

# 2015 International Residential Code Errata

(Portions of text and tables not shown are unaffected by the errata)

Applicable to the 1<sup>st</sup> PRINTING (This Errata Posted: December 16, 2015)

## Chapter 11 ENERGY EFFICIENCY

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

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Vertical fenestration other than opaque doors	Total area $\sum A_g =$ (a) The proposed glazing area, where the proposed glazing area is less than 15 percent of the conditioned floor area (b) 15 percent of the conditioned floor area, where the proposed glazing area is 15 percent or more of the conditioned floor area	As proposed
	Orientation: equally distributed to four cardinal compass orientations (N, E, S & W).	As proposed
	U-factor: as specified in Table R402.1.4	As proposed
	SHGC: as specified in Table R402.1.2 except that for climates with no requirement (NR) SHGC = 0.40 shall be used.	As proposed
	Interior shade fraction: 0.92-(0.21 × SHGC for the standard reference design)	0.92-(0.21 × SHGC as proposed)
	External shading: none	As proposed

(Notes a-g are unchanged)

h. For residences with conditioned basements, R-2 and R-4 residences and townhouses, the following formula shall be used to determine glazing area:

$$AF = A_s \times FA \times F$$

where:

AF = Total glazing area.

A<sub>s</sub> = Standard reference design total glazing area.

FA = (Above-grade thermal boundary gross wall area)/(above-grade boundary wall area + 0.5 × below-grade boundary wall area).

F = (Above-grade thermal boundary wall area)/(above-grade thermal boundary wall area + common wall area) or 0.56, whichever is greater.

and where:

Thermal boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.

Above-grade thermal boundary wall is any thermal boundary wall component not in contact with soil.

Below-grade boundary wall is any thermal boundary wall in soil contact.

Common wall area is the area of walls shared with an adjoining dwelling unit.

L and CFA are in the same units.

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(Portions of text and tables not shown are unaffected by the errata)

Applicable to the 1<sup>st</sup> PRINTING ( This Errata Posted: December 15, 2015)

## Chapter 11 ENERGY EFFICIENCY

### N1101.6 (R202) Defined terms.

~~**HISTORIC BUILDING.** Buildings that are listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law.~~

**HISTORIC BUILDING.** Any building or structure that is one or more of the following:

1. Listed, or certified as eligible for listing by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.
2. Designated as historic under an applicable state or local law.
3. Certified as a contributing resource within a National Register-listed, state-designated or locally designated historic district.

### N1103.3.3 (R403.3.3) Duct testing (Mandatory). Ducts shall be pressure tested...

1. Rough-in test: .....
2. Post construction test: .....

*(Indent position of exception is moved to the left to the position shown below)*

**Exception:** A duct air leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope.

A written report of the results of the test shall be signed by the party conducting the test and provided to the code official.

**N1103.5 (R403.5) Service hot water systems.** Energy conservation measures for service hot water systems shall be in accordance with Sections N1103.5.1 ~~and~~ through N1103.5.4.

**N1106.7.1 (R406.7.1) Minimum capabilities.** Calculation procedures used to comply with this section shall be software tools capable of calculating the ERI as described in Section R406.3, and shall include the following capabilities:

1. Computer generation of the *ERI reference design* using only the input for the *rated design*.

*(Indent position of the following text is moved to the right to the position as shown below)*

The calculation procedure shall not allow the user to directly modify the building component characteristics of the *ERI reference design*.

2. Calculation of whole building.....
3. Calculations that account....
4. Printed *code official* inspection....

**N1109.1.1.1 (R503.1.1.1) Replacement Fenestration.** Where.....Table ~~N1102.1.4~~ N1102.1.2.

# 2015 International Residential Code Errata

(Portions of text and tables not shown are unaffected by the errata)

Applicable to the 1<sup>st</sup> PRINTING ( This Errata Posted: August 13, 2015)

## Chapter 11 ENERGY EFFICIENCY

**N1106.2 (R406.2) Mandatory requirements.** Compliance with this section requires that the mandatory provisions identified in Sections N1101.13 through N1104 identified as “mandatory” and Section N1103.5.3 be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table 402.1.2 1 or ~~402.1.4~~ 402.1.3 of the 2009 *International Energy Conservation Code*.

**Exception:** Supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6.

# 2015 International Residential Code Errata

(Portions of text and tables not shown are unaffected by the errata)

Applicable to the 1 <sup>st</sup> PRINTING ( This Errata Posted: July 13, 2015)
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## CHAPTER 11 ENERGY EFFICIENCY

**N1102.3 (R402.3) Fenestration (Prescriptive).** In addition to the requirements of Section N1102, fenestration shall comply with Sections N1102.3.1 through ~~N1102.4.5~~ N1102.3.5.

**N1108.1.1.1 (R502.1.1.1) Building envelope.** New building envelope assemblies that are part of the addition shall comply with Sections.....

**Exception:** Where nonconditioned space is changed to conditioned space, the building envelope of the addition shall comply where the UA, as determined in Section ~~N1102.1.4~~ ~~N1102.1.5~~, of the existing.....

**N1109.1.1 (R503.1.1) Building envelope.** Building envelope assemblies that are part of the alteration shall comply with Section N1102 or N1102.1.4. Sections N1102.2.1 through N1102.2.~~4.2~~ 13, N1102.3.1, N1102.3.2, N1102.4.3 and ~~N1102.4.4~~ N1102.4.5.

# 2015 International Residential Code Errata

(Portions of text and tables not shown are unaffected by the errata)

<b>Applicable to the 1<sup>st</sup> PRINTING (June 17, 2015)</b>
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## CHAPTER 11 ENERGY EFFICIENCY

**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 ~~R-N~~1102.4.1 through ~~R1102.4.4~~ N1102.4.5.

# 2015 International Residential Code Errata

(Portions of text and tables not shown are unaffected by the errata)

1<sup>st</sup> PRINTING ( THIS ERRATA POSTED: May 29<sup>th</sup>, 2015)

## CHAPTER 11 ENERGY EFFICIENCY

**N1106.2 (R406.2) Mandatory requirements.** Compliance with this section requires that the mandatory provisions identified in Sections N1101.2 **13 through N1104 identified as "mandatory" and Section** N1103.5.3 be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table 402.1.2 or 402.1.4 of the 2009 *International Energy Conservation Code*.

**Exception:** Supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of  
R-6.

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(Portions of text and tables not shown are unaffected by the errata)

## 1<sup>st</sup> PRINTING (10-30-14)

**N1101.13.1 (R401.2.1) Tropical zone.** *Residential buildings* in the tropical zone at elevations below 2,400 feet (731.5 m) above sea level shall be deemed to comply with this chapter where the following conditions are met:

1. Not more than one-half of the *occupied* space is air conditioned.
2. The *occupied* space is not heated.
3. Solar, wind or other renewable energy source supplies not less than 80 percent of the energy for service water heating.
4. Glazing in *conditioned* space has a *solar heat gain coefficient* of less than or equal to 0.40, or has an overhang with a projection factor equal to or greater than 0.30.
5. Permanently installed lighting is in accordance with Section N1104.
6. The exterior roof surface complies with one of the options in Table C402.2.1.1 of the *International Energy Conservation Code*, or the roof/ceiling has insulation with an *R*-value of R-15 or greater. If present, attics above the insulation are vented and attics below the insulation are unvented.
7. Roof surfaces have a minimum slope of  $\frac{1}{4}$  inch (6.4 mm) per foot of run. The finished roof does not have water accumulation areas.
8. Operable fenestration provides ventilation area equal to not less than 14 percent of the floor area in each room. Alternatively, equivalent ventilation is provided by a ventilation fan.
9. Bedrooms with exterior walls facing two different directions have operable fenestration on exterior walls facing two directions.
10. Interior doors to bedrooms are capable of being secured in the open position.
11. A ceiling fan or ceiling fan rough-in is provided for bedrooms and the largest space that is not used as a bedroom.

**N1103.5.3 (R403.5.3) Hot water pipe insulation (prescriptive). ...**

1. – 5. ....

6. Buried in piping.

(Remainder of items unchanged)

**N1103.10 (R403.10) Pools and permanent spa energy consumption (Mandatory).** The energy consumption of pools and permanent spas shall be in accordance with Sections N1103.10.1 through N1103.10.3.

~~**N1103.10.1 (R403.10.1) Residential pools and permanent residential spas.** Swimming pools and permanent spas that are accessory to detached one- and two-family dwellings and townhouses three stories or less in height above grade plane and that are available only to the household and its guests shall be in accordance with APSP-145.~~

**N1103.10.1 (R403.10.1) Heaters.** The electric power to heaters shall be controlled by a readily accessible on-off switch that is an integral part of the heater mounted on the exterior of the heater, or external to and within 3 feet (914 mm) of the heater. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with continuously burning ignition pilots.

**N1103.10.2 (R403.10.2) Time switches.** Time switches or other control methods that can automatically turn off and on according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that have built-in time switches shall be in compliance with this section.

**Exceptions:**

1. Where public health standards require 24-hour pump operation.
2. Pumps that operate solar- and waste-heat-recovery pool heating systems.

**N1103.10.3 (R403.10.3) Covers.** Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other approved vapor-retardant means.

**Exception:** Where more than 70 percent of the energy for heating, computed over an operation season, is from site-recovered energy, such as from a heat pump or solar energy source, covers or other vapor-retardant means shall not be required.

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**N1103.12 (R403.12) Residential pools and permanent residential spas.** Residential swimming pools .....shall be in accordance with ~~APSP-145~~ **APSP-15**.

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

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Above-grade walls	Type: mass wall if proposed wall is mass; otherwise wood frame.	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table N1102.1.4	As proposed
	Solar absorptance = 0.75	As proposed
	Emittance = 0.90	As proposed
Basement and crawl space walls	Type: same as proposed	As proposed
	Gross area: same as proposed	As proposed
	U-factor: from Table N1102.1.4, with insulation layer on interior side of walls	As proposed
Above-grade floors	Type: wood frame	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table N1102.1.4	As proposed
Ceilings	Type: wood frame	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table N1102.1.4	As proposed
Roofs	Type: composition shingle on wood sheathing	As proposed
	Gross area: same as proposed	As proposed
	Solar absorptance = 0.75	As proposed
	Emittance = 0.90	As proposed
Attics	Type: vented with aperture = 1 ft <sup>2</sup> per 300 ft <sup>2</sup> ceiling area	As proposed
Foundations	Type: same as proposed	As proposed
	Foundation wall area above and below grade and soil characteristics: same as proposed	As proposed
Opaque doors	Area: 40 ft <sup>2</sup>	As proposed
	Orientation: North	As proposed
	U-factor: same as fenestration from Table N1102.1.4	As proposed
Vertical fenestration other than opaque doors	Total area <sup>b</sup> = (a) The proposed glazing area, where the proposed glazing area is less than 15 percent of the conditioned floor area (b) 15 percent of the conditioned floor area, where the proposed glazing area is 15 percent or more of the conditioned floor area	As proposed
	Orientation: equally distributed to four cardinal compass orientations (N, E, S & W).	As proposed
	U-factor: as specified in Table N1102.1.4	As proposed
	SHGC: as specified in Table N1102.1.2 except that for climates with no requirement (NR) SHGC = 0.40 shall be used.	As proposed
	Interior shade fraction: 0.92-(0.21 × SHGC for the standard reference design)	0.92-(0.21 × SHGC as proposed)
	External shading: none	As proposed
Skylights	None	As proposed

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Thermally isolated sunrooms	None	As proposed
Air exchange rate	<p>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 <math>0.01 \times CFA + 7.5 \times (N_{br} + 1)</math> where:</p> <p><math>CFA</math> = conditioned floor area  <math>N_{br}</math> = number of bedrooms</p> <p>Energy recovery shall not be assumed for mechanical ventilation.</p>	<p>For residences that are not tested, the same air leakage rate as the standard reference design.</p> <p>For tested residences, the measured air exchange rate<sup>a</sup>.</p> <p>The mechanical ventilation rate<sup>b</sup> shall be in addition to the air leakage rate and shall be as proposed.</p>
<b>BUILDING COMPONENT</b>	<b>STANDARD REFERENCE DESIGN</b>	<b>PROPOSED DESIGN</b>
Mechanical ventilation	<p>None, except where mechanical ventilation is specified by the proposed design, in which case:</p> <p>Annual vent fan energy use:</p> $\text{kWh/yr} = 0.03942 \times CFA + 29.565 \times (N_{br} + 1)$ <p>where:</p> <p><math>CFA</math> = conditioned floor area  <math>N_{br}</math> = number of bedrooms</p>	As proposed
Internal gains	$IGain = 17,900 + 23.8 \times CFA + 4104 \times N_{br}$ (Btu/day per dwelling unit)	Same as standard reference design.
Internal mass	An internal mass for furniture and contents of 8 pounds per square foot of floor area.	Same as standard reference design, plus any additional mass specifically designed as a thermal storage element <sup>c</sup> but not integral to the building envelope or structure.
Structural mass	For masonry floor slabs, 80 percent of floor area covered by R-2 carpet and pad, and 20 percent of floor directly exposed to room air.	As proposed
	For masonry basement walls, as proposed, but with insulation required by Table R402.1.4 located on the interior side of the walls	As proposed
	For other walls, for ceilings, floors, and interior walls, wood frame construction	As proposed
Heating systems <sup>d, e</sup>	<p>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 C403 of the IECC-Commercial Provisions.</p> <p>Capacity: sized in accordance with Section N1103.7</p>	As proposed
Cooling systems <sup>d, f</sup>	<p>As proposed</p> <p>Capacity: sized in accordance with Section N1103.7.</p>	As proposed
Service water heating <sup>d, e, f</sup>	<p>As proposed</p> <p>Use: same as proposed design</p>	<p>As proposed</p> <p>gal/day = <math>30 + (10 \times N_{br})</math></p>
Thermal distribution systems	<p>Duct insulation: From Section N1103.2.1</p> <p>A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems. For tested duct systems, the leakage rate shall be 4 cfm (113.3 L/min) per 100 ft<sup>2</sup> (9.29 m<sup>2</sup>) of conditioned floor area at a pressure of differential of 0.1 inches w.g.</p>	As tested or as specified in Table R405.5.2(2) if not tested. Duct insulation shall be as proposed.

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	(25 Pa).	
Thermostat	Type: Manual, cooling temperature setpoint = 75°F; Heating temperature setpoint = 72°F	Same as standard reference

For SI: 1 square foot = 0.93 m<sup>2</sup>, 1 British thermal unit = 1055 J, 1 pound per square foot = 4.88 kg/m<sup>2</sup>, 1 gallon (US) = 3.785 L, °C = (°F-32)/1.8, 1 degree = 0.79 rad.

- a. Where required by the *code official*, testing shall be conducted by an *approved* party. Hourly calculations as specified in the ASHRAE *Handbook of Fundamentals*, or the equivalent shall be used to determine the energy loads resulting from infiltration. □
- b. The combined air exchange rate for infiltration and mechanical ventilation shall be determined in accordance with Equation 43 of 2001 ASHRAE *Handbook of Fundamentals*, page 26.24 and the “Whole-house Ventilation” provisions of 2001 ASHRAE *Handbook of Fundamentals*, page 26.19 for intermittent mechanical ventilation.
- c. Thermal storage element shall mean a component not part of the floors, walls or ceilings that is part of a passive solar system, and that provides thermal storage such as enclosed water columns, rock beds, or phase-change containers. A thermal storage element must be in the same room as fenestration that faces within 15 degrees (0.26 rad) of true south, or must be connected to such a room with pipes or ducts that allow the element to be actively charged.
- d. For a proposed design with multiple heating, cooling or water heating systems using different fuel types, the applicable standard reference design system capacities and fuel types shall be weighted in accordance with their respective loads as calculated by accepted engineering practice for each equipment and fuel type present.
- e. For a proposed design without a proposed heating system, a heating system with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and proposed design.
- f. For a proposed design home without a proposed cooling system, an electric air conditioner with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and the proposed design.
- g. For a proposed design with a nonstorage-type water heater, a 40-gallon storage-type water heater with the prevailing federal minimum energy factor for the same fuel as the predominant heating fuel type shall be assumed. For the case of a proposed design without a proposed water heater, a 40-gallon storage-type water heater with the prevailing federal minimum efficiency for the same fuel as the predominant heating fuel type shall be assumed for both the proposed design and standard reference design.

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<b>1<sup>st</sup> PRINTING (6-4-14)</b>
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~~N403.10.3~~ N1103.10.3 (R403.10.3) **Time switches.** Time switches or other control methods that can automatically turn off and on according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that have built-in time switches shall be in compliance with this section.

**Exceptions:**

1. Where public health standards require 24-hour pump operation.
2. Pumps that operate solar- and waste-heat-recovery pool heating systems.