

Effective October 1st 2012

State of Alabama Residential Energy Requirements As Modified 2009 International Residential Code

Please choose which Energy code compliance path you
will be using for this project

1. **Prescriptive Path** – is the building envelope and equipment built and installed to the minimum requirements as prescribed in the 2009 IRC Chapter 11 (Energy Efficiency) as modified by the AERCB. Prescriptive Path shall be in compliance with Tables N1102.1, N1102.1.2 and N1102.4.2.

2. **Alternative Path** - This allows trade-offs in the Building Envelope as long as the total building thermal envelope UA is less than or equal to the total UA resulting from using the default U- Factors in Table N1102.1.2. This alternative method ***will require plans and documentation and REScheck software report or equivalent.***

3. **Performance Path** – Simulated Performance Alternative is based on section 405 of the 2009 IECC and compares performance, energy use and cost while allowing extensive trade-offs in the building envelope. This method ***will require plans and documentation and also a simulation report provided by a Design Professional or other qualified energy professional.***

Owner/ Agent -----

Date-----

Property Address-----

Date-----

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State of Alabama Residential Energy Requirements As Modified 2009 International Residential Code

This is a Residential Energy Code Help Sheet Produced by the City of Tuscaloosa Planning & Development Services. The requirements below will be enforced on the first permit issued on October 1st, 2012. Some requirements are already being enforced by adoption of earlier codes in the City Of Tuscaloosa. There are three methods approved by the Alabama Energy and Residential Code Board to be in compliance with the new energy codes:

1. **Prescriptive Path** – is the building envelope and equipment built and installed to the minimum requirements as prescribed in the 2009 IRC Chapter 11 (Energy Efficiency) as modified by the AERCB. Prescriptive Path shall be in compliance with Tables N1102.1, N1102.1.2 and N1102.4.2.
2. **Total UA Alternative Path** - This allows trade-offs in the Building Envelope as long as the total building thermal envelope UA is less than or equal to the total UA resulting from using the default U- Factors in Table N1102.1.2. This alternative method ***will require plans and documentation and REScheck software report or equivalent.***
3. **Performance Path** – Simulated Performance Alternative is based on section 405 of the 2009 IECC and compares performance, energy use and cost while allowing extensive trade-offs in the building envelope. This method ***will require plans and documentation and also a simulation report provided by a Design Professional or other qualified energy professional.***

Mandatory Requirement: Air Leakage and Building Thermal Envelope Required for All Paths; Prescriptive, Performance and UA Alternative

1. **Building envelope** shall be sealed to limit infiltration. The following shall be **caulked, gasketed, weather stripped, or sealed** with an air barrier material, suitable film or solid material.
 1. All joints, seams and penetrations
 2. Site built windows, doors, and skylights
 3. Openings between window and door assemblies and their jambs and framing
 4. Utility penetrations
 5. Dropped ceiling or chases adjacent to the building envelope
 6. Knee walls
 7. Walls and ceiling separating the garage from conditioned space
 8. Behind tubs and showers on exterior walls
 9. Common walls between dwelling units
 10. Attic access openings
 11. Rim joists junctions
 12. Other sources of infiltration

2. **Air sealing and insulation.** Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options:

Air leakage test option

Air leakage is less than 7 ACH when tested with a blower door at pressure of **50 Pascals**. Testing shall be conducted by a certified Duct and Envelope Tightness (DET) Verifier or approved third party, such as a HERS Rater or BPI Building Analyst.

OR

Visual inspection option

1. **Air Barrier and Thermal Barrier** Exterior thermal envelope insulation for framed walls are installed in substantial contact and continuous alignment with build envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air permeable insulation is not used as a sealing material.
2. **Ceiling and Attic** Air barrier in any dropped ceiling is substantially aligned with insulation and any gaps are sealed. Attic access (except unvented attic), knee walk, access door or drop down stair is sealed.
3. **Walls Corners and headers** are insulated. Junction of foundation and sill plate is sealed.
4. **Windows and Doors** Space between window/door jambs and framing is sealed.
5. **Rim Joists** Rim joists are insulated and include an air barrier.
6. **Floor** (including above garage and cantilevered floors) Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of floor.
7. **Crawlspace Walls** Insulation is permanently attached to walls. Exposed earth in invented crawlspaces is covered with Class 1 vapor retarder with overlapping joints taped.
8. **Shafts and Penetrations** Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.
9. **Narrow Cavities** Batts in narrow cavities are cut to fit or are filled by sprayed/ blown insulation.
10. **Garage Separation** Air sealing is provided between the garage and conditioned spaces.
11. **Recessed Lighting** Recessed light fixtures are airtight, IC rated and sealed to drywall. Exception: fixtures in conditioned space.
12. **Plumbing and Wiring** Insulations is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing or sprayed/ blown insulation extends behind piping and wiring.
13. **Shower and Tubs** on exterior walls Shower and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
14. **Electrical and other boxes on exterior walls** Air barrier extends behind boxes or air sealed type boxes are installed.
15. **Common Walls** Air barrier is installed in common wall between dwelling units.
16. **HVAC Register Boots** HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
17. **Fireplace** Fireplace walls will require an air barrier.

Prescriptive Method Inspections – Minimum Requirements

Building / Framing Inspection Requirements

3. Window & door glazing shall be labeled and certified by the manufacturer with the **U-factor maximum of 0.50 & (SHGC) solar heat gain coefficient maximum of 0.30.**
4. Windows and sliding glass doors shall have an air leakage rate of no more than **0.3 cubic foot per minute** per square foot and side hung doors no more than **0.5 cubic foot** and listed and labeled by the manufacturer.
5. Building envelope shall be sealed to limit infiltration. The following shall be **caulked, gasketed, weather stripped, or sealed** with an air barrier material, suitable film or solid material.
 1. All joints, seams and penetrations
 2. Site built windows, doors, and skylights
 3. Openings between window and door assemblies and their jambs and framing
 4. Utility penetrations
 5. Dropped ceiling or chases adjacent to the building envelope
 6. Knee walls
 7. Walls and ceiling separating the garage from conditioned space
 8. Behind tubs and showers on exterior walls
 9. Common walls between dwelling units
 10. Attic access openings
 11. Rim joists junctions
 12. Other sources of infiltration

Insulation Inspection Requirements

1. **Wall Insulation minimum R-13** (or U-Factor ≤ 0.082) Insulation must be applied to wood framed walls that are above grade and associated with the building thermal envelope.
2. **Floor Insulation minimum R-19** (or U-Factor ≤ 0.047) Insulation shall be installed to maintain permanent contact with the underside of subfloor decking.
3. **Attic Insulation minimum R-30** (or U-factor ≤ 0.035)

Prescriptive includes the **U- Factor Alternative** – An alternative to the R-Values, compliance can be demonstrated by calculating the U-Factors for a component. Table N1102.1.2 gives U-Factors that are deemed to be equivalent to the R-Values in Table N1102.1.

Mechanical Rough Inspection Requirements

1. **Supply ducts in attics** shall be insulated to a minimum of **R-8**. Supply Ducts in a crawlspace, unconditioned basement and all return air duct shall be minimum **R-6**.
2. The joints and seams of all ducts, air handlers, filter boxes, and building cavities used as return air ducts must be sealed with **UL-181 tape**, mastic or mastic tape or comply with section M1601.4.1 2009 IRC.
3. Building cavities may not be used for supply ducts. All supply ducts must be lined with metal, flex duct, duct board or other material approved in section M1601 of the IRC.

4. HVAC system piping capable of carrying fluids above 105 F or below 55 F must be insulated to a minimum **R-3**.
5. Outdoor air intake and exhaust openings must have automatic or gravity **dampers that close** when the ventilation system is not operating.
6. Heating and cooling equipment shall be sized as specified in section **M1401.3** 2009 IRC. *Inspectors shall reserve the right to ask for the calculation sheets to verify the heating and cooling Methodologies.*
7. New site-built, masonry wood burning fireplaces shall have **outside combustion air**.
8. All penetrations open to unconditioned spaces must be sealed.

Electrical Rough Inspections Requirement

1. Recessed light fixtures in unconditioned space must be **air tight and IC rated**.
2. All penetrations open to unconditioned spaces must be sealed.

Plumbing Rough Inspections Requirement

1. All circulating hot water piping shall be insulated to a minimum **R-2**.
2. All penetrations open to unconditioned spaces must be sealed.

Building Final Inspection Requirement

1. Attic access doors and pull down stairs shall be **weather stripped and insulated** to equal the equivalent to the surrounding surfaces. A wood framed or equivalent **baffle or retainer** is required when loose insulation is installed.

Mechanical Final Inspection Requirement

1. New site-built, masonry wood burning fireplaces shall have **gasketed doors**.
2. HVAC register boots are **sealed** to subfloor or sheetrock.

Electrical Final Inspection Requirements

1. Recess light fixtures are sealed to the sheetrock.
2. A minimum of **50 percent** of the lamps shall be high –efficacy lamps.

Plumbing Final Inspection Requirements

1. Circulating hot water systems shall have an **automatic** or readily accessible **manual switch** that can turn off the pump when the system is not in use.

Effective July 1st 2013

1. HVAC **duct leakage test** shall be performed by a certified Envelope Tightness (DET) Verifier or approved third party, such as a HERS Rater or BPI Building Analyst.

THIS IS A HELP SHEET FOR THE RESIDENTIAL ENERGY CODE. THIS DOES NOT COVER ALL ENERGY CODES FOR TOTAL ENERGY CODE COMPLIANCE

Tuscaloosa is in Zone 3

APPENDIX A

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT *

CLIMATE ZONE	FENES-TRATION U-FACTOR ^b	SKY-LIGHT U-FACTOR ^b	GLAZED FENEST-RATION SHGC ^{b, *}	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 ^e 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.

- 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.
- The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
- "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.
- 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.
- There are no SHGC requirements in the Marine Zone.
- Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.
- Or insulation sufficient to fill the framing cavity, R-19 minimum.
- "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.
- The second R-value applies when more than half the insulation is on the interior of the mass wall.
- 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.