National Association of Home Builders

2018

International Codes Suggested Amendments

National Association of Home Builders

State and local HBAs should consider these amendments to maintain cost-effective and affordable code provisions when discussing the adoption of the 2018 International Codes. NAHB developed these amendments based on the outcome of the 2015-2017 ICC Code Development Cycles.

Each amendment is shown in *legislative text* (underline and ~~strikethrough~~) and includes a supporting reason s explaining why the jurisdiction should consider them.. Some of the suggested amendments, such as those for energy code provisions and the residential sprinklers, have additional supporting documents and information on the NAHB website and are so indicated.

From the *"Amendment Lookup"* page read the brief introduction and choose the amendment you are interested in. The underlined portion is a hotlink to the amendment.

This document is available upon request in "Word" format. You can copy and or change any portion of the "Word" document to fit you precise needs, if you would like the word document sent to you or if you have questions, please contact:

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2018 International Residential Code

1. Fire Separation Distance

This amendment would return the fire separation distances between structures to those that were required prior to residential sprinklers becoming part of the IRC.

2. Self-Closing Devices

This amendment removes the requirement for all doors separating the garage from the interior dwelling to be equipped with a self-closing and latching device.

3. Stair Geometry (8-¼ Inch Riser)

This amendment returns the IRC to the 8 ¼ inch riser by 9 inch tread depth used in the 2006 IRC.

4. Stair Geometry (8-Inch Riser)

This amendment revises the Internal Residential Code to coincide with the stair geometry to 8-inch riser by 9-inch tread depth as found in the UBC.

5. Guard Requirement

This amendment reinstates the guard requirement only for those areas where the elevation difference from the walking edge to the ground directly below is more than 30 inches.

6. Footing Tables

This amendment replaces the existing footing tables in the IRC with revised tables providing more reasonable footing widths, while still complying with accepted engineering practice and design standards.

7. Residential Fire Sprinklers

This amendment would delete the mandatory requirement for residential sprinklers from the International Residential Code. A companion amendment titled Fire Separation Distance returns the fire separation distances between structures to those required before residential sprinklers became part of the IRC.

8. Protection of Building Envelope

"This amendment eliminates the requirement to provide an exterior-rated door at the top of a stairway that is enclosed by breakaway walls and provides access to a dwelling elevated on piers or piles in a coastal flood zone."

9. Solar Photovoltaic Roof Systems

This amendment corrects language copied from the International Fire Code to address solar photovoltaic panels installed on the roof of one- and two-family dwellings.

10. **Mezzanines**

This amendment removes IBC language that=does not apply to mezzanines within a one- and two-family dwellings.

11. **Foundation Anchorage**

This amendment provides an exception to the requirement for attaching bottom plates of braced wall panels on the interior of a dwelling to foundations with anchor bolts. The exception applies in low-wind, low-seismic areas where gypsum board is used as the bracing method for the interior wall in question.

12. Air Leakage Rate Correction (climate zones 1-8)

This amendment modifies the requirement from 3 air changes per hour (ACH) to 5 ACH in Climate Zones 1-8.

13. Air Leakage Trade-Off

This amendment allows builders to trade improvements in other building energy components for less stringent building envelope pressure test results, provides flexibility in meeting the air-tightness requirements and provides options for recovering from an unexpected air-tightness test failure.

14. Prescriptive Table Requirements

This amendment replaces 2015 IRC Chapter 11 Tables N1102.1.2 and N1102.1.4 with tables from the 2009 IRC Chapter 11.

15. Basement Wall R-Value/U-Factors Reduction (Climate Zone 5)

This amendment reduces the basement wall R-value requirement in Climate Zone 5 to a more reasonable R-value based those acceptable to both NAHB and DOE in the 2009 IRC Chapter 11..

16. Ceiling R-Value/U-Factors Reduction (climate zones 2-5)

This amendment reinstates the appropriate minimum ceiling R-values in climate zones 2, 3, 4 and 5, those published in the 2009 IRC, Chapter 11.

17. Wall R-Value/U-Factors Corrections (Climate Zone 3)

This amendment reinstates the appropriate minimum wall assembly R-values/U-factors in Climate Zone 3 published in the 2009 IRC Chapter 11.

18. Wall R-Value/U-Factors Corrections (Climate Zones 6-8)

This amendment reinstates the appropriate minimum wall assembly R-Values/U-Factors in climate zones 6, 7 & 8 published in the 2009 IRC Chapter 11.

19. Mechanical Equipment Trade-Off

This amendment reinstates the performance option in the IRC Chapter 11 to reduce prescriptive requirements by installing HVAC equipment with higher energy-efficiency performance ratings than required by code.

20. Rooms Containing Fuel Burning Appliances

This amendment removes the requirement to insulate, seal and separate from the thermal envelope the area surrounding fuel burning appliances.

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1. Fire Separation Distance

This amendment would return the fire separation distances between structures to those required before residential sprinklers became part of the International Residential Code.

Revise as follows:

Delete Tables R302.1(1) and R302.1(2) and replace with new table.

TABLE R302.1 EXTERIOR WALLS

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	Fire-resistance rated	1 hour—tested in accordance with ASTM E 119 or UL 263 with exposure from the outside	0 feet
	Not fire-resistance rated	0 hours	3 feet[a]
Projections	Not allowed	N/A	< 2 feet
	Fire-resistance rated	1 hour on the underside[b, c]	2 feet[a]
	Not fire-resistance rated	0 hours	3 feet
Openings in walls	Not allowed	N/A	< 3 feet
	Unlimited	0 hours	3 feet[a]
Penetrations	All	Comply with Section R302.4	< 3 feet
		None required	3 feet[a]

For SI: 1 foot = 304.8 mm.
N/A = Not Applicable
a. For residential subdivisions where all *dwellings* are equipped throughout with an automatic sprinkler system installed in accordance with Section P2904, the *fire separation distance* for nonrated exterior walls and rated projections shall be permitted to be reduced to 0 feet, and unlimited unprotected openings and penetrations shall be permitted, where the adjoining *lot* provides an open setback *yard* that is 6 feet or more in width on the opposite side of the property line.
b. The roof eave fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave if fireblocking is provided from the wall top plate to the underside of the roof sheathing.
c. The roof eave fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave provided that gable vent openings are not installed.

Reason:

During the supplemental code cycle before the 2006 edition of the IRC, the fire separation distances were increased by 2 feet without any scientific data or reports that proved the allowable distance found in previous editions of the IRC contributed to any increase in exposure fires from one dwelling to another. Despite this fact, the IRC code development committee has failed to return this section to the earlier language.

To this day, there are no known reports or studies that demonstrate the previously allowed 3-foot separation distance from the property line and 6-foot separation between structures failed to provide the minimum required safe distance..

Return to Residential

2. Self Closing Devices

This amendment removes the requirement for all doors separating the garage from the interior dwelling to be equipped with a self-closing and latching device.

Revise 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 honeycomb 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~~.

Reason:

NAHB strongly disagrees with the new requirement for door closures on openings between the garage and the house. For many years, proponents argued that fires that originate in the garage could pass through these openings but failed to provide any reliable data or statistics. As a result, the committee and the governmental members repeatedly disapproved this requirement.

During the 2009-10 code development process, the proponents returned with a new reason to prevent the spread of carbon monoxide from vehicles and the by-products produced by burning thermoplastics. While the proponents were able to produce an extremely lengthy dissertation on the hazards of carbon monoxide and the number of false alarms created by carbon monoxide detectors, nowhere in their written or oral testimony did they link any statistical substantiation to need for closures on these openings nor has there been any other evidence produced by other parties.

Return to Residential

3. Stair Geometry (8 ¼ Inch Riser)

This amendment revises the 2012 IRC to return stair geometry to the 8 ¼-inch riser by 9-inch tread depth of the 2006 IRC.

Revise as follows:

R311.7.5 Stair treads and risers. Stair treads and risers shall meet the requirements of this section. For the purposes of this section, dimensions and dimensioned surfaces shall be exclusive of carpets, rugs or runners.
R311.7.5.1 Risers. The riser height shall be not more than 8 ¼ inch (210mm) ~~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 openings located more than 30 inches (762 mm), as measured vertically, to the floor or grade below do not permit the passage of a 4-inch-diameter (102 mm) sphere.

Exceptions:

1. The opening between adjacent treads is not limited on spiral stairways.
2. The riser height of spiral stairways shall be in accordance with Section R311.7.10.1.

R311.7.5.2 Treads. The tread depth shall be not less than 9 inches (229mm) ~~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).

Reason:

This amendment retains the stair geometry requirements allowed under the Building Officials and Code Administrators National Building Code (BOCA). This amendment allows the continued use of the 8 ¼" x 9" geometry, the dimensions still accepted by many state and local jurisdictions across the country.

These dimensions, originally accepted in the first draft of the IRC and the historic dimensions in the Council of American Building Official's CABO One- and Two-family Building Code, adequately provide for stair safety in residential occupancies. No sound documentation or data has ever been presented demonstrating these proposed dimensions are any less safe or are a contributing factor in accidental residential falls than a stair geometry of 7 ¾"x 10".

The safety benefits of the 7 ¾" riser and 10" tread stair geometry are technically unsubstantiated and are not practical in many home designs. If the footprint of the house must be increased to accommodate the additional space needed, adequately sized living spaces are sacrificed without any demonstrated gain. This can lead to an economic hardship on first-time home buyers of smaller homes, and in particular for construction on smaller lots, infill projects, and townhomes.

As outlined in Section R101.3 of the IRC, the intent of the code is to provide minimum requirements for occupant safety and health. There is adequate substantiation to show that 8¼-inch x 9 inch geometry provides this minimum level of occupant safety.

Notes/additional background:

Prior to the Building Officials and Code Administrators 1996 BOCA National Building Code, and the 1995 CABO One-and-Two Family Building Code, stair geometry requirements were set at the 8 ¼" x 9" dimensions.

An alternative amendment is available for jurisdictions that wish to retain the use of past UBC requirements of an 8-inch maximum riser height and 9-inch minimum tread depth. For that amendment, please see suggested amendment "Stair Geometry (8" x 9").”

Return to Residential

4. Stair Geometry (8-Inch Riser)

This amendment revises the Internal Residential Code to coincide with the stair geometry to 8-inch riser by 9-inch tread depth as found in the UBC.

Revise as follows:

R311.7.5 Stair treads and risers. Stair treads and risers shall meet the requirements of this section. For the purposes of this section, dimensions and dimensioned surfaces shall be exclusive of carpets, rugs or runners.
R311.7.5.1 Risers. The riser height shall be not more than 8 inches (210 mm) ~~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 openings located more than 30 inches (762 mm), as measured vertically, to the floor or grade below do not permit the passage of a 4-inch-diameter (102 mm) sphere.

Exceptions:

1. The opening between adjacent treads is not limited on spiral stairways.
2. The riser height of spiral stairways shall be in accordance with Section R311.7.10.1.

R311.7.5.2 Treads. The tread depth shall be not less than 9 inches (229mm) ~~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).

Reason:

This amendment retains the stair geometry requirements allowed under the Uniform Building Code (UBC). This amendment allows the continued use of the 8" x 9" geometry, the dimensions still accepted by many state and local jurisdictions across the country. In fact, many adopt stair geometry requirements of 8 ¼" x 9".

The 8" x 9" geometry has always adequately provided for occupant safety in residential occupancies. No sound documentation or data has ever been presented demonstrating it is any less safe or a contributing factor in accidental residential falls than a stair geometry of 7 ¾" x 10" or other even more stringent geometries.

The safety benefits of the 7 ¾" riser and 10" tread stair geometry are technically unsubstantiated and are not practical in many home designs. If the footprint of the house must be increased to accommodate the additional space needed, adequately sized living spaces are sacrificed without any demonstrated gain. This can lead to an economic hardship on first-time home buyers of smaller homes, and in particular for construction on smaller lots, infill projects, and townhomes.

As outlined in Section R101.3 of the IRC, the intent of the code is to provide minimum requirements for occupant safety and health. There is adequate substantiation to show that 8-inch x 9 inch geometry provides this minimum level of occupant safety.

Notes/additional background:

This is an alternative amendment to accommodate those jurisdictions accustomed to or that wish to retain the use of past UBC requirements of an 8-inch maximum riser height and a 9-inch minimum tread depth.

Prior to changes in 1996 BOCA and 1995 CABO One-and-Two Family Building Code, stair geometry requirements were set at an 8 ¼ inch maximum for risers and a 9-inch minimum tread depth. For these dimensions, please see suggested amendment "Stair Geometry (8 ¼" x 9")."

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5. Guard Requirement

This amendment reinstates the guard requirement only for those areas where the elevation difference from the walking edge to the ground directly below is more than 30 inches.

Revise as follows:

R312.1.1 Where required. Guards shall be located along open-sided walking surfaces of all decks, porches, balconies, including stairs, ramps and landings that are located more than 30 inches measured vertically to the floor or grade below. ~~at any point within 36 inches (914 mm) horizontally to the edge of the open side~~ Insect screening shall not be considered as a guard.

Reason:

This amendment retains the provisions of previous editions of the IRC, where guardrails were required when the elevation difference between the walking surface was greater than 30 inches to the floor or grade directly below. The 2018 IRC now requires a guardrail where the elevation difference is greater than 30 inches from the walking surface to a horizontal point 36 inches adjacent to the leading edge of the walking surface to the grade or floor below. This change will now require the building official to carry a four-foot level to conduct inspections.

The proponent of this change referred to work conducted and reports written by the ICC Code Technology Committee (CTC). At no time during the public hearings was any technical justification presented to substantiate the change requiring the building official to measure 36 inches away from the leading edge of the walking surface or tread to determine when a guardrail should or should not be required. After reviewing the many reports from the CTC website, it is still unclear from where the 36-inch requirement was derived. There are no studies that can support claims that this will have an effect on reducing possible injuries. While the proponent promotes this as a means for consistent enforcement of the guard requirements, there is no evidence of increased risk to the safety of the occupant if the current method of measuring from the edge of the walking surface to grade below is used.

Return to Residential

6. Footing Tables

This amendment replaces the existing footing tables in the IRC with revised tables providing more reasonable footing widths, while still complying with accepted engineering practice and design standards

Revise as follows:

R403.1.1 Minimum size. The minimum width, W, and thickness, T, for concrete footings shall be in accordance with Tables R403.1(1) through R403.1(3) and Figure R403.1(1) or R403.1.3, as applicable, but not less than 12 inches in width and not less than 6 inches in depth. The footing width shall be based on the load-bearing value of the soil in accordance with Table R401.4.1. Footing projections, P, shall be not less than 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).

Modify Tables R403.1(1), R403.1(2) and R403.1(3) with the following:

TABLE R403.1(1)
MINIMUM WIDTH AND THICKNESS FOR CONCRETE FOOTINGS FOR LIGHT-FRAME CONSTRUCTION (inches)[a,b,c,d]

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	15~~18~~ x 6	12~~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	14~~16~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story—plus basement	19~~22~~ x 6	14~~16~~ x 6	12~~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	18~~19~~ x 6	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story—plus basement	23~~25~~ x 8	17~~19~~ x 6	14~~15~~ x 6	12~~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	12~~13~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—plus basement	15~~19~~ x 6	12~~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	15~~17~~ x 6	12~~13~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story—plus basement	19~~23~~ x 6	14~~17~~ x 6	12~~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	18~~20~~ x 6	14~~15~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story—plus basement	23~~26~~ x 8	17~~20~~ x 6	14~~16~~ x 6	12~~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	13~~16~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—plus basement	17~~21~~ x 6	13~~16~~ x 6	12~~13~~ x 6	12 x 6	12 x 6	12 x 6
	2 story—slab-on-grade	13~~14~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story—with crawl space	16~~19~~ x 6	12~~14~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story—plus basement	21~~25~~ x 7	15~~19~~ x 6	12~~15~~ x 6	12 x 6	12 x 6	12 x 6
	3 story—slab-on-grade	16~~17~~ x 6	12~~13~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story—with crawl space	20~~22~~ x 6	15~~17~~ x 6	12~~13~~ x 6	12 x 6	12 x 6	12 x 6
	3 story—plus basement	24 x 8~~28 x 9~~	18~~21~~ x 6	15~~17~~ x 6	12~~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	14~~18~~ x 6	12~~13~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—plus basement	18 x 6~~24 x 7~~	14~~18~~ x 6	12~~14~~ x 6	12 x 6	12 x 6	12 x 6
	2 story—slab-on-grade	14~~16~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story—with crawl space	18~~21~~ x 6	13~~16~~ x 6	12~~13~~ x 6	12 x 6	12 x 6	12 x 6
	2 story—plus basement	22 x 7~~27 x 9~~	17~~20~~ x 6	13~~16~~ x 6	12~~14~~ x 6	12 x 6	12 x 6
	3 story—slab-on-grade	18~~19~~ x 6	13~~14~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story—with crawl space	21~~25~~ x 7	16~~18~~ x 6	13~~15~~ x 6	12 x 6	12 x 6	12 x 6
	3 story—plus basement	26 x 9~~30 x 10~~	19~~23~~ x 6	15~~18~~ x 6	13~~15~~ x 6	12~~13~~ x 6	12 x 6

For SI: 1 inch = 25.4 mm, 1 plf = 14.6 N/m, 1 pound per square foot = 47.9 N/m2.

~~a. Interpolation allowed. Extrapolation is not allowed.~~

b. ~~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).~~

a. Linear interpolation of footing width is permitted between the soil bearing pressures in the table.

b. The table is based on the following conditions and loads: Building width: 32 feet; Wall height: 10 foot; Basement wall height: 10 foot; Dead loads: 20 psf roof and ceiling assembly, 10 psf floor assembly, 15 psf wall assembly
Live loads: Roof and ground snow loads as listed, 40 psf first floor, 30 psf second and third floor

c. Where the building width perpendicular to the wall footing is greater than 32 feet, the footing width shall be increased by 2 inches and footing depth shall be increased by 1 inch for every 4 feet of increase in building width.

d. Where the building width perpendicular to the wall footing is not greater than 32 feet, a 2 inch decrease in footing width and 1 inch decrease in footing depth is permitted for every 4 feet of decrease in bu

TABLE R403.1(2)
MINIMUM WIDTH AND THICKNESS FOR CONCRETE FOOTINGS FOR LIGHT-FRAME CONSTRUCTION WITH BRICK VENEER (inches)[a,b,c,d]

SNOW LOAD OR ROOF LIVE LOAD	STORY AND TYPE OF STRUCTURE WITH BRICK VENEER	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	13~~15~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—plus basement	18~~21~~ x 6	13~~15~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story—slab-on-grade	16~~15~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story—with crawl space	19~~20~~ x 6	14~~15~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story—plus basement	24~~26~~ x 8	18~~20~~ x 6	14~~16~~ x 6	12~~13~~ x 6	12 x 6	12 x 6
	3 story—slab-on-grade	22~~20~~ x 6	16~~15~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story—with crawl space	25 x 9~~26 x 8~~	19 x 6	15 x 6	13 x 6	12 x 6	12 x 6
	3 story—plus basement	30~~32~~ x 11	22~~24~~ x 7	15~~19~~ x 6	15~~16~~ x 6	13~~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	13~~16~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—plus basement	18~~22~~ x 6	13~~16~~ x 6	12~~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	19~~22~~ x 6	15~~16~~ x 6	12~~13~~ x 6	12 x 6	12 x 6	12 x 6
	2 story—plus basement	24 x 8~~27 x 9~~	18~~21~~ x 6	14~~16~~ x 6	12~~14~~ x 6	12 x 6	12 x 6
	3 story—slab-on-grade	22 x 7~~21 x 6~~	16 x 6	13 x 6	12 x 6	12 x 6	12 x 6
	3 story—with crawl space	25 x 9~~27 x 8~~	19~~20~~ x 6	15~~16~~ x 6	13 x 6	12 x 6	12 x 6
	3 story—plus basement	30~~33~~ x 11	22~~24~~ x 7	15~~20~~ x 6	15~~16~~ x 6	13~~14~~ x 6	12 x 6
50 psf	1 story—slab-on-grade	12~~13~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—with crawl space	15~~18~~ x 6	12~~14~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—plus basement	19 x 6~~24 x 7~~	15~~18~~ x 6	12~~14~~ x 6	12 x 6	12 x 6	12 x 6
	2 story—slab-on-grade	17~~18~~ x 6	13~~14~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story—with crawl space	21~~24~~ x 7	16~~18~~ x 6	13~~14~~ x 6	12 x 6	12 x 6	12 x 6
	2 story—plus basement	25 x 9~~29 x 10~~	19~~22~~ x 6	15~~18~~ x 6	13~~15~~ x 6	12~~13~~ x 6	12 x 6
	3 story—slab-on-grade	23~~27~~ x 7	17~~18~~ x 6	14~~13~~ x 6	12 x 6	12 x 6	12 x 6
	3 story—with crawl space	27 x 10~~29 x 9~~	20~~22~~ x 6	16~~17~~ x 6	13~~14~~ x 6	12 x 6	12 x 6
	3 story—plus basement	31~~35~~ x 12	24~~26~~ x 8	16~~21~~ x 6	16~~17~~ x 6	13~~15~~ x 6	12~~13~~ x 6
70 psf	1 story—slab-on-grade	14~~15~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—with crawl space	16~~20~~ x 6	12~~15~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—plus basement	21 x 7~~26 x 8~~	16~~20~~ x 6	13~~16~~ x 6	12~~13~~ x 6	12 x 6	12 x 6
	2 story—slab-on grade	19~~20~~ x 6	14~~15~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story—with crawl space	22 x 7~~26 x 8~~	17~~19~~ x 6	13~~15~~ x 6	12~~13~~ x 6	12 x 6	12 x 6
	2 story—plus basement	27 x 10~~32 x 11~~	20 x 6~~24 x 7~~	16~~19~~ x 6	13~~16~~ x 6	12~~14~~ x 6	12 x 6
	3 story—slab-on-grade	25 x 9~~26 x 8~~	19 x 6	15 x 6	12~~13~~ x 6	12 x 6	12 x 6
	3 story—with crawl space	28 x 10~~31 x 11~~	21~~23~~ x 7	17~~19~~ x 6	14~~16~~ x 6	12~~13~~ x 6	12 x 6
	3 story—plus basement	33~~37~~ x 13	25~~28~~ x 9	17~~22~~ x 6	16~~18~~ x 6	14~~16~~ x 6	12~~14~~ x 6

For SI: 1 inch = 25.4 mm, 1 plf = 14.6 N/m, 1 pound per square foot = 47.9 N/m2.

~~a. Interpolation allowed. Extrapolation is not allowed.~~

b. ~~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).~~

a. Linear interpolation of footing width is permitted between the soil bearing pressures in the table.
b. The table is based on the following conditions and loads: Building width: 32 feet; Wall height: 10 foot; Basement wall height: 10 foot; Dead loads: 20 psf roof and ceiling assembly, 10 psf floor assembly, 45 psf wall assembly
Live loads: Roof and ground snow loads as listed, 40 psf first floor, 30 psf second and third floor
c. Where the building width perpendicular to the wall footing is greater than 32 feet, the footing width shall be increased by 2 inches and footing depth shall be increased by 1 inch for every 4 feet of increase in building width.
d. Where the building width perpendicular to the wall footing is not greater than 32 feet, a 2 inch decrease in footing width and 1 inch decrease in footing depth is permitted for every 4 feet of decrease in building width.

TABLE R403.1(3)
MINIMUM WIDTH AND THICKNESS FOR CONCRETE FOOTINGS WITH CAST-IN-PLACE CONCRETE OR ~~FULLY~~ PARTIALLY-GROUTED CONCRETE MASONRY WALL CONSTRUCTION (inches)[a,b,c,d]

SNOW LOAD OR ROOF LIVE LOAD	STORY AND TYPE OF STRUCTURE WITH CMU OR CONCRETE	LOAD-BEARING VALUE OF SOIL (psf)					
		1500	2000	2500	3000	3500	4000
20 psf	1 story—slab-on-grade	12~~14~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—with crawl space	14~~19~~ x 6	12~~14~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—plus basement	19 x 6~~25 x~~ 8	14~~19~~ x 6	12~~15~~ x 6	12~~13~~ x 6	12 x 6	12 x 6
	2 story—slab-on-grade	17 x 6~~23 x 7~~	13~~18~~ x 6	12~~14~~ x 6	12 x 6	12 x 6	12 x 6
	2 story—with crawl space	21 x 7~~29 x 9~~	16~~22~~ x 6	13~~17~~ x 6	12~~14~~ x 6	12 x 6	12 x 6
	2 story—plus basement	25 x 9~~35 x 12~~	19 x 6~~26 x 8~~	15~~21~~ x 6	13~~17~~ x 6	12~~15~~ x 6	12~~13~~ x 6
	3 story—slab-on-grade	24 x 8~~32x 11~~	18 x 6~~24 x 7~~	14~~19~~ x 6	12~~16~~ x 6	12~~14~~ x 6	12 x 6
	3 story—with crawl space	28 x 10~~38 x 14~~	21 x 7~~28 x 9~~	17~~23~~ x 6	14~~19~~ x 6	12~~16~~ x 6	12~~14~~ x 6
	3 story—plus basement	32 x 12~~43 x 17~~	24 x 8~~33 x 11~~	19~~26~~ x 8	16~~22~~ x 6	14~~19~~ x 6	12~~16~~ x 6
30 psf	1 story—slab-on-grade	12~~15~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—with crawl space	14~~20~~ x 6	12~~15~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—plus basement	19 x 6~~26 x 8~~	14~~20~~ x 6	12~~16~~ x 6	12~~13~~ x 6	12 x 6	12 x 6
	2 story—slab-on-grade	17 x 6~~24 x 7~~	13~~18~~ x 6	12~~15~~ x 6	12 x 6	12 x 6	12 x 6
	2 story—with crawl space	21 x 7~~30 x 10~~	16~~22~~ x 6	13~~18~~ x 6	12~~15~~ x 6	12~~13~~ x 6	12 x 6
	2 story—plus basement	25 x 9~~36 x 13~~	19~~27~~ x 8	15~~21~~ x 6	13~~18~~ x 6	12~~15~~ x 6	12~~13~~ x 6
	3 story—slab-on-grade	12 x 8~~33 x 12~~	18 x 6~~25 x 7~~	15~~20~~ x 6	12~~17~~ x 6	12~~14~~ x 6	12 x 6
	3 story—with crawl space	28 x 10~~39 x 14~~	21 x 7~~29 x 9~~	17 x 6~~23 x 7~~	14~~19~~ x 6	12~~17~~ x 6	12~~14~~ x 6
	3 story—plus basement	32 x 12~~44 x 17~~	24 x 8~~33 x 12~~	19 x 6~~27x 8~~	16~~22~~ x 6	14~~19~~ x 6	12~~17~~ x 6
50 psf	1 story—slab-on-grade	13~~17~~ x 6	12~~13~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—with crawl space	16~~22~~ x 6	12~~17~~ x 6	12~~13~~ x 6	12 x 6	12 x 6	12 x 6
	1 story—plus basement	20 x 6~~28x 9~~	15~~21~~ x 6	12~~17~~ x 6	12~~14~~ x 6	12 x 6	12 x 6
	2 story—slab-on-grade	19 x 6~~27 x 8~~	14~~20~~ x 6	12~~16~~ x 6	12~~13~~ x 6	12 x 6	12 x 6
	2 story—with crawl space	23 x 8~~32 x 11~~	17 x 6~~24 x 7~~	14~~19~~ x 6	12~~16~~ x 6	12~~14~~ x 6	12 x 6
	2 story—plus basement	27 x 10~~38 x 14~~	20 x 6~~28 x 9~~	16~~23~~ x 6	13~~19~~ x 6	12~~16~~ x 6	12~~14~~ x 6
	3 story—slab-on-grade	13 x 9~~35 x 13~~	19 x 6~~27 x 8~~	15~~21~~ x 6	13~~18~~ x 6	12~~15~~ x 6	12~~13~~ x 6
	3 story—with crawl space	29 x 11~~41 x 15~~	22 x 7~~31 x 10~~	18 x 6~~24 x 7~~	15~~20~~ x 6	13~~17~~ x 6	12~~15~~ x 6
	3 story—plus basement	34 x 13~~47 x 18~~	25 x 9~~35 x 12~~	20 x 6~~28 x 9~~	17 x 6~~23 x 7~~	14~~20~~ x 6	13~~17~~ x 6
70 psf	1 story—slab-on-grade	15~~19~~ x 6	12~~14~~ x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story—with crawl space	17 x 6~~25 x 7~~	13~~18~~ x 6	12~~15~~ x 6	12 x 6	12 x 6	12 x 6
	1 story—plus basement	22 x 7~~30 x 10~~	16~~23~~ x 6	13~~18~~ x 6	12~~15~~ x 6	12 13 x 6	12 x 6
	2 story—slab-on-grade	20 x 6~~29 x 9~~	15~~22~~ x 6	12~~17~~ x 6	12 14 x 6	12 x 6	12 x 6
	2 story—with crawl space	24 x 8~~34 x 12~~	18 x 6~~26 x 8~~	14~~21~~ x 6	12~~17~~ x 6	12~~15~~ x 6	12~~13~~ x 6
	2 story—plus basement	28 x 10~~40 x 15~~	21 x 7~~30 x 10~~	17 x 6~~24 x 7~~	14~~20~~ x 6	12~~17~~ x 6	12~~15~~ x 6
	3 story—slab-on-grade	14 x 10~~38 x 14~~	20 x 6~~28 x 9~~	16~~23~~ x 6	14~~19~~ x 6	12~~16~~ x 6	12~~14~~ x 6
	3 story—with crawl space	31 x 12~~43 x 16~~	23 x 8~~32 x 11~~	18 x 6~~26 x 8~~	15~~21~~ x 6	15~~18~~ x 6	12~~16~~ x 6
	3 story—plus basement	35 x 14~~49 x 19~~	26 x 9~~37 x 13~~	21 x 7~~29 x 10~~	18 x 6~~24 x 7~~	15~~21~~ x 6	13~~18~~ x 6

For SI: 1 inch = 25.4 mm, 1 plf = 14.6 N/m, 1 pound per square foot = 47.9 N/m2.

~~a. Interpolation allowed. Extrapolation is not allowed.~~
~~b. 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).~~

a. Linear interpolation of footing width is permitted between the soil bearing pressures in the table.
b. The table is based on the following conditions and loads: Building width: 32 feet; Wall height: 10 foot; Basement wall height: 10 foot; Dead loads: 20 psf roof and ceiling assembly, 10 psf floor assembly, 55 psf wall assembly

Live loads: Roof and ground snow loads as listed, 40 psf first floor, 30 psf second and third floor

c. Where the building width perpendicular to the wall footing is greater than 32 feet, the footing width shall be increased by 2 inches and footing depth shall be increased by 1 inch for every 4 feet of increase in building width.

d. Where the building width perpendicular to the wall footing is not greater than 32 feet, a 2 inch decrease in footing width and 1 inch decrease in footing depth is permitted for every 4 feet of decrease in building width.

Reason:

Builders using the new footing tables introduced in the 2015 IRC have found the footing widths required by the table are significantly larger than those required by previous editions of Table R403.1, which dated back to the CABO codes. In many cases they were wider than an engineering analysis would suggest. A careful review of the calculations underlying the 2015 IRC tables found a number of cases where load assumptions and determinations were overly conservative, and a few cases where the calculations were actually unconservative. Problems with the assumptions and calculations included the following:

- *The original calculations apply the full ground snow load to the roof. The actual roof snow load per ASCE 7 is 70% of the ground snow load or 20 pounds per square foot, whichever is greater.*
- *The original calculations apply a 100 pound per square foot weight for above-grade concrete or masonry walls, representing a solid or fully-grouted 8" CMU wall. Such walls are more likely to be either 8" CMU with reinforcing @ 48" o.c. or 8" insulated concrete forms, both of which have a 55 pound per square foot weight.*
- *The original calculations use only the ASCE 7 load combination that applies a 0.75 factor for concurrent roof/snow and floor live loads, ignoring the load combinations that apply just the roof/attic LL, just the snow load, or just the total floor live loads.*
- *The original calculations are based on tributary width, yet Footnote #2 adds 2 inches of footing width for every 2 feet of additional **building width**. As a result of confusing building and tributary width, the footnote adds twice as much footing width as is necessary based on the loads!*

In addition, many engineers either ignore the weight of below-grade foundation walls and footings in calculations or use a reduced load to account for the difference between the density of the soil and the density of concrete or masonry used in the footings and walls. The justification is that existing soils, which generally have dry densities of 105 to 125 pounds per cubic foot, are being replaced by concrete or masonry materials with densities of 135 to 150 pounds per cubic foot. The assumption is that the additional weight of the foundation walls and footings is not sufficient to cause additional compression and settlement of the soil under footing bearing pressures to a degree that would harm the structure.

Other key changes in the revised code text and footing tables include:

- *The original footnote allowing footing width and depth to be adjusted is converted into two footnotes. One footnote requires an increase in footing width and depth when the building width perpendicular to a wall footing exceeds 32 feet. The second footnote permits, but does not require, a decrease in footing width and depth for a building width of 32 feet or narrower.*
- *The charging text is revised to clarify the minimum width of a footing shall not be less than 12 inches and depth shall not be less than 6 inches. Previously, the limitation on depth was buried in a footnote.*

These revised tables correct the inconsistencies in the load assumptions and calculations. In addition, the calculations for the revised tables apply a differential density of 50 pcf in lieu of the full density of concrete and masonry, recognizing common practice. The result is footing widths for one- and two-family dwellings that are more in line with historic practice, while still technically justified under engineering standards and accepted practices.

Return to Residential

7. Residential Fire Sprinklers

This amendment would delete the mandatory requirement for residential sprinklers from the International Residential Code. A companion amendment titled Fire Separation Distance returns the fire separation distances between structures to those required before residential sprinklers became part of the IRC.

Revise as follows:

Delete Section R313 entirely

~~**SECTION R313**~~
~~**AUTOMATIC FIRE SPRINKLER SYSTEMS**~~
~~**R313.1 Townhouse automatic fire sprinkler systems.** An automatic residential fire sprinkler system shall be installed in townhouses.~~
~~**Exception:** An automatic residential fire sprinkler system shall not be required where 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.~~
~~**Exception:** 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.~~

Reason:

Since the inclusion of the mandatory requirement for residential sprinklers in the 2009 IRC, more than 42 states have amended or passed legislation removing the residential sprinkler mandate for new one- and two-family dwellings. Of those states, 27 prohibit communities from requiring fire sprinkler systems from being installed. It is important to note that the voluntary installation of residential sprinklers is still allowed.

The median age of one- and two-family housing in the U.S. is 35 years, and that number continues to increase. These older homes are more likely to have outdated electrical systems, appliances, use space heaters or display other characteristics that lead to a greater risk of a fire starting. Newer homes have fire blocking, hardwired smoke alarms and egress windows installed to today's codes, all of which increase the chances of surviving a fire. ***Even as homes built to today's residential code get older, they will continue to provide protection for families through their improved safety.***

While questions regarding construction code requirements intended to increase the safety of homes cannot, and should not, be decided solely on the issue of cost, it is reasonable to ask if there is a demonstrated state- or region-specific need for the requirement or if an acceptable level of safety can be achieved through other, less expensive means. The cost of an incremental increase in the margin of safety can be quite high.

Higher regulatory costs have real consequences for working American families. These regulations end up pushing the price of housing beyond the means of many teachers, police officers, firefighters and other middle-class workers. Every $838 increase in construction costs adds an additional $1,000 to the final price of the home, and in the U.S., over 150,000 households would no longer qualify for a mortgage based on that $1,000 increase to a median-priced home. The average cost of a sprinkler system is $6,000.

Mandating costly incremental increases in safety will only protect those who can afford them and will often decrease safety for those who cannot. Families who cannot qualify to purchase homes due to the increased costs from mandatory code requirements such as fire sprinklers will have to live in housing that is less safe, because that housing was built to less stringent code requirements.

Return to Residential

8. Protection of Building Envelope

This amendment eliminates the requirement to provide an exterior-rated door at the top of a stairway that is enclosed by breakaway walls and provides access to a dwelling elevated on piers or piles in a coastal flood zone.

Revise as follows:

~~**R322.3.5.1 Protection of building envelope.** An exterior door that meets the requirements of Section R609 shall be installed at the top of stairs that provide access to the building and that are enclosed with walls designed to break away in accordance with Section R322.3.4.~~

Reason:

This amendment deletes the requirement added in the 2015 IRC that an exterior door be provided at the top of a stairway enclosed by breakaway walls and providing access to a dwelling located in a Coastal A Zone or Zone V special flood hazard area and elevated on piers or piles. While having a door at the top of such a stair may be good practice, the additional requirements associated with it being an exterior door are overly conservative, particularly if the door at the bottom of the enclosed stair is also an exterior door. By requiring compliance with all of the requirements of Section R609, the specified door would need to have a design pressure rating consistent with the design wind speed for the site, the door frame would need to be stiffened to resist the loads from such a door, proper anchorage of the door to the frame would need to be provided, and the door opening would need head, jamb, and sill flashing. The minimum added cost to provide a standard exterior door with flashing in lieu of a standard interior door is around $300; a hurricane wind-rated door would add an additional $200-$300 to the minimum costs.

It is noted that this requirement does not appear in the basic construction requirements of the National Flood Insurance Program in accordance with 44 CFR 60.3. It is also not specified as a practice that a community would earn credit for mandating and enforcing under FEMA's Community Rating Service, and would not lead to discounted flood insurance premiums.

Return to Residential

9. Solar Photovoltaic Roof Systems

This amendment corrects language copied from the International Fire Code to address solar photovoltaic panels installed on the roof of a one- and two-family dwelling.

Revise as follows:

R324.7 Access and pathways. Roof access, pathways and spacing requirements shall be provided in accordance with Sections R324.7.1 through R324.7.2.5.

Exceptions:

1. Detached garages and accessory structures to one and two-family *dwellings* and *townhouses,* such as parking shade structures, carports, solar trellises and similar structures.
2. Roof access, pathways and spacing requirements need not be provided where an alternative ventilation method *approved* by the code official has been provided or where the code official has determined that vertical ventilation techniques will not be employed.

R324.7.1 Roof access points. Roof access points shall be located in areas that do not require the placement of ground ladders over openings such as windows or doors, and located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires or signs.

R324.7.2 Solar photovoltaic systems. Solar photovoltaic systems shall comply with Sections R324.7.2.1 through R324.7.2.5.

R324.7.2.1 Size of solar photovoltaic array. Each photovoltaic array shall be limited to 150 feet by 150 feet (45 720 by 45 720 mm). Multiple arrays shall be separated by a clear access pathway not less than 3 feet (914 mm) in width.

R324.7.2.2 Hip roof layouts. Panels and modules installed on *dwellings* with hip roof layouts shall be located in a manner that provides a clear access pathway not less than 3 feet (914 mm) in width from the eave to the ridge on each roof slope where panels and modules are located. The access pathway shall be located ~~at a structurally strong location on the building capable of supporting the live load of fire fighters~~ along the structural members of the roof framing to support any person accessing the roof.

Exception: These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal (16.6 percent) and less.

R324.7.2.3 Single ridge roofs. Panels and modules installed on *dwellings* with a single ridge shall be located in a manner that provides two, 3-foot-wide (914 mm) access pathways from the eave to the ridge on each roof slope where panels or modules are located.

Exception: This requirement shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal (16.6 percent) and less.

R324.7.2.4 Roofs with hips and valleys. Panels and modules installed on *dwellings* with roof hips or valleys shall not be located less than 18 inches (457 mm) from a hip or valley where panels or modules are to be placed on both sides of a hip or valley. Where panels are to be located on one side only of a hip or valley that is of equal length, the 18-inch (457 mm) clearance does not apply.

Exception: These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal (16.6 percent) and less.

~~**R324.7.2.5 Allowance for smoke ventilation operations.** Panels and modules installed on dwellings shall not be located less than 3 feet (914 mm) below the roof ridge to allow for fire department smoke ventilation operations.~~

~~**Exception:** Where an alternative ventilation method approved by the code official has been provided or where the code official has determined that vertical ventilation techniques will not be employed, clearance from the roof ridge is not required.~~

Reason:

This change is suggested based on two reasons. First, there is no reference in any of the ICC codes which specifically quantifies the weight of a fully geared up fire fighter. In addition, the provision for the access and the ability of the roof to support the live load of an individual should not be limited to the fire service. Solar PV panels will require cleaning and maintenance by the installer, electricians will need to periodically access

it to repair or replace components, and owners will need to clear debris and perform other housekeeping items. Secondly, while the IRC does take in to consideration the safety of occupants and fire service personnel, the IRC is not a fire service manual and should not include operational requirements for attacking fires from an offensive or defensive position. The IRC is a standalone building code for one- and two family dwellings and townhouses and it is not a fire operation manual.

Return to Residential

10. Mezzanines

This amendment removes IBC language that does not apply to mezzanines within one- and two family dwellings.

Revise as follows:

R325 MEZZANINES

R325.1 General. Mezzanines shall comply with Section R325.

R325.2 Mezzanines. The clear height above and below mezzanine floor construction shall be not less than 7 feet 2134 mm).

R325.3 Area limitation. The aggregate area of a mezzanine or mezzanines shall be not greater than one-third of the floor area of the room or space in which they are located. The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the *mezzanine* is located.

R325.4 Means of egress. The means of egress for mezzanines shall comply with the applicable provisions of Section R311.

R325.5 Openness. Mezzanines shall be open and unobstructed to the room in which they are located except for walls not more than ~~42 inches (1067 mm)~~ 36 inches (914 mm) in height, columns and posts.

> ~~**Exceptions:**~~
> ~~1. Mezzanines or portions thereof are not required to be open to the room in which they are located, provided that the aggregate floor area of the enclosed space is not greater than 10 percent of the mezzanine area.~~
> ~~2. In buildings that are not more than two stories above *grade plane* and equipped throughout with an automatic sprinkler system in accordance with NFPA 13R, Appendix S, a mezzanine having two or more means of egress shall not be required to be open to the room in which the mezzanine is located.~~

Reason:

During the code hearings, the residential code committee approved a modified version of the proposal which extracted language dealing with mezzanines directly from the IBC. The committee modified the height of the wall between the mezzanine and the room below to have walls no greater than 36 inches in height to be coordinated with the guard heights in the IRC.

This change also deletes the two exceptions to the openness requirements of the mezzanine, which were extracted directly from the IBC and have no bearing on a mezzanine that would be constructed in a one- and two family dwelling or townhouse. The second exception also references automatic sprinklers system that are inappropriate for the IRC (NFPA 13R is four-story multifamily).

Return to Residential

11. Foundation Anchorage

This amendment provides an exception to the requirement for attaching bottom plates of braced wall panels on the interior of a dwelling to foundations with anchor bolts. The exception applies in low-wind, low-seismic areas where gypsum board is used as the bracing method for the interior wall in question.

Revise as follows:

R403.1.6 Foundation anchorage. Wood sill plates and wood walls supported directly on continuous foundations shall be anchored to the foundation in accordance with this section.

Cold-formed steel framing shall be anchored directly to the foundation or fastened to wood sill plates anchored to the foundation. Anchorage of cold-formed steel framing and sill plates supporting cold-formed steel framing shall be in accordance with this section and Section R505.3.1 or R603.3.1.

Wood sole plates at all exterior walls on monolithic slabs, wood sole plates of *braced wall panels* at building interiors on monolithic slabs and all wood sill plates shall be anchored to the foundation with minimum 1/2-inch diameter (12.7 mm) anchor bolts spaced a maximum of 6 feet (1829 mm) on center or *approved* anchors or anchor straps spaced as required to provide equivalent anchorage to 1/2-inch-diameter (12.7 mm) anchor bolts. Bolts shall extend a minimum of 7 inches (178 mm) into concrete or grouted cells of concrete masonry units. The bolts shall be located in the middle third of the width of the plate. A nut and washer shall be tightened on each anchor bolt. There shall be a minimum of two bolts per plate section with one bolt located not more than 12 inches (305 mm) or less than seven bolt diameters from each end of the plate section. Interior bearing wall sole plates on monolithic slab foundations that are not part of a *braced wall panel* shall be positively anchored with approved fasteners. Sill plates and sole plates shall be protected against decay and termites where required by Sections R317 and R318.

Exceptions:

1. Walls 24 inches (610 mm) total length or shorter connecting offset braced wall panels shall be anchored to the foundation with a minimum of one anchor bolt located in the center third of the plate section and shall be attached to adjacent braced wall panels at corners as shown in Item 9 of Table R602.3(1).

2. Connection of walls 12 inches (305 mm) total length or shorter connecting offset braced wall panels to the foundation without anchor bolts shall be permitted. The wall shall be attached to adjacent braced wall panels at corners as shown in Item 9 of Table R602.3(1).

3. Where the basic wind speed in accordance with Figure R301.2(4)A does not exceed 115 miles per hour (51 m/s), the seismic design category is A or B and Method GB in accordance with Section R602.10 is used for a *braced wall line* on the interior of the dwelling, anchor bolts shall not be required for the wood sole plates of the *braced wall panels*. Positive anchorage with approved fasteners shall be provided.

Reason:

This amendment revises the language for anchorage of light-frame wood stud walls to the foundations of the house. As currently stated, the provisions require anchor bolts for the portions of a wall on the interior of a dwelling that are designated as braced wall panels for a braced wall line passing through the dwelling. To provide the required 7–inch embedment depth, a thickened slab or other continuous footing would be necessary. Chapters 4 and 6 of the IRC do not explicitly require a continuous foundation in these locations in low-wind, low-seismic areas, and they are not traditionally provided. If interpreted and enforced by plan reviewers and inspectors in these areas, disputes and project delays will result and/or home owners will incur significant additional construction costs.

The ICC Ad-Hoc Committee on Wall Bracing revised this section during the 2007/2008 code cycle with the intent of ensuring that sufficient anchorage is provided along braced wall lines inside a dwelling to transfer lateral loads to either monolithic (thickened) slab foundations or continuous footings. While NAHB agrees that providing a continuous load path is important, the new language is overly broad in its application and not technically justified for many common conditions. The typical bracing method used for braced wall lines on the interior of a one- or two-story dwelling in a low-wind, low-seismic area is Method GB, consistent with

the use of gypsum board as the typical interior wall finish material. The allowable shear capacity for Method GB when used on both sides of a braced wall is 200plf (pounds per linear foot). The standard fastener schedule, Table R602.3(1), specifies 3-16d nails at 16" spacing for fastening the bottom plate of a braced wall panel on the interior of a dwelling to floor framing below (such as a raised floor system over a crawlspace or pier-and-beam foundation). This standard nailing provides a 200plf allowable capacity, as would many typical post-installed anchors (e.g. wedge or expansion anchors) that are short enough to be installed in just a slab-on-grade without the need for thickened footings, or even power-actuated fasteners. 1/2" diameter anchor bolts at 6-foot spacing are not necessary for the proper anchorage of these walls.

The proposed amendment provides an exception to the requirement that an interior wall that also used as part of a braced wall line be fastened to a slab-on-grade with anchor bolts, rather than other methods of making a "positive connection" such as wedge or expansion anchors, power fasteners, or concrete nails. The exception is limited to areas of low wind and low seismic hazards and to walls braced using gypsum board, with its lower allowable shear capacity.

Return to Residential

12. Air Leakage Rate Correction (Climate Zones 1-8)

This amendment modifies the requirement from 3 air changes per hour (ACH) to 5 ACH in climate zones 1-8.

Revise as follows:

N1102.4.1.2 (R402.4.1.2) Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding five air changes per hour in Climate Zones 1 ~~and 2, and three air changes per hour in Climate Zones 3~~ through 8. Testing shall be conducted in accordance with RESNET/ICC 380, ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

Table N1105.5.2 (1) [R405.5.2 (1)]
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Air exchange rate	Air leakage rate of 5 air changes per hour in Climate Zones 1 ~~and 2, and 3 air changes per hour in Climate Zones 3~~ through 8 at a pressure of 0.2 inches w.g (50 Pa). The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than 0.01 × *CFA* + 7.5 × (*Nbr* + 1) where: *CFA* = conditioned floor area *Nbr* = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.	For residences that are not tested, the same air leakage rate as the standard reference design. For tested residences, the measured air exchange rate[a]. The mechanical ventilation rated shall be in addition to the air leakage rate and shall be as proposed.

Footnotes remain unchanged

Reason:

Building tightness is an important part of an energy-efficient and comfortable house. However, 3 air changes (ACH) per hour at 50 Pascals is an extremely low target tightness, especially for smaller homes. The ASHRAE Handbook of Fundamentals shows that around 8% of U.S. homes achieve 3 ACH or less, 13% achieve 4 and less than 23% achieve 5. The proposed 5 ACH while still an aggressive tightness level will provide a tight, comfortable, energy-efficient home.

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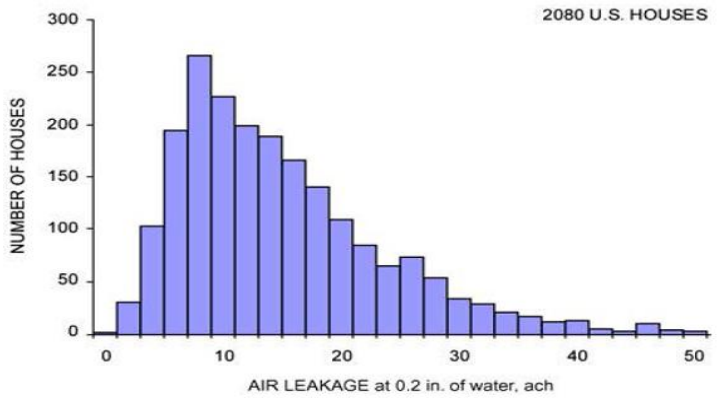

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13. Air Leakage Trade-Off

This amendment allows builders to trade improvements in other building energy components for less stringent building envelope pressure test results, provides flexibility in meeting the air-tightness requirements and provides options for recovering from an unexpected air-tightness test failure.

Revise as follows:

N1102.4 (R402.4) Air leakage ~~(Mandatory)~~. The building thermal envelope shall be constructed to limit air leakage in accordance with the requirements of Sections N1102.4.1 through N1102.4.4.

N1102.4.1 (R402.4.1) Building thermal envelope. The *building thermal envelope* shall comply with Sections N1102.4.1.1 and N1102.4.1.2. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.

N1102.4.1.1 (R402.4.1.1) Installation (Mandatory). The components of the *building thermal envelope* as listed in Table N1102.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table N1102.4.1.1, as applicable to the method of construction. Where required by the *code official*, an *approved* third party shall inspect all components and verify compliance.

N1102.4.1.2 (R402.4.1.2) Testing (Mandatory). The building or dwelling unit shall be tested ~~and verified as having an air leakage rate of not exceeding 5 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8~~ for air leakage. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*. During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weather stripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures;
3. Interior doors, if installed at the time of the test, shall be open;
4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling systems, if installed at the time of the test, shall be turned off; and
6. Supply and return registers, if installed at the time of the test, shall be fully open.

N1102.4.1.3 (R402.4.1.3) Leakage rate (Prescriptive). The building or dwelling unit shall have an air leakage rate not exceeding 5 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8, when tested in accordance with Section N1102.4.1.2.

Reason:

These modifications relocate the mandatory maximum air-tightness requirement and provide designers and builders the flexibility to trade off building tightness with other performance path measures when using the performance path. Currently the building tightness requirement is "mandatory" and the 3 and 5 ACH tightness levels, even under ideal circumstances, are very difficult to achieve. This amendment will provide energy neutral trade-offs, for expensive and sometimes unattainable requirements, by allowing other building improvements to be used to attain the same level of efficiency. This amendment does not change the stringency; it only increases its flexibility while achieving the required energy efficiency.

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14. Prescriptive Table Requirements

This amendment replaces 2018 IRC Chapter 11 Tables N1102.1.2 and N1102.1.4 with tables from the 2009 IRC Chapter 11.

Delete Table N1102.1.2 and Table N1102.1.4 in their entirety and replace with the following:

TABLE N1102.1.2 (R402.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	1.20	0.75	0.30	30	13	3 / 4	13	0	0	0
2	0.65[j]	0.75	0.30	30	13	4 / 6	13	0	0	0
3	0.50[j]	0.60	0.30	30	13	5 / 8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5 / 10	19	10/13	10, 2ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5[h]	13 / 17	30[g]	10/13	10, 2ft	10/13
6	0.35	0.60	NR	49	20 or 13+5[h]	15 / 19	30[g]	15/19	10, 4ft	10/13
7 and 8	0.35	0.60	NR	49	21	19 / 21	38[g]	15/19	10, 4ft	10/13

For SI: 1 foot = 304.8 mm.

a. R-values are minimums. U-factors and SHGC are maximums. R-19 batts compressed into a nominal 2 x 6 framing cavity such that the R-value is reduced by R-l or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.

b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

c. "15/19" means R-15 continuous insulated sheathing on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulated sheathing on the interior or exterior of the home. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

d. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Zones 1 through 3 for heated slabs.

e. There are no SHGC requirements in the Marine Zone.

f. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.

g. Or insulation sufficient to fill the framing cavity, R-19 minimum.

h. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

i. The second R-value applies when more than half the insulation is on the interior of the mass wall.

j . For impact rated fenestration complying with Section R301.2.1.2 of the *International Residential Code* or Section 1608.1.2 of the *International Building Code,* the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.

TABLE N1102.1.4 (R402.1.4) EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.75	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.65	0.65	0.035	0.082	0.141	0.047	0.360	0.136
4 except Marine	0.40	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.057	0.060	0.033	0.050	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.050	0.065

a. Non-fenestration U-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except Marine, and the same as the frame wall U-factor in Marine Zone 4 and Zones 5 through 8.
c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.

Reason:

The increased table values in the 2012 IECC and the 2015 IECC did not show justification for the cost increases from the 2009 IECC. Studies indicate nationally almost a $6,000 increase to the cost of constructing a single-family detached dwelling with a 13-year simple payback. With statistics showing that for every $1,000 increase to the cost of construction nearly 206,000 potential home buyers will not qualify for a mortgage. This, increase disqualifies approximately 1.3 million families from purchasing a home every year. That equates to approximately $24,000,000 in potential taxes revenues never being generated for municipalities.

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15. Basement Wall R-Value/U-Factor Reduction (Climate Zone 5)

This amendment reduces the basement wall R-Value requirement in Climate Zone 5 to a more reasonable R-value based on values that were acceptable to both NAHB and DOE in the 2009 IRC Chapter 11..

Revise as follows:

TABLE N1102.1.2 (R402.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGCb,[e]	CEILING R -VALUE	WOOD FRAME WALL R -VALUE	MASS WALL R -VALUEi	FLOOR R -VALUE	BASEMENT[c] WALL R -VALUE	SLAB[d] R -VALUE AND DEPTH	CRAWL SPACE[c] WALL R - VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	20 or 13+5h',i	8/13	19	5/13f	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5h,i	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5h,i	13/17	30g	10/13 ~~15/19~~	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10h',i	15/20	30g	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10h,i	19/21	38g	15/19	10, 4 ft	15/19

Footnotes remain unchanged

TABLE N1102.1.4 (R402.1.4) EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factorb	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	0.060	0.098	0.047	0.091c	0.136
4 except Marine	0.35	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.060	0.082	0.033	~~0.050~~ 0.059	0.055
6	0.32	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	0.045	0.057	0.028	0.050	0.055

Footnotes remain unchanged

Reason:

The prescriptive basement wall requirement increased from R-10 to R-15 in the 2012 IRC Chapter 11. Calculations used to justify the change were based on energy models, which had less sophisticated algorithms than Energy Plus, now the preferred modeling software for the Department of Energy (DOE). When using Energy Plus, the energy savings in a 700 square foot basement totaled $7/yr. in Chicago (Climate zone 5). The additional cost for this is conservatively estimated at $590. This makes the simple payback in excess of 84 years. This also will create a negative cash flow for the consumer. The values being modified by this amendment are the same as what was proposed by DOE in its proposal EC13 from the 2009 cycle. The excessive values currently in code were not submitted by DOE.

The energy modeling was done using the Energy Plus simulation engine and BEopt version 1.4, Cost

figures came from ASHRAE RP-1481.

Climate Zone	Representative City	Basement Wall R-Value Change	Energy Savings	Incremental Cost	Simple Payback
5	Chicago, IL	R-10->R-15	$7/yr	$590 ($0.82/ft2)	84 years

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16. Ceiling R-Value/U-Factor Reductions (climate zones 2-5)

This amendment reinstates the appropriate minimum ceiling R-Values in climate zones 2, 3, 4 and 5, those published in the 2009 IRC Chapter 11.

Revise as follows:

TABLE N1102.1.2 (R402.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b,e]	CEILING R -VALUE	WOOD FRAME WALL R -VALUE	MASS WALL R -VALUEi	FLOOR R -VALUE	BASEMENT[c] WALL R -VALUE	SLAB[d] R -VALUE AND DEPTH	CRAWL SPACE[c] WALL R - VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	~~38~~ 30	13	4/6	13	0	0	0
3	0.35	0.55	0.25	~~38~~ 30	20 or 13+5[h,i]	8/13	19	5/13f	0	5/13
4 except Marine	0.35	0.55	0.40	~~49~~ 38	20 or 13+5[h,i]	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	~~49~~ 38	20 or 13+5[h,i]	13/17	30[g]	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10[h,i]	15/20	30[g]	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10[h,i]	19/21	38[g]	15/19	10, 4 ft	15/19

Footnotes remain unchanged

TABLE N1102.1.4 (R402.1.4)
EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U- Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	~~0.030~~ 0.035	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	~~0.030~~ 0.035	0.060	0.098	0.047	0.091c	0.136
4 except Marine	0.35	0.55	~~0.026~~ 0.030	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	~~0.026~~ 0.030	0.060	0.082	0.033	0.050 0.059	0.055
6	0.32	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	0.045	0.057	0.028	0.050	0.055

Footnotes remain unchanged

Reason:

There were four changes in the Ceiling R-value requirements in the 2012 IECC, none of which are cost effective. An energy and cost analysis was performed to show that the simple paybacks are in the 80-130 year range.

Climate Zone	Representative City	Change	Energy Savings	Incremental Cost	Simple Payback
2	Orlando, FL	R-38->R-30	$10/yr	$1,305	130 years
3	Atlanta, GA	R-38->R-30	$16/yr	$1,305	82 years
4	Richmond, VA	R-49->R-38	$15/yr	$1,379	92 years
5	Indianapolis, IN	R-49->R-38	$15/yr	$1,379	92 years

The energy modeling was done using the Energy Plus simulation engine and BEopt version 1.4, Cost figures came from ASHRAE RP-1481. Vaulted or cathedralized ceiling are very problematic when trying to achieve R- 49, which is about 16 inches thick. This would require a rafter at least 17" tall (which does not exist) or an insulated panel, which represents a very small portion of the market.

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17. Wall R-Value/U-Factors Corrections (Climate Zone 3 & 4)

This amendment reinstates the appropriate minimum wall assembly R-Values/U-Factors in Climate Zone 3 & 4 published in the 2009 IRC Chapter 11.

Revise as follows:

TABLE N1102.1.2 (R402.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b,e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R -VALUE	BASEMENT[c] WALL R -VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R - VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	13 ~~20 or 13+5[h,i]~~	8/13	19	5/13f	0	5/13
4 except Marine	0.35	0.55	0.40	49	13 ~~20 or 13+5[h,i]~~	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5[h,i]	13/17	30g	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10[h,i]	15/20	30g	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10[h,i]	19/21	38[g]	15/19	10, 4 ft	15/19

Footnotes remain unchanged

TABLE N1102.1.4 (R402.1.4) EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	~~0.060~~ 0.84	0.098	0.047	0.091c	0.136
4 except Marine	0.35	0.55	0.026	~~0.060~~ 0.84	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.32	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	0.045	0.057	0.028	0.050	0.055

Reason:

Frame wall requirements in Climate Zone 3 changed from R-13 to R-20, which is not cost effective for the consumer.

Climate Zone	Representative City	Wall R-Value Change	Energy Savings	Incremental Cost	Simple Payback
3	Atlanta, GA	R-13->R-20	$50/yr.	$1,199	24 years
4	Richmond, VA	R-13->R-20	$59/yr.	S1,199	20 years

The energy modeling was done using the Energy Plus simulation engine and BEopt version 1.4, Cost figures came from ASHRAE RP-1481. Not only is the payback is extremely long, but for a consumer, there would be a negative cash flow based on the incremental cost and energy savings. The increase in the monthly mortgage would be $6.43 (@ 5%) and the average monthly energy savings would be $4.17 in zone 3 and $4.92 in zone 4 causing the home owner to pay more in additional monthly mortgage payments than the energy savings returns.

The values being modified by this amendment are the same as what was proposed by the Department of Energy in its proposal EC13 from the last cycle. The values currently adopted were an increase from proposals not submitted by the Department of Energy.

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18. Wall R-Value/U-Factors Corrections (Climate Zone 6-8)

This amendment reinstates the appropriate minimum wall assembly R-Values/U-Factors in climate zones 6, 7 & 8 published in the 2009 IRC Chapter 11.

Revise as follows:

TABLE N1102.1.2 (R402.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b,e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R -VALUE	BASEMENT[c] WALL R -VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R - VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	20 or 13+5[h,i]	8/13	19	5/13f	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5[h,i]	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5[h,i]	13/17	30g	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20 or 13+5[h,i] ~~20+5 or 13+10[h,i]~~	15/20	30g	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20 or 13+5[h,i] ~~20+5 or 13+10[h,i]~~	19/21	38[g]	15/19	10, 4 ft	15/19

TABLE N1102.1.4 (R402.1.4) EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	0.060	0.098	0.047	0.091c	0.136
4 except Marine	0.35	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.32	0.55	0.026	~~0.045~~ 0.060	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	~~0.045~~ 0.060	0.057	0.028	0.050	0.055

Footnotes remain unchanged

Reason:

The prescriptive wall requirement increased to R-20+R5 in climate zones 6, 7 and 8 of the 2012 IRC Chapter 11. The additional cost for this is estimated at $1,819 for 1,016 square feet of wall. This makes the simple payback between 26 and 55 years depending on the climate zone. This also will create a negative cash flow for the consumer in all cases.

Climate Zone	Representative City	Basement Wall R-Value Change	Energy Savings	Incremental Cost	Simple Payback
6	Minneapolis, MN	R-20->R-20+5	$33/yr	$1,819 ($1.79/ft2)	55 years
7	Bemidgi, MN	R-20->R-20+5	$41/yr	$1,819 ($1.79/ft2)	44 years
8	Fairbanks, AK	R-20->R-20+5	$71/yr	$1,819 ($1.79/ft2)	26 years

The energy modeling was done using the Energy Plus simulation engine and BEopt version 1.4, Cost figures came from ASHRAE RP-1481.

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19. Mechanical Equipment Trade-Off

This amendment reinstates the performance option in IRC Chapter 11 to reduce prescriptive requirements by installing HVAC equipment with higher energy-efficiency performance ratings than required by the code.

Revise as follows:

TABLEN1105.5.2 (1) (R405.5.2 (1))
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems [d,e]	~~As proposed for other than electric heating without a heat pump, Where the proposed design utilizes electric heating without a heat pump the standard reference design shall be an air source heat pump meeting the requirements of Section R403 of the IECC-Commercial Provisions.~~ Fuel type: same as proposed design Efficiencies: - Electric: air-source heat pump with prevailing federal minimum standards -Nonelectric furnaces: natural gas furnace with prevailing federal minimum standards -Nonelectric boilers: natural gas boiler with prevailing federal minimum standards -Capacity: sized in accordance with Section R403.6	~~As proposed~~ As proposed As proposed As proposed As proposed
Cooling systems [d, f]	~~As proposed~~ -Fuel type: Electric -Efficiency: in accordance with prevailing federal minimum standards -Capacity: sized in accordance with Section N1103.6	~~As proposed~~ As proposed As proposed As proposed
Service Water Heating [d,e,f,g]	~~As proposed~~ -Fuel type: same as proposed design -Efficiency: in accordance with prevailing federal minimum standards -Use: gal/day = 30 + 10 × N_{br} -Tank temperature: 120°F ~~-Use: same as proposed design~~	~~As proposed~~ As proposed As proposed Same as standard reference Same as standard reference ~~gal/day = 30 + (10 × N_{br})~~

Footnotes remain unchanged

Reason:

This amendment serves to retain energy-neutral equipment trade-off provisions from 2006 IRC Chapter 11 for heating systems, cooling systems, and service water heating. By retaining these, builders can optimize a code-compliant house design by using energy-efficient equipment. Quite often, the use of this high-efficiency equipment provides a more cost-effective solution to achieve code compliance. Eliminating this ability discourages the concept of the "house as a system" approach which is a cornerstone of building science.

Rejecting this amendment will create a disincentive to install state-of- the-art, energy-efficient equipment. It will increase the cost of construction by driving builders to often use less efficient equipment while increasing the cost of construction.

Significant improvements in the efficiency of HVAC and water heating equipment have been made in the

last 20 years. With the increased emphasis on new and improved technologies, this trend is expected to continue and will result in even higher energy savings in future years. If builders are forced to comply with the energy code by installing requirements which are not cost effective, there will be a resistance to install higher efficiency equipment. This could end up hurting energy efficiency in the long term: For instance, consumers in homes with non-condensing furnaces will be less likely to install a higher efficiency condensing replacement furnace because of the additional cost to run an exhaust vent.

Industries such as log home manufacturers may no longer be able to construct to projected higher envelope requirements. The combination of increases in envelope thermal requirements, building tightness and duct tightness combined with the elimination of energy-neutral trade-offs pose a serious threat to the viability of the log home industry. There are practical limitations to the thickness of log home walls, increases in log diameter have an exponential increase to the cost of logs, making log walls with a U-factor of 0.082 or lower prohibitively expensive.

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20. Rooms Containing Fuel Burning Appliances

This amendment removes the requirement to insulate, seal and separate from the thermal envelope the area surrounding fuel burning appliances.

Revise as follows:

Delete section and do not replace.

~~**N1102.4.4 (R402.4.4) Rooms containing fuel-burning appliances.** In Climate Zones 3 through 8, where open combustion air ducts provide combustion air to open combustion fuel burning appliances, the appliances and combustion air opening shall be located outside the building thermal envelope or enclosed in a room, isolated from inside the thermal envelope. Such rooms shall be sealed and insulated in accordance with the envelope requirements of Table R402.1.2, where the walls, floors and ceilings shall meet not less than the basement wall *R*-value requirement. The door into the room shall be fully gasketed and any water lines and ducts in the room insulated in accordance with Section R403. The combustion air duct shall be insulated where it passes through conditioned space to a minimum of R-8.~~

~~**Exceptions**:~~

~~1. Direct vent appliances with both intake and exhaust pipes installed continuous to the outside.~~
~~2. Fireplaces and stoves complying with Section R402.4.2 and Section R1006 of the *International Residential Code*.~~

Reason:

This was a new section to the 2015 IECC and has proven to be confusing and is being misinterpreted.

- *No data was shown verifying a problem existed*
- *No energy savings potential was shown.*
- *No cost data was provided to justify the increase to the cost of construction.*
- *A study done by Home Innovation Research Labs finds the cost of meeting this requirement would be $878 for a home with space heating or water heating equipment in the basement.*

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2018 International Energy Conservation Code

E1. Air Leakage Rate Correction (Climate Zones 1-8)

This amendment modifies the requirements from 3 air changes per hour (ACH) to 5 ACH in Climate Zones 1-8.

E2. Air Leakage Trade-Offs

This Amendment allows builders to trade improvements in other building energy components for less stringent building envelope pressure test results. This performance option provides flexibility in meeting the air tightness requirements and provides options for recovering from an unexpected air tightness test failure.

E3. Prescriptive Table Requirements

This amendment replaces 2015 IECC Tables R402.1.2 and R402.1.4 in the residential section of the 2015 with the following tables from the 2009 IECC.

E4. Basement Wall R-Value/U-Factors Reduction (Climate Zone 5)

This amendment reduces the basement wall insulation values requirements in Climate Zone 5, to a more reasonable R-Value/U-Factor based on values acceptable to both NAHB and DOE in the 2009 IECC.

E5. Ceiling R-Value/U-Factors Reduction (Climate Zones 2-5)

This amendment reinstates the appropriate minimum ceiling R-Values in climate zones 2, 3, 4 and 5, those published in the 2009 IECC.

E6. Wall R-Value/U-Factors Corrections (Climate Zone 3 & 4)

This amendment reinstates the appropriate minimum wall assembly R-Values/U-Factors in climate zones 3 & 4 published in the 2009 IECC.

E7. Wall R-Value/U-Factors Corrections (Climate Zones 6-8)

This amendment reinstates the appropriate minimum wall assembly R-Values/U-Factors in climate zones 6, 7 & 8 published in the 2009 IECC.

E8. Mechanical Equipment Trade-Off

This amendment reinstates the performance option to reduce prescriptive requirements by installing HVAC equipment with higher energy-efficiency performance ratings than required by code.

E9. Rooms Containing Fuel Burning Appliances

This amendment removes the requirement to insulate, seal and separate from the thermal envelope the area surrounding fuel burning appliances.

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E1. Air Leakage Rate Correction (climate zones 1-8)

This amendment modifies the requirements from 3 Air Changes per Hour (ACH) to 5 ACH in climate zones 1 through 8.

Revise as follows:

R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zones 1 ~~and 2, and three air changes per hour in Climate Zones 3~~ through 8. Testing shall be conducted in accordance with RESNET/ICC 380, ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

Table R405.5.2 (1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

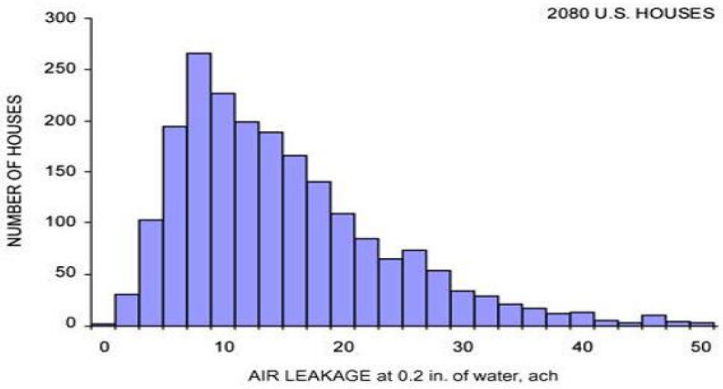
BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Air exchange rate	Air leakage rate of 5 air changes per hour in Climate Zones 1 ~~and 2, and 3 air changes per hour in Climate Zones 3~~ through 8 at a pressure of 0.2 inches w.g (50 Pa). The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than 0.01 × *CFA* + 7.5 × (*Nbr* + 1) where: *CFA* = conditioned floor area *Nbr* = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.	For residences that are not tested, the same air leakage rate as the standard reference design. For tested residences, the measured air exchange rate[a]. The mechanical ventilation rated shall be in addition to the air leakage rate and shall be as proposed.

Footnotes remain unchanged

Reason:

Building tightness is an important part of an energy-efficient and comfortable house. However, 3 air changes (ACH) per hour at 50 Pascals is an extremely low target tightness, especially for smaller homes. The ASHRAE Handbook of Fundamentals shows that around 8% of U.S. homes achieve 3 ACH or less, 13% achieve 4 and less than 23% achieve 5. The proposed 5 ACH while still an aggressive tightness level will provide a tight, comfortable, energy-efficient home.

2013 ASHRAE Handbook—Fundamentals



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E2. Air Leakage Trade-Offs

This Amendment allows builders to trade improvements in other building energy components for less stringent building envelope pressure test results. This performance option provides flexibility in meeting the air tightness requirements and provides options for recovering from an unexpected air tightness test failure.

Revise as follows:

R402.4 Air leakage ~~(Mandatory).~~ The building thermal envelope shall be constructed to limit air leakage in accordance with the requirements of Sections R402.4.1 through R402.4.4.

R402.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections R402.4.1.1 and R402.4.1.2. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.

R402.4.1.1 Installation (Mandatory). The components of the *building thermal envelope* as listed in Table R402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table R402.4.1.1, as applicable to the method of construction. Where required by the *code official*, an *approved* third party shall inspect all components and verify compliance.

R402.4.1.2 Testing (Mandatory). The building or dwelling unit shall be tested ~~and verified as having an air leakage rate of not exceeding 5 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8~~ for air leakage. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*. During testing:

7. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures;
8. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures;
9. Interior doors, if installed at the time of the test, shall be open;
10. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
11. Heating and cooling systems, if installed at the time of the test, shall be turned off; and
12. Supply and return registers, if installed at the time of the test, shall be fully open.

R402.4.1.3 Leakage rate (Prescriptive). The building or dwelling unit shall have an air leakage rate not exceeding 5 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8, when tested in accordance with Section R402.4.1.2.

Reason:

These modifications relocate the mandatory maximum air-tightness requirement and provide designers and builders the flexibility to trade off building tightness with other performance path measures when using the performance path. Currently the building tightness requirement is "mandatory" and the 3 and 5 ACH tightness levels, even under ideal circumstances, are very difficult to achieve. This amendment will provide energy neutral trade-offs, for expensive and sometimes unattainable requirements, by allowing other building improvements to be used to attain the same level of efficiency. This amendment does not change the stringency; it only increases its flexibility while achieving the required energy efficiency.

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E3. Prescriptive Table Requirements

This amendment replaces 2015 IECC Tables R402.1.2 and R402.1.4 in the residential section of the 2015 with the following tables from the 2009 IECC.

Revise as follows:

Delete Table 402.1.1 and Table 402.1.3 in their entirety and replace with the following:

TABLE R402.1.2
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	1.20	0.75	0.30	30	13	3 / 4	13	0	0	0
2	0.65[j]	0.75	0.30	30	13	4 / 6	13	0	0	0
3	0.50[j]	0.60	0.30	30	13	5 / 8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5 / 10	19	10/13	10, 2ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5[h]	13 / 17	30[g]	10/13	10, 2ft	10/13
6	0.35	0.60	NR	49	20 or 13+5[h]	15 / 19	30[g]	15/19	10, 4ft	10/13
7 and 8	0.35	0.60	NR	49	21	19 / 21	38[g]	15/19	10, 4ft	10/13

For SI: 1 foot = 304.8 mm.

a. R-values are minimums. U-factors and SHGC are maximums. R-19 batts compressed into a nominal 2 x 6 framing cavity such that the R-value is reduced by R-l or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.

b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

c. "15/19" means R-15 continuous insulated sheathing on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulated sheathing on the interior or exterior of the home. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

d. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Zones 1 through 3 for heated slabs.

e. There are no SHGC requirements in the Marine Zone.

f. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.

g. Or insulation sufficient to fill the framing cavity, R-19 minimum.

h. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

i. The second R-value applies when more than half the insulation is on the interior of the mass wall.

j . For impact rated fenestration complying with Section R301.2.1.2 of the *International Residential Code* or Section 1608.1.2 of the *International Building Code,* the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.

TABLE 402.1.4
EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.75	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.65	0.65	0.035	0.082	0.141	0.047	0.360	0.136
4 except Marine	0.40	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.057	0.060	0.033	0.050	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.050	0.065

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except Marine, and the same as the frame wall U-factor in Marine Zone 4 and Zones 5 through 8.
c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.
d. Foundation U-factor requirements shown in Table 402.1.3 include wall construction and interior air films but exclude soil conductivity and exterior air films. U-factors for determining code compliance in accordance with Section 402.1.4 (total *UA* alternative) of Section 405 (Simulated Performance Alternative) shall be modified to include soil conductivity and exterior air films.

Reason:

The increased table values in the 2012 IECC and the 2015 IECC did not show justification for the cost increases from the 2009 IECC. Studies indicate nationally almost a $6,000 increase to the cost of constructing a single-family detached dwelling with a 13-year simple payback. With statistics showing that for every $1,000 increase to the cost of construction nearly 206,000 potential home buyers will not qualify for a mortgage. This, increase disqualifies approximately 1.3 million families from purchasing a home every year. That equates to approximately $24,000,000 in potential taxes revenues never being generated for municipalities.

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E4. Basement Wall R-Value/U-Factors Reduction (Climate Zone 5)

This amendment reduces the basement wall insulation value requirements in Climate Zone 5, to a more reasonable R-Value/U-Factor based on values acceptable to both NAHB and DOE in the 2009 IECC.

Revise as follows:

TABLE R402.1.2
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b,e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R -VALUE	BASEMENT[c] WALL R -VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R - VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	20 or 13+5[h,i]	8/13	19	5/13f	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5[h,i]	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5[h,i]	13/17	30g	10/13 ~~15/19~~	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10[h,i]	15/20	30g	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10[h,i]	19/21	38[g]	15/19	10, 4 ft	15/19

TABLE R402.1.4 EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	0.060	0.098	0.047	0.091c	0.136
4 except Marine	0.35	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.060	0.082	0.033	0.059 ~~0.050~~	0.055
6	0.32	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	0.045	0.057	0.028	0.050	0.055

Footnotes remain unchanged

Reason:

The prescriptive basement wall requirement increased from R-10 to R-15 in the 2012 IECC. Calculations used to justify the change were based on energy models with less sophisticated algorithms than Energy Plus, now DOE's preferred modeling software. When using Energy Plus, the energy savings in a 700-square-foot basement totaled $7 a year in Chicago (Climate Zone 5). The additional cost for this is conservatively estimated at $590. This makes the simple payback in excess of 84 years. The values being modified by this proposal are the same as those that DOE proposed in EC13 during the last code cycle. The values currently adopted were an increase from proposals not submitted by DOE.

Climate Zone	Representative City	Basement Wall R-Value Change	Energy Savings	Incremental Cost	Simple Payback
5	Chicago, IL	R-10->R-15	$7/yr	$590 ($0.82/ft2)	84 years

The energy modeling was done using the Energy Plus simulation engine and BEopt version 1.4, Cost figures came from ASHRAE RP-1481.

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E5. Ceiling R-Value/U-Factors Reduction (Climate Zones 2-5)

This amendment reinstates the appropriate minimum ceiling R-Values in climate zones 2, 3, 4 and 5, those published in the 2009 IRC Chapter 11.

Revise as follows:

Footnotes remain unchanged

TABLE R402.1.2
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b,e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R -VALUE	BASEMENT[c] WALL R -VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R - VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	~~38~~ 30	13	4/6	13	0	0	0
3	0.35	0.55	0.25	~~38~~ 30	20 or 13+5[h,i]	8/13	19	5/13f	0	5/13
4 except Marine	0.35	0.55	0.40	~~49~~ 38	20 or 13+5[h,i]	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	~~49~~ 38	20 or 13+5[h,i]	13/17	30[g]	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10[h,i]	15/20	30[g]	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10[h,i]	19/21	38[g]	15/19	10, 4 ft	15/19

TABLE R402.1.4 EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	~~0.030~~ 0.035	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	~~0.030~~ 0.035	0.060	0.098	0.047	0.091c	0.136
4 except Marine	0.35	0.55	~~0.026~~ 0.030	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	~~0.026~~ 0.030	0.060	0.082	0.033	0.050	0.055
6	0.32	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	0.045	0.057	0.028	0.050	0.055

Footnotes remain unchanged

Reason:

There were four changes in the Ceiling R-value requirements in the 2012 IECC, none of which should have been considered cost effective. An energy and cost analysis was performed to show that the simple paybacks are in the 80-130 year range.

Climate Zone	Representative City	Change	Energy Savings	Incremental Cost	Simple Payback
2	Orlando, FL	R-38->R-30	$10/yr	$1,305	130 years
3	Atlanta, GA	R-38->R-30	$16/yr	$1,305	82 years
4	Richmond, VA	R-49->R-38	$15/yr	$1,379	92 years
5	Indianapolis, IN	R-49->R-38	$15/yr	$1,379	92 years

The energy modeling was done using the Energy Plus simulation engine and BEopt version 1.4, Cost figures came from ASHRAE RP-1481. Vaulted or cathedral ceiling are very problematic when trying to achieve R-49, which is about 16 inches thick. This would require a rafter at least 17" tall (which does not exist) or an insulated panel, which represents a very small portion of the market.

Return to IECC

E6. Wall R-Value/U-Factors Corrections (Climate Zone 3 & 4)

This amendment reinstates the appropriate minimum wall assembly R-Values/U-Factors in climate zone 3 & 4 published in the 2009 IECC.

Revise as follows:

TABLE R402.1.2

INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENTa

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b,e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R -VALUE	BASEMENT[c] WALL R -VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R - VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	~~20 or 13+5[h,i]~~ 13[i]	8/13	19	5/13f	0	5/13
4 except Marine	0.35	0.55	0.40	49	~~20 or 13+5[h,i]~~ 13	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5[h,i]	13/17	30g	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10[h,i]	15/20	30g	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10[h,i]	19/21	38[g]	15/19	10, 4 ft	15/19

TABLE R402.1.4 EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	~~0.060~~ 0.84	0.098	0.047	0.091c	0.136
4 except Marine	0.35	0.55	0.026	~~0.060~~ 0.84	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.32	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	0.045	0.057	0.028	0.050	0.055

Footnotes remain unchanged

Reason:

Frame wall requirements in Climate Zone 3 changed from R-13 to R-20, which was, is not cost effective for the consumer.

Climate Zone	Representative City	Wall R-Value Change	Energy Savings	Incremental Cost	Simple Payback
3	Atlanta, GA	R-13->R-20	$50/yr	$1,199	24 years
4	Richmond, VA	R-13->R-20	$59/yr	S1,199	20 years

The energy modeling was done using the Energy Plus simulation engine and BEopt version 1.4, Cost figures came from ASHRAE RP-1481. Not only is the payback is extremely long, but for a consumer, there would be a negative cash flow based on the incremental cost and energy savings. The increase in the monthly mortgage would be $6.43 (@ 5%) and the average monthly energy savings would be $4.17 in Zone 3 and $4.92 in Zone 4 causing the home owner to pay more in additional monthly mortgage payments than the energy savings returns.

The values being modified by this proposal are the same as what DOE proposed in its EC13 during the 2009 code cycle. The values currently adopted were an increase from proposals not submitted by DOE.

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E7. Wall R-Value/U-Factors Corrections (Climate Zones 6-8)

This amendment reinstates the appropriate minimum wall assembly R-Values/U-Factors in climate zones 6, 7 & 8 published in the 2009 IRC Chapter 11.

Revise as follows:

TABLE R402.1.2
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b,e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R -VALUE	BASEMENT[c] WALL R -VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R - VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	20 or 13+5[h,i]	8/13	19	5/13f	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5[h,i]	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5[h,i]	13/17	30[g]	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20 or 13+5h,i ~~20+5 or 13+10h,i~~	15/20	30[g]	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20 or 13+5h,i ~~20+5 or 13+10h,i~~	19/21	38[g]	15/19	10, 4 ft	15/19

Footnotes remain unchanged

TABLE R402.1.4 EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	0.060	0.098	0.047	0.091c	0.136
4 except Marine	0.35	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.32	0.55	0.026	~~0.048~~ 0.057	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	~~0.048~~ 0.057	0.057	0.028	0.050	0.055

Footnotes remain unchanged

Reason:

The prescriptive wall requirement increased to R-20+R5 in climate zones 6, 7 and 8 in the 2012 IECC. The additional cost for this is estimated at $1,819 for 1,016 square feet of wall. This makes the simple payback between 26 and 55 years depending on the climate zone. This also will create a negative cash flow for the consumer in all cases.

Climate Zone	Representative City	Basement Wall R-Value Change	Energy Savings	Incremental Cost	Simple Payback
6	Minneapolis, MN	R-20->R-20+5	$33/yr	$1,819 ($1.79/ft2)	55 years
7	Bemidgi, MN	R-20->R-20+5	$41/yr	$1,819 ($1.79/ft2)	44 years
8	Fairbanks, AK	R-20->R-20+5	$71/yr	$1,819 ($1.79/ft2)	26 years

The energy modeling was done using the Energy Plus simulation engine and BEopt version 1.4, Cost figures came from ASHRAE RP-1481.

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E8. Mechanical Equipment Trade-Off

This amendment reinstates the performance option to reduce prescriptive requirements by installing HVAC equipment with higher energy-efficiency performance ratings than required by the code.

Revise as follows:

TABLE R405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems [d, e]	~~As proposed for other than electric heating without a heat pump. Where the proposed design utilizes electric heating without a heat pump the standard reference design shall be an air source heat pump meeting the requirements of Section R403 of the IECC-Commercial Provisions.~~ Fuel type: same as proposed design Efficiencies: Electric: air-source heat pump with prevailing federal minimum standards Nonelectric furnaces: natural gas furnace with prevailing federal minimum standards Nonelectric boilers: natural gas boiler with prevailing federal minimum standards Capacity: sized in accordance with Section R403.6	~~As proposed~~ As proposed As proposed As proposed As proposed
Cooling systems [d, e]	~~As proposed~~ Fuel type: Electric Efficiency: in accordance with prevailing federal minimum standards Capacity: sized in accordance with Section R403,6	~~As proposed~~ As proposed As proposed
Service Water Heating [d, e, f, g]	~~As proposed~~ Fuel type: same as proposed design Efficiency: in accordance with prevailing federal minimum standards Use: gal/day = 30 + 10 × *Nbr* Tank temperature: 120°F ~~Use: same as proposed design~~	~~As proposed~~ As proposed Same as standard reference Same as standard reference ~~gal/day = 30 + (10 × *Nbr)*~~

Footnotes remain unchanged

Reason:

This amendment serves to retain energy-neutral equipment trade-off provisions from the 2006 IECC for heating and cooling systems and service water heating. By retaining these, builders have an opportunity to optimize a code-compliant house design by using energy-efficient equipment. Quite often, the use of this high-efficiency equipment provides a more cost-effective solution to achieve code compliance. Eliminating this ability discourages the concept of the "house as a system" approach, which is a cornerstone of building science.

Rejecting this amendment will reduce any incentive to install state-of- the-art, energy-efficient

equipment. It will increase the cost of construction by driving builders to often use less efficient equipment.

Significant improvements in the efficiency of HVAC and water heating equipment have been made in the last 20 years. With the increased emphasis on new and improved technologies, this trend is expected to continue and will result in even higher energy savings in future years. If builders are forced to comply with the energy code by installing requirements which are not cost-effective, there will be a resistance to install higher efficiency equipment. This could end up hurting energy efficiency in the long term, consumers which have non-condensing furnaces will be less likely to install a higher efficiency condensing replacement furnace because of the additional cost to run an exhaust vent.

Industries such as log home manufacturers may no longer be able to construct to projected higher envelope requirements. The combination of increases in envelope thermal requirements, building tightness and duct tightness combined with the elimination of energy neutral trade-offs pose a serious threat to the viability of the log home industry. There are practical limitations to the thickness of log home walls. Increasing requirements for the log diameter has a exponential increase in the cost of the logs, making log walls with a U- factor of 0.082 or lower prohibitively expensive

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E9. Rooms Containing Fuel Burning Appliances

This amendment removes the requirement to insulate, seal and separate from the thermal envelope the area surrounding fuel burning appliances.

Revise as follows:

Delete section and do not replace.

~~**R402.4.4 (N1102.4.4) Rooms containing fuel-burning appliances.** In Climate Zones 3 through 8, where open combustion air ducts provide combustion air to open combustion fuel burning appliances, the appliances and combustion air opening shall be located outside the building thermal envelope or enclosed in a room, isolated from inside the thermal envelope. Such rooms shall be sealed and insulated in accordance with the envelope requirements of Table R402.1.2, where the walls, floors and ceilings shall meet not less than the basement wall *R*-value requirement. The door into the room shall be fully gasketed and any water lines and ducts in the room insulated in accordance with Section R403. The combustion air duct shall be insulated where it passes through conditioned space to a minimum of R-8.~~

~~**Exceptions**:~~

~~1. Direct vent appliances with both intake and exhaust pipes installed continuous to the outside.~~
~~2. Fireplaces and stoves complying with Section R402.4.2 and Section R1006 of the *International Residential Code*.~~

Reason:

This was a new section to the 2015 IECC and has proven to be confusing and is being misinterpreted.

- *No data was shown verifying a problem existed*
- *No energy savings potential was shown.*
- *No cost data was provided to justify the increase to the cost of construction.*
- *A study done by Home Innovation Research Labs finds the cost of meeting this requirement would be $878 for a home with space heating or water heating equipment in the basement.*

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2018 International Building Code

B1. Canopies and Marquees

This amendment removes the requirement to design a multifamily building canopy with a flat or low-slope top surface using the higher live load associated with a marquee where such canopies cannot be accessed from a window or door above the canopy.

B2 Deck and Balcony Loads

This amendment restores the deck live load for one- and two-family dwellings in the IBC to 40 psf, matching the IRC. This will maintain consistency for dwellings designed under either code, and allow the use of commonly-accepted prescriptive tables and details such as those in the American Wood Council's *DCA 6 – Prescriptive Residential Wood Deck Construction Guide*.

B3. Emergency Elevator Communication Systems

This amendment limits the requirements for emergency elevator communication systems for the deaf, hard of hearing and speech impaired to elevators designated for public use.

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B1. Canopies and Marquees

This amendment removes the requirement to design a multifamily building canopy with a flat or low-slope top surface using the higher live load associated with a marquee where such canopies cannot be accessed from a window or door above the canopy.

Revise as follows:

MARQUEE. A canopy that is supported entirely by a building, is constructed of noncombustible materials, and has a top surface which is sloped less than 25 degrees from the horizontal ~~and is located less than 10 feet (3.05 m) from operable openings above or adjacent to the level of the marquee~~.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS[g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
21. Marquees~~, except one- and two-family dwellings~~	75	—
25. Residential		
One- and two-family dwellings		
Uninhabitable attics without storage[i]	10	
Uninhabitable attics with storage [i, j, k]	20	
Habitable attics and sleeping areas[k]	30	
Canopies~~, including marquees~~	20	
All other areas	40	
Hotels and multifamily dwellings		
Private rooms and corridors serving them	40	
Public rooms[m] and corridors serving them	100	
26. Roofs		
All roof surfaces subject to maintenance workers		300
Awnings and canopies:		
Fabric construction supported by a skeleton structure	5 Nonreducible	
All other construction, except one- and two-family dwellings and occupiable canopies	20	
Ordinary flat, pitched, and curved roofs (that are not occupiable)	20	
Where primary roof members are exposed to a work floor, at single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs:		
Over manufacturing, storage warehouses, and repair garages		2,000
All other primary roof members		300
Occupiable roofs:		
Roof gardens	100	
Assembly areas	100[m]	
Canopies	75[n]	
All other similar areas	Note l	Note l

n. An occupiable canopy is a canopy that has a top surface which is sloped less than 25 degrees from the horizontal and is located less than 10 feet (3.05 m) from operable openings above or adjacent to the level of the canopy.

Reason:

This amendment revises the 2015 IBC language regarding canopies and marquees. Language approved initially for the 2012 IBC substantially changed the design requirements for many small

porch and patio roofs or canopies on residential buildings, particularly those located nowhere near public streets. Prior to the 2012 IBC, these roofs were designed for standard roof live loads or local ground snow loads (typically in the range of 20 or 30 pounds per square foot). These elements are now required to be designed for 75psf if they happen to be less than 10 feet vertically from a window above or horizontally from a window at the level of the canopy. This represents a substantial increase in design requirements for apartment or condominium complexes with these elements, as well as a substantial issue for renovations. An NAHB proposal amended the 2015 IBC to restore the traditional 20psf roof live load requirement for porches, patios, or canopies on one- and two-family dwellings, but the issue remains for multifamily buildings.

This amendment makes two key changes. First, it revises the definition of a marquee to reflect the specific construction requirements provided in Section 3106.5. This fixes a conflict that was introduced when the longstanding definition of a "marquee" (an element generally associated with theaters) was amended to include elements that had previously been considered "canopies." Second, it adds a line item under "occupiable roofs" for canopies and establishes a 75psf live load requirement for a canopy that could be considered an "occupiable roof." As described in the new Footnote n, this would be a canopy with a flat or low-slope top surface which can be accessed from an operable window or other opening that is less than 10 feet above the top surface of the canopy or within 10 feet of either end of the canopy. These changes preserve the intent of what the National Council of Structural Engineering Associations' (NCSEA) Code Advisory Committee was trying to achieve – requiring a higher live load for a canopy that could be used as a means of egress or otherwise accessed by building occupants – without applying the term "marquee" to an element that most code users, not to mention the average person on the street, would call a "canopy". These changes would also remove the 75psf requirement from flat or low-slope canopies on multifamily buildings as long as they are not accessible as noted above.

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B2. Deck and Balcony Loads

This amendment restores the deck live load for one- and two-family dwellings in the IBC to 40 psf, matching the IRC. This will maintain consistency for dwellings designed under either code, and allow the use of commonly-accepted prescriptive tables and details such as those in the American Wood Council's DCA 6 – Prescriptive Residential Wood Deck Construction Guide.

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS[g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
5. Decks and balconies, except one- and two-family dwellings[h]	1.5 times the live load for the area served, not required to exceed 100	—
25. Residential		
One- and two-family dwellings		
Uninhabitable attics without storage[i]	10	
Uninhabitable attics with storage [i, j, k]	20	
Habitable attics and sleeping areas[k]	30	
Canopies, including marquees	20	
Decks and balconies[h]	40	
All other areas	40	
Hotels and multifamily dwellings		
Private rooms and corridors serving them	40	
Public rooms[m] and corridors serving them	100	

Reason:

During the 2006/2007 code cycle, changes were approved for the IBC and IRC that removed separate loads for decks and balconies. Prior to the changes, decks were required to support a live load of 40 pounds per square foot and balconies a live load of 60 pounds per square foot. The difference was generally attributed to the frequent use of cantilevered construction for balconies. In the course of aligning the requirements, the IRC settled on 40 pounds per square foot for both decks and balconies, while the IBC required the load to match the occupancy served. For residential buildings, this was effectively 40 pounds per square foot; for office buildings, schools and other IBC occupancies this could be up to 100 pounds per square foot.

When a similar alignment was attempted in ASCE 7, the committee balked at reducing the balcony live load and chose to establish a load of 1.5 times the occupancy served. This restored residential balcony loads to 60 pounds per square foot but increased decks to the

same load. No evidence was presented to or brought forward by the committee showing that 40 pounds per square foot was inadequate for decks attached to one- and two-family dwellings, and changes in deck ledger attachments requiring the use of lag bolts or through-bolts instead of nails have addressed the most common issue leading to deck failures.

In the 2018 edition of the IBC, the live load table was amended to match ASCE 7 (proposal S85-16). No attempt was made to separate out one- and two-family dwellings to keep them consistent with the IRC, which has maintained the 40 pound per square foot requirement. In fact, three proposals to amend the IRC (RB26, RB27 and RB190) were all disapproved. Neither the ASCE 7 committee (mostly made up of engineers specializing in high-rise buildings, stadiums, industrial facilities and other large structures) nor the IBC-Structural committee has chosen to recognize the lower risk associated with one- and two-family dwellings or the evolution in deck construction practices which have addressed the most significant contribution to deck failures.

This amendment restores a 40 pound per square foot live load for decks and balconies associated with one- and two-family dwellings built under the IBC. This will maintain consistency between the IBC and IRC, allowing the same plan to be constructed under either code with minimal revisions. This will also permit engineers and builders to make use of recognized prescriptive design tables and details such as those in the American Wood Council's "DCA 6 – Prescriptive Residential Wood Deck Construction Guide", which are based on a 40 pound per square foot live load.

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B3. Emergency Elevator Communication Systems

This amendment limits the requirements for emergency elevator communication systems for the deaf, hard of hearing and speech impaired to elevators designated for public use.

Revise as follows:

3001.2 Emergency elevator communication systems for the deaf, hard of hearing and speech impaired.
An emergency two-way communication system shall be provided that:

1. Is a visual and text-based and a video-based 24/7 live interactive system.
2. Is fully accessible by the deaf, hard of hearing and speech impaired, and shall include voice-only options for hearing individuals.
3. Has the ability to communicate with emergency personnel utilizing existing video conferencing technology, chat/text software or other approved technology.

Exception: An emergency elevator communication system for the deaf, hard of hearing and speech impaired is not required in elevators not designated for public use.

Reason:

The requirement for emergency elevator communication systems for the deaf, hard of hearing and speech impaired was added to the IBC for the 2018 edition. However, the new language applies to every elevator in a building, not just elevators that serve accessible means of egress or are available to the public. There are no exceptions for service or freight elevators or private residence elevators. This exceeds the current ICC A117.1 accessibility standard, ADA and the Fair Housing Act and goes well beyond the requirement for two-way communication systems in elevator lobbies per IBC Section 1009.8.

There are also no ASTM or other consensus standards for this technology to insure consistent enforcement of this code requirement. The open-ended nature of what constitutes a code-compliant system is problematic, and owners may be required to install equipment that is more or less than what was intended by this code change.

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2018 International Fire Code

F1. Scoping of the International Fire Code

This amendment removes language that would apply the provisions of the International Fire Code on one- and two-family dwellings that are constructed using the International Residential Code.

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F1. Scoping of the International Fire Code

This amendment removes language that would apply the provisions of the International Fire Code on one- and two-family dwellings that are constructed using the International Residential Code.

Revise as follows:

IFC [A] 102.5 Application of residential code. Where structures are designed and constructed in accordance with the International Residential Code, the provisions of this code shall apply as follows:

1. Construction and design provisions: Provisions of this code pertaining to the exterior of the structure shall apply including, but not limited to, premises identification, fire apparatus access and water supplies. ~~Where interior or exterior systems or devices are installed, construction permits required by Section 105.7 of this code shall also apply~~.
2. Administrative, and operational ~~and maintenance~~ provisions: All such provisions of this code shall apply.

Reason:

This amendment addresses some of the controversy that has risen since the language was added to the code. One of the significant problems is found in the last sentence of the first application, regarding the construction permits required by section 105.7. All of the required construction permits that would apply to these types of structures, as indicated in this section, are already addressed within the scope of the IRC. The concept of the IRC being a single-source construction code is specifically stated within the commentary to R101.1, which says the intent of the IRC is to be a "stand-alone residential code that establishes minimum regulations for one- and two-family dwellings and townhouses." The IFC commentary to 102.5 further emphasizes this concept by stating "The IRC is designed and intended for use as a stand-alone code for the construction of detached one- and two-family dwellings and townhouses not more than three stories in height". As such, the construction of detached one- and two-family dwellings and townhouses is regulated exclusively by the IRC and not subject to the provision of any other I-Codes, other than to the extent specifically referenced. The intent of providing a stand-alone residential code is that there is no need for duplicative construction or permitting requirements within the I-Codes that would require a builder or home owner to get separate permits under the IRC and IFC for the same scope of work. Approval of this amendment will ensure the intent of the IRC scope, as a stand-alone construction document, is maintained while ensuring that the exterior fire protection features are still regulated under the scope of the IFC.

Another problem with the current language is the reference to all maintenance requirements of the IFC for IRC constructed structures. Prior to the approval of the model code language, there was no specific provision in the IFC that required maintenance for IRC structures in accordance with the IFC. If maintenance provisions apply, it raises the question: Is the fire service truly planning on enforcing the maintenance provisions in the IFC for fire alarm systems and carbon monoxide detectors in single family homes? And if so, how? In many states, once a one- and two-family dwelling or townhouse receives its certificate of occupancy there is no more involvement with the building official. The IFC states that it is the fire official's responsibility to ensure existing buildings meet the requirements of this code and that all buildings are maintained in accordance with its provisions. How many departments have requested entry to ensure that every existing one- and two-family dwelling is equipped with a carbon monoxide detector as required by the IFC? The current language of the IFC leaves the fire service open to liability if they are not enforcing the provisions of this code as it is written and adopted. Although some of the referenced standards in the IFC do not require maintenance on some of the systems in one- and two-family dwellings or townhouses, the inference is that maintenance is required if the term "maintenance" remains in Item 2 under Section 102.5.

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