

FORM R406-2017

RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST

***Florida Department of Business and Professional Regulation
Residential Energy Rating Index Method Compliance Alternative***

Applications for compliance with the 2017 Florida Building Code, Energy Conservation via the residential Energy Rating Index Method Compliance Alternative shall include:

- This checklist
- A Form R406-2017 report shall document compliance report requirements of Section R406.6.2 of the Florida Energy Code. Compliance software tools shall generate a report that documents that the ERI of the rated design complies with Sections R406.3 and R406.4. The compliance documentation shall include the following information:
 - Address or other identification of the residential building.
 - An inspection checklist documenting the building component characteristics of the rated design. The inspection checklist shall show results for both the ERI reference design and the rated design, and shall document all inputs entered by the user necessary to reproduce the results.
 - Name and version fo the compliance software tool.
 - Name of individual completing the compliance report.
 - The software shall indicate that whether the compliance calculation is performed for worst case scenario.
- Energy Performance Level (EPL) Display Card (one page)
- HVAC system sizing and selection based on ACCA Manual S or per exceptions provided in Section R403.7
- Mandatory Requirements (five pages)

Required prior to CO for the Performance Method:

- 2017 Air Barrier and Insulation Inspection Component Criteria checklist (Table R402.4.1.1 of the 2017 Florida Building Code, Energy Conservation - one page)
- A completed Form 2017 Envelope Leakage Test Report (usually one page). Section R402.4 or R402.4.1.2 exceptions may apply
- A completed Form 2017 Duct Leakage Test Report (usually one page)

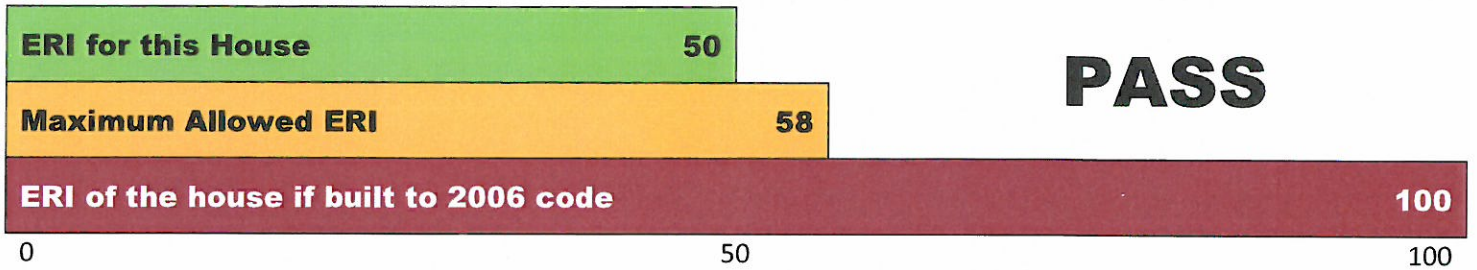
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**** Software Title and Version Here **** - FBC 6th Edition (2017) Compliant Software

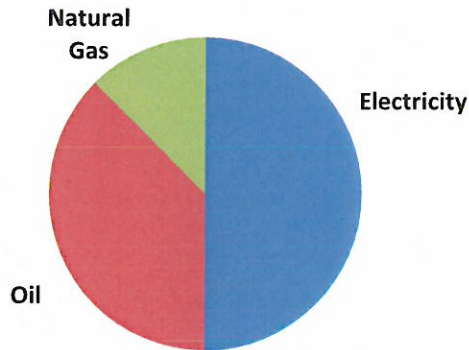
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Florida R406 ERI Report

Property 25 Parkes Street Miami FL 33101 Permit Office: xx Permit Number: xx Jurisdiction: xx County: xx	Worst Case Scenario Calculation: No On-site Renewable Power Production: No Envelope Efficiency Meets or Exceeds: IECC-2009 Reference Design Configuration: IECC-2006 Climate Zone: 1	Builder Street Building Co. 2 Barton Street Miami FL 33101 Phone:
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Energy Costs by Source



Estimated Energy Use Breakdown

Source	Usage	Price*	Cost
Electricity	xx kWh	\$xxx/kWh	\$xxx
Natural gas	xx Therms	\$xxx/Therm	\$xxx
Oil	xx Gallons	\$xxx/Gallon	\$xxx
On-site power production	0 kWh	\$xxx/kWh	
Total			\$xxx

* Energy prices are state wide averages published by The Department of Energy, Energy Information Administration.

Person completing this rating

Name: Joe Rater


Address: Liberty ERI Rating Co
200 Griffith St
Miami FL 33101

Phone: _____

Signature: _____

Date of Rating: _____

Review of the plans and specifications covered by this calculation indicates compliance with the Florida Energy Code. Before construction is completed, this building will be inspected for compliance with Section 553.908 Florida Statutes.



BUILDING OFFICIAL: _____

DATE: _____

**Software Provider
Logo**

Name and Version of Compliance Software Tool

ERI Mandatory Requirements Status

Property 25 Parkes Street Miami FL 33101 Permit Office: xx Permit Number: xx Jurisdiction: xx County: xx	On-site Renewable Power Production: No Envelope Efficiency Meets or Exceeds: IECC-2009 Climate Zone: 1 Calculated ERI: 50 Date of Rating: 1/1/18	Builder Street Building Co. 2 Barton Street Miami FL 33101 Phone:	Rater Joe Rater Liberty ERI Rating Co 200 Griffith St Miami FL 33101
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Energy Code Reference	Topic (See attached Mandatory Requirements for details.)	Verified in Software
2009 IECC Tables 402.1.1 or 402.1.3	Thermal envelope efficiency. Home has no on-site power production.	PASS
2015 IECC Tables 402.1.2 or 402.1.4	Thermal envelope efficiency. Home has on-site power production.	Not Applicable
2015 IECC 403.5.3	Hot water pipe insulation.	PASS
R406.3	Insulation of ducts not completely inside thermal envelope.	PASS
R402.4.1.1	Building Thermal Envelope Installation	
R402.4.1.2	Air changes per hour. ACH50 = 7.	PASS
R402.4.2	Fireplaces have dampers and outdoor combustion air.	PASS
R402.4.4	Rooms containing fuel burning appliances. Zones 3-8	Not Applicable
R402.4.5	Recessed lighting rating and sealing.	
R403.1.1	Thermostat provision.	

**Software Provider
Logo**

Name and Version of Compliance Software Tool

406

Building Input Summary Report

PROJECT											
Title:	Right-Energy® Florida 2014			Bedrooms:	3	Address type:	Street address				
Building Type:	FLAsBuilt			Bathrooms:	1	Lot#:	Lot. 410-111				
Owner:	Mr. and Mrs. Henry Wagner			Conditioned Area:	2100	Block/Subdivision:	Lexington Crossing				
# of Units:	1			Total Stories:	1	Platbook:	111-11				
Builder Name:	Wrightsoft			Worst Case:	No	Street:	1516 Ninth Street				
Permit Office:	Tampa			Rotate Angle:	0	County:	Hillsborough				
Jurisdiction:	Hillsborough County			Cross Ventilation:	No	City, State, Zip:	Tampa, FL 33601				
Family Type:	Single-Family			Whole House Fan:	No						
New/Existing:	New (From Plans)			Terrain:	Ocean/Lake						
Year Construct:	2017			Shielding:	Suburban						
Comment:	Pre-construction										
CLIMATE											
✓	Design Location	TMY Site	IECC Zone	Design Temp 97.5 %	2.5 %	Int Design Temp Winter	Summer	Heating Degree Days	Design Moisture	Daily Temp Range	
	FL, Tampa International AP	FL_Tampa_Intl_AP	2	43	91	70	75	0	53	Low	
BLOCKS											
#	Name	Area	Volume								
1	Living AH	2100.00ft²	18900.00ft³								
SPACES											
#	Area	Volume	Kitchen	Occupants	Bedrooms	Infil ID	Finished	Cooled	Heated		
1	Living	2100.00ft²	18900.00ft³	No	4	3	1	Yes	Yes	Yes	
FLOORS											
✓ #	Floor Type	Space	Perimeter	R-Value	Area	Tile	Wood	Carpet			
1	Bg floor, light dry soil, on grade depth, carp 80	Living	162 ft	0	2100.00ft²	0	0	0.8			
ROOF											
✓ #	Type	Materials	Roof Area	Gable Area	Roof Color	Solar Absor.	SA Tested	Emitt	Emitt Tested	Deck Insul.	Pitch (deg)
1	Gable or shed	RoofAsph	2661 ft²	100 ft²	Light	0.60	No	0.90	No	6	22
ATTIC											
✓ #	Type	Ventilation	Vent Ratio (1 in)	Area	RBS	IRCC					
1	Full attic	Vented	300	2100.00ft²	N	N					
CEILING											
✓ #	Ceiling Type	Space	R-Value	Area	Framing Fraction			Truss Type			
1	Attic ceiling, asphalt s	Living	30	2100.00ft²	0.10			--			
WALLS											
✓ #	Ornt	Adjacent To	Wall Type	Space	Cavity R-Value	Width Ft In	Height Ft In	Area	Sheathing R-Value	Framing Fraction	Solar Absor. Below Grade%
1	N	Exterior	Frm wall, e	Living	19	30 0	9 0	270.0 ft²	4	0.25	0.75 0
2	E	Exterior	Frm wall, e	Living	19	36 0	9 0	324.0 ft²	4	0.25	0.75 0
3	S	Exterior	Frm wall, e	Living	19	50 0	9 0	450.0 ft²	4	0.25	0.75 0
4	W	Exterior	Frm wall, e	Living	19	46 0	9 0	414.0 ft²	4	0.25	0.75 0
5	-	Partition	Frm wall, s	Living	15	30 0	9 0	270.0 ft²	0	0.25	0.75 0
DOORS											
✓ #	Ornt	Door Type		Space	Storms	U-Value	Width Ft In	Height Ft In	Area		
1	N	Door, wd sc type		Living	None	0.390	3 0	6 8	20.0 ft²		
2	N	Door, wd sc type		Living	None	0.390	3 2	6 8	21.1 ft²		

406.6.1

WINDOWS														
✓ #	Ornt	Wall ID	Frame	Panes	NFRC	U-Factor	SHGC	Storms	Area	Depth	Overhang Separation	Interior Shade	Screening	
1	N	1	None	Single (Clear)	Yes	0.032	0.25	No	14.0ft ²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
2	N	1	None	Single (Clear)	Yes	0.032	0.25	No	30.0ft ²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
3	N	1	None	Single (Clear)	Yes	0.032	0.25	No	30.0ft ²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
4	E	2	None	Single (Clear)	Yes	0.032	0.25	No	45.0ft ²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
5	S	3	Wood	Double (Clear)	Yes	0.032	0.25	No	40.0ft ²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
6	S	3	None	Single (Clear)	Yes	0.032	0.25	No	13.5ft ²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
7	W	4	None	Single (Clear)	Yes	0.032	0.25	No	45.0ft ²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	

GARAGE						
✓ #	Floor Area	Ceiling Area	Exposed Wall Perimeter	Avg. Wall Height	Exposed Wall Insulation	
1	440 ft ²	440 ft ²	54 ft	9 ft	19	

INFILTRATION								
#	Scope	Method	SLA	CFM 50	ELA	EqlA	ACH	ACH 50
1	Wholehouse	Blower Door	0.000401	2205	121.3	227.8	0.41	7.00

HEATING SYSTEM						
✓ #	System Type	Subtype	Efficiency	Capacity	Block	Ducts
1	Split air source heat pump		HSPF: 8.2	22.4 kBtu/hr	1	sys#1

COOLING SYSTEM								
✓ #	System Type	Subtype	Efficiency	Capacity	Air Flow	SHR	Block	Ducts
1	Split air source heat pump		SEER: 14.0	20.2 kBtu/hr	673 cfm	0.70	1	sys#1

HOT WATER SYSTEM								
✓ #	System Type	Subtype	Location	EF	Cap	Use	SetPnt	Conservation
1	Electric conventional			0.96	40 gal	60 gal	120 °F	None

SOLAR HOT WATER SYSTEM						
✓ FSEC Cert #	Company Name	System Model #	Collector Model #	Collector Area	Storage Volume	FEF
12345	Sample	SSWS-678	SSWC-123	35.0 ft ²	70.0 gal	3.0

DUCTS													
✓ #	Location	--- Supply --- R-Value	Area	--- Return --- Location	Area	Leakage Type	Air Handler	CFM 25 Out	Percent Leakage	QN	RLF	HVAC # Heat	# Cool
1	Living AH	8.0	223 ft ²	Living AH	15 ft ²	Default Leakage	Living AH	(Default)	6.00			1	1

TEMPERATURES														
Programable Thermostat:							Ceiling Fans:							
Cooling	Heating	Venting	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Thermostat Schedule:		Florida Building Code, 6th Edition (2017)												
Schedule Type		1	2	3	4	5	6	7	8	9	10	11	12	
Cooling (WD)		AM	75	75	75	75	75	75	75	75	75	75	75	
		PM	75	75	75	75	75	75	75	75	75	75	75	
Cooling (WEH)		AM	75	75	75	75	75	75	75	75	75	75	75	
		PM	75	75	75	75	75	75	75	75	75	75	75	
Heating (WD)		AM	72	72	72	72	72	72	72	72	72	72	72	
		PM	72	72	72	72	72	72	72	72	72	72	72	
Heating (WEH)		AM	72	72	72	72	72	72	72	72	72	72	72	
		PM	72	72	72	72	72	72	72	72	72	72	72	

Reference Home Characteristics

Mr. and Mrs. Henry Wagner
1516 Ninth Street
Tampa, FL 33601

Title: SimpleHouse
FLBase2014

TMY City: FL_Tampa_Intl_AP

Above-grade Walls (Uo)	0.084
Above-grade Wall Solar Absorptance	0.75
Above-grade Wall Infrared Emittance	0.90
Basement Walls (Uo)	n/a
Above-grade Floors (Uo)	n/a
Slab Insulation R-Value	0.0
Ceilings (Uo)	0.030
Roof Solar Absorptance	0.75
Roof Infrared Emittance	0.90
Attic Vent Area (ft ²)	7.00
Crawlspace Vent Area (ft ²)	n/a
Exposed Masonry Floor Area (ft ²)	508.00
Carpet & Pad R-Value	2.0
Door Area (ft ²)	40.00
Door U-Factor	0.400
North Window Area (ft ²)	78.75
South Window Area (ft ²)	78.75
East Window Area (ft ²)	78.75
West Window Area (ft ²)	78.75
Window U-Factor	0.400
Window SHGC (Heating)	0.2169
Window SHGC (Cooling)	0.2169
ACH50	7.00
Internal Gains * (Btu/day)	80192
Water heater gallons per day	60.00
Water Heater set point temperature	120.00
Water heater efficiency rating	0.95
Labeled Heating System Rating and Efficiency	HSPF = 8.2
Labeled Cooling System Rating and Efficiency	SEER = 14.0
Air Distribution System Efficiency	0.88
Thermostat Type	Manual
Heating Thermostat Settings	72.0 (All hours)
Cooling Thermostat Settings	75.0 (All hours)

To be added per 2017 TAM page R-40:
Sensible Internal Gains
Latent Internal Gains
Specific Leakage Area by zone or SLAo3 as appropriate.
DHW pipe length
DHW loop length

ENERGY PERFORMANCE LEVEL (EPL) DISPLAY CARD

ESTIMATED ENERGY PERFORMANCE INDEX = 83
The lower the Energy Performance Index, the more efficient the home.

1516 Ninth Street, Tampa, FL 33601

<p>1. New construction or existing 2. Single family or multiple family 3. Number of units, if multiple family 4. Number of bedrooms 5. Is this a worst case? 6. Conditioned floor area (ft²)</p>	<p>New (From Plans) Single-Family 1 3 No 2100.00</p>	<p>9. Wall Types a. Frm wall, eifs ext, r-15 ca b. Frm wall, stucco ext, r-15 c. N/A d. N/A</p>	<p>Insulation 19.0 15.0 R= R=</p>	<p>Area (ft²) 1458.00 270.00</p>	
<p>7. Windows** a. U-Factor: SHGC: b. U-Factor: SHGC: c. U-Factor: SHGC: d. U-Factor: SHGC: Area Weighted Average Overhang Depth: Area Weighted Average SHGC:</p>	<p>Description Sgl, U=0.032 SHGC=0.25 Dbl, U=0.032 SHGC=0.25 1.000 ft 0.250</p>	<p>Area (ft²) 299.58 40.56</p>	<p>10. Ceiling Types a. Attic ceiling, asphalt s b. N/A c. N/A</p>	<p>Insulation R=30.0 R= R=</p>	<p>Area (ft²) 2100.00</p>
<p>8. Floor Types a. Bg floor, light dry soil, on grade b. N/A c. N/A</p>	<p>Insulation R=0.0 R= R=</p>	<p>Area (ft²) 2100.00</p>	<p>11. Ducts a. Sup:Living AH/Ret:Living AH/AH:Living AH</p>	<p>R 8.0</p>	<p>Area (ft²) 222.79</p>
			<p>12. Cooling systems a. Split air source heat pump b.</p>	<p>kBtu/hr 20.2</p>	<p>Efficiency SEER: 14.0</p>
			<p>13. Heating systems a. Split air source heat pump b.</p>	<p>kBtu/hr 22.4</p>	<p>Efficiency HSPF: 8.2</p>
			<p>14. Hot water systems a. Electric conventional (40 gal) b. Conservation features Solar:FEF=3.0</p>		<p>Cap: 40 gal EF: 0.96</p>
			<p>15. Credits Solar WH</p>		

I certify that this home complied with the Florida Energy Efficiency Code for Building Construction through the above energy saving features which will be installed (or exceeded) in this home before final inspection. Otherwise, a new EPL Display Card will be completed based on installed Code compliant features.

Builder Signature: _____ Date: _____

Address of New Home: _____ City/FL Zip: _____



**Label required by Section 303.1.3 of the Florida Building Code, Energy Conservation, if not DEFAULT.

ADDRESS: 1516 Ninth Street
Tampa, FL 33601

PERMIT #: 2222-1

MANDATORY REQUIREMENTS - See individual code sections for full details.

SECTION R401 GENERAL

R401.2 Projects shall comply with one of the following:

2. Section R405 and the provisions of Section R401 through R404 labeled "Mandatory".

R401.3 Energy Performance Level (EPL) display card (Mandatory). The building official shall require that an energy performance level (EPL) display card be completed and certified by the builder to be accurate and correct before final approval of the building for occupancy. Florida law (Section 553.9085, Florida Statutes) requires the EPL display card to be included as an addendum to each sales contract for both presold and nonpresold residential buildings. The EPL display card contains information indicating the energy performance level and efficiencies of components installed in a dwelling unit, completed and signed by the builder. The building official shall verify that the EPL display card accurately reflects the plans and specifications submitted to demonstrate compliance for the building. A copy of the EPL display card can be found in Appendix RD.

R402.4 Air leakage (Mandatory). The building thermal envelope shall be constructed to limit air leakage in accordance with the requirements of Sections R402.4.1 through R402.4.5.

Exception: Dwelling units of R-2 Occupancies and multiple attached single family dwellings shall be permitted to comply with Section C402.5.

R402.4.1 Building thermal envelope. The building thermal envelope shall comply with Sections R402.4.1.1 and R402.4.1.2. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.

R402.4.1.1 Installation. The components of the building thermal envelope as listed in Table R402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table 402.4.1.1, as applicable to the method of construction. Where required by the code official, an approved third party shall inspect all components and verify compliance.

R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding seven air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ANSI/RESET/ICC 380 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Testing shall be conducted 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) or an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope.

Exception: Testing is not required for additions, alterations, renovations, or repairs, of the building thermal envelope of existing buildings in which the new construction is less than 85 percent 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.
6. Supply and return registers, if installed at the time of the test, shall be fully open.

R402.4.2 Fireplaces. New wood-burning fireplaces shall have tight-fitting flue dampers or doors, and outdoor combustion air. Where using tight-fitting doors on factory-built fireplaces listed and labeled in accordance with UL 127, the doors shall be tested and listed for the fireplace. Where using tight-fitting doors on masonry fireplaces, the doors shall be listed and labeled in accordance with UL 907.

R402.4.3 Fenestration air leakage. Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m²), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m²), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer.

Exception: Site-built windows, skylights and doors.

MANDATORY REQUIREMENTS - (Continued)

R402.4.4 Rooms containing fuel-burning appliances In Climate Zones 3 through 8, where open combustion air ducts provide combustion air to open combustion fuel burning appliances, the appliances and combustion air opening shall be located outside the building thermal envelope or enclosed in a room, isolated from inside the thermal envelope. Such rooms shall be sealed and insulated in accordance with the envelope requirements of Table R402.1.2, where the walls, floors and ceilings shall meet not less than the basement wall R-value requirement. The door into the room shall be fully gasketed and any water lines and ducts in the room insulated in accordance with Section R403. The combustion air duct shall be insulated where it passes through conditioned space to a minimum of R-8.

Exceptions:

1. Direct vent appliances with both intake and exhaust pipes installed continuous to the outside.
2. Fireplaces and stoves complying with Section R402.4.2 and Section R1006 of the Florida Building Code, Residential.

R402.4.5 Recessed lighting. Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires 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 E283 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.

SECTION R403 SYSTEMS**R403.1 Controls**

R403.1.1 Thermostat provision (Mandatory). At least one thermostat shall be provided for each separate heating and cooling system.

R403.1.3 Heat pump supplementary heat (Mandatory). Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.

R403.3.2 Sealing (Mandatory). All ducts, air handlers, filter boxes and building cavities that form the primary air containment passageways for air distribution systems shall be considered ducts and plenum chambers, shall be constructed and sealed in accordance with Section C403.2.9.2 of the Commercial Provisions of this code and shall be shown to meet duct tightness criteria below.

Duct tightness shall be verified by testing in accordance with ANSI/RESNET/ICC 380 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, to be "substantially leak free" in accordance with Section R403.3.3.

R403.3.2.1 Sealed air handler. Air handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design air flow rate when tested in accordance with ASHRAE 193.

R403.3.3 Duct testing. Ducts shall be pressure tested to determine air leakage by one of the following methods:

1. Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. All registers shall be taped or otherwise sealed during the test.
2. Post construction test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All registers shall be taped or otherwise sealed during the test.

Exceptions:

1. A duct leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope.
2. Duct testing is not mandatory for buildings complying by Section 405 of this code.

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

R403.3.5 Building Cavities (Mandatory). Building framing cavities shall not be used as ducts or plenums.

R403.4 Mechanical system piping insulation (Mandatory). Mechanical system piping capable of carrying fluids above 105°F (41°C) or below 55°F (13°C) shall be insulated to a minimum of R-3.

R403.4.1 Protection of piping insulation. Piping insulation exposed to weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance, and wind, and shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall not be permitted.

R403.5.1 Heated water circulation and temperature maintenance systems (Mandatory). Heated water circulation systems shall be in accordance with Section R403.5.1.1. Heat trace temperature maintenance systems shall be in accordance with Section R403.5.1.2. Automatic controls, temperature sensors and pumps shall be accessible. Manual controls shall be readily accessible.

R403.5.1.1 Circulation systems. Heated water circulation systems shall be provided with a circulation pump. The system return pipe shall be dedicated return pipe or a cold water supply pipe. Gravity and thermosiphon circulation systems shall be prohibited. Controls for circulating hot water system pumps shall start the pump based on the identification of a demand for hot water within the occupancy. The controls shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is no demand for hot water.

R403.5.1.2 Heat trace systems. Electric heat trace systems shall comply with IEEE 515.1 or UL 515. Controls for such systems shall automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping in accordance with the times when heated water is used in the occupancy.

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MANDATORY REQUIREMENTS - (Continued)

R403.5.5 Heat traps (Mandatory). Storage water heaters not equipped with integral heat traps and having vertical pipe risers shall have heat traps installed on both the inlets and outlets. External heat traps shall consist of either a commercially available heat trap or a downward and upward bend of at least 3 1/2 inches (89 mm) in the hot water distribution line and cold water line located as close as possible to the storage tank.

R403.5.6 Water heater efficiencies (Mandatory).

R403.5.6.1 Storage water heater temperature controls.

R403.5.6.1.1 Automatic controls. Service water heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use. The minimum temperature setting range shall be from 100°F to 140°F (38°C to 60°C).

R403.5.6.1.2 shut down. A separate switch or a clearly marked circuit breaker shall be provided to permit the power supplied to electric service systems to be turned off. A separate valve shall be provided to permit the energy supplied to the main burner(s) of combustion types of service water heating systems to be turned off.

R403.5.6.2 Water heating equipment. Water heating equipment installed in residential units shall meet the minimum efficiencies of Table C404.2 in Chapter 4 of the Florida Building Code, Energy Conservation, Commercial Provisions, for the type of equipment installed. Equipment used to provide heating functions as part of a combination system shall satisfy all stated requirements for the appropriate water heating category. Solar water heaters shall meet the criteria of Section R403.5.6.2.1.

R403.5.6.2.1 Solar water heating system. Solar systems for domestic hot water production are rated by the annual solar energy factor of the system. The solar energy factor of a system shall be determined from the Florida Solar Energy Center Directory of Certified Solar Systems. Solar collectors shall be tested in accordance with ISO Standard 9806, Test Methods for Solar Collectors, and SRCC Standard TM-1, Solar Domestic Hot Water System and Component Test Protocol. Collectors in installed solar water-heating systems should meet the following criteria:

1. Be installed with a tilt angle between 10 degrees and 40 degrees of the horizontal; and
2. Be installed at an orientation within 45 degrees of true south.

R403.6 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of the Florida Building Code, Residential or Florida Building Code, Mechanical, as applicable, or with other approved means of ventilation, including: Natural, Infiltration or Mechanical means. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

R403.6.1 Whole-house mechanical ventilation system fan efficacy. When installed to function as a whole-house mechanical ventilation system, fans shall meet the efficacy requirements of Table R403.6.1.

Exception: Where mechanical ventilation fans are integral to tested and listed HVAC equipment, they shall be powered by an electronically commutated motor.

R403.6.2 Ventilation air. Residential buildings designed to be operated at a positive indoor pressure of for mechanical ventilation shall meet the following criteria:

1. The design air change per hour minimums for residential buildings in ASHRAE 62.2, Ventilation for Acceptable Indoor Air Quality, shall be the maximum rates allowed for residential applications.
2. No ventilation or air-conditioning system make-up air shall be provided to conditioned space from attics, crawlspaces, attached enclosed garages or outdoor spaces adjacent to swimming pools or spas.
3. If ventilation air is drawn from enclosed spaces(s), then the walls of the space(s) from which air is drawn shall be insulated to a minimum of R-11 and the ceiling shall be insulated to a minimum of R-19, space permitting, or R-10 otherwise.

R403.7 Heating and cooling equipment (Mandatory).

R403.7.1 Equipment sizing. Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on the equipment loads calculated in accordance with ACCA Manual J or other approved methodologies, heating and cooling calculation based on building loads for the directional orientation of the building. The manufacturer and model number of the outdoor and indoor units (if split system) shall be submitted along with the sensible and total cooling capacities at the design conditions described in Section R302.1. This code does not allow designer safety factors, provisions for future expansion or other factors that affect equipment sizing. System sizing calculations shall not include loads created by local intermittent mechanical ventilation such as standard kitchen and bathroom exhaust systems. New or replacement heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is installed.

TABLE R403.6.1

WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY

FAN LOCATION	AIRFLOW RATE MINIMUM CFM	MINIMUM EFFICACY (a) CFM/WATT	AIRFLOW RATE MAXIMUM CFM
Range hoods	Any	2.8 cfm/watt	Any
In-line fan	Any	2.8 cfm/watt	Any
Bathroom, utility room	10	1.4 cfm/watt	< 90
Bathroom, utility room	90	2.8 cfm/watt	Any

For SI: 1 cfm - 28.3 L/min.

(a) When tested in accordance HVI Standard 916

MANDATORY REQUIREMENTS - (Continued)

R403.7.1.1 Cooling equipment capacity. Cooling only equipment shall be selected so that its total capacity is not less than the calculated total load but not more than 1.15 times greater than the total load calculated according to the procedure selected in Section 403.7, or the closest available size provided by the manufacturer's product lines. The corresponding latent capacity of the equipment shall not be less than the calculated latent load.

The published value for AHRI total capacity is a nominal, rating-test value and shall not be used for equipment sizing. Manufacturer's expanded performance data shall be used to select cooling-only equipment. This selection shall be based on the outdoor design dry-bulb temperature for the load calculation (or entering water temperature for water-source equipment), the blower CFM provided by the expanded performance data, the design value for entering wet-bulb temperature and the design value for entering dry-bulb temperature

Design values for entering wet-bulb and dry-bulb temperatures shall be for the indoor dry bulb and relative humidity used for the load calculation and shall be adjusted for return side gains if the return duct(s) is installed in an unconditioned space.

Exceptions:

1. Attached single- and multiple-family residential equipment sizing may be selected so that its cooling capacity is less than the calculated total sensible load but not less than 80 percent of that load.
2. When signed and sealed by a Florida-registered engineer, in attached single- and multiple-family units, the capacity of equipment may be sized in accordance with good design practice.

R403.7.1.2 Heating equipment capacity.

R403.7.1.2.1 Heat pumps Heat pump sizing shall be based on the cooling requirements as calculated according to Section R403.7.1.1, and the heat pump total cooling capacity shall not be more than 1.15 times greater than the design cooling load even if the design heating load is 1.15 times greater than the design cooling load.

R403.7.1.2.2 Electric resistance furnaces. Electric resistance furnaces shall be sized within 4 kW of the design requirements calculated according to the procedure selected in Section R403.7.1

R403.7.1.2.3 Fossil fuel heating equipment. The capacity of fossil fuel heating equipment with natural draft atmospheric burners shall not be less than the design load calculated in accordance with Section R403.7.1.

R403.7.1.3 Extra capacity required for special occasions. Residences requiring excess cooling or heating equipment capacity on an intermittent basis, such as anticipated additional loads caused by major entertainment events, shall have equipment sized or controlled to prevent continuous space cooling or heating within that space by one or more of the following options:

1. A separate cooling or heating system is utilized to provide cooling or heating to the major entertainment areas.
2. A variable capacity system sized for optimum performance during base load periods is utilized.

R403.8 Systems serving multiple dwelling units (Mandatory). Systems serving multiple dwelling units shall comply with Sections C403 and C404 of the IECC—Commercial Provisions in lieu of Section R403.

R403.9 Snow melt and ice system controls (Mandatory). Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F (10°C), and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F (4.8°C).

R403.10 Pools and permanent spa energy consumption (Mandatory). The energy consumption of pools and permanent spas shall be in accordance with Sections R403.10.1 through R403.10.5.

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.

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 operations.
2. Pumps that operate solar- and waste-heat-recovery pool heating systems.
3. Where pumps are powered exclusively from on-site renewable generation.

R403.10.3 Covers. Outdoor heated swimming pools and outdoor permanent spas shall be equipped with a vapor- retardant cover on or at the water surface or a liquid cover or other means proven to reduce heat loss.

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.

R403.10.4 Gas- and oil-fired pool and spa heaters. All gas- and oil-fired pool and spa heaters shall have a minimum thermal efficiency of 82 percent for heaters manufactured on or after April 16, 2013, when tested in accordance with ANSI Z 21.56. Pool heaters fired by natural or LP gas shall not have continuously burning pilot lights.

MANDATORY REQUIREMENTS - (Continued)

R403.10.5 Heat pump pool heaters. Heat pump pool heaters shall have a minimum COP of 4.0 when tested in accordance with AHRI 1160, Table 2, Standard Rating Conditions-Low Air Temperature. A test report from an independent laboratory is required to verify procedure compliance. Geothermal swimming pool heat pumps are not required to meet this standard.

R403.11 Portable spas (Mandatory). The energy consumption of electric-powered portable spas shall be controlled by the requirements of APSP-14.

SECTION R404

ELECTRICAL POWER AND LIGHTING SYSTEMS

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

Exception: Low-voltage lighting.

R404.1.1 Lighting equipment (Mandatory). Fuel gas lighting systems shall not have continuously burning pilot lights.

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TABLE 402.4.1.1

AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

Project Name:	Right-Energy® Florida 2014 Example	Builder Name:	Wrightsoft
Street:	1516 Ninth Street	Permit Office:	Tampa
City, State, Zip:	Tampa, FL 33601	Permit Number:	2222-1
Owner:	Mr. and Mrs. Henry Wagner	Jurisdiction:	Hillsborough County
Design Location:	FL, Tampa International AP		
COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA	
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous barrier. Breaks or joints in the air barrier shall be sealed.	sealing material. Air-permeable insulation shall not be used as a	
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attics paces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.	
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities with corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier	
Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing shall be sealed.		
Rim joists	Rim joists are insulated and include an air barrier.	Rim joists shall be insulated.	
Floors (including above-garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity Insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.	
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided in lieu of floor insulation, insulation shall be permanently attached to the crawlspace walls.	
Shafts, penetrations	Duct shafts, utility penetrations, and flue shaft openings to exterior or unconditioned space shall be sealed.		
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity spaces.	
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.		
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.	
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.	
Shower/tub on exterior wall	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	Exterior walls adjacent to showers and tubs shall be insulated.	
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.		
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.		
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.		

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.

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FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION

Envelope Leakage Test Report Performance Methods OR ERT

Project Name: Right-Energy® Florida 2014 Example Street: 1516 Ninth Street City, State, Zip: Tampa, FL 33601 Design Location: FL Tampa International AP Cond. Floor Area: 2100 ft ²	Builder Name: Wrightsoft Permit Office: Tampa Permit Number: 2222-1 Jurisdiction: Hillsborough County Cond. Volume: 18900 ft ³
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Envelope Leakage Test Results

Regression Data:

C: _____ n: _____ R: _____

Single or Multi Point Test Data:

	HOUSE PRESSURE	FLOW
1	Pa	cfm
2	Pa	cfm
3	Pa	cfm
4	Pa	cfm
5	Pa	cfm
6	Pa	cfm

Leakage Characteristics

Required ACH(50) from

FORM R405-2017: _____

Tested ACH(50)*: _____

* Tested leakage must be less than or equal to the required ACH(50) shown on Form R405-2017 for this building. If the tested ACH(50) is less than 3, the building must have a mechanical ventilation system.

402.4.1.2 Testing option. The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 7 air changes per hour in Climate Zones 1 and 2. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Testing shall be conducted 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) or an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. 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.

I hereby certify that the above envelope leakage performance results demonstrate compliance with Florida Energy Code requirements in accordance with Section R402.4.1.2.

Signature: _____

Printed Name: _____

DATE: _____

Testing shall be conducted 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) or an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official.



BUILDING OFFICIAL: _____

DATE: _____

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FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION

Form R405 Duct Leakage Test Report Performance Method

OR ERI

Project Name: Right-Energy® Florida 2014 Example	Builder: Wrightsoft
Street: 1516 Ninth Street	Permit Office: Tampa
City, State, Zip: Tampa, FL 33601	Permit Number: 2222-1
Design Location: FL, Tampa International AP	Jurisdiction: Hillsborough County
	Duct Test Time: Post Construction

Required Duct Leakage from FORM R405-2017 _____ Qn (Out)

Duct Leakage Test Results

CFM25 Duct Leakage Test Values		
Line	System	Outside Duct Leakage
1	System 1	_____ cfm25(Out)
2	System 2	_____ cfm25(Out)
3	System 3	_____ cfm25(Out)
4	System 4	_____ cfm25(Out)
5	Tested Total House Duct System Leakage	Sum lines 1-4 _____ Divide by _____ (Total Conditioned Floor Area) = _____ Qn (Out)*

*Tested Qn (Out) must be less than or equal to the required Qn (Out)

I certify the above tested leakage to outside, Qn, is not greater than the proposed duct leakage Qn specified on FORM R405-2017.

Signature: _____

Printed Name: _____

DATE: _____

Duct tightness shall be verified by testing to ANSI/RESNET/ICC 380 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.



BUILDING OFFICIAL: _____

DATE: _____