

**FLORIDA BUILDING CODE, ENERGY CONSERVATION**

**Residential Building Thermal Envelope Approach**

**FORM R402-2017**

**Climate Zone**

**Scope:** Compliance with Section R401.2(1) of the *Florida Building Code, Energy Conservation*, shall be demonstrated by the use of Form R402 for single- and multiple-family residences of three stories or less in height, additions to existing residential buildings, alterations, renovations and building systems in existing buildings, as applicable. To comply, a building must meet or exceed all of the energy efficiency requirements on Table R402A and all applicable mandatory requirements summarized in Table R402B of this form. If a building does not comply with this method, or by the UA Alternative method, it may still comply under Section R405 of the *Florida Building Code, Energy Conservation*.

<b>PROJECT NAME AND ADDRESS:</b>  <b>OWNER:</b>	<b>BUILDER:</b>  <b>PERMITTING OFFICE:</b> <b>JURISDICTION NUMBER:</b> <b>PERMIT NUMBER:</b>
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**General Instructions:**

1. Fill in all the applicable spaces of the "To Be Installed" column on Table R402A with the information requested. All "To Be Installed" values must be equal to or more efficient than the required levels.
2. Complete page 1 based on the "To Be Installed" column information.
3. Read the requirements of Table R402B and check each box to indicate your intent to comply with all applicable items.
4. Read, sign and date the "Prepared By" certification statement at the bottom of page 1. The owner or owner's agent must also sign and date the form.

<b>1. New construction, addition, or existing building</b> <b>2. Single-family detached or multiple-family attached</b> <b>3. If multiple-family, number of units covered by this submission</b> <b>4. Is this a worst case? (yes/no)</b> <b>5. Conditioned floor area (sq. ft.)</b> <b>6. Windows, type and area</b> a) U-factor: b) Solar Heat Gain Coefficient (SHGC) c) Area <b>7. Skylights</b> a) U-factor: b) Solar Heat Gain Coefficient (SHGC) <b>8. Floor type, area or perimeter, and insulation:</b> a) Slab-on-grade (R-value) b) Wood, raised (R-value) c) Wood, common (R-value) d) Concrete, raised (R-value) e) Concrete, common (R-value) <b>9. Wall type and insulation:</b> a) Exterior:    1. Wood frame (Insulation R-value) 2. Masonry (Insulation R-value) b) Adjacent:  1. Wood frame (Insulation R-value) 2. Masonry (Insulation R-value) <b>10. Ceiling type and insulation</b> a) Attic (Insulation R-value) b) Single assembly (Insulation R-value) <b>11. Air distribution system:</b> a) Duct location, insulation b) AHU location c) Total duct leakage. Test report attached. <b>12. Cooling system:</b> a) type b) efficiency <b>13. Heating system:</b> a) type b) efficiency <b>14. HVAC sizing calculation: attached</b> <b>15. Water heating system:</b> a) type b) efficiency	<table style="width:100%; border-collapse: collapse;"> <tr><td style="width:5%; text-align: right;">1.</td><td style="width:75%; border-bottom: 1px solid black;"></td><td style="width:20%;"></td></tr> <tr><td style="text-align: right;">2.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">3.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">4.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">5.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">6a.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">6b.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">6c.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">7a.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">7b.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">8a.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">8b.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">8c.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">8d.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">8e.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">9a1.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">9a2.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">9b1.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">9b2.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">10a.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">10b.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">11a.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">11b.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">11c.</td><td style="border-bottom: 1px solid black;">_____ cfm/100 s.f.</td><td style="text-align: right;">Yes <input type="checkbox"/> No <input type="checkbox"/></td></tr> <tr><td style="text-align: right;">12a.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">12b.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">13a.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">13b.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">14.</td><td style="border-bottom: 1px solid black;"></td><td style="text-align: right;">Yes <input type="checkbox"/> No <input type="checkbox"/></td></tr> <tr><td style="text-align: right;">15a.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> <tr><td style="text-align: right;">15b.</td><td style="border-bottom: 1px solid black;"></td><td></td></tr> </table>	1.			2.			3.			4.			5.			6a.			6b.			6c.			7a.			7b.			8a.			8b.			8c.			8d.			8e.			9a1.			9a2.			9b1.			9b2.			10a.			10b.			11a.			11b.			11c.	_____ cfm/100 s.f.	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I hereby certify that the plans and specifications covered by this form are in compliance with the *Florida Building Code, Energy Conservation*.  
**PREPARED BY:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
 I hereby certify that this building is in compliance with the *Florida Building Code, Energy Conservation*.  
**OWNER/AGENT:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Review of plans and specifications covered by this form indicate compliance with the *Florida Building Code, Energy Conservation*. Before construction is complete, this building will be inspected for compliance in accordance with Section 553.908, F.S.  
**CODE OFFICIAL:** \_\_\_\_\_  
**Date:** \_\_\_\_\_



TABLE R402A

BUILDING COMPONENT	PRESCRIPTIVE REQUIREMENTS <sup>1</sup>		INSTALLED VALUES
	Climate Zone 1	Climate Zone 2	
Windows Skylights	U-Factor = NR SHGC = 0.25 U-factor = 0.75 SHGC = 0.30	U-Factor = 0.40 <sup>2</sup> SHGC = 0.25 U-factor = 0.65 SHGC = 0.30	U-Factor = SHGC = U-factor = SHGC =
Doors: Exterior door	U-factor = NR	U-factor = 0.40 <sup>3</sup>	U-factor =
Floors: Slab-on-Grade Over unconditioned spaces <sup>4</sup>	NR R-13	NR R-13	R-Value =
Walls <sup>4</sup> : Ext. and Adj. Frame Mass Insulation on wall interior Insulation on wall exterior	R-13  R-4 R-3	R-13  R-6 R-4	R-Value =  R-Value = R-Value =
Ceilings <sup>5</sup>	R=30	R=38	R-Value =
Air infiltration	Blower door test is required on the building envelope to verify leakage $\leq 1$ ACH; test report provided to code official.		Total leakage = ACH Test report attached? Yes <input type="checkbox"/> No <input type="checkbox"/>
Air distribution system <sup>5</sup> : Air handling unit Duct R-value  Air leakage <sup>5</sup> : Duct test  Ducts in conditioned space	Not allowed in attic R-value $\geq R-8$ (supply in attics) or $\geq R-6$ (all other duct locations)  Postconstruction test Total leakage $\leq 4$ cfm/100 s.f. Rough-in test Total leakage $\leq 4$ cfm/100 s.f. (air handler installed) Total leakage $\leq 3$ cfm/100 s.f. (air handler not installed) Test not required if all ducts and AHU are in conditioned space		Location: R-Value =  Total leakage = _____ cfm/100s.f. Test report Attached? Yes <input type="checkbox"/> No <input type="checkbox"/> Location:
Air conditioning system: Central system $\leq 65,000$ Btu/h Room unit or PTAC Other:	Minimum federal standard required by NAECA <sup>6</sup> : SEER 14.0 EER [from Table C403.2.3(3)] See Tables C403.2.3(1)-(11)		SEER = EER =
Heating system: Heat pump $\leq 65,000$ Btu/h Gas furnace, non-weatherized Oil furnace, non-weatherized Other:	Minimum federal standard required by NAECA <sup>6</sup> : HSPF 8.2 AFUE 80% AFUE 83%		HSPF = AFUE = AFUE =
Water heating system (storage type): Electric <sup>7</sup>  Gas fired <sup>8</sup>  Other (describe):	Minimum federal standard required by NAECA <sup>6</sup> : 40 gal: EF = 0.92 50 gal: EF = 0.90 40 gal: EF = 0.69 50 gal: EF = 0.58		Gallons = EF = Gallons = EF =

NR = No requirement.

- Each component present in the As Proposed home must meet or exceed each of the applicable performance criteria in order to comply with this code using this method.
- For impact rated fenestration complying with Section R301.2.1.2 of the *Florida Building Code, Residential* or Section 1609.1.2 of the *Florida Building Code, Building*, the maximum U-factor shall be 0.65 in Climate Zone 2. An area-weighted average of U-factor and SHGC shall be accepted to meet the requirements, or up to 15 square feet of glazed fenestration area are exempted from the U-factor and SHGC requirement based on Sections R402.3.1, R402.3.2 and R402.3.3.
- One side-hinged opaque door assembly up to 24 square feet is exempted from this U-factor requirement.
- R-values are for insulation material only as applied in accordance with manufacturer's installation instructions. For mass walls, the "interior of wall" requirement must be met except if at least 50 percent of the insulation required for the "exterior of wall" is installed exterior of, or integral to, the wall.
- Ducts & AHU installed "substantially leak free" per Section R403.3.2. Test required by either individuals as defined in Section 553.993(5) or (7), *Florida Statutes*, or individuals licensed as set forth in Section 489.105(3)(f), (g) or (i), *Florida Statutes*. The total leakage test is not required for ducts and air handlers located entirely within the building thermal envelope.
- Minimum efficiencies are those set by the *National Appliance Energy Conservation Act* of 1987 for typical residential equipment and are subject to NAECA rules and regulations. For other types of equipment, see Tables C403.2.3(1-11) of the *Commercial Provisions of the Florida Building Code, Energy Conservation*.
- For other electric storage volumes, minimum EF =  $0.97 - (0.00132 * \text{volume})$ .
- For other natural gas storage volumes, minimum EF =  $0.67 - (0.0019 * \text{volume})$ .



TABLE R402B MANDATORY REQUIREMENTS			
Component	Section	Summary of Requirement(s)	Check
Air leakage	R402.4	To be caulked, gasketed, weatherstripped or otherwise sealed per Table R402.4.1.1. Recessed lighting: IC-rated as having $\leq 2.0$ cfm tested to ASTM E 283. Windows and doors: 0.3 cfm/sq. ft. (swinging doors: 0.5 cfm/sf) when tested to NFRC 400 or AAMA/WDMA/CSA 101/I.S. 2/A440. Fireplaces: Tight-fitting flue dampers & outdoor combustion air.	
Programmable thermostat	R403.1.2	A programmable thermostat is required for the primary heating or cooling system.	
Air distribution system	R403.3.2 R403.3.4	Ducts shall be tested as per Section R403.3.2 by either individuals as defined in Section 553.993(5) or (7), <i>Florida Statutes</i> , or individuals licensed as set forth in Section 489.105(3) (f), (g) or (i), <i>Florida Statutes</i> . Air handling units are not allowed in attics.	
Water heaters	R403.5	Comply with efficiencies in Table C404.2. Hot water pipes insulated to $\geq R-3$ to kitchen outlets, other cases. Circulating systems to have an automatic or accessible manual OFF switch. Heat trap required for vertical pipe risers.	
Swimming pools & spas	R403.10	Spas and heated pools must have vapor-retardant covers or a liquid cover or other means proven to reduce heat loss except if 70% of heat from site-recovered energy. Off/timer switch required. Gas heaters minimum thermal efficiency is 82%. Heat pump pool heaters minimum COP is 4.0.	
Cooling/heating equipment	R403.7	Sizing calculation performed & attached. Special occasion cooling or heating capacity requires separate system or variable capacity system.	
Lighting equipment	R404.1	At least 75% of permanently installed lighting fixtures shall be high-efficacy lamps.	