a masonry, metal or factory-built *chimney* shall not be used to supply *combustion air*.

   **Exception:** Direct-vent gas-fired *appliances* designed for installation in a solid fuel-burning *fire-place* where installed in accordance with the manufacturer's instructions.

8. *Combustion air* intake openings located on the exterior of a building shall have the lowest side of such openings located not less than 12 inches (305 mm) vertically from the adjoining finished ground level or the manufacturer's recommendations, whichever is more stringent."

71. Subsection G2408.2 (305.3), "Elevation of Ignition Source," of Section G2408 (305), "Installation," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2408.2 (305.3) Elevation of ignition source.** *Equipment* and *appliances* having an *ignition source* shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the floor [~~in *hazardous locations* and public garages,~~] private garages[~~, repair garages, motor fuel-dispensing facilities and parking garages~~]. For the purpose of this section, rooms or spaces that are not part of the *living space* of a *dwelling unit* and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

**Exceptions:**

1. Elevation of the *ignition source* is not required for *appliances* that are listed as flammable vapor ignition resistant.

2. Electric appliances or electric water heaters.

**G2408.2.1 (305.3.1) Installation in residential garages.** In residential garages where *appliances* are installed in a separate, enclosed space having access only from outside of the garage, such *appliances* shall be permitted to be installed at floor level, provided that the required *combustion air* is taken from the exterior of the garage."

72. Subsection G2408.3 (305.5), "Private Garages," of Section G2408 (305), "Installation," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is deleted.

73. Subsection G2412.5 (401.5), "Identification," of Section G2412 (401), "General," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2412.5 (401.5) Identification.** For other than black steel *pipe*, exposed *piping* shall be identified by a permanently attached yellow label marked "Gas" in black letters. The marking shall be spaced at intervals not exceeding 5 feet (1524 mm). The marking shall not be required on *pipe* located in the same room as the equipment [~~*appliance*~~] served. Both ends of each section of medium pressure corrugated stainless steel tubing (CSST) shall identify its operating gas pressure with an approved permanently attached tag. The tags are to be composed of aluminum or stainless steel and the following wording shall be stamped into the tag:

WARNING
½ to 5 psi gas pressure
Do Not Remove."

74. Subsection G2413.3 (402.3), "Sizing," of Section G2413 (402), "Pipe Sizing," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2413.3 (402.3) Sizing.** *Gas piping* shall be sized in accordance with one of the following:

1. *Pipe* sizing tables or sizing equations in accordance with Section G2413.4.
2. The sizing tables included in a listed *piping* system's manufacturer's installation instructions.
3. Other *approved* engineering methods.

**Exception:** Corrugated stainless steel tubing (CSST) shall be a minimum of ½ inch (18 EDH)."

75. Subsection G2415.12 (404.12), "Minimum Burial Depth," of Section G2415 (404), "Piping System Installation," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2415.12 (404.12) Minimum burial depth.** Underground *piping systems* shall be installed a minimum depth of 18 [~~12~~] inches (458 [~~305~~] mm), measured from top of pipe to existing [~~below~~] grade[~~, except as provided for in Section G2415.10.1.~~

~~**G2415.12.1 (404.12.1) Individual outside appliances.** Individual lines to outside lights, grills or other *appliances* shall be installed a minimum of 8 inches (203 mm) below finished grade, provided that such installation is *approved* and is installed in locations not susceptible to physical damage.~~]"

76. Subsection G2417.1 (406.1), "General," of Section G2417 (406), "Inspection, Testing and Purging," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2417.1 (406.1) General.** Prior to acceptance and initial operation, all *piping* installations shall be visually inspected and pressure tested to determine that the materials, design, fabrication and installation practices comply with the requirements of this code. The permit holder shall make the applicable tests prescribed in Sections 2417.1.1 through 2417.7.5 to determine compliance with the provisions of this code. The permit holder shall give reasonable advance notice to the *building official* when the piping system is ready for testing. The equipment, material, power and labor necessary for the inspections and test shall be furnished by the permit holder and the permit holder shall be responsible for determining that the work will withstand the test pressure prescribed in the following tests.

**G2417.1.1 (406.1.1) Inspections.** Inspection shall consist of visual examination, during or after manufacture, fabrication, assembly or *pressure tests* as appropriate.

**G2417.1.2 (406.1.2) Repairs and additions.** In the event repairs or additions are made after the *pressure test*, the affected *piping* shall be tested.

Minor repairs and additions are not required to be *pressure tested* provided that the work is inspected and connections are tested with a noncorrosive leak-detecting fluid or other *approved* leak-detecting methods.

**G2417.1.3 (406.1.3) New branches.** Where new branches are installed to new *appliances*, only the newly installed branches shall be required to be *pressure tested*. Connections between the new *piping* and the existing *piping* shall be tested with a noncorrosive leak-detecting fluid or other *approved* leak-detecting methods.

**G2417.1.4 (406.1.4) Section testing.** A *piping system* shall be permitted to be tested as a complete unit or in sections. Under no circumstances shall a *valve* in a line be used as a bulkhead between gas in one section of the *piping system* and test medium in an adjacent section, unless two *valves* are installed in series with a valved "tell-tale" located between these *valves*. A valve shall not be subjected to the test pressure unless it can be determined that the valve, including the valve closing mechanism, is designed to safely withstand the test pressure.

**G2417.1.5 (406.1.5) Regulators and valve assemblies.** *Regulator* and valve assemblies fabricated independently of the *piping system* in which they are to be installed shall be permitted to be tested with inert gas or air at the time of fabrication.

**G2417.1.6 (406.1.6) Pipe clearing.** Prior to testing, the interior of the pipe shall be cleared of all foreign material."

77. Subsection G2417.4 (406.4), "Test Pressure Measurement," of Section G2417 (406), "Inspection, Testing and Purging," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2417.4 (406.4) Test pressure measurement.** Test pressure shall be measured with [~~a manometer or with~~] a pressure-measuring device designed and calibrated to read, record, or indicate a pressure loss caused by leakage during the *pressure test* period. The source of pressure shall be isolated before the *pressure tests* are made. [~~Mechanical gauges used to measure test pressures shall have a range such that the highest end of the scale is not greater than five times the test pressure.~~]

**G2417.4.1 (406.4.1) Test pressure.** The test pressure to be used shall be not less than [~~one and one-half times the proposed maximum working pressure, but not less than~~] 3 psig (20 kPa gauge). For tests requiring a pressure of 3 psig, diaphragm gauges must utilize a dial with a minimum diameter of 3 ½ inches, a set hand, 1/10 pound incrementation and pressure range not to exceed 6 psi for tests requiring a pressure of 3 psig. For tests requiring a pressure of 10 psig, diaphragm gauges must utilize a dial with a minimum diameter of 3 ½ inches, a set hand, a minimum of 2/10 pound incrementation and a pressure range not to exceed 20 psi. For welded piping, and for piping carrying gas at pressures in excess of 14 inches water column pressure (3.48 kPa) (1/2 psi) and less than 200 inches of water column pressure (52.2 kPa) (7.5 psi), the test pressure must not be less than 10 pounds per square inch (69.6 kPa). For piping carrying gas at a pressure that exceeds 200 inches of water column (52.2 kPa) (7.5 psi), the test pressure must be not less than one and one-half times the proposed maximum working pressure. [~~, irrespective of design pressure. Where the test pressure exceeds 125 psig (862 kPa gauge), the test pressure shall not exceed a value that produces a hoop stress in the *piping* greater than 50 percent of the specified minimum yield strength of the *pipe*.~~]

Diaphragm gauges used for testing must display a current calibration and be in good working condition. The appropriate test must be applied to the diaphragm gauge used for testing.

**G2417.4.2 (406.4.2) Test duration.** The test duration shall be held for a length of time satisfactory to the *building official*, but in no case for [~~not~~] less than 15 [~~10~~] minutes. For welded piping, and for piping carrying gas at pressures in excess of 14 inches water column pressure (3.48 kPa), the test duration must be held for a length of time satisfactory to the *building official*, but in no case for less than 30 minutes."

78. Subsection G2420.1 (409.1), "General," of Section G2420 (409), "Gas Shutoff Valves," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended by adding a new Paragraph G2420.1.4, "Valves in CSST Installations," to read as follows:

"**G2420.1.4 Valves in CSST installations.** Shutoff valves installed with corrugated stainless steel (CSST) piping systems must be supported with an approved termination fitting, or equivalent support, suitable for the size of the valves, of adequate strength and quality, and located at intervals so as to prevent or damp out excessive vibration, but in no case greater than 12 inches from the center of the valve. Supports must be installed so as not to interfere with the free expansion and contraction of the system's piping, fittings and valves between anchors. All valves and supports must be designed and installed so they will not be disengaged by movement of the supporting piping."

79. Paragraph 2420.5.1 (409.5.1), "Located Within Same Room," of Subsection G2420.5 (409.5), "Appliance Shutoff Valve," of Section G2420 (409), "Gas Shutoff Valves," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2420.5.1 (409.5.1) Located within same room.** The shutoff *valve* shall be located in the same room as the *appliance*. The shutoff *valve* shall be within 6 feet (1829 mm) of the *appliance*, and shall be installed upstream of the union, connector or quick disconnect device it serves. Such shutoff *valves* shall be provided with access. *Appliance shutoff valves* located in the firebox of a *fireplace* shall be installed in accordance with the *appliance* manufacturer's instructions. A secondary valve shall be installed within 3 feet (914 mm) of the firebox if *appliance* shutoff is in the firebox."

80. Subsection G2421.1 (410.1), "Pressure Regulators," of Section G2421 (410), "Flow Controls," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2421.1 (410.1) Pressure regulators.** A line *pressure regulator* shall be installed where the *appliance* is designed to operate at a lower pressure than the supply pressure. *Line gas pressure regulators* shall be listed as complying with ANSI Z21.80 Access shall be provided to *pressure regulators*. *Pressure regulators* shall be protected from physical damage. *Regulators* installed on the exterior of the building shall be *approved* for outdoor installation. Access to regulators must comply with the requirements for access to appliances as specified in Section M1305.

**Exception:** A passageway or level service space is not required when the regulator is capable of being serviced and removed through the required attic opening."

81. Subparagraph G2422.1.2.3 (411.1.3.3), "Prohibited Locations and Penetrations," of Paragraph G2422.1.2 (411.1.3), "Connector Installation," of Subsection G2422.1 (411.1), "Connecting Appliances," of Section G2422 (411), "Appliance Connections," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2422.1.2.3 (411.1.3.3) Prohibited locations and penetrations.** Connectors shall not be concealed within, or extended through, walls, floors, partitions, ceilings or *appliance* housings unless such installation is allowed by the manufacturer's installation instructions.

[~~**Exceptions:**~~

~~1. Connectors constructed of materials allowed for *piping systems* in accordance with Section G2414 shall be permitted to pass through walls, floors, partitions and ceilings where installed in accordance with Section G2420.5.2 or G2420.5.3~~

~~2.~~] Rigid black steel *pipe* connectors shall be permitted to extend through openings in *appliance* housings.

[~~3. *Fireplace* inserts that are factory equipped with grommets, sleeves or other means of protection in accordance with the listing of the *appliance*.~~

~~4. Semirigid *tubing* and listed connectors shall be permitted to extend through an opening in an *appliance* housing, cabinet or casing where the tubing or connector is protected against damage.~~]"

82. Subsection G2445.2 (621.2), "Prohibited Use," of Section G2445 (621), "Unvented Room Heaters," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2445.2 (621.2) Prohibited use.** One or more *unvented room heaters* shall not be used as the sole source of comfort heating in a *dwelling unit*.

**Exception:** Existing *approved* unvented heaters may continue to be used in *dwelling units*, in accordance with the code provisions in effect when installed, when *approved* by the *building official* unless an unsafe condition is determined to exist as described in Section 203 of Chapter 52 of the *Dallas City Code*, "Administrative Procedures for the Construction Codes.""

83. Paragraph G2448.1.1 (624.1.1), "Installation Requirements," of Subsection G2448.1 (624.1), "General," of Section G2448 (624), "Water Heaters," of Chapter 24, "Fuel Gas," of the 2012 International Residential Code is amended to read as follows:

"**G2448.1.1 (624.1.1) Installation requirements.** The requirements for *water heaters* relative to access, sizing, *relief valves*, drain pans and scald protection shall be in accordance with this *code*."

84. Paragraph P2603.5.1, "Sewer Depth," of Subsection P2603.5, "Freezing," of Section P2603, "Structural and Piping Protection," of Chapter 26, "General Plumbing Requirements," of the 2012 International Residential Code is amended to read as follows:

"**P2603.5.1 Sewer depth.** [~~*Building sewers* that connect to private sewage disposal systems shall be a not less than **[NUMBER]** inches (mm) below finished *grade* at the point of septic tank connection.~~] *Building sewers* shall be not less than 12 [~~**[NUMBER]**~~] inches (304 mm) below *grade*."

85. Chapter 26, "General Plumbing Requirements," of the 2012 International Residential Code is amended by adding a new Section P2610, "Irrigation Systems," to read as follows:

"**SECTION P2610**
**IRRIGATION SYSTEMS**

**P2610.1 Irrigation systems.** All irrigation systems must comply with the provisions of Appendix J, "Standards for Design, Installing and Maintaining Landscape Irrigation Systems," of the *Dallas Plumbing Code*."

86. Chapter 26, "General Plumbing Requirements," of the 2012 International Residential Code is amended by adding a new Section P2611, "Water Reuse Systems," to read as follows:

"**SECTION P2611**
**WATER REUSE SYSTEMS**

**P2611.1 Water reuse systems.** All water reuse systems must comply with the provisions of Chapter 13, "Water Reuse Systems," of the *Dallas Plumbing Code*."

87. Subsection P2709.1, "Construction," of Section P2709, "Shower Receptors," of Chapter 27, "Plumbing Fixtures," of the 2012 International Residential Code is amended to read as follows:

"**P2709.1 Construction.** Where a shower receptor has a finished curb threshold, it shall be not less than 1 inch (25 mm) below the sides and back of the receptor. The curb shall be not less than 2 inches (51 mm) and not more than 9 inches (229 mm) deep when measured from the top of the curb to the top of the drain. The finished floor shall slope uniformly toward the drain not less than ¼ unit vertical in 12 units horizontal (2-percent slope) nor more than ½ unit vertical per 12 units horizontal (4-percent slope) and floor drains shall be flanged to provide a water-tight joint in the floor. Thresholds must be of sufficient width to accommodate a minimum 22-inch (559 mm) door.

**Exception:** Showers designed to comply with ICC/ANSI A117.1 or other designs as approved by the *building official.*"

88. Subsection P2718.1, "Waste Connection," of Section P2718, "Clothes Washing Machine," of Chapter 27, "Plumbing Fixtures," of the 2012 International Residential Code is amended to read as follows:

"**P2718.1 Waste connection.** The discharge from a clothes washing machine shall be through an *air break* into a standpipe. Standpipes must be individually trapped. Standpipes must extend not less than 18 inches (457 mm) but not greater than 42 inches (1066 mm) above the trap weir. Access must be provided to all standpipes and drains for rodding. A trap serving a standpipe cannot be installed below the floor."

89. Subsection P2801.6, "Water Heaters Installed in Garages," of Section P2801, "General," of Chapter 28, "Water Heaters," of the 2012 International Residential Code is amended to read as follows:

"**P2801.6 Water heaters installed in garages.** Water heaters having an *ignition source* shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the garage floor.

**Exceptions:**

1. Elevation of the ignition source is not required for water heaters [~~appliances~~] that are listed as flammable vapor ignition-resistant.

2. Electric water heaters."

90. Paragraph P2803.6.1, "Requirements for Discharge Pipe," of Subsection P2803.6, "Installation of Relief Valves," of Section P2803, "Relief Valves," of Chapter 28, "Water Heaters," of the 2012 International Residential Code is amended to read as follows:

"**P2803.6.1 Requirements for discharge pipe.** The discharge piping serving a pressure-relief valve, temperature-relief valve or combination valve shall:

1. Not be directly connected to the drainage system.

2. Discharge through an air gap [~~located in the same room as the water heater~~].

3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.

4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.

   **Exception:** Multiple relief devices may be installed to a single T&P discharge piping system when first approved by the *building official* and permitted by the manufacturer's installation instructions and installed pursuant to those instructions.

5. Discharge by indirect means [~~to the floor, to the pan serving the water heater or storage tank,~~] to an approved waste receptor or to the outdoors.

6. Discharge in a manner that does not cause personal injury or structural damage.

7. Discharge to a termination point that is readily observable by the building occupants.

8. Not be trapped.

9. Be installed to flow by gravity.

10. Not terminate less [~~more~~] than 6 inches (152 mm) or more than 24 inches (609 mm) above grade nor more than 6 inches (152 mm) above the [~~floor or~~] waste receptor.

11. Not have a threaded connection at the end of the piping.

12. Not have valves or tee fittings.

13. Be constructed of those materials listed in Section P2904.5 or materials tested, rated and *approved* for such use in accordance with ASME A112.4.1."

91. Paragraph P2902.5.3, "Lawn Irrigation Systems," of Subsection P2902.5, "Protection of Potable Water Connections," of Section P2902, "Protection of Potable Water Supply," of Chapter 29, "Water Supply and Distribution," of the 2012 International Residential Code is amended to read as follows:

"**P2902.5.3 Lawn irrigation systems.** The potable water supply to lawn irrigation systems shall be protected against backflow by an atmospheric vacuum breaker, a pressure vacuum breaker assembly, a double-check assembly or a reduced pressure principle backflow prevention assembly. Valves shall not be installed downstream from an atmospheric vacuum breaker. Where chemicals are introduced into the system, the potable water supply shall be protected against backflow by a reduced pressure principle backflow prevention assembly."

92. Subsection P2903.2, "Maximum Flow and Water Consumption," of Section P2903, "Water-Supply System," of Chapter 29, "Water Supply and Distribution," of the 2012 International Residential Code is amended to read as follows:

"**P2903.2 Maximum flow and water consumption.** Where the state-mandated maximum flow rate is more restrictive than those of this section, the state flow rate prevails. [~~The maximum water consumption flow rates and quantities for all plumbing fixtures and fixture fittings shall be in accordance with Table P2903.2.~~]"

93. Paragraph P2903.9.1, "Service Valve," of Subsection P2903.9, "Valves," of Section P2903, "Water-Supply System," of Chapter 29, "Water Supply and Distribution," of the 2012 International Residential Code is amended to read as follows:

"**P2903.9.1 Service valve.** Each *dwelling unit* shall be provided with an accessible main shutoff valve near the entrance of the water service. The valve shall be of a full-open type having nominal restriction to flow[~~, with provision for drainage such as a bleed orifice or installation of a separate drain valve. Additionally, the water service shall be valved at the curb or lot line in accordance with local requirements~~]."

94. Section P2904, "Dwelling Unit Fire Sprinkler Systems," of Chapter 29, "Water Supply and Distribution," of the 2012 International Residential Code is deleted and replaced with a new Section P2904, "Dwelling Unit Fire Sprinkler Systems," to read as follows:

"**SECTION P2904**
**DWELLING UNIT FIRE SPRINKLER SYSTEMS**

**P2904.1 General.** The design and installation of multipurpose residential fire sprinkler systems must be in accordance with the most current edition of NFPA 13D."

95. Paragraph P3005.2.6, "Base of Stacks," of Subsection P3005.2, "Drainage Pipe Cleanouts," of Section P3005, "Drainage System," of Chapter 30, "Sanitary Drainage," of the 2012 International Residential Code is deleted and replaced with a new Paragraph P3005.2.6, "Upper Terminal," to read as follows:

"**P3005.2.6 Upper terminal.** Each horizontal drain must be provided with a cleanout at its upper terminal.

**Exception:** Cleanouts may be omitted on a horizontal drain less than 5 feet (1524 mm) in length unless such line is serving sinks or urinals."

96. Section 3009, "Gray Water Recycling Systems," of Chapter 30, "Sanitary Drainage," of the 2012 International Residential Code is deleted.

97. Subsection P3105.1, "Distance of Trap from Vent," of Section P3105, "Fixture Vents," of Chapter 31, "Vents," of the 2012 International Residential Code is amended to read as follows:

"**P3105.1 Discharge of trap from vent.** Each fixture trap shall have a protecting vent located so that the slope and the *developed length* in the *fixture drain* from the trap weir to the vent fitting are within the requirements set forth in Table P3105.1.

[~~**Exception:** The *developed length* of the *fixture drain* from the trap weir to the vent fitting for self-siphoning fixtures, such as water closets, shall not be limited.~~]"

98. Section P3111, "Combination Waste and Vent System," of Chapter 31, "Vents," of the 2012 International Residential Code is deleted.

99. Subsection P3112.2, "Vent Connection," of Section P3112, "Island Fixture Venting," of Chapter 31, "Vents," of the 2012 International Residential Code is deleted and replaced with a new Subsection P3112.2, "Installation," to read as follows:

"**P3112.2 Installation.** Traps for island sinks and similar equipment must be roughed in above the floor and may be vented by extending the vent as high as possible, but not less than the drain board height and then returning it downward and connecting it to the horizontal sink drain immediately downstream from the vertical fixture drain. The return vent must be connected to the horizontal drain through a wye-branch fitting and must, in addition, be provided with a foot vent taken off the vertical fixture vent by means of a wye-branch immediately below the floor and extending to the nearest partition and then through the roof to the open air or may be connected to other vents at a point not less than 6 inches (152 mm) above the flood level rim of the fixtures served. Drainage fittings must be used on all parts of the vent below the floor level and minimum slope of ¼ inch per foot (20.9 mm/m) back to the drain must be maintained. The return bend used under the drain board must be a one piece fitting or an assembly of a 45 degree (0.79 radius), a 90 degree (1.6 radius) and a 45 degree (0.79 radius) elbow in the order named. Pipe sizing must be as elsewhere required in this code. The island sink drain, upstream of the return vent, must serve no other fixtures. An accessible cleanout must be installed in the vertical portion of the foot vent."

100. Chapter 34, "General Requirements," of the 2012 International Residential Code is deleted and replaced with a new Chapter 34, "General Requirements," to read as follows:

"**CHAPTER 34**
**GENERAL REQUIREMENTS**

**SECTION E3401**
**GENERAL**

**E3401.1 Applicability.** The provisions of the *Dallas Electrical Code* establish the general scope of the electrical system and equipment requirements of this code."

101. Chapter 35, "Electrical Definitions"; Chapter 36, "Services"; Chapter 37, "Branch and Feeder Requirements"; Chapter 38, "Wiring Methods"; Chapter 39, "Power and Lighting Distribution"; Chapter 40, "Devices and Luminaires"; Chapter 41, "Appliance Installation"; Chapter 42, "Swimming Pools"; and Chapter 43, "Class 2 Remote-Control, Signaling and Power-Limited Circuits," of the 2012 International Residential Code are deleted.

102. The AAMA standards of Chapter 44, "Referenced Standards," of the 2012 International Residential Code are amended to read as follows:

"**AAMA** American Architectural Manufacturers Association
1827 Walden Office Square, Suite 550
Schaumburg, IL 60173

| Standard reference number | Title | Referenced in code section number |
|---|---|---|
| AAMA/WDMA/CSA 101/I.S.2/A440—11 | North American Fenestration Standards/Specifications for Windows, Doors and Skylights | R308.6.9, R612.3, N1102.4.4 [~~N1102.4.3~~] |
| 450—09 | Voluntary Performance Rating Method for Mulled Fenestration Assemblies | R612.8 |
| 506—08 | Voluntary Specifications for Hurricane Impact and Cycle Testing of Fenestration Products | R612.6.1 |
| 711—07 | Voluntary Specifications for Self-adhering Flashing Used for Installation of Exterior Wall Fenestration Products | R703.8" |

103. The ASHRAE standards of Chapter 44, "Referenced Standards," of the 2012 International Residential Code are amended to read as follows:

"**ASHRAE** American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. 1791 Tullie Circle, NE Atlanta, GA 30329

| Standard reference number | Title | Referenced in code section number |
|---|---|---|
| ASHRAE—2009 | ASHRAE Handbook of Fundamentals | N1102.1.3 [~~N1102.1.4. Table N1105.5.2(1)~~], P3001.2, P3101.4, P3103.2 |
| [~~ASHRAE 193—2010~~ | ~~Method of Test for Determining Air Tightness of HVAC Equipment~~ | ~~N1103.2.2.1~~] |
| 34—2010 | Designation and Safety Classification of Refrigerants | M1411.1" |

104. The ASME standards of Chapter 44, "Referenced Standards," of the 2012 International Residential Code are amended by adding the following standard to read as follows:

| | | |
|---|---|---|
| "A112.19.14—2006 | Six-Liter Water Closets Equipped With a Dual Flushing Device | 325.5.2.1, 325.5.2.2" |

105. The ASTM standards of Chapter 44, "Referenced Standards," of the 2012 International Residential Code are amended by amending the following standards to read as follows:

| | | |
|---|---|---|
| "D 2846/ D 2846M— 09 | Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-water Distribution Systems | Table M2101.1[~~, P2904.9.1.2,~~] Table P2905.4, Table P2905.5, Table P2905.6" |
| "E 119—08a | Test Methods for Fire Tests of Building Construction and Materials | R302.2, R302.2.1, R302.2.2, R302.3, R302.4.1, 316.4" |
| "E 283—04 | Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure | |

Differences Across the Specimen . . . . . N1102.4.5 [~~N1102.4.4~~]"

106. The CSA standards of Chapter 44, "Referenced Standards," of the 2012 International Residential Code are amended by amending the following standard to read as follows:

"AAMA/WDMA/CSA 101/I.S.2/A440—11 North American Fenestration Standards/Specification for Windows, Doors and Unit Skylights . . . . . N1102.4.4 [~~N1102.4.3~~]"

107. The ICC standards of Chapter 44, "Referenced Standards," of the 2012 International Residential Code are amended by adding or amending the following standards to read as follows:

"ICC/ANSI A117.1—09 Accessible and Usable Buildings and Facilities . . . . . R321.3, P2709.1"

"ICC 700—12 National Green Building Standard . . . . . .325.2"

108. The NFPA standards of Chapter 44, "Referenced Standards," of the 2012 International Residential Code are amended by amending the following standards to read as follows:

"13D—10 Standard for the Installation of Sprinkler Systems in One- and Two-family Dwellings and Manufactured Homes . . . . . R313.1.1, R313.3.1, R313.2.1, P2904.1[~~, P2904.2, P2904.6.1~~]"

"13R—10 Standard for the Installation of Sprinkler Systems in Residential Occupancies Up to and Including Four Stories in Height. . . . . .R313.4.1"

"[~~70—11~~ ~~National Electrical Code . . . E3401.1, E3401.2, E4301.1, Table E4303.2, E4304.3, E4304.4~~]"

109. The UL standards of Chapter 44, "Referenced Standards," of the 2012 International Residential Code are amended by amending the following standard to read as follows:

"263—03 Standards for Fire Test of Building Construction and Materials— with revisions through October 2007 . Table R302.1(2), R302.2, R302.2.1, R302.2.2, R302.3, R302.4.1, R316.4"

110. Appendix E, "Manufactured Housing Used as Dwellings," of the 2012 International Residential Code is retitled as Appendix E, "Prefabricated Housing Used as Dwelling," and adopted with the following amendments:

A. Section AE101, "Scope," is amended to read as follows:

**"SECTION AE101**
**SCOPE**

**AE101.1 Industrialized housing.** All *industrialized housing* is subject to the Texas Industrialized Housing and Building Act, Texas Civil Statutes, Article 5221f-1 and Texas Civil Statutes, Article 1900.

**AE101.2 Manufactured housing.** All *manufactured housing* is subject to the Texas Manufactured Housing Standards Act, Texas Revised Civil Statutes, Article 5221f.

**AE101.3 Prefabricated housing** [~~**General**~~]**.** These provisions shall be applicable only to a *prefabricated* [~~*manufactured*~~] *home* used as a single or two-family *dwelling unit* [~~installed on privately owned (nonrental) lots~~] and shall apply to the following:

1. Construction, *alteration* and repair of any foundation system which is necessary to provide for the installation of an *industrialized housing* [~~*manufactured home*~~] unit.

2. Construction, installation, *addition*, *alteration*, repair or maintenance of the building service *equipment* which is necessary for connecting *prefabricated* [~~*manufactured*~~] *homes* to water, fuel, or power supplies and sewage systems.

[~~3. *Alterations, additions* or repairs to existing *manufactured homes*. The construction, *alternation*, moving, demolition, repair and use of accessory buildings and structures, and their building service *equipment*, shall comply with the requirements of the codes adopted by this *jurisdiction*.~~]

These provisions shall not be applicable to the design and construction of *manufactured homes* and shall not be deemed to authorize either modifications or *additions* to *manufactured homes* where otherwise prohibited.

**Exception:** In addition to these provisions, new and replacement *prefabricated* [~~*manufactured*~~] *homes* to be located in flood hazard areas as established in Table R301.2(1) of the *Dallas One- and Two-Family Dwelling* [~~*International Residential*~~] *Code* shall meet the applicable requirements of Section R322 of the *Dallas One- and Two-Family Dwelling* [~~*International Residential*~~] *Code* or the floodplain regulations contained in the *Dallas Development Code*.

**AE101.3.1 Alterations, additions or repairs to existing industrialized homes.** Alterations, additions or repairs to existing industrialized homes shall comply with the *Dallas One- and Two-Family Dwelling Code* and Section 103.1 of Chapter 52 of the *Dallas City Code.*

**AE101.3.2 Relocated industrialized housing.** Relocated *industrialized housing* is treated as moved buildings in accordance with Section 309 of the *Dallas Existing Building Code.*"

B. Section AE102, "Application to Existing Manufactured Homes and Building Service Equipment," is deleted.

C. Subsection AE201.1, "General," of Section AE201, "Definitions," is amended to read as follows:

"**AE201.1 General.** For the purpose of these provisions, certain abbreviations, terms, phrases, words and their derivatives shall be construed as defined or specified herein.

**ACCESSORY BUILDING.** Any building or structure, or portion thereto, located on the same property as a *prefabricated* [~~*manufactured*~~] *home* which does not qualify as a *prefabricated* [~~*manufactured*~~] *home* as defined herein.

**ALTERATION.** Any construction, other than ordinary repairs of the house or building, to an existing *industrialized house* or building after affixing of the *decal* by the *manufacturer. Industrialized housing* or buildings that have not been maintained are considered altered.

**ALTERATION DECAL.** The approved form of certification issued by the department to an *industrialized builder* to be permanently affixed to a *module* indicating that *alterations* to the industrialized building *module* have been constructed to meet or exceed the state model code requirements.

**BUILDING SERVICE EQUIPMENT.** Refers to the plumbing, mechanical and electrical *equipment*, including piping, wiring, fixtures and other accessories which provide sanitation, lighting, heating, ventilation, cooling, fire protection and facilities essential for the habitable occupancy of a *prefabricated* [~~*manufactured*~~] *home* or accessory building or structure for its designated use and occupancy.

**BUILDING SYSTEM.** The design or method of assembly of *modules* or *modular components* represented in the plans, specifications and other documentation which may include structural, electrical, mechanical, plumbing, fire protection and other systems affecting health and safety.

**CLOSED CONSTRUCTION.** That condition where any *industrialized housing* or building, *modular component* or portion thereof is manufactured in such a manner that all portions cannot be readily inspected at the site without disassembly or destruction thereof.

**COMPONENT.** A sub-assembly, subsystem or combination of elements for use as a part of a building system or part of a *modular component* that is not structurally independent, but may be part of structural, plumbing, mechanical, electrical, fire protection or other systems affecting life safety.

**DECAL.** The approved form of certification issued by the department to the *manufacturer* to be permanently affixed to the *module* indicating that it has been constructed to meet or exceed the code requirements and in compliance with these sections.

**DEPARTMENT.** The Texas Department of Licensing and Regulation.

**DESIGN PACKAGE.** The aggregate of all plans, designs, specifications and documentation required by these sections to be submitted to the *design review agency*, or required by the *design review agency* for compliance review, including the compliance control manual and the *on-site construction* documentation. Unique or site specific foundation drawings and special *on-site construction* details prepared for specific projects are not a part of the design package except as approved by the Texas Industrialized Housing and Building Act.

**DESIGN REVIEW AGENCY.** An approved organization, private or public, determined by the *Texas Industrialized Building Code Council* to be qualified by reason of facilities, personnel, experience and demonstrated reliability to review designs, plans, specifications and building systems documentation, and to certify compliance to these sections evidenced by affixing the *Texas Industrialized Building Code Council's* stamp.

**EXECUTIVE DIRECTOR.** Executive director of the *department.*

**INDUSTRIALIZED BUILDER.** A person who is engaged in the assembly, connection and *on-site construction* and erection of *modules* or *modular components* at the building site or who is engaged in the purchase of *industrialized housing* or buildings or of *modules* or *modular components* from a *manufacturer* for sale or lease to the public; a subcontractor of an industrialized builder is not a builder for purposes of these sections.

**INDUSTRIALIZED HOUSING.** A residential *structure* that is designed for the use and occupancy of one or more families, that is constructed in one or more *modules* or constructed using one or more *modular components* built at a location other than the permanent residential site, and that is designed to be used as a permanent residential *structure* when the *modules* or *modular components* are transported to the permanent residential site and are erected or installed on a *permanent foundation system.* The term includes the plumbing, heating, air-conditioning and electrical systems. The term does not include any residential *structure* that is in excess of three stories or 49 feet in height as measured from the finished grade elevation at the building entrance to the peak of the roof. The term does not mean nor apply to (1) housing constructed of sectional or panelized systems not utilizing *modular components* or (2) any ready-built home which is constructed so that the entire living area is contained in a single unit or section at a temporary location for the purpose of selling it and moving it to another location. In addition, the term does not include a "*manufactured home*" or a "*mobile home.*"

**INSIGNIA.** The approved form of certification issued by the department to the *manufacturer* to be permanently affixed to the *modular component* indicating that it has been constructed to meet or exceed the code requirements and in compliance with the sections in this chapter.

**MANUFACTURED HOME.** A structure transportable in one or more sections which, in the traveling mode, is 8 body feet (2438 body mm) or more in width or 40 body feet (12,192 body mm) or more in length or, when erected on site, is 320 or more square feet (30 $m^2$), and which is built on a permanent chassis and designed to be used as a *dwelling* with or without a permanent foundation when connected to the required utilities, and includes plumbing, heating, air-conditioning and electrical systems contained therein; except that such term shall include any structure which meets all the requirements of this paragraph, except the size requirements and with respect to which the manufacturer voluntarily files a certification required by the Secretary of the U.S. Department of Housing and Urban Development (HUD) and complies with the standards established under this title.

For mobile homes built prior to June 15, 1976, a *label* certifying compliance with the *Standard for Mobile Homes*, NFPA 501, ANSI 119.1, in effect at the time of manufacture, is required. For the purpose of these provisions, a mobile home shall be considered a *manufactured home*.

**MANUFACTURED HOME INSTALLATION.** Construction which is required for the installation of a *manufactured home*, including the construction of the foundation system, required structural connections thereto and the installation of on-site water, gas, electrical and sewer systems and connections thereto which are necessary for the normal operation of the *manufactured home*.

**MANUFACTURED HOME STANDARDS.** The *Manufactured Home* Construction and Safety Standards as promulgated by the U.S. Department of Housing and Urban Development (HUD) or the Texas Department of Housing and Community Affairs.

**MANUFACTURER.** A person who constructs or assembles *modules* or *modular components* at a *manufacturing facility* which are offered for sale or lease, sold or leased, or otherwise used.

**MANUFACTURING FACILITY.** The place other than the building site, at which machinery, equipment and other capital goods are assembled and operated for the purpose of making, fabricating, constructing, forming or assembly of *industrialized housing*, buildings, *modules* or *modular components*.

**MOBILE HOME.** A factory-assembled *structure* or *structures* equipped with the necessary service connections and made to be readily movable as a unit or units on its (their) own running gear and designed to be used as a *dwelling unit*(s) without a permanent foundation.

**MODEL.** A specific design of an *industrialized house*, building or *modular component* which is based on size, room arrangement, method of construction, location, arrangement or size of plumbing, mechanical or electrical equipment and systems therein in accordance with an approved *design package*.

**MODULAR COMPONENT.** A structural portion of any *dwelling* that is constructed at a location other than the homesite in such a manner that its construction cannot be adequately inspected for code compliance at a homesite without damage or without removal of a part thereof and reconstruction.

**MODULE.** A three dimensional section of *industrialized housing*, designed and approved to be transported as a single section independent of other sections, to a site for *on-site construction* with or without other modules *or modular components*.

**ON-SITE CONSTRUCTION.** Preparation of the site, foundation construction, assembly and connection of the *modules* or *modular components*, affixing the *structure* to the permanent foundation, connecting the *structures* together, completing all site-related construction in accordance with designs, plans, specifications and on-site construction documentation.

**OPEN CONSTRUCTION.** That condition where any house, building or portion thereof is constructed in such a manner that all parts or processes of manufacture can be readily inspected at the building site without disassembly, damage to or destruction thereof.

**PERMANENT FOUNDATION SYSTEM.** A foundation system for *industrialized housing* designed to meet the applicable requirements of the *Dallas Building Code* or the *Dallas One- and Two-Family Dwelling Code*.

**PERSON.** An individual, partnership, company, corporation, association or any other legal entity, however organized.

**PREFABRICATED HOUSING.** Includes both *industrialized housing* and *manufactured homes*.

[~~**PRIVATELY OWNED (NONRENTAL) LOT.** A parcel of real estate outside of a *manufactured home* rental community (park) where the land the *manufactured home* to be installed are held in common ownership.~~]

**STRUCTURE.** An *industrialized house* which results from the complete assemblage of the *modules*, *modular components* or components designed to be used together to form a completed unit.

**TEXAS INDUSTRIALIZED BUILDING CODE COUNCIL.** The state-appointed council having as its mission the assurance that the designs, plans and specifications of *industrialized housing* and buildings meet the mandatory state codes."

D. Section AE301, "Permits," is deleted and replaced with a new Section AE301, "Permits," to read as follows:

"SECTION AE301
PERMITS

**AE301.1 Permit requirements.** This section is governed by Chapter 52 of the *Dallas City Code*."

E. Section AE302, "Application for Permit," is deleted and replaced with a new Section AE302, "Application for Permit," to read as follows:

"SECTION AE302
APPLICATION FOR PERMIT

**AE302.1 Permit application requirements and procedures.** This section is governed by Chapter 52 of the *Dallas City Code*."

F. Section AE303, "Permits Issuance," is deleted and replaced with a new Section AE303, "Permits Issuance," to read as follows:

"SECTION AE303
PERMITS ISSUANCE

**AE303.1 Issuance, expiration, suspension, revocation and validity of permits.** Except as otherwise provided in Section AE303.2, this section is governed by Chapter 52 of the *Dallas City Code*.

**AE303.2 Other requirements and procedures for permit issuance.**

**AE303.2.1 Uniform application.** The administration and enforcement of permit requirements shall be reasonably and uniformly applied without distinction to whether the housing or building for which the permit is issued is prefabricated or constructed on site.

**AE303.2.2 Compliance with state-adopted codes and regulations**. Permits shall be issued based on compliance with state-adopted codes and regulations relating to the construction and design of *industrialized housing* and not on local construction and design requirements for structures.

**AE303.2.3 Design package and unique on-site construction documentation.** Before issuing a permit for *industrialized housing*, the *building official* shall review the *design package* and any unique *on-site construction* documentation that has been stamped by a *design review agency* as being in compliance with all state-adopted codes and regulations.

**AE303.2.4 Disputes over whether a design package and/or unique on-site documentation meets state code requirements.** Questions concerning the code compliance of an approved *design package* must be raised prior to the issuance of a building permit. The *building official* shall forward in writing to the *executive director* any instances where it is found that the approved *design package* does not meet the mandatory building codes adopted in this chapter. The documentation must specify the code sections and the reasons why the design package fails to meet the mandatory building codes.

**AE303.2.4.1 In compliance.** If the approved *design package* is found to be in compliance, the *executive director* shall notify all concerned parties and the *building official* shall issue a building permit.

**AE303.2.4.2 Not in compliance.** If the approved *design package* is not in compliance, the *executive director* shall notify all concerned parties and the *industrialized builder* or *manufacturer* shall bring the building into compliance with the mandatory building codes.

**AE303.2.4.3 Disagreement.** If the *building official*, *industrialized builder*, or *manufacturer* disagrees with the *executive director*, the *Texas Industrialized Building Code Council* shall determine at its next scheduled meeting whether the approved *design package* complies with the mandatory building codes. The decision of the council is binding on all parties.

**AE303.2.5 Dispute over whether on-site construction complies with approved design package and/or unique on-site construction documentation.** If a dispute or difference of opinion arises between the *industrialized builder* and the *building official* as to whether the *on-site construction* meets or exceeds the approved *design package* or unique *on-site construction* documentation, the dispute or difference of opinion must be resolved by the commissioner. If the commissioner is unable to resolve the dispute, then he will forward it to the *Texas Industrialized Building Code Council* for resolution.

**AE303.2.6 Correction of deviations.** If an inspector finds a *structure*, or any part thereof, at the building site to be in violation of the approved *design package* and/or the unique on-site plans and specifications, the inspector shall immediately post a deviation notice and notify the *industrialized builder*. The *industrialized builder* is responsible for assuring that all deviations are corrected and inspected prior to occupation of the building.

**AE303.2.7 Unique on-site details.** If the typical foundation drawing in the *on-site construction* documentation is not suitable for a specific site, or if the *structure* is only partially constructed of *modular components*, or if the *industrialized builder* will add unique on-site details, a registered Texas professional engineer (or architect for one and two-family dwellings or buildings having one story and total floor area or 5,000 square feet or less) shall design and stamp the unique foundation drawings or on-site details. Review by a *design review* agency is not needed or required."

G. Section AE304, "Fees," is deleted and replaced with a new Section AE304, "Fees," to read as follows:

"**SECTION AE304**
**FEES**

**AE304.1 Permit fees.** This section is governed by Chapter 52 of the *Dallas City Code*."

H. Section AE305, "Inspections," is deleted and replaced with a new Section AE305, "Inspections," to read as follows:

"**SECTION AE305**
**INSPECTIONS**

**AE305.1 General.** This section is governed by Chapter 52 of the *Dallas City Code*."

I. Subsection AE306.1, "General," of Section AE306, "Special Inspections," is amended to read as follows:

"**AE306.1 General.** This section is governed by Section 1704 of the *Dallas Building Code*. In addition to the inspections required by Section 1704 of the *Dallas Building Code* [~~AE305~~], the *building official* may require the owner to employ a special inspector during construction of specific types of work as described in this code."

J. Subsection AE307.1, "General," of Section AE307, "Utility Service," is amended to read as follows:

"**AE307.1 General.** Utility service shall not be provided to any building service *equipment* which is regulated by these provisions or other applicable codes, and for which a prefabricated home [~~*manufactured home*~~] installation *permit* is required by these provisions, until *approved* by the *building official*."

K. Subsection AE401.1, "Manufactured Homes," of Section AE401, "Occupancy Classification," is retitled as Subsection AE401.1, "Industrialized Homes," and amended to read as follows:

"**AE401.1 Industrialized** [~~**Manufactured**~~] **homes.** An industrialized home [~~*manufactured home*~~] shall be limited in use to a residential use or its living facility components, including sleeping, eating, cooking and sanitation and accessory use [~~single *dwelling unit*~~].

**Exception:** Industrialized homes converted and in compliance with Chapters 51, 51A, and 53, as well as other applicable ordinances of the *Dallas City Code*."

L. Subsection AE402.1, "General," of Section AE402, "Location on Property," is amended to read as follows:

"**AE402.1 General.** Prefabricated homes [~~*Manufactured homes*~~] and accessory buildings shall be located on the property in accordance with applicable codes and ordinances of the *jurisdiction*."

M. Section AE501, "Design," is amended to read as follows:

"**SECTION AE501**
**DESIGN**

**AE501.1 General.** An industrialized home [~~*manufactured home*~~] shall be installed on a foundation system which is designed and constructed to sustain within the stress limitations specified in this code and all loads specified in this code. *Industrialized housing* may not be installed on a temporary foundation system.

[~~**Exception:** When specifically authorized by the *building official*, foundation and anchorage systems which are constructed in accordance with the methods specified in Section AE600 of these provisions, or in the HUD, *Permanent Foundations for Manufactured Housing*, 1984 Edition, Draft, shall be deemed to meet the requirements of this appendix.~~]

**AE501.2 Manufacturer's installation instructions.** The installation instructions as provided by the manufacturer of the industrialized home [~~*manufactured home*~~] shall be used to determine permissible points of support for vertical loads and points of attachment for anchorage systems used to resist horizontal and uplift forces.

**AE501.3 Rationality.** Any system or method of construction to be used shall submit to a rational analysis in accordance with well-established principles of mechanics."

N. Section AE502, "Foundation Systems," is amended to read as follows:

"**SECTION AE502**
**FOUNDATION SYSTEMS**

**AE502.1 General.** Foundation systems designed and constructed in accordance with this section are [~~may be considered~~] a permanent installation.

**AE502.2 Soil classification.** Soil [~~The~~] classification shall be in accordance with Chapter 4 of this code [~~the soil at each *manufactured home* site shall be determined when required by the *building official*. The *building official* may require that the determination be made by an engineer or architect licensed by the state to conduct soil investigations.~~]

~~The classification shall be based on observation and any necessary tests of the materials disclosed by borings or excavations made in appropriate locations. Additional studies may be necessary to evaluate soil strength, the effect of moisture variation on soil bearing capacity, compressibility and expansiveness.~~

~~When required by the *building official*, the soil classification design bearing capacity and lateral pressure shall be shown on the plans~~].

**AE502.3 Footings and foundations.** Footings and foundations[~~, unless otherwise specifically provided,~~] shall be in accordance with Chapter 4 of [~~constructed of materials specified by~~] this code [~~for the intended use and in all cases shall extend below the frost line. Footings of concrete and masonry shall be of solid material. Foundations supporting untreated wood shall extend at least 8 inches (203 mm) above the adjacent finish *grade*. Footings shall have a minimum depth below finished *grade* of 12 inches (305 mm) unless a greater depth is recommended by a foundation investigation.~~

~~Piers and bearing walls shall be supported on masonry or concrete foundations or piles, or other *approved* foundation systems which shall be of sufficient capacity to support all loads~~].

**AE502.4 Foundation design.** Foundation [~~When a~~] design [~~is provided, the foundation system~~] shall be [~~designed~~] in accordance with Chapter 4 of [~~the applicable structural provisions of this code and shall be designed to minimize differential settlement. Where a design is not provided, the minimum foundation requirements shall be as set forth in~~] this code.

**AE502.5 Drainage.** Drainage [~~Provisions~~] shall be in accordance with Chapter 4 of this code [~~made for the control and drainage of surface water away from the *manufactured home*~~].

**AE502.6 Under-floor clearances—ventilation and access.** A minimum clearance of 12 inches (305 mm) shall be maintained beneath the lowest member of the floor support framing system. Clearances from the bottom of wood floor joists or perimeter joists shall be as specified in this code.

Under-floor spaces shall be ventilated with openings as specified in this code. If combustion air for one or more heat-producing *appliance* is taken from within the under-floor spaces, ventilation shall be adequate for proper *appliance* operation.

Under-floor access openings shall be provided. Such openings shall be not less than 18 inches (457 mm) in any dimension and not less than 3 square feet (0.279 $m^2$) in area, and shall be located so that any water supply and sewer drain connections located under the industrialized home [~~*manufactured home*~~] are accessible."

O. Subsection AE503.1, "Skirting and Permanent Perimeter Enclosures," of Section AE503, "Skirting and Perimeter Enclosures," is amended to read as follows:

"**AE503.1 Skirting and permanent perimeter enclosures.** [~~Skirting and permanent perimeter enclosures shall be installed only where specifically required by other laws or ordinances.~~] Skirting, when installed, shall be of material suitable for exterior exposure and contact with the ground. Permanent perimeter enclosures shall be constructed of materials as required by this code for regular foundation construction.

Skirting shall be installed in accordance with the skirting manufacturer's installation instructions. Skirting shall be adequately secured to ensure stability, minimize vibration and susceptibility to wind damage, and compensate for possible frost heave."

P. Subsection AE504.1, "General," of Section AE504, "Structural Additions," is amended to read as follows:

"**AE504.1 General.** Accessory buildings shall not be structurally supported by or attached to a prefabricated home [~~*manufactured home*~~] unless engineering calculations are submitted to substantiate any proposed structural connection.

**Exception:** The *building official* may waive the submission of engineering calculations if it is found that the nature of the work applied for is such that engineering calculations are not necessary to show conformance to these provisions."

Q. Subsection AE505.1, "General," of Section AE505, "Building Service Equipment," is amended to read as follows:

"**AE505.1 General.** The installation, *alteration*, repair, replacement, *addition* to or maintenance of the building service *equipment* within the industrialized home [~~*manufactured home*~~] shall conform to regulations set forth in this code [~~the *Manufactured Home* Standards~~]. Such work which is located outside the prefabricated home [~~*manufactured home*~~] shall comply with this code and other [~~the~~] applicable city ordinances [~~codes adopted by this *jurisdiction*~~]."

R. Subsection AE507.1, "General," of Section AE507, "Occupancy, Fire Safety and Energy Conservation Standards," is amended to read as follows:

"**AE507.1 General.** *Alterations* made to an industrialized home [~~*manufactured home*~~] subsequent to its initial installation shall conform to the occupancy, fire safety and energy conservation requirements set forth in this code [~~the *Manufactured Home* Standards~~]."

S. Section AE600, "Special Requirements for Foundation Systems," is deleted and replaced with a new Section AE600, "Special Requirements for Alternate Foundation Systems," to read as follows:

"SECTION AE600
SPECIAL REQUIREMENTS FOR ALTERNATE FOUNDATION SYSTEMS

**AE600.1 General.** The following conditions apply to all foundations in accordance with this section:

1. All plans for approved foundation designs in accordance with this section must bear the seal and signature of an engineer or architect licensed to practice in the State of Texas.

2. All required forces of Section R301 must be included in the approved design.

3. Perimeter load bearing partitions must rest on a grade beam or piers unless the proposed cantilevered perimeter wall proposal is explicitly specified in the approved design.

4. Positive anchorage must exist between the building *structure* and foundation and between the foundation and footing unless an alternate method is provided and explicitly specified in the approved design.

5. If ties are used (Section AE605), additional items are required as follows:

   5.1. A special inspector (licensed structural engineer hired by the owner) shall inspect the foundation, part of which will include the determination as to whether the metal ties and its connections are properly installed.

   5.2. Drawings and specifications are required showing each connection component indicating its design strength with respect to tension, compression, shear, torsion, etc.

   5.3. Any proposed foundation system in which periodic tension adjustment is necessary is not acceptable."

T. Subsection AE602.1, "General," of Section AE602, "Pier Construction," is amended to read as follows:

"**AE602.1 General.** Piers shall be designed and constructed to distribute loads evenly. Multiple-section homes may have concentrated roof loads which will require special consideration. Load-bearing piers may be constructed utilizing one of the following methods listed. Such piers shall be considered to resist only vertical forces acting in a downward direction. They shall not be considered as providing any resistance to horizontal loads induced by wind or earthquake forces.

1. A prefabricated load-bearing device that is listed and *labeled* for the intended use.

2. Mortar shall comply with ASTM C 270, Type M, S or N; this may consist of one part Portland cement, one-half part hydrated lime and four parts sand by volume. Lime shall not be used with plastic or waterproof cement.

3. A cast-in-place concrete pier with concrete having specified compressive strength at 28 days of 2,500 pounds per square inch (17,225 kPa).

Alternative materials and methods of construction may be used for piers which have been designed by an engineer or architect licensed by the S[s]tate of Texas [~~to practice as such~~].

Caps and leveling spacers may be used for leveling of the industrialized home [~~*manufactured home*~~]. Spacing of piers shall be as specified in the manufacturer's installation instructions, if available, or as specified in the design by an engineer or architect licensed by the State of Texas [~~*approved* designer~~]."

U. Subsection AE604.1, "Ground Anchors," of Section AE604, "Anchorage Installations," is retitled as Subsection AE604.1, "Anchors," and amended to read as follows:

"**AE604.1** [~~**Ground**~~] **A**[**a**]**nchors.** Ground anchors are not approved for industrialized home installations. Anchors shall be designed and installed to transfer the anchoring loads to the footings [~~ground~~]. The load-carrying portion of the [~~ground~~] anchors shall be installed to the full depth called for in [~~by~~] the design by an engineer licensed by the State of Texas [~~manufacturer's installation instructions and shall extend below the established frost line into undisturbed soil~~].

Manufactured [~~ground~~] anchors shall be listed and installed in accordance with the terms of their listing and the anchor manufacturer's instructions, and shall include the means of attachment of ties meeting the requirements of Section AE605. [~~Ground~~] A[a]nchor manufacturer's installation instructions shall include the amount of preload required and load capacity [~~in various types of soil~~]. These instructions shall include tensioning adjustments which may be needed to prevent damage to the industrialized home [~~*manufactured home*, particularly damage that can be caused by frost heave~~]. Each [~~ground~~] anchor shall be marked with the manufacturer's identification and listed model identification number which shall be visible after installation. [~~Instructions shall accompany each listed ground anchor specifying the types of soil for which the anchor is suitable under the requirements of this section.~~]

Each *approved* [~~ground~~] anchor, when installed, shall be capable of resisting an allowable working load at least equal to 3,150 pounds (14 kN) in the direction of the tie plus a 50-percent overload [4,725 pounds (21 kN) total] without failure. Failure shall be considered to have occurred when the anchor moves more than 2 inches (51 mm) at a load of 4,725 pounds (21 kN) in the direction of the tie installation. [~~Those ground anchors which are designed to be installed so that loads on the anchor are other than direct withdrawal shall be designed and installed to resist an applied design load of 3,150 pounds (14 kN) at 40 to 50 degrees from vertical or within the angle limitations specified by the home manufacturer without displacing the tie end of the anchor more than 4 inches (102 mm) horizontally.~~] Anchors designed for the connection of multiple ties shall be capable of resisting the combined working load and overload consistent with the intent expressed herein.

[~~When it is proposed to use ground anchors and the *building official* has reason to believe that the soil characteristics at a given site are such as to render the use of ground anchors advisable, or when there is doubt regarding the ability of the ground anchors to obtain their listed capacity, the *building official* may require that a representative field installation be made at the site in question and tested to demonstrate ground anchor capacity. The *building official* shall approve the test procedures.~~]"

V. Subsection AE604.2, "Anchoring Equipment," of Section AE604, "Anchorage Installations," is amended to read as follows:

"**AE604.2 Anchoring equipment.** Anchoring *equipment*[~~, when installed as a permanent installation,~~] shall be capable of resisting all loads as specified within these provisions. When the stabilizing system is designed by an engineer or architect licensed by the S[s]tate of Texas [~~to practice as such~~], alternative designs may be used, providing the anchoring *equipment* to be used is capable of withstanding a load equal to 1.5 times the calculated load. All anchoring *equipment* shall be listed and *labeled* as being capable of meeting the requirements of these provisions. Anchors as specified in this code may be attached to the main frame of the industrialized home [~~*manufactured home*~~] by an *approved* 3/16-inch-thick (4.76 mm) slotted steel plate anchoring device. Other anchoring devices or methods meeting the requirements of these provisions may be permitted when *approved* by the *building official*.

Anchoring systems shall be so installed as to be permanent. Anchoring *equipment* shall be so designed to prevent self-disconnection with no hook ends used."

W. Subsection AE605.1, "General," of Section AE605, "Ties, Materials and Installation," is amended to read as follows:

"**AE605.1 General.** Steel strapping, cable, chain or other *approved* materials shall be used for ties. All ties shall be fastened to [~~ground~~] anchors and drawn tight with turnbuckles or other adjustable tensioning devices or devices supplied with the [~~ground~~] anchor. Tie materials shall be capable of resisting an allowable working load of 3,150 pounds (14 kN) with no more than 2 percent elongation and shall withstand a 50-percent overload [4,750 pounds (21 kN)]. Ties shall comply with the weathering requirements of Section AE604.3. Ties shall connect the [~~ground~~] anchor and the main structural frame. Ties shall not connect to steel outrigger beams which fasten to and intersect the main structural frame unless specifically stated in the manufacturer's installation instructions. Connection of cable ties to main frame members shall be 5/8-inch (15.9 mm) closed-eye bolts affixed to the frame member in an *approved* manner. Cable ends shall be secured with at least two U-bolt cable clamps with the "U" portion of the clamp installed on the short (dead) end of the cable to ensure strength equal to that required by this section.

Wood floor support systems shall be fixed to perimeter foundation walls in accordance with provisions of this code. The minimum number of ties required per side shall be sufficient to resist the wind load stated in this code. Ties shall be as evenly spaced as practicable along the length of the industrialized home [~~*manufactured home*~~] with the distance from each end of the home and the tie nearest that end not exceeding 8 feet (2438 mm). When continuous straps are provided as vertical ties, such ties shall be positioned at rafters and studs. Where a vertical tie and diagonal tie are located at the same place, both ties may be connected to a single anchor, provided the anchor used is capable of carrying both loads. Multiple-section industrialized homes [~~*manufactured homes*~~] require diagonal ties only. Diagonal ties shall be installed on the exterior main frame and slope to the exterior at an angle of 40 to 50 degrees from the vertical or within the angle limitations specified by the home manufacturer. Vertical ties which are not continuous over the top of the industrialized home [~~*manufactured home*~~] shall be attached to the main frame."

X. Section AE606, "Referenced Standards," is amended to read as follows:

**"SECTION AE606**
**REFERENCED STANDARDS**

ASTM C 270—04 Specification for Mortar for Unit Masonry . . . . . .AE602
[~~NFPA 501—03 Standard on Manufactured Housing . . . . . AE201~~]"

111. Appendix G, "Swimming Pools, Spas and Hot Tubs," of the 2012 International Residential Code is adopted with the following amendment:

A. Section AG101, "General," is amended to read as follows:

**"SECTION AG101**
**GENERAL**

**AG101.1 General.** The provisions of this appendix and the provisions of Chapter 43A, "Swimming Pools," of the *Dallas City Code* shall control the design and construction of swimming pools, spas and hot tubs installed in or on the *lot* of a one- or two-family dwelling. To the extent of any conflict between Chapter 57, "*Dallas One- And Two-Family Dwelling Code*," of the *Dallas City Code*, hereafter referred to as "this code"; and other city ordinances, this code shall prevail.

**AG101.2 Pools in flood hazard areas.** Pools that are located in flood hazard areas established by Table R301.2(1), including above-ground pools, on-ground pools and in-ground pools that involve placement of fill, shall comply with Section AG101.2.1 or AG101.2.2.

**Exception:** Pools located in riverine flood hazard areas which are outside of designated floodways.

**AG101.2.1 Pools located in designated floodways.** Where pools are located in designated floodways, documentation shall be submitted to the *building official* which demonstrates that the construction of the pool will not increase the design flood elevation at any point within the *jurisdiction*.

**Exception:** Projects complying with Section 51A-5.104 of the *Dallas Development Code* are deemed compliant with this section.

**AG101.2.2 Pools located where floodways have not been designated.** Where pools are located where design flood elevations are specified but floodways have not been designated, the applicant shall provide a floodway analysis that demonstrates that the proposed pool will not increase the design flood elevation more than 1 foot (305 mm) at any point within the *jurisdiction*.

**Exception:** Projects complying with Section 51A-5.104 of the *Dallas Development Code* are deemed compliant with this section."

112. Appendix H, "Patio Covers," of the 2012 International Residential Code is adopted.

113. Appendix I, "Private Sewage Disposal," of the 2012 International Residential Code is adopted and amended to read as follows:

"**APPENDIX I**
**PRIVATE SEWAGE DISPOSAL**

**SECTION AI101**
**GENERAL**

**AI101.1 Scope.** Private sewage disposal systems shall conform to Appendix I of the *Dallas Plumbing* [~~*International Private Sewage Disposal*~~] *Code*."

114. Appendix J, "Existing Buildings and Structures," of the 2012 International Residential Code is adopted with the following amendments:

A. Subsection AJ102.5, "Flood Hazard Areas," of Section AJ102, "Compliance," is amended to read as follows:

"**AJ102.5 Flood hazard areas.** Work performed in existing buildings located in a flood hazard area as established by Table R301.2(1) shall be subject to the provisions of Section 51A-5.104 of the *Dallas Development Code* [~~R105.3.1.1~~]."

B. Subsection AJ102.7, "Other Alternatives," of Section AJ102, "Compliance," is deleted.

C. Subsection AJ103.1, "General," of Section AJ103, "Preliminary Meeting," is amended to read as follows:

"**AJ103.1 General.** If a building *permit* is required at the request of the prospective *permit* applicant, the *building official* or his designee shall meet with the prospective applicant to discuss plans for any proposed work under these provisions prior to the application for the *permit.* The purpose of this preliminary meeting is for the *building official* to gain an understanding of the prospective applicant's intentions for the proposed work, and to determine, together with the prospective applicant, the specific applicability of these provisions.

**Exception:** The *building official* may substitute a project information sheet indicating the categories of proposed work in lieu of a meeting."

D. Subsection AJ201.1, "General," of Section AJ201, "Definitions," is amended to read as follows:

"**AJ201.1 General.** For the purposes of this appendix, the terms used are defined as follows.

**ALTERATION.** The rearrangement or reconfiguration of any space by the construction of walls or partitions or by a change in ceiling height; the *addition* or elimination of any door or window; the [~~reconfiguration or~~] extension or arrangement of any system; [~~or~~] the installation of any additional *equipment* or fixtures and any work which reduces the loadbearing capacity of, or which imposes additional loads on, a primary structural component.

**CATEGORIES OF WORK.** The nature and extent of construction work undertaken in an existing building. The categories of work covered in this appendix, listed in increasing order of stringency of requirements, are repair, renovation, *alteration* and reconstruction.

**DANGEROUS.** Where the stresses in any member; the condition of the building, or any of its components or elements or attachments; or other condition that results in an overload exceeding 150 percent of the stress allowed for the member of material in this code.

**EQUIPMENT OR FIXTURE.** Any plumbing, heating, electrical, ventilating, air-conditioning, refrigerating and fire protection *equipment*; and elevators, dumb waiters, boilers, pressure vessels, and other mechanical facilities or installations that are related to building services.

**LOAD-BEARING ELEMENT.** Any column, girder, beam, joist, truss, rafter, wall, floor or roof sheathing that supports any vertical load in addition to its own weight and/or any lateral load.

**MATERIALS AND METHODS REQUIREMENTS.** Those requirements in this code that specify material standards; details of installation and connection; joints; penetrations; and continuity of any element, component or system in the building. The required quantity, fire resistance, flame spread, acoustic or thermal performance, or other performance attribute is specifically excluded from materials and methods requirements.

**RECONSTRUCTION.** The reconfiguration of a space that affects an exit, a renovation and/or *alteration* when the work area is not permitted to be occupied because existing means-of-egress and fire protection systems, or their equivalent, are not in place or continuously maintained; and/or there are extensive *alterations* as defined in Section AJ501.3. Reconstruction does not include projects comprised only of floor finish replacement, painting or wallpapering, or the replacement of *equipment* or furnishings. Asbestos hazard abatement and lead hazard abatement projects shall not be classified as reconstruction solely because occupancy of the work area is not permitted.

**REHABILITATION.** Any repair, renovation, *alteration* or reconstruction work undertaken in an existing building.

**RENOVATION.** The removal [~~change, strengthening or *addition* of load-bearing elements;~~] and[~~/or the refinishing,~~] replacement[~~, bracing, strengthening, upgrading or extensive repair of existing materials, elements, components, *equipment* and/~~]or covering of existing interior or exterior trim, finish, doors, windows, or other materials with new materials that serve the same purpose and do not change the configuration of space [~~fixtures~~]. Renovation shall include the replacement of equipment or fixtures, the change, strengthening, bracing, or addition of load bearing elements, or extensive replacement of existing materials [~~involves no reconfiguration of spaces. Interior and exterior painting are not considered refinishing for purposes of this definition, and are not renovation~~].

**REPAIR.** The patching, restoration and/or minor replacement of materials, elements, components, *equipment* and/or fixtures for the purposes of maintaining those materials, elements, components, *equipment* and/or fixtures in good or sound condition.

**WORK.** That scope of activities affected by any repair, *renovation*, *alteration* or *reconstruction* work and indicted as such in the permit.

**WORK AREA.** That portion of a building affected by any renovation, *alteration* or reconstruction work as initially intended by the owner and indicated as such in the *permit*. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed, and portions of the building where work not initially intended by the owner is specifically required by these provisions for a renovation, *alteration* or reconstruction."

E. Subsection AJ301.4, "Electrical," of Section AJ301, "Repairs," is amended to read as follows:

"**AJ301.4 Electrical.** [~~Repair or replacement of~~] E[e]xisting electrical wiring and *equipment* undergoing repair [~~with like material~~] shall be permitted to be repaired or replaced in accordance with the *Dallas Electrical Code*.

[~~**Exceptions:**~~

~~1. Replacement of electrical receptacles shall comply with the requirements of Chapters 34 through 43.~~

~~2. Plug fuses of the Edison-base type shall be used for replacements only where there is no evidence of overfusing or tampering in accordance with the applicable requirements of Chapters 34 through 43.~~

~~3. For replacement of nongrounding-type receptacles with grounding-type receptacles and for branch circuits that do not have an *equipment* grounding conductor in the branch circuitry, the grounding conductor of a grounding-type receptacle outlet shall be permitted to be grounded to any accessible point on the grounding electrode system, or to any accessible point on the grounding electrode conductor, as allowed and described in Chapters 34 through 43.~~]"

F. Subsection AJ501.5, "Electrical Equipment and Wiring," of Section AJ501, "Alterations," is amended to read as follows:

"**AJ501.5 Electrical equipment and wiring.**

**AJ501.5.1 Materials and methods.** All n[~~N~~]ewly installed electrical *equipment* and wiring relating to work done in any work area shall comply with the materials and methods requirements of Chapter[s] 34 [~~through 43~~].

**Exception:** Electrical *equipment* and wiring in newly installed partitions and ceilings shall comply with all the applicable requirements of Chapter[s] 34 [~~through 43~~].

**AJ501.5.2 Electrical service.** Service to the *dwelling unit* shall be a minimum of 100 ampere, three-wire capacity and service *equipment* shall be dead front having no live parts exposed that could allow accidental contact. [~~Type "S" fuses shall be installed when fused *equipment* is used.~~]

**Exception.** Existing service of 60 ampere, three-wire capacity, and feeders of 30 ampere or larger two- or three-wire capacity shall be accepted if adequate for the electrical load being served.

**AJ501.5.3 Additional electrical requirements.** When the work area includes any of the following areas within a *dwelling unit*, the requirements of Sections AJ501.5.3.1 through AJ501.5.3.5 shall apply.

**AJ501.5.3.1 Enclosed areas.** Enclosed areas other than closets, kitchens, *basements*, garages, hallways, laundry areas and bathrooms shall have a minimum of two duplex receptacle outlets, or one duplex receptacle outlet and one ceiling- or wall-type lighting outlet.

**AJ501.5.3.2 Kitchen and laundry areas.** Kitchen areas shall have a minimum of two duplex receptacle outlets. Laundry areas shall have a minimum of one duplex receptacle outlet located near the laundry *equipment* and installed on an independent circuit.

**AJ501.5.3.3 Ground-fault circuit-interruption.** Ground-fault circuit-interruption shall be provided on newly installed receptacle outlets if required by Chapter[s] 34 [~~through 43~~].

**AJ501.5.3.4 Lighting outlets.** At least one lighting outlet shall be provided in every bathroom, hallway, stairway, attached garage and detached garage with electric power to illuminate outdoor entrances and exits, and in utility rooms and *basements* where these spaces are used for storage or contain *equipment* requiring service.

**AJ501.5.3.5 Clearance.** Clearance for electrical service *equipment* shall be provided in accordance with Chapter[s] 34 [~~through 43~~]."

115. Appendix K, "Sound Transmission," of the 2012 International Residential Code is adopted.

116. Appendix O, "Automatic Vehicular Gates," of the 2012 International Residential Code is adopted.

117. Appendices A, B, C, D, F, L, M, N, P, and Q of the 2012 International Residential Code are not adopted.

118. All chapters of the 2012 International Residential Code adopted by this ordinance are subchapters of Chapter 57 of the Dallas City Code, as amended.

119. Any errata corrections published by the International Code Council for the 2012 International Residential Code, as they are discovered, are considered as part of this code.

120. All references in the 2012 International Residential Code to the fire code, building code, plumbing code, mechanical code, electrical code, existing building code, energy conservation code, fuel gas code, and green construction code refer, respectively, to Chapters 16, 53, 54, 55, 56, 58, 59, 60, and 61 of the Dallas City Code.

SECTION 2. That a person violating a provision of this ordinance, upon conviction, is punishable by a fine not to exceed $2,000. No offense committed and no liability, penalty, or forfeiture, either civil or criminal, incurred prior to the effective date of this ordinance will be discharged or affected by this ordinance. Prosecutions and suits for such offenses, liabilities, penalties, and forfeitures may be instituted, and causes of action pending on the effective date of this ordinance may proceed, as if the former laws applicable at the time the offense, liability, penalty, or forfeiture was committed or incurred had not been amended, repealed, reenacted, or superseded, and all former laws will continue in effect for these purposes.

SECTION 3. That Chapter 57 of the Dallas City Code, as amended, will remain in full force and effect, save and except as amended by this ordinance. Any existing structure, system, development project, or registration that is not required to come into compliance with a requirement of this ordinance will be governed by the requirement as it existed in the former law last applicable to the structure, system, development project, or registration, and all former laws will continue in effect for this purpose.

SECTION 4. That the terms and provisions of this ordinance are severable and are governed by Section 1-4 of Chapter 1 of the Dallas City Code, as amended.

SECTION 5. That this ordinance will take effect on November 1, 2013, and it is accordingly so ordained.

APPROVED AS TO FORM:

WARREN M. S. ERNST, Interim City Attorney

By _____
Assistant City Attorney

Passed SEP 25 2013

For a Copy of the exhibit
Please contact
The City Secretary's Office