305-2-4-.09. Residential Building Codes. The 2015 International Residential Code (IRC) as modified below.

(1) IRC CHAPTER 3 BUILDING PLANNING.

(a) SECTION R302 FIRE-RESISTANT CONSTRUCTION.

1. **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 (35mm) in thickness, solid or honeycomb core steel doors not less than 1 3/8 inches (35mm) thick, or 20 minute fire-rated doors.

(b) SECTION R313 AUTOMATIC FIRE SPRINKLER SYSTEMS.

1. **R313.1 Townhouse automatic fire sprinkler systems.** Where installed, automatic residential fire sprinkler systems shall be installed in accordance with Section P2904 or NFPA 13D.

2. **R313.2 ONE AND TWO FAMILY DWELLINGS AUTOMATIC FIRE SYSTEMS.** Where voluntarily installed, installations shall comply with this section.

(c) SECTION R322 FLOOD-RESISTANT CONSTRUCTION.

1. **R322.3.5.1 PROTECTION OF BUILDING ENVELOPE.** Section deleted.

(d) SECTION 324 SOLAR PHOTOVOLTAIC ROOF SYSTEMS.

1. **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 accessing the roof designed in accordance with Chapter 3.

(2) IRC CHAPTER 11 ENERGY EFFICIENCY.

(a) SECTION N1101 GENERAL.

1. N1101.3 (R101.5.1) Compliance materials. The Alabama Residential and Energy Codes Board shall approve specific computer software, worksheets, compliance manuals

and other similar materials that meet the intent of this code.

2. N1101.4 (R102.1.1) Above code programs. The Alabama Building and Energy Codes Board shall deem a national, state or local energy-efficiency program to exceed the energy efficiency required by this code. Buildings approved in writing by such an energy-efficiency program shall be considered in compliance with this code. The requirements identified as "mandatory" in Chapter 11 shall be met.

3. N1101.6 (R202) DEFINED TERMS.

(i) Projection factor. The ratio of the horizontal depth of an overhang, eave, or permanently attached shading device, divided by the distance measured vertically from the bottom of the fenestration glazing to the underside of the overhang, eave, or permanently attached shading device.

(ii) Semi conditioned space. An unfinished area of the dwelling such as the attic or crawl space that is insulated as to limit or prevent air infiltration and maintain consistent temperatures commensurate with those inside the thermal envelope.

4. N1101.7.2 (R301.3) International climate zones. Section deleted.

5. N1101.8 (R301.4) Tropical climate zone. Section deleted.

6. N1101.9 (R302.1) Interior design conditions. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 70°F (22° C) for heating and minimum of 75°F (24° C) for cooling.

7. N1101.11.1 (R303.2.1) Protection of exposed insulation. Section deleted

8. N1101.13.1 (R401.2.1) Tropical zone. Section deleted.

(b) SECTION N1102 (R402) BUILDING THERMAL ENVELOPE.

1. N1102.2.2 (R402.2.2) Ceilings without attic spaces. Where Section R402.1.2 (N1102.1.2) would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such

roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section R402.1.2 (N1102.1.2) shall be limited to 500 square feet (46 m^2) or 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the U-factor alternative approach in Section R402.1.4 (N1102.1.4) and the total UA alternative in Section R402.1.5 (N1102.1.5).

2. N1102.2.2.1 (R402.2.2.1) Semi-conditioned attics. Where table N1102.1.1 (R402.1.1) requires R-30 or Table N1102.1.3 (R402.1.3) requires a U-Factor of 0.035, Sprayed Polyurethane Foam (SPF) with a U-Factor of 0.05 or R-value of R-20 shall be deemed equivalent to the provisions in N1102.2.2 (R402.2.2).

3. N1102.2.4 (R402.2.4) Access hatches and doors. Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level in accordance with the following insulation values:

1. Hinged vertical doors shall have a maximum U-Factor of U-0.20 (R-5 minimum)and comply with Section R-316
2. Hatches/scuttle hole covers shall have a maximum U-Factor of U-0.05 (R-19 minimum) and;
3. Pull down stairs shall have a maximum U-Factor of U-0.20 with a minimum of 75 percent of the panel area having (R-5 minimum) insulation.

Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer is required to be provided when loose fill insulation is installed the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation.

4. N**1102.2.10 (R402.2.10) Slab on grade floors.** Section deleted.

5. N1102.2.11 (R402.2.11) Crawl space walls. As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. The band joist shall be insulated and air sealed in accordance with Table N1102.4.1.1 (R402.4.1.1). A 3 inch (76mm) inspection/view strip shall be provided immediately below the floor joists

to permit inspections for termites. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the bottom of the inspection/view strip to within 9 inches(229mm) of the finished interior grade adjacent to the foundation wall. Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder in accordance with Section R408 of the International Residential Code. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and shall extend up the stem wall not less than 6 inches (153mm) and shall be attached to the stem wall.

6. N1102.3.2.1 (R402.3.2.1) Glazed fenestration SHGC exception. In Climate Zones 2 and 3, permanently shaded vertical fenestration shall be permitted to satisfy the SHGC requirements. The projection factor of an overhang, eave, or permanently attached shading device shall be greater than or equal to the value listed in table N1102.2.3.1 for the appropriate orientation. The minimum projection shall extend beyond each side of the glazing a minimum of 12 inches (0.3m). Each orientation shall be rounded to the nearest cardinal orientation (+/-45 degrees or 0.79 rad) for purposes of calculations and demonstrating compliance.

7. N1102.4.1.1 (R402.4.1) Installation (Mandatory). The components of the building thermal envelope as listed in Table N1102.4.1.1 (Table R402.4.1.1) shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table N1102.4.1.1 (Table 402.4.1.1), as applicable to the method of construction.

8. 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. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). 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 weatherstripping 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.

(9) N1102.4.5 (R402.4.5) Recessed lighting. Recessed luminaries installed in the building thermal envelope shall be installed sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaries shall be IC-rated and labeled as having an air leakage rate not more than 2.0 cfm (0.944 L/s) when tested in accordance with ASTM E 283 at a 1.57 psf (75 Pa) pressure differential. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

(c) SECTION N1103 (R403) SYSTEMS.

1. N1103.1.1 (R403.1.1) Programmable thermostat. Section deleted.

2. N1103.9 (R403.9) Snow melt system controls. Section deleted.

3. N1103.10 (R403.10) Residential pools and permanent residential spas. Section deleted.

4. N1103.10.1 (R403.10.1) Residential pools and permanent residential spas. Section deleted.

5. N1103.10.2 (R403.10.2) Heaters. Section deleted.

6. N1103.10.3 (R403.10.3) Time Switches. Section deleted.

7. N1103.10.4 (R403.10.4) Covers. Section Deleted

8. N1103.11 (R403.11) Portable spas. Section deleted.

9. N1103.12 (R403.12) Residential pools and permanent residential spas. Section deleted.

(d) SECTION N1104 (R404) ELECTRICAL POWER AND LIGHTING SYSTEMS (MANDATORY).

1. N1104.1 (R404.1) Lighting equipment (Mandatory). Not less than 75 percent of the lamps in permanently installed lighting fixtures at the time of inspection shall be high-efficacy lamps or not less than 75 percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.

(e) SECTION N1105 (R405) SIMULATED PERFORMANCE ALTERNATIVE (PERFORMANCE).

1. N1105.1 (R405.1) Scope. This section establishes criteria for compliance using simulated energy performance analysis. Such analysis shall include heating cooling and service water heating energy only. The code official is not responsible for verification of compliance for documents submitted under this section.

2. N1105.3 (R405.3) Performance-based compliance. Compliance based on simulated energy performance requires that a proposed residence (*proposed design*) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. Energy prices shall be taken from a source such as the Department of Energy, Energy Information Administration's *State Energy Price and Expenditure Report. Building officials*—shall be permitted to require time-or-use pricing in energy cost calculation.

(f) SECTION N1106 (R406) ENERGY RATING INDEX COMPLIANCE ALTERNATIVE.

1. N1106.1 (R406.1) Scope. This section establishes criteria for compliance using an Energy Rating Index (ERI). Such analysis shall include heating cooling and service water heating energy only. The code official is not responsible for verification of compliance for documents submitted under this section.

2. N1106.4 (R406.4) ERI-based compliance. Compliance based on an ERI analysis requires that the rated design be shown to have an ERI less than or equal to a score of 70 in both zones 2 and 3 when compared to the ERI reference design.

3. Table N1106.4 (Table R406.4) Maximum Energy Rating Index. Table Deleted.

(3) IRC CHAPTER 24 FUEL GAS

(a) SECTION G24122 (401) GENERAL.

1. G2412.9 (401.9) Identification. Each length of pipe and tubing utilized in a fuel gas system shall bear the identification of the manufacturer. If not provided on the packaging or crating or by other approved documentation, each pipe fitting, utilized in a piping system shall bear the identification of the manufacturer.

(4) IRC CHAPTER 34 ELECTRICAL GENERAL REQUIREMENTS

(a) SECTION E3401 GENERAL.

1. R3401.1 Applicability. The provisions of Chapters 34 through 43 shall establish the general scope of the electrical system and equipment requirements of this code. Chapters 34 through 43 cover those wiring methods and materials most commonly encountered in the construction of one- and two-family dwellings and structures regulated by this code. Other wiring methods, materials, and subject matter covered in NFPA 70-2008 or in compliance with the 2008 National Electric Code, or subsequent editions of such codes shall be allowed by this code and deemed equivalent with the code adopted by this board.

(5) EFFECTIVE DATE. For purposes of enforcement, this code shall become effective on October 1, 2016.

Author: Karen Clifton; Bret Warren, Heather Goggin
Statutory Authority: Code of Ala. 1975, §§41-23-80 through 85, as amended
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Amended: January 16, 2014; Effective: March 18, 2014
Repealed:
New Rule: Filed

APPENDIX A

TABLE N1102.1.1.1 (R402.1.1)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT [a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT U-FACTOR[b]	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	1.2	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]	0.65	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-1 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 the 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
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
2	0.65	0.75	0.035	0.084	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.084	0.141	0.047	0.360	0.135

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 0.14 in Zone 2 and 0.12 in Zone 3.

TABLE N1102.2.2.1
MINIMUM PROJECTION FACTOR REQUIRED BY ORIENTATION FOR SHGC EXCEPTION

Orientation	Projection Factor
North	>=0.40[a]
South	>=0.20
East	>=0.50
West	>=0.50

a. For the north orientation, a vertical projection located on the west edge of the fenestration with equivalent PF>=0.15 shall also satisfy the minimum projection factor requirement.

TABLE C402.5.2
MAXIMUM AIR LEAKAGE RATE
FOR FENESTRATION ASSEMBLIES

FENESTRATION ASSEMBLY	MAXIMUM RATE (CFM/FT^2)	TEST PROCEDURE
Windows	0.20[a]	AAMA/WDMA/ CSA101/I.S.2/A440 or NFRC 400
Sliding doors	0.20[a]	
Swinging doors	0.20[a]	
Skylights – with condensation weepage openings	0.30	
Skylights – all other	0.20[a]	
Curtain walls	0.06	NFRC 400 or ASTM E 283 at 1.57 psf (75 Pa)
Storefront glazing	0.06	
Commercial glazed swinging entrance doors	1.00	
Revolving doors	1.00	
Garage doors	0.40	ANSI/DASMA 105, NFRC 400, or ASTM E 283 at 1.57 psf (75 Pa)
Rolling doors	1.00	
High-speed doors	1.30	

For SI: 1 cubic foot per minute = 0.47L/s, 1 square foot = 0.093 m^2.

a. The maximum rate for windows, sliding and swinging doors, and skylights is permitted to be 0.3 cfm per square foot of fenestration or door area when tested in accordance with AAMA/WDMA/CSA101/I.S.2/A440 at 6.24 psf (300 Pa).

TABLE N1105.5.5(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Glazing[a]	Total area[b] =15% of the conditioned floor area	As proposed
	Orientation: equally distributed to four cardinal compass orientations (N, E, S, & W)	As proposed
	U-factor: from Table 402.1.3	As proposed
	SHGC: From Table 402.1.1 except that for climates with no requirement (NR)SHGC = 0.40 shall be used.	As proposed
	Interior shade fraction: 0.92-(0.21 x SHGC for the standard reference design)	As proposed
	External shading: none	As proposed
Heating systems[h]	Fuel type: same as proposed design	As proposed
	Efficiences: Electric: air-source heat pump with prevailing federal minimum standards	As proposed
	Nonelectric furnaces: natural gas furnace with prevailing federal minimum standards	As proposed
	Nonelectric boilers: natural gas boiler with prevailing federal minimum standards	As proposed
	Capacity: sized in accordance with Section N1103.6	As proposed
Cooling systems[h, j]	Fuel Type: Electric	As proposed
	Efficiency: In accordance with prevailing federal minimum standards	As proposed
	Capacity: sized in accordance with Section N1103.6	As proposed
Service Water Heating[h, k, i]	Fuel type: same as proposed design	As proposed
	Efficiency: In accordance with prevailing federal minimum standards	As proposed
	Use: gal/day = 30 10 x Nbr	Same as standard reference
	Tank temperature: 120° F	

Author: Karen Clifton; Bret Warren, Heather Goggin
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