Florida Building Code, Energy Conservation

Residential Building Thermal Envelope Approach

FORM R402-2017 **R-Value Computation Method** **Florida Climate Zone ____**

Scope: Compliance with Section R402.1.2 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.*

PROJECT NAME: AND ADDRESS:		BUILDER:
		PERMITTING OFFICE:
		JURISDICTION NUMBER:
OWNER:		PERMIT NUMBER:

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.

		Check!
1. New construction, addition, or existing building	1. _____	_____
2. Single-family detached or multiple-family attached	2. _____	_____
3. If multiple-family, number of units covered by this submission	3. _____	_____
4. Is this a worst case? (yes/no)	4. _____	_____
5. Conditioned floor area (sq. ft.)	5. _____	_____
6. Windows type and area:		
a) U-factor:	6a. _____	_____
b) Solar Heat Gain Coefficient (SHGC):	6b. _____	_____
c) Area:	6c. _____	_____
7. Skylights, type and area:		
a) U-factor:	7a. _____	_____
b) Solar Heat Gain Coefficient (SHGC):	7b. _____	_____
c) Skylight area:	7c. _____	_____
8. Floor type, area or perimeter, and insulation:(Total exposed area = 0 sqft)		
a) Slab-on-grade (R-value)	8a. _____	_____
b) Wood, raised (R-value)	8b. _____	_____
c) Wood, common (R-value)	8c. _____	_____
d) Concrete, raised (R-value)	8d. _____	_____
e) Concrete, common (R-value)	8e. _____	_____
9. Wall type, area and insulation:(Total exposed area = 0 sqft)		
a) Exterior: 1. Wood frame (Insulation R-value)	9a1. _____	_____
2. Masonry (Insulation R-value)	9a2. _____	_____
b) Adjacent: 1. Wood frame (Insulation R-value)	9b1. _____	_____
2. Masonry (Insulation R-value)	9b2. _____	_____
10. Ceiling type, area and insulation(Total exposed area = 0 sqft)		
a) Attic (Insulation R-value)	10a. _____	_____
b) Single assembly (Insulation R-value)	10b. _____	_____
11. Air distribution system:		
a) Duct location, insulation	11a. _____ cfm/100 s.f.	Yes / No
b) AHU location	11b. _____	_____
c) Total Duct Leakage, Test report attached	11c. _____	_____
12. Cooling system: a) type:	12a. _____	_____
b) efficiency	12b. _____	_____
13. Heating system: a) type:	13a. _____	_____
b) efficiency	13b. _____	_____
14. HVAC sizing calculation: attached	14. **Verify attachment**	Yes / No
15. Water heating system: a) type	15a. _____	_____
b) efficiency	15b. _____	_____

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[1]		INSTALLED VALUES
	Climate Zone 1	Climate Zone 2	Fens. U-Factor (Avg) = _____
Windows	U-Factor ≤ NR[2]	U-Factor ≤ 0.40[2]	U-Factors (Avg) = _____
	SHGC ≤ 0.25	SHGC ≤ 0.25	SHGC (Avg) = _____
Skylights	U-Factor ≤ 0.75	U-Factor ≤ 0.65	U-Factors (Avg) = _____
	SHGC ≤ 0.30	SHGC ≤ 0.30	SHGC (Avg) = _____
Doors: Exterior door	U-Factor ≤ NR	U-Factor ≤ 0.40[3]	U-Factors (Max) = _____
Floors: Over unconditioned spaces[4]	≥ R-13	≥ R-13	R-Value (Min) = _____
Common	≥ R-11	≥ R-11	R-Value (Min) = _____
Walls[4]: Ext. and Adj.			
Frame	≥ R-13	≥ R-13	R-Value (Min) = _____
Mass(Insulation on wall interior):	≥ R-4	≥ R-6	R-Value (Min) = _____
Mass(Insulation on wall exterior):	≥ R-3	≥ R-4	R-Value (Min) = _____
Common(multifamily):	Fr: ≥ R-11, Mass: ≥ R-6	Fr: ≥ R-11, Mass: ≥ R-6	R-Value (Min) = _____
Ceilings: Exposed	≥ R-30	≥ R-38	R-Value (Min) = _____
Common	≥ R-11	≥ R-11	R-Value (Min) = _____
Air infiltration:	Blower door test is required on the building envelope to verify leakage ≤ 7 ACH50; Test report provided to code official.		Total leakage (ACH50) = _____ Test report attached? ☐Yes ☐No
Air distribution system[5]:			
Air handling unit	Not allowed in attic		Location: _____
	Sealed		Sealed: _____
Duct R-Value	≥ R-8 (Ducts in unconditioned attics, Diameter ≥ 3 in.)		R-Value (Ducts in unc. attic) = _____
	≥ R-4.2 (Ducts in uncond.(not attics), Diam. < 3 in.) ≥		R-Value (Small Ducts in unc) = _____
	≥ R-6 (all other unconditioned ducts).		R-Value (Others in unc. space) = _____
Air Leakage[5]/Duct test	Air handler installed: Total leakage ≤ 4 cfm/100 s.f.		Proposed _____ cfm/100 sq. ft.
	Air handler Not installed:Total leakage ≤ 3 cfm/100 s.f.		Test report required? Yes / No
Ducts in conditioned space	Test not required if all ducts and AHU are in conditioned space.		Location: (select one) Conditioned or Unconditioned
Air conditioning systems:	Minimum federal standard required by NAECA[6]		
Central system ≤ 65,000 Btu/h	SEER ≥ 14.0		SEER (Min) = _____
	EER [from Table C403.2.3(3)]		EER (Min) = _____
PTAC			
Other:	See Tables C403.2.3(1)-(11)		
Heating systems:	Minimum federal standard required by NAECA[6]		
Heat Pump ≤ 65,000 Btu/h	HSPF ≥ 8.2		HSPF (Min) = _____
Gas Furnace, non-weatherized	AFUE ≥ 80%		AFUE (Min) = _____
Oil Furnace, non-weatherized Other:	AFUE ≥ 83%		AFUE (Min) = _____
Water heating system (storage type):	Minimum federal standard required by NAECA[6!]		
Electric:[7]	40 gallons: EF!≥!0.948, 50 gallons: EF!≥!0.945		Gallons = _____; EF (Min) = _____
Gas fired:[8]	40 gallons: EF!≥!0.615, 50 gallons: EF!≥!0.60		Gallons = _____; EF (Min) = _____
Other (describe):			

NR = No requirement

(1) Each component present in the As Proposed home must meet or exceed each of the applicable criteria in order to comply with this code using this method.

(2) 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 Section R402.3.1, R402.3.2 and R402.3.3.

(3) One side-hinged opaque door assembly up to 24 square feet is exempted from this U-factor requirement.

(4) 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.

(5) 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.

(6) 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.*

(7) For electric storage volumes <= 55, min. EF = 0.960 – (0.0003 * volume). For electric storage volumes > 55, min. EF = 2.057 – (0.00113 * volume).

(8) For natural gas storage volumes <= 55, min. EF = 0.675 – (0.0015 * volume). For natural gas storage volumes > 55, min. EF = 0.8012 – (0.00078 * volume).

(9) For electric tankless, min. EF = 0.93. For natural gas tankless, min. EF = 0.82

DATE: ____/____/_____

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 <= 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), Florida Statutes, or individuals licensed as set forth in Section 489.105(3) (f), (g) or (i), Florida Statutes. Air handling units are not allowed in attics.	
Water heaters	R403.5	Comply with efficiencies in Table C404.2. Hot water pipes insulated to >= 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.	
Cooling/heating equipment	R403.7	Sizing calculation performed & attached. Special occasion cooling or heating capacity requires seperate system or variable capacity system.	
Swimming pools & spas	R403.10	Spas and heated pools must have vapor-retardent 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	
Lighting equipment	R404.1	At least 75% of permanently installed lighting fixtures shall be high-efficacy lamps.	