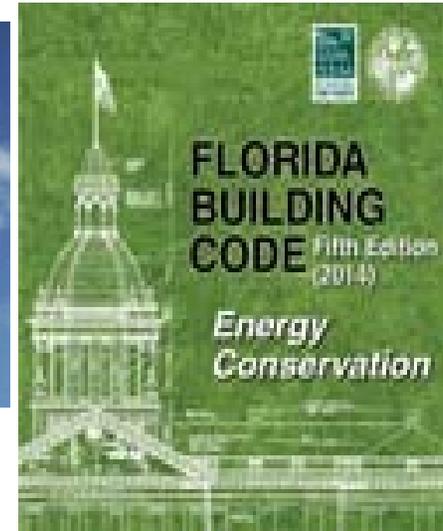
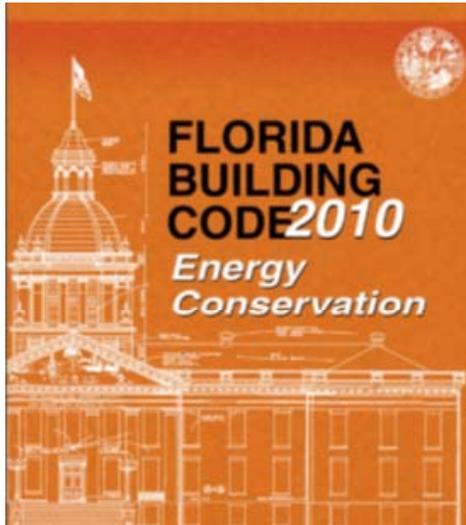


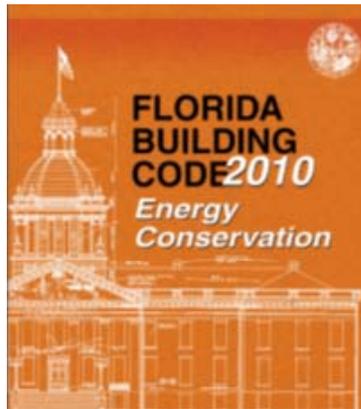
Florida Building Code Energy Conservation



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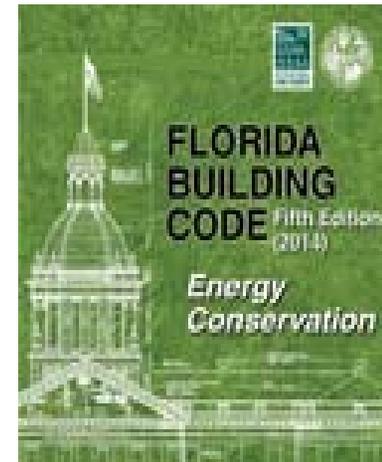
Code Change

Out with the Old – In with the New



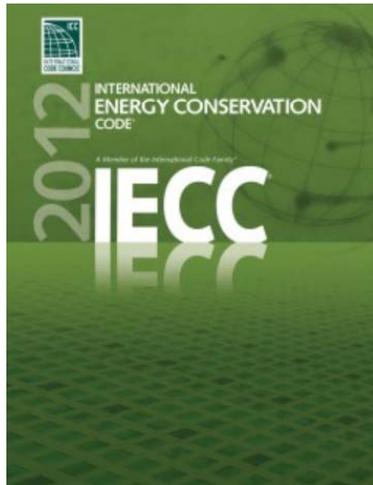
← Ends June 30th 2015

→ Begins June 30th 2015



Raises the Bar on the
“Standard Reference Design”
Home
by 10% or Maybe More

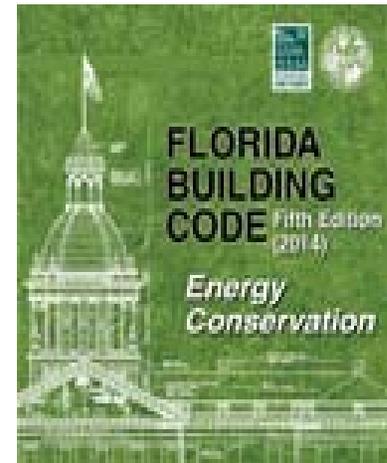
Moved to the 2012 IECC



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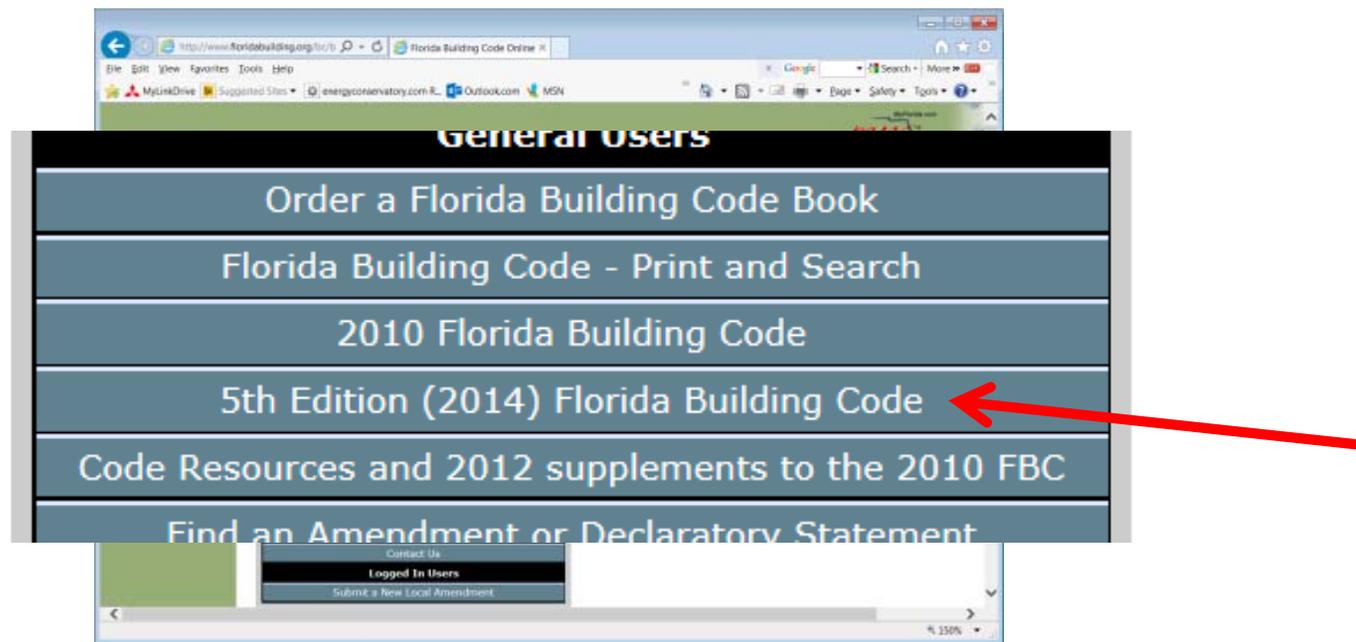
**Florida
Amendments**

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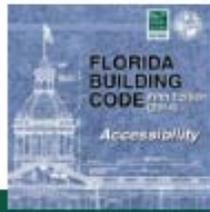
Florida Building Code – On Line



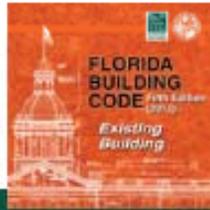
http://www.floridabuilding.org/bc/bc_default.aspx

Florida Building Code – Book Shelf

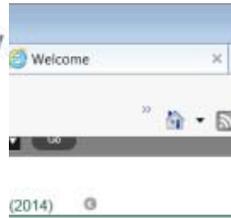
Florida Building Code
5th Edition (2014) Accessibility



Florida Building Code
5th Edition (2014) Existing Building



Florida Building Code
5th Edition (2014) Plumbing



Florida Building Code
5th Edition (2014) Building



Florida Building Code
5th Edition (2014) Fuel Gas



Florida Building Code
5th Edition (2014) Residential



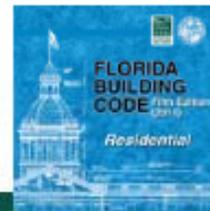
Florida Building Code
5th Edition (2014) Building



Florida Building Code
5th Edition (2014) Fuel Gas



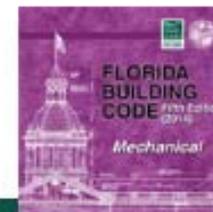
Florida Building Code
5th Edition (2014) Residential



Florida Building Code
5th Edition (2014) Energy Conservation



Florida Building Code
5th Edition (2014) Mechanical



Florida Building Code
5th Edition (2014) Test Protocols



CALCS-PLUS

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Florida Building Code 5th Edition (2014) Energy Conservation

ENERGY CONSERVATION CODE COVER

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CHAPTER 3 [CE] GENERAL REQUIREMENTS

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Climate Zones

Indoor Design Conditions

10%+ More Efficient Than 2010

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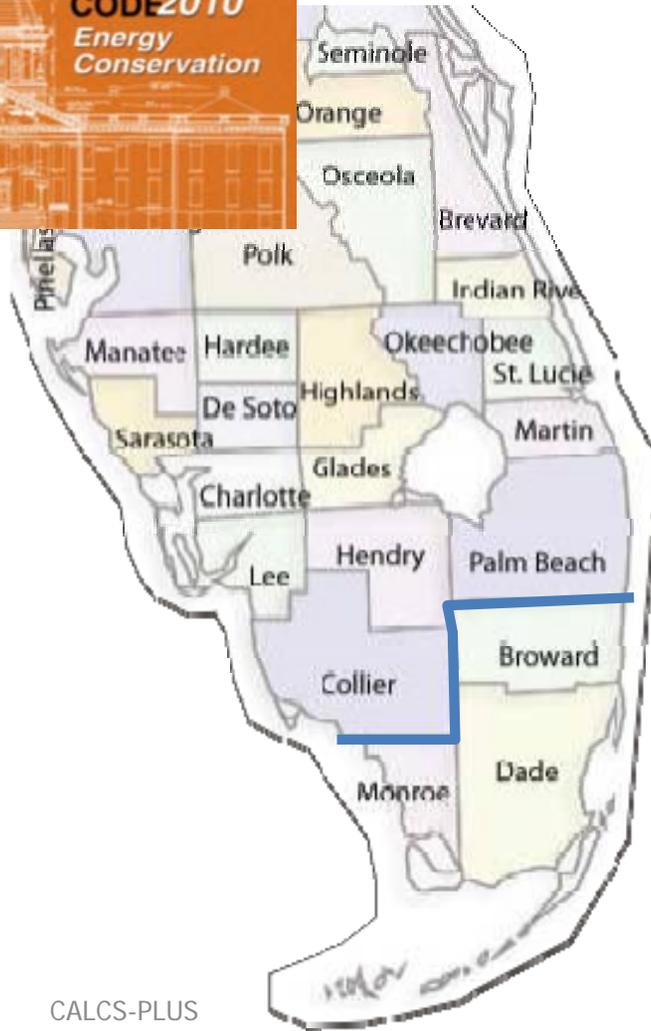
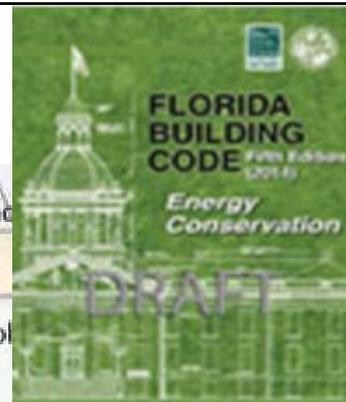
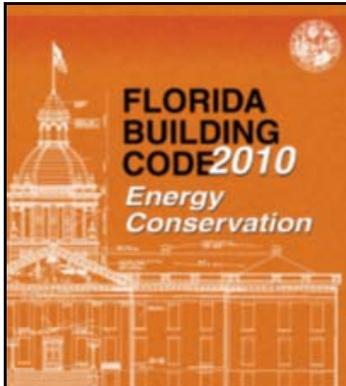
Thank You



Questions?

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Climate Zone Change



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General Requirements

SECTION R302 DESIGN CONDITIONS

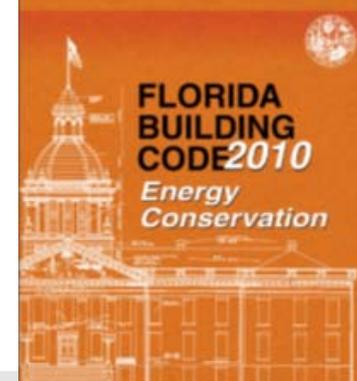
R302.1 Interior design conditions.

The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 75°F (24°C) for cooling.



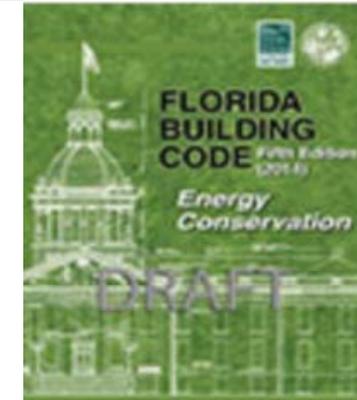
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Prescriptive



2010 Energy Code

% Glazing ^a	FENESTRATION U-FACTOR ^b	SKYLIGHT ^b U-FACTOR	GLAZED FENESTRATION SHGC ^b	CEILING R-VALUE	ROOF REFLECTANCE TESTED PER SECTION 405.6.2	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ^e	FLOOR R-VALUE/ ^f SLAB R-VALUE ^d	DOOR U-FACTOR	DUCTS: R-VALUE/ ^g LOCATION ^h	AIR HANDLER LOCATION ^a	AIR LEAKAGE TESTED PER SECTION 403.2.2.1
20%	0.65 ⁱ	0.75	0.30	30	0.25	13	6/7.8	13/0	0.65	R-6/ Conditioned	Conditioned	Qn= 0.03



CLIMATE ZONE	FENESTRATION U-FACTOR ^{b, j}	SKYLIGHT ^b U-FACTOR	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	.65	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0

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2014 Energy Code

Prescriptive

New Construction
Additions
Renovations

Must Meet
Sections
R402.1.1
thru R402.4

Must Meet

Table R402.1.1 Insulation and Fenestration Requirements by Component

CLIMATE ZONE	FENESTRATION U-FACTOR ^{b, l}	SKYLIGHT ^b U-FACTOR	GLAZED FENESTRATION SHGC ^{b, e}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ^f	FLOOR R-VALUE	BASEMENT ^c WALL R-VALUE	SLAB ^d R-VALUE & DEPTH	CRAWL SPACE ^c WALL R-VALUE
1	.65	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0

- Building Infiltration Testing R402.4.1.2
- Programmable Thermostat Required R403.1.2
- Supply ducts in attic insulated to R-8 R403.2.1
- Duct testing required R403.2.2
- Air Handlers not allowed in attics R403.2.4
- R-3 insulation on (most) all piping R403.4.2
- 75% high efficiency lighting R404.1

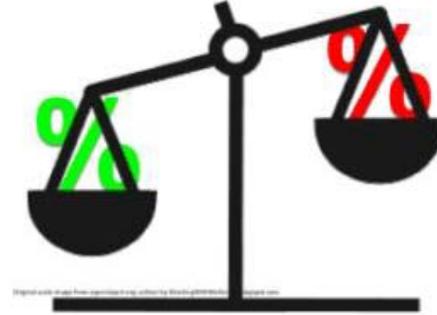
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No GFA Limit

Residential Energy Efficiency

R402.1.4

Total UA Alternative



R402.1.4 Total UA alternative.

If the total building thermal envelope UA (sum of U-factor times assembly area) is less than or equal to the total UA resulting from using the U-factors in Table R402.1.3 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table R402.1.1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to UA compliance.



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Residential Energy Efficiency

R402.1.4

Total UA Alternative

Proposed Building sum of U-factor times assembly area

Less than or equal to

Prescriptive Building sum of (Table 402.1.3) U-Factor times assembly area

Building shall be considered in compliance with Table R402.1.1.

UA calculation consistent with the ASHRAE *Handbook of Fundamentals*

Include the thermal bridging effects of framing materials.

The SHGC requirements shall be met in addition to UA compliance



Software works well



Table R402.1.3

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
1	0.50	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.082	0.165	0.064	0.360	0.477

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Residential Energy Efficiency

Performance Path

R405.3 Performance-based compliance.

Compliance based on simulated energy performance requires that a proposed residence (**proposed design**) be shown to have annual total normalized modified loads that are less than or equal to the annual total loads of the **standard reference design**



Proposed

Is \leq Energy Than



Reference

CALCS-PLUS

Standard Reference Design

2010 **Change** 2014



Proposed



Reference

Selected Standard Reference Design Values		
Component	2010 Reference	2014 Reference
Window Area	18% GFA	As proposed if <15% ≥ 15% - Reference
Window U-Factor / SHGC	.75 / .40	(1), 0.65 / .25 (2), 0.40 / 0.25
Ceiling U Factor	0.035	(1), 0.035 (2), 0.030
HVAC	SEER 13 / HSPF 7.7	SEER 14 / HSPF 8.2
Indoor Temp (F)	78/68	75/72

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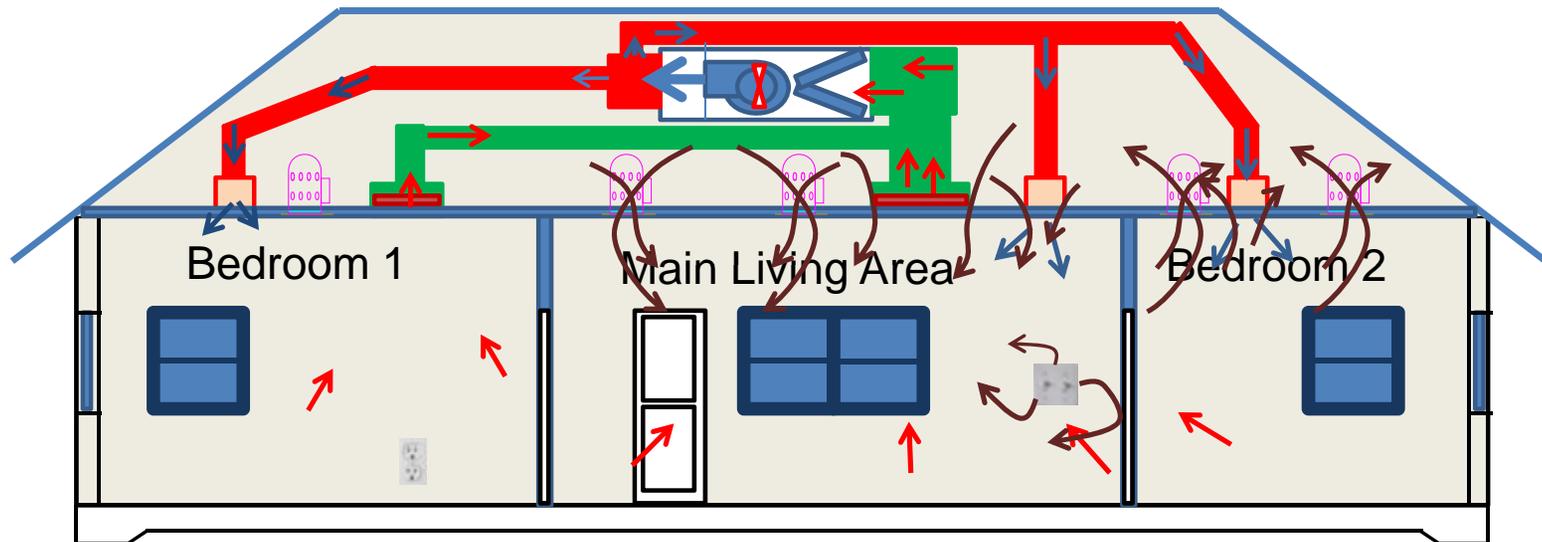
About 10% More Energy Efficient

Testing the Air Barrier

Building Air leakage

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 R402.4.4.



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Residential Energy Efficiency

Blower Door Testing

R402.4.1.2 Testing.

The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 5 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals)



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Could Still Go Away

**About
R402.4.1.2 Testing.**



Home Front

May 2015

The Official Publication of the Manatee-Sarasota Building Industry Association

Thank You for Renewing!

- 2-10 Home Buyers Warranty
- 84 Lumber
- Action Automatic Door & Gate
- Allegra Homes



Greetings BIA members:

This morning as I sit through a 2nd class in as many weeks on the new Florida Building Code, 5th Edition (2014), I am reminded that this industry has many codes and regulations that govern our activities. Not only do you as builders and associates need to be concerned with the customer service aspect of your businesses, you must also

You may not know but we are still battling parts of this new code, like the Blower Door Test and the new requirement for Ventilation in residential construction. If given the opportunity once the legislature reconvenes in June, our lobbying group through the FHBA will be asking for a stay of 90 days or more from the effective date of July 1, 2015.



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- CPA Consultants
- Danny Via Plumbing
- Dawson Companies
- David H. Rosenberg P.L.
- Dieters Sod & Landscaping
- DreamMaker Bath & Kitchen
- First Federal Bank of Florida
- FM Contract Services
- Harvath Home Services
- HD Supply—White Cap
- Herald Tribune
- Heritage Builders of West Florida
- Joseph Angeleri, Inc.
- Kimley Horn and Associates
- Lee Wetherington Homes
- M R Shank & Company
- McKenzie Homes, LLC

(Requiring more specificity in notice to contractors)

- HB 791: Residential Properties (Bulk Buyer Liability)
- HB 1151: Residential Master Building Permit

Finally, I would like to thank each one of you that participated in our Golf Tournament and for welcoming me into this organization. I look forward to growing with this organization as we continue to grow in membership and prominence locally and throughout the great state of Florida.

Best Regards,

Jon Mast

Chief Executive Officer

- Michael Saunders & Company
- Nelson Homes
- PGT
- Porges, Hamlin, Knowles & Hawk, P.A.
- ProBuild East
- Sarasota Builders & Remodelers

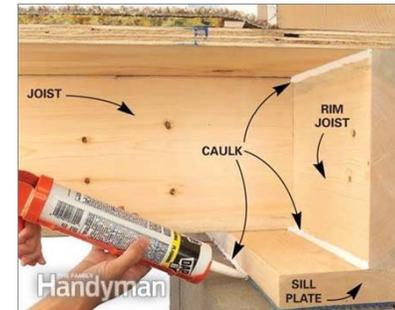
- Sarasota Ford
- Sherwin Williams Company
- Taylor Morrison
- Whelstone Engineering & Testing
- White Aluminum Products
- Wilson Window

Commercial

C402.4 Air leakage (Mandatory).

The thermal envelope of buildings shall comply with Sections C402.4.1 through C402.4.9.

C402.4.1 Air barriers.



A continuous air barrier shall be provided throughout the building thermal envelope. The air barriers shall be permitted to be located on the inside or outside of the building envelope, located within the assemblies composing the envelope, or any combination thereof. The air barrier shall comply with Sections C402.4.1.1 and C402.4.1.2.

Exception: Air barriers are not required in buildings located in Climate Zones 1, 2 and 3.

No Need to Comply

not required in buildings located in
Climate Zones 1, 2 and 3

C402.4.1.1 and C402.4.1.2

C402.4.1.1 Air barrier construction.

C402.4.1.2 Air barrier compliance options.

C402.4.1.2.1 Materials.

C402.4.1.2.2 Assemblies.

C402.4.1.2.3 Building test.



CALCS-PLUS

Florida Amendments

C402.4.9.1 Vented dropped ceiling cavities.

Where vented dropped ceiling cavities occur over conditioned spaces, the ceiling shall be considered to be both the upper thermal envelope and pressure envelope of the building and shall contain a continuous air barrier between the conditioned space and the vented unconditioned space that is also sealed to the air barrier of the walls. See the definition of air barrier in Section C202.



C402.4.9.2 Unvented dropped ceiling cavities.

Where unvented dropped ceiling cavities occur over conditioned spaces that do not have an air barrier between the conditioned and unconditioned space (such as T-bar ceilings), they shall be completely sealed from the exterior environment (at the roof plane) and adjacent spaces by a continuous air barrier that is also sealed to the air barrier of the walls. In that case, the roof assembly shall constitute both the upper thermal envelope and pressure envelope of the building.

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Commissioning



C403.2.9 Mechanical systems commissioning and completion requirements.

Mechanical systems shall be commissioned and completed in accordance with Section C408.2.

C408.2 Mechanical systems commissioning and completion requirements.

Prior to passing the final mechanical inspection, the *registered design professional* shall provide evidence of mechanical systems *commissioning* and completion in accordance the provisions of this section.

Construction document notes shall clearly indicate provisions for *commissioning* and completion requirements in accordance with this section and are permitted to refer to specifications for further requirements. Copies of all documentation shall be given to the owner and made available to the *code official* upon request in accordance with Sections C408.2.4 and C408.2.5.

Exception



C403.2.9 Mechanical systems commissioning and completion requirements.

C408.2 Mechanical systems commissioning and completion requirements.

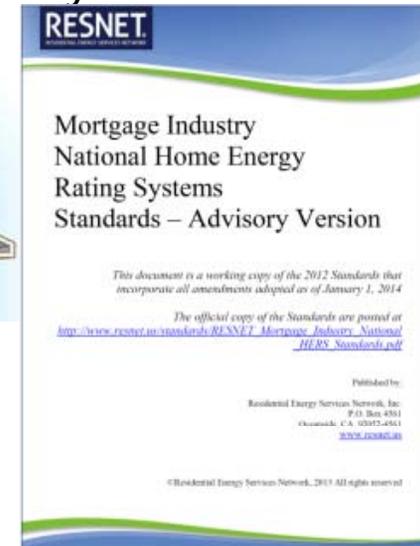
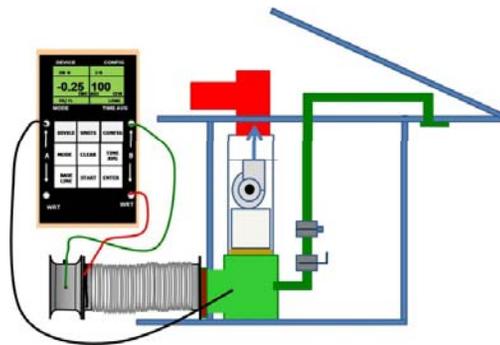
Exception: The following systems are exempt from the commissioning requirements:

1. Mechanical systems in buildings where the total mechanical equipment capacity is less than 480,000 Btu/h (140 690 W) cooling capacity and 600,000 Btu/h (175 860 W) heating capacity.
2. Systems included in Section C403.3 that serve dwelling units and sleeping units in hotels, motels, boarding houses or similar units.

Residential Energy Efficiency

R403.2.2 Sealing (Mandatory).

Duct tightness shall be verified by testing to Section 803 of the RESNET Standards by either an energy rater certified in accordance with Section 553.990, Florida Statutes, or as authorized by Florida Statutes, to be “substantially leak free” by either a Post-Construction Test or Rough-In Test :



Exceptions:

1. The total leakage test is not required for ducts and air handlers located entirely within the building thermal envelope.
2. Duct testing is not mandatory for buildings complying by Section 405 of this code.

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Residential Energy Efficiency

R403.2.4 Air-handling units.

Air handling units shall not be installed in the attic when a home is brought into code compliance by Section R402 (**Prescriptive**). Air-handling units shall be allowed in attics for compliance by Section R405 (**Performance**) only if the following conditions are met:



1. The service panel of the equipment is located within 6 feet (1829 mm) of an attic access.
2. A device is installed to alert the owner or shut the unit down when the condensation drain is not working properly.
3. The attic access opening is of sufficient size to replace the air handler.
4. A notice is posted on the electric service panel indicating to the homeowner that the air handler is located in the attic. Said notice shall be in all capitals, in 16 point type, with the title and first paragraph in bold:

CALCS-PLUS

Notice to Homeowner

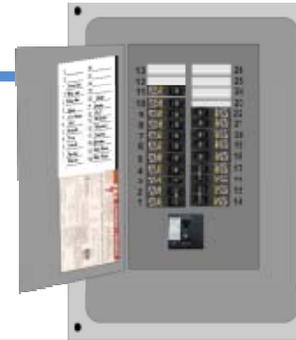
NOTICE TO HOMEOWNER

A PART OF YOUR AIR-CONDITIONING SYSTEM, THE AIR HANDLER, IS LOCATED IN THE ATTIC. FOR PROPER, EFFICIENT, AND ECONOMIC OPERATION OF THE AIR-CONDITIONING SYSTEM, YOU MUST ENSURE THAT REGULAR MAINTENANCE IS PERFORMED. YOUR AIRCONDITIONING SYSTEM IS EQUIPPED WITH ONE OR BOTH OF THE FOLLOWING:

- (1) A DEVICE THAT WILL ALERT YOU WHEN THE CONDENSATION DRAIN IS NOT WORKING PROPERLY OR
- (2) A DEVICE THAT WILL SHUT THE SYSTEM DOWN WHEN THE CONDENSATION DRAIN IS NOT WORKING.

TO LIMIT POTENTIAL DAMAGE TO YOUR HOME, AND TO AVOID DISRUPTION OF SERVICE, IT IS RECOMMENDED THAT YOU ENSURE PROPER WORKING ORDER OF THESE DEVICES BEFORE EACH SEASON OF PEAK OPERATION.

CALCS-PLUS



Spot Ventilation – Local Exhaust

R403.5 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.

Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.



Residential Energy Efficiency

R403.5.1 Whole-house mechanical ventilation system fan efficacy.

Mechanical ventilation system fans shall meet the efficacy requirements of Table R403.5.1.

Exception:

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



FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)	AIR FLOW 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.

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2014 Mechanical Code

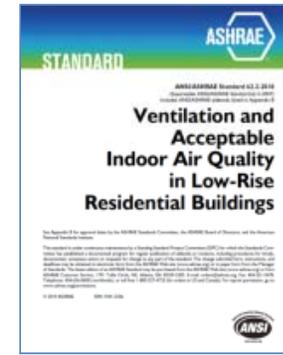
Chapter 4, Table 403.3 Minimum Ventilation Rates

TABLE 403.3—continued MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT ² ^a	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT ² ^a	EXHAUST AIRFLOW RATE CFM/FT ² ^a
Offices				
Conference rooms	50	5	0.06	—
Office spaces	5	5	0.06	—
Reception areas	30	5	0.06	—
Telephone/data entry	60	5	0.06	—
Main entry lobbies	10	5	0.06	—
Specialty shops				
Automotive motor-fuel dispensing stations ^b	—	—	—	1.5
Barber	25	7.5	0.06	0.5
Beauty salons ^b	25	20	0.12	0.6
Nail salons ^{b, h}	25	20	0.12	0.6
Private dwellings, single and multiple				
Garages, common for multiple units ^b	—	—	—	0.75
Garages, separate for each dwelling ^b	—	—	—	100 cfm per car
Kitchens ^b	—	—	—	25/100 ⁱ
Living areas ^c	Based upon number of bedrooms. First bedroom, 2; each additional bedroom, 1	0.35 ACH but not less than 15 cfm/person	—	—
Toilet rooms and bathrooms ^g	—	—	—	20/50 ^f

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Residential Energy Efficiency



R403.5.2 Ventilation air.

Residential buildings designed to be operated at a positive indoor pressure or for mechanical ventilation shall meet the following criteria:

1. The design air change per hour minimums for residential buildings in **ASHRAE 62**, 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 space(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.

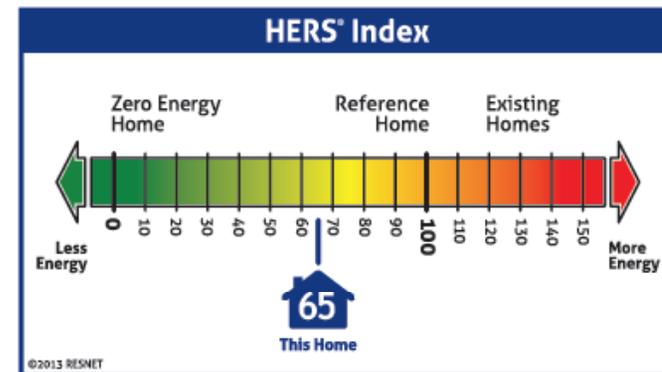
Ventilation Air Its Here to Stay

Scope and Administration R102.1.1 Above code programs.

The code official or other authority having jurisdiction shall be permitted to 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 4 shall be met.



CALCS-PLUS



ASHRAE 62 Minimums

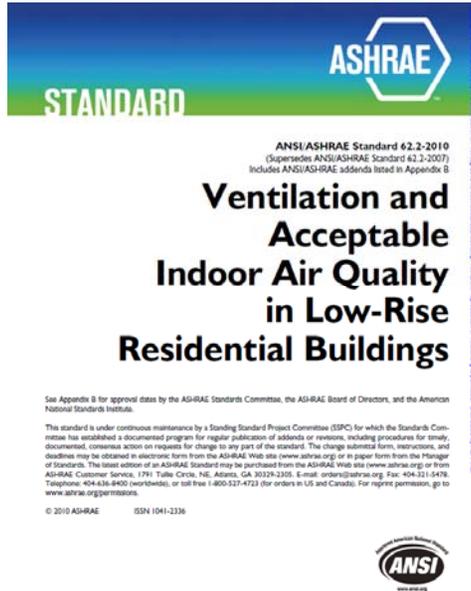


TABLE 4.1a (I-P)
Ventilation Air Requirements, cfm

Floor Area (ft ²)	Bedrooms				
	0-1	2-3	4-5	6-7	>7
<1500	30	45	60	75	90
1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
>7500	105	120	135	150	165

OR

ASHRAE 62.2-2010, Formula 4.1a

$$Q_{fan} = 0.01 \times A_{floor} + 7.5(N_{br} + 1)$$

Where:

Q_{fan} = Fan Flow Rate, CFM

A_{floor} = Floor Area in square feet

N_{br} = Number of Bedrooms, Not to be less than 1

CALCS-PLUS

2014 Mechanical Code

CHAPTER 4 VENTILATION

401.2 Ventilation required.

Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403.

Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section 402.4.1.2 of the Florida Building Code, Energy Conservation, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403.

403.3 Outdoor airflow rate.

Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with this section.

Occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3.

CALCS-PLUS

2014 Florida Mechanical Code

CHAPTER 4 VENTILATION

TABLE 403.3—continued MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT ² ^a	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT ² ^a	EXHAUST AIRFLOW RATE CFM/FT ² ^a
Private dwellings, single and multiple				
Garages, common for multiple units ^b	—	—	—	0.75
Garages, separate for each dwelling ^b	—	—	—	100 cfm per car
Kitchens ^b	—	—	—	25/100 ^f
Living areas ^c	Based upon number of bedrooms. First bedroom, 2; each additional bedroom, 1	0.35 ACH but not less than 15 cfm/person	—	—
Toilet rooms and bathrooms ^g	—	—	—	20/50 ^f

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited (see Section 403.2.1, Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

g. Mechanical exhaust is required and recirculation is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air re-circulated from these spaces (see Section 403.2.1, Items 2 and 4).

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How Much Ventilation?

Section 403.5.2 of the Florida Building Code – Energy Conservation says:

The design air change per hour minimums for residential buildings in **ASHRAE 62**, Ventilation for Acceptable Indoor Air Quality, shall be the maximum rates allowed for residential applications.

ASHRAE 62.2-2010 Minimum 7.5 CFM per person + (.01 CFM x SQ FT)

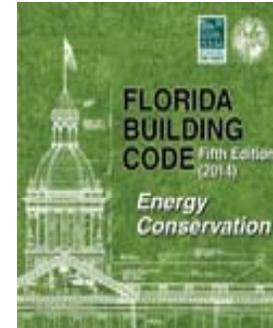
Table 403.3 of the Florida Building Code – Mechanical, Chapter 4, Ventilation says:

<p>PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p</p>
<p>CFM/PERSON</p>
<p>0.35 ACH but not less than 15 cfm/person</p>



Conflicts

SECTION R106 REFERENCED STANDARDS



R106.1 Referenced codes and standards.

The codes and standards referenced in this code shall be those listed in Chapter 5, and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections R106.1.1 and R106.1.2.

R106.1.1 Conflicts. Where conflicts occur between provisions of this code and referenced codes and standards, **the provisions of this code shall apply.**

R106.1.2 Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, **the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.**

R106.2 Conflicting requirements.

Where the provisions of this code and the referenced standards conflict, **the provisions of this code shall take precedence.**

Ventilation

Lets look at a 3 bedroom home, 2,000 SQ FT

The quantity of people is equal to the number of bedrooms + 1

ASHRAE 62.2-2010 Minimum

7.5 CFM per person + .01 CFM / SQ FT

$$(7.5 \times 4) + (.01 \times 2,000) =$$

$$30 + 20 = 50 \text{ CFM}$$

Table 403.3 of the Florida Building Code – Mechanical, Chapter 4, Ventilation

0.35 ACH but not less
than 15 cfm/person

$$4 \times 15 = 60$$

However

Lets look at a 3 bedroom home, 8,000 SQ FT

ASHRAE 62.2-2010 Minimum

7.5 CFM per person + .01 CFM / SQ FT

$$(7.5 \times 4) + (.01 \times 8,000) =$$

$$30 + 80 = 110 \text{ CFM}$$

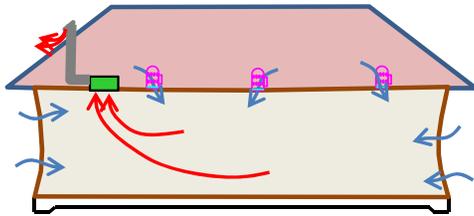
Table 403.3 of the Florida Building Code – Mechanical, Chapter 4, Ventilation

0.35 ACH but not less
than 15 cfm/person

$$4 \times 15 = 60 \text{ CFM}$$

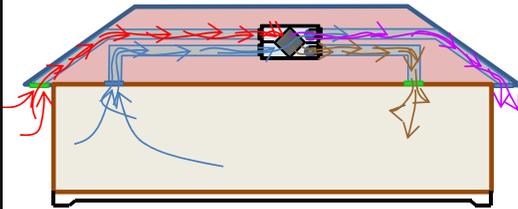
Ventilation Air

Three methods of supplying ventilation air



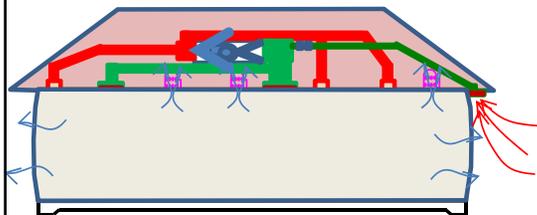
Exhaust

Air is exhausted from a known location and replacement air enters the building from an un-known location



Balanced

Air is exhausted from a known location and replacement air enters the building from known location



Supply

Air enters the building from a known location and exhaust air leaves the building from an unknown location

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Residential Range Hoods

Mechanical Code, Chapter 5



505.2 Makeup air required.

Exhaust hood systems capable of exhausting in excess of 400 cfm (0.19 m³/s) shall be provided with *makeup air* at a rate approximately equal to the exhaust air rate. Such *makeup air* systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.

Exception: In a single-family dwelling, make-up air is not required for range hood exhaust systems capable of exhausting:

(a) Four hundred cubic feet per minute or less; or

(b) More than 400 cubic feet per minute but no more than 800 cubic feet per minute if there are no gravity vent appliances within the conditioned living space of the structure.

Forms

FORM R405-2014
TABLE 402.4.1.1
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA	CHECK
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. Exterior thermal envelope contains a continuous barrier. Breaks or joints in the air barrier shall be sealed. Air permeable insulation shall not be used as a sealing material.	
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any g... Access openings, dr... attic spaces shall be	
Walls	Corners and headers and sill plate shall be The junction of the to Exterior thermal env substantial contact a Knee walls shall be s	
Windows, skylights and doors	The space between framing shall be seal	
Rim joists	Rim joists are insulat	
Floors (including above-garage and cantilevered floors)	Insulation shall be ins of sub/floor decking. The air barrier shall b	
Crawl space walls	Where provided in lie attached to the crawl Exposed earth in unvapor retarder with o	
Shafts, penetrations	Duct shafts, utility pe unconditioned space	
Narrow cavities	Batts in narrow caviti by insulation that on spaces.	
Garage separation	Air sealing shall be p	
Recessed lighting	Recessed light fixture air tight, IC rated, and	
Plumbing and wiring	Batt insulation shall exterior walls, or insu space shall extend b	
Shower/tub on exterior wall	Exterior walls adjace barrier installed sepa	
Electrical/phone box on	The air barrier shall b air sealed boxes sha	
HVAC register boots	HVAC register boots sealed to the sub-flo	
Fireplace	An air barrier shall be gasketed doors	

FORM R405-2014
FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION
Form R405 Duct Leakage Test Report
Performance Method

Project Name: Cramer GW73-205 NC
Street: 1
City, State, Zip: Bradenton, FL
Owner: Design Location: FL, Sarasota

Builder Name: Manatee County
Permit Office: Manatee County
Permit Number: Jurisdiction: 511000
Duct Test Time: Post Construction

Duct Leakage Test Results

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	Total House Duct System Leakage	Sum lines 1-4 Divide by (Total Conditioned Floor Area) = (Q_n,Out)

Five duct testing strategies compliance requirements in 403.2.2.

Duct tightness shall be verified by testing to Section 803 of the RESNET Standards by an energy rater certified in accordance with Section 553.99, Florida Statutes.

BUILDING OFFICIAL:
DATE:

EnergyGauge® USA - FlaRes2014 - Section R405.4.1 Compliant 5 Page 1 of 1

ENERGY PERFORMANCE LEVEL (EPL) DISPLAY CARD

ESTIMATED ENERGY PERFORMANCE INDEX* = 95

The lower the Energy Performance Index, the more efficient the home.

r, Bradenton, FL,

	New (From Plans)	Insulation	Area
1. New construction or existing	Single-family	a. Concrete Block - Int Insul, Exterior	R=4.1 1717.50 ft²
2. Existing family or multiple family	1	b. Frame - Wood, Exterior	R=19.0 1563.20 ft²
3. Existing units, if multiple family	4	c. Frame - Wood, Adjacent	R=11.0 359.50 ft²
4. Multi-family units	No		
5. Is this a "crawl"?	3712		
6. Conditioned floor area (ft²)			
7. Windows	Description	Area	
a. U-Factor:	U=0.60	203.00 ft²	
SHGC:	0.34		
b. U-Factor:	0.63	102.88 ft²	
SHGC:	0.34		
c. U-Factor:	0.63	64.00 ft²	
SHGC:	0.34		
d. U-Factor:	other (see details)	49.72 ft²	
SHGC:	other (see details)		
8. Floor Types	Description	Area	
a. Slab-On-Grade Edge Insulation	R=0.0	203.00 ft²	
b. Floor over Garage	R=11.0	464.00 ft²	
c. N/A			
9. Wall Types (2640.2 sqft)	Description	Area	
a. Concrete Block - Int Insul, Exterior	R=4.1	1717.50 ft²	
b. Frame - Wood, Exterior	R=19.0	1563.20 ft²	
c. Frame - Wood, Adjacent	R=11.0	359.50 ft²	
d. N/A			
10. Ceiling Types (2786.7 sqft)	Description	Area	
a. Under Attic (Vented)	R=30.0	2479.00 ft²	
b. Knee Wall (Vented)	R=20.0	313.65 ft²	
c. N/A			
11. Ducts	Description	Area	
a. Sup. ABC, Rat, ABC, AH, Cond Spc	R=8	8 ft²	
b. 3/4"			
12. Cooling systems	Description	Efficiency	
a. Central Unit	66.0 SEER	14.00	
13. Heating systems	Description	Efficiency	
a. Electric Heat Pump	66.0 HSPF	8.20	
14. Hot water systems	Description	Cap: 50 gallons	
a. Natural Gas	EF: 0.560		
15. Credits	Description	Value	
a. Conservation features	None		
b. None			
c. N/A			

Class/Floor Area: 0.113 Total Proposed Modifications: 97.90
Total Baseline Load: 102.82

PASS

I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Energy Code.

PREPARED BY: _____ DATE: _____

I hereby certify that this building, as designed, is in compliance with the Florida Energy Code.

OWNER/AGENT: _____ DATE: _____

BUILDING OFFICIAL: _____ DATE: _____

*Note: This is not a Building Energy Rating. If you mortgage (EM) incentives if you obtain a Florida 838-1492 or see the EnergyGauge web site at energy information about the Florida Building Code, Energy staff.

**Label required by Section R303.1.3 of the Florida Building Code.

6/10/2015 3:21 PM EnergyGauge® USA - FlaRes2014 Section R405.4.1 Compliant Software Page 1 of 5

CALCS-PLUS

Form R405-2014

FORM R405-2014

RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST

FORM R405-2014

FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION

Florida Department of Business and Professional Regulation - Residential Performance Method

Project Name: Cramer GW73-205 NC
 Street: r
 City, State, Zip: Bradenton, FL
 Owner: r
 Design Location: FL, Sarasota

Builder Name: r
 Permit Office: Manatee County
 Permit Number: r
 Jurisdiction: 511000

1. New construction or existing	New (From Plans)	9. Wall Types (3640.2 sqft.)	Insulation	Area
2. Single family or multiple family	Single-family	a. Concrete Block - Int Insul, Exterior	R=4.1	1717.50 ft ²
3. Number of units, if multiple family	1	b. Frame - Wood, Exterior	R=19.0	1563.20 ft ²
4. Number of bedrooms	4	c. Frame - Wood, Adjacent	R=11.0	359.50 ft ²
5. Is this a worst case?	No	d. N/A	R=	ft ²
6. Conditioned floor area above grade (ft ²)	3712	10. Ceiling Types (2786.7 sqft.)	Insulation	Area
Conditioned floor area below grade (ft ²)	0	a. Under Attic (Vented)	R=30.0	2473.00 ft ²
7. Windows (419.6 sqft.)	Description	b. Knee Wall (Vented)	R=30.0	313.65 ft ²
a. U-Factor:	U=0.60	c. N/A	R=	ft ²
SHGC:	0.34	11. Ducts	R	ft ²
b. U-Factor:	0.60	a. Sup: Attic, Ret: Attic, AH: Cond Spc	6	743
SHGC:	0.34	12. Cooling systems	kBtu/hr	Efficiency
c. U-Factor:	0.59	a. Central Unit	66.0	SEER:14.00
SHGC:	0.34	13. Heating systems	kBtu/hr	Efficiency
d. U-Factor:	other (see details)	a. Electric Heat Pump	66.0	HSPF:8.20
SHGC:	other (see details)	14. Hot water systems		
Area Weighted Average Overhang Depth:	3.247 ft.	a. Natural Gas	Cap: 50 gallons	
Area Weighted Average SHGC:	0.34	b. Conservation features	EF: 0.580	
8. Floor Types (2473.0 sqft.)	Insulation	15. Credits	None	
a. Slab-On-Grade Edge Insulation	R=0.0			
b. Floor over Garage	R=11.0			
c. N/A	R=			

Glass/Floor Area: 0.113
 Total Proposed Modified Loads: 97.90
 Total Baseline Loads: 102.82

PASS

I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Energy Code.

PREPARED BY: _____
 DATE: _____

I hereby certify that this building, as designed, is in compliance with the Florida Energy Code.

OWNER/AGENT: _____
 DATE: _____

Review the plans and specifications covered by this calculation to verify compliance with the Florida Energy Code. Before construction is completed this building will be inspected for compliance with Section 603.908 Florida Statutes.

BUILDING OFFICIAL: _____
 DATE: _____



- Compliance requires certification by the air handler unit manufacturer that the air handler enclosure qualifies as certified factory-sealed in accordance with R403.2.2.1.
- Compliance requires an Air Barrier and Insulation Inspection Checklist in accordance with R402.4.1.1 and an envelope leakage test report in accordance with R402.4.1.2.
- Compliance with a proposed duct leakage On requires a Duct Leakage Test Report confirming duct leakage to outdoors, tested in accordance with Section 803 of RESNET Standards, is not greater than 0.030 On for whole house.

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Form R405 Duct Leakage Test Report (usually one page)

FORM R405-2014

ENERGY PERFORMANCE LEVEL (EPL) DISPLAY CARD

ESTIMATED ENERGY PERFORMANCE INDEX* = 95
 The lower the Energy Performance Index, the more efficient the home.

r, Bradenton, FL,

1. New construction or existing	New (From Plans)	9. Wall Types	Insulation	Area
2. Single family or multiple family	Single-family	a. Concrete Block - Int Insul, Exterior	R=4.1	1717.50 ft ²
3. Number of units, if multiple family	1	b. Frame - Wood, Exterior	R=19.0	1563.20 ft ²
4. Number of bedrooms	4	c. Frame - Wood, Adjacent	R=11.0	359.50 ft ²
5. Is this a worst case?	No	d. N/A	R=	ft ²
6. Conditioned floor area above grade (ft ²)	3712	10. Ceiling Types	Insulation	Area
Conditioned floor area below grade (ft ²)	0	a. Under Attic (Vented)	R=30.0	2473.00 ft ²
7. Windows (419.6 sqft.)	Description	b. Knee Wall (Vented)	R=30.0	313.65 ft ²
a. U-Factor:	U=0.60	c. N/A	R=	ft ²
SHGC:	0.34	11. Ducts	R	ft ²
b. U-Factor:	0.60	a. Sup: Attic, Ret: Attic, AH: Cond Spc	6	743
SHGC:	0.34	12. Cooling systems	kBtu/hr	Efficiency
c. U-Factor:	0.59	a. Central Unit	66.0	SEER:14.00
SHGC:	0.34	13. Heating systems	kBtu/hr	Efficiency
d. U-Factor:	other (see details)	a. Electric Heat Pump	66.0	HSPF:8.20
SHGC:	other (see details)	14. Hot water systems		
Area Weighted Average Overhang Depth:	3.247 ft.	a. Natural Gas	Cap: 50 gallons	
Area Weighted Average SHGC:	0.34	b. Conservation features	EF: 0.58	
8. Floor Types (2473.0 sqft.)	Insulation	15. Credits	None	
a. Slab-On-Grade Edge Insulation	R=0.0			
b. Floor over Garage	R=11.0			
c. N/A	R=			

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

Builder Signature: _____ Date: _____

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



*Note: This is not a Building Energy Rating. If your Index is below 70, your home may qualify for energy efficient mortgage (EEM) incentives if you obtain a Florida EnergyGauge Rating. Contact the EnergyGauge Hotline at (321) 638-1492 or see the EnergyGauge web site at energygauge.com for information and a list of certified Raters. For information about the Florida Building Code, Energy Conservation, contact the Florida Building Commission's support staff.

**Label required by Section R303.1.3 of the Florida Building Code, Energy Conservation, if not DEFAULT.

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Form R405-2014

FORM R405-2014

RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST

Florida Department of Business and Professional Regulation Simulated Performance Alternative (Performance) Method

Applications for compliance with the 2014 Florida Building Code, Energy Conservation via the residential Simulated Performance method shall include

- This checklist
- A Form R405 report that documents that the Proposed Design complies with Section R405.3 of the Florida Energy Code. This form shall include a summary page indicating home address, e-ratio and the pass or fail status along with summary areas and types of components, whether the home was simulated as a worst-case orientation, name and version of the compliance software tool, name of individual completing the compliance report (1 page) and an input summary checklist that can be used for field verification (usually 4 pages/may be greater).

Mandatory Requirements(three pages)

Required prior to CO for the Performance Method:

- Air Barrier and Insulation Inspection Component Criteria checklist (Table R402.4.1.1 - one page)
- A completed Envelope Leakage Test Report(usually one page)
- If Form R405 duct leakage type indicates anything other than "default leakage", then a completed Form R405 Duct Leakage Test Report (usually one page)

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Mandatory Requirements

<p>FORM R405-2014 Florida Department of Business and Professional Regulation Residential Whole Building Performance</p> <p>ADDRESS: _____ _____ Bradenton, FL, _____</p>	<p>FORM R405-2014 MANDATORY REQUIREMENTS - (Continued)</p> <ul style="list-style-type: none"> ○ R403.2.2.1 Sealed air handler. Air handlers shall have a manufacturer's designation for an air leakage design air flow rate when tested in accordance with ASHRAE 193. ○ R403.2.3 Building Cavities (Mandatory). Building framing cavities shall not be used as ducts or plenums. ○ R403.3 Mechanical system piping insulation (Mandatory). Mechanical system piping capable of carrying 80 or below 55°F (13°C) shall be insulated to a minimum of R-3. ○ R403.3.1 Protection of piping insulation. Piping insulation exposed to weather shall be protected by sunlight, moisture, equipment maintenance, and wind, and shall provide shielding from solar radiant material. Adhesive tape shall not be permitted. ○ R403.4.1 Circulating hot water systems (Mandatory). Circulating hot water systems shall be provided with accessible manual switch that can turn off the hot-water circulating pump when the system is not in use. ○ R403.4.3 Heat traps (Mandatory). Storage water heaters not equipped with integral heat traps and having vent heat traps installed on both the gas and outlets. External heat traps shall consist of either a commercially available downward and upward bend of at least 3 1/8 inches (89 mm) in the hot water distribution line and cold water line to the storage tank. ○ R403.4.4 Water heater efficiencies (Mandatory). Water heater efficiencies <ul style="list-style-type: none"> ○ R403.4.4.1 Storage water heater temperature controls <ul style="list-style-type: none"> ● R403.4.4.1.1 Automatic controls. Service water heating systems shall be equipped with automatic capable of adjustment from the lowest to the highest acceptable temperature settings for the inlet temperature setting range shall be from 100°F to 140°F (38°C to 60°C). ● R403.4.4.1.2 Shut down. A separate switch or a clearly marked circuit breaker shall be provided to electric service systems to be turned off. A separate valve shall be provided to permit the one or combustion types of service water heating systems to be turned off. ○ R403.4.4.2 Water heating equipment. Water heating equipment installed in residential units shall Table C404.2 in Chapter 4 of the Florida Building Code, Energy Conservation, Commercial Provisions. Equipment used to provide heating functions as part of a combination system shall satisfy all stated re heating category. Solar water heaters shall meet the criteria Section R403.4.4.2.1. <ul style="list-style-type: none"> ● R403.4.4.2.1 Solar water heating systems. Solar systems for domestic hot water production a factor of the system. The solar energy factor of a system shall be determined from the Florida Standard Solar Systems. Solar collectors shall be tested in accordance with ISO Standard 9806, and SHRC Standard TM-1, Solar Domestic Hot Water System and Component Test Protocol. C heating systems should meet the following criteria: <ol style="list-style-type: none"> 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. 	<p>FORM R405-2014 MANDATORY REQUIREMENTS - (Continued)</p> <ul style="list-style-type: none"> ○ R403.6.1.1 Cooling equipment capacity. (continued) 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 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 temperature shall be 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. <p>Exceptions:</p> <ol style="list-style-type: none"> 1. Attached single- and multi-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 multi-family units, the capacity of equipment may be sized in accordance with good design practice. ○ R403.6.1.2 Heating equipment capacity <ul style="list-style-type: none"> ● R403.6.1.2.1 Heat pumps. Heat pumps sizing shall be based on the cooling requirements as calculated according to Section R403.6.1.1 and the heat pump total cooling capacity shall not be more than 1.15 times greater than the design cooling load. ● R403.6.1.2.2 Electric resistance furnaces. Electric resistance furnaces shall be sized within 4 kW of the design requirements calculated according to the procedure selected in Section R403.6.1. ● R403.6.1.2.3 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 R403.6.1. ○ R403.6.1.3 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: <ol style="list-style-type: none"> 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.
<p>MANDATORY REQUIREMENTS See individual code sections</p> <ul style="list-style-type: none"> ○ 403.3 Energy Performance Level (EPL) display card (Mandatory). display card be completed and certified by the builder to be accurate and [Section 563.9005, Florida Statutes] requires the EPL display card to be in nonresidential buildings. The EPL display card contains information installed in a dwelling unit. The building official shall verify that the EPL card and specifications submitted to demonstrate compliance for the building. ○ R402.4 Air leakage (Mandatory). The building thermal envelope shall meet Sections R402.1 through R402.4.4. <ul style="list-style-type: none"> ○ R402.4.1 Building thermal envelope. The building thermal sealing methods between dissimilar materials shall allow for differential movement. <ul style="list-style-type: none"> ● R402.4.1.1 Installation. The components of the building envelope shall be installed in accordance with the manufacturer's instructions and the code. Where required by the code official, an approved third party shall verify the installation. ● R402.4.1.2 Testing. The building or dwelling unit shall be tested in accordance with the code official, an approved third party shall verify the installation. A written report of the results of the official. Testing shall be performed at any time after construction. During testing: <ol style="list-style-type: none"> 1. Exterior windows and doors, fireplace and stove doors other infiltration control measures; 2. Dampers including exhaust, intake, makeup air, backdraft infiltration control measures; 3. Interior doors, if installed at the time of the test, shall be closed. 4. Exterior doors for continuous ventilation systems and heating and cooling systems, if installed at the time of the test, shall be closed. 5. Heating and cooling systems, if installed at the time of the test, shall be set to maintain the design indoor temperature. ○ R402.4.2 Fireplaces. New wood-burning fireplaces shall have a fire rating of not less than 1-hour. ○ R402.4.3 Fenestration air leakage. Windows, skylights and sliding doors shall be tested in accordance with AAMA-WDMA-ESA 1011.5.2:R4440 by an accredited, independent testing agency. <p>Exception: Site-built windows, skylights and doors.</p> ○ R402.4.4 Recessed lighting. Recessed luminaires installed in unconditioned and unconditioned spaces. All recessed luminaires shall be tested in accordance with AAMA-WDMA-ESA 1011.5.2:R4440 by an accredited, independent testing agency. <p>Exception: Luminaires shall be sealed with a gasket or caulk between the luminaire and the ceiling.</p> ○ R403.1.1 Thermostat provision (Mandatory). At least one thermostat shall be provided for each space. ○ R403.1.3 Heat pump supplementary heat (Mandatory). Heat pumps shall be provided with supplementary heat operation when the heat pump is unable to maintain the design indoor temperature. ○ R403.2.2 Sealing (Mandatory)All ducts, air handlers, and filter boxes and passageways for air distribution systems shall be considered ducts and shall be tested in accordance with Section C403.2.7.2 of the Commercial Provisions of this code and shall be tested in accordance with Section 603 of the RESNET 553.99, Florida Statutes, or as authorized by Florida Statutes, to be "substantially" airtight. ○ R403.2.3 Post-construction test. Total leakage shall be less than or equal to 0.15 cfm (1.5 L/s/m²) at a pressure differential of 0.1 inches w.g. (25 Pa) ac register boots shall be taped or otherwise sealed during the test. ○ R403.2.4 Rough-in test. Total leakage shall be less than or equal to 4 cfm (1.1 L/s/m²) at a pressure differential of 0.1 inches w.g. (25Pa) across the system taped or otherwise sealed during the test. If the air handler is not installed, the test shall be performed on the conditioned floor area. <p>Exceptions:</p> <ol style="list-style-type: none"> 1. The total leakage test is not required for ducts and air handlers 2. Duct testing is not mandatory for buildings complying with Section 610.010, Florida Statutes. <p>6/10/2015 3:21 PM EnergyGauge® USA - FlaRes2014</p>	<p>MANDATORY REQUIREMENTS - (Continued)</p> <ul style="list-style-type: none"> ○ R403.4.4.2.1 Solar water heating systems. Solar systems for domestic hot water production a factor of the system. The solar energy factor of a system shall be determined from the Florida Standard Solar Systems. Solar collectors shall be tested in accordance with ISO Standard 9806, and SHRC Standard TM-1, Solar Domestic Hot Water System and Component Test Protocol. C heating systems should meet the following criteria: <ol style="list-style-type: none"> 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. ○ R403.5 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of Section R403.5.1 of the Florida Building Code, Residential or Florida Building Code, Mechanical, as applicable, or with other approved mechanical ventilation system. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not in use. <ul style="list-style-type: none"> ○ R403.5.1 Whole-house mechanical ventilation system fan efficacy. Mechanical ventilation system fan efficacy shall be in accordance with the requirements of Table R403.5.1. <p>Exception: Where mechanical ventilation fans are integral to tested and listed HVAC equipment electronically commutated motor.</p> ○ R403.5.2 Ventilation air. Residential buildings designed to be operated at a positive indoor pressure shall meet the following criteria: <ol style="list-style-type: none"> 1. The design air change per hour minimums for residential applications. 2. No ventilation or air-conditioned system make air shall be provided to conditioned space from attics, 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-19, space permitting, or R-19.5. ○ R403.6 Heating and cooling equipment (Mandatory). The following sections are mandatory for cooling and heating equipment. <ul style="list-style-type: none"> ○ R403.6.1 Equipment sizing. Heating and cooling equipment shall be sized in accordance with ACC equipment loads calculated in accordance with ACCA Manual J or other approved heating and cooling load calculation method based on building loads for the directional orientation of the building. The manufacturer and model number of the equipment shall be submitted along with the sensible and total cooling capacities at the design indoor and outdoor conditions. This code does not allow designer safety factors, provisions for future expansion, or equipment that is not listed in the ACCA Manual J. System sizing calculations shall not include loads created by local interior spaces such as standard kitchen and bathroom exhaust systems. <ul style="list-style-type: none"> ● R403.6.1.1 Cooling equipment capacity. Cooling only equipment shall be selected so that its cooling capacity is less than or equal to 1.15 times greater than the total load calculated according to Section R403.6.1.1, or the closest available size provided by the manufacturer's product lines. The cooling capacity shall not be less than the calculated latent load. <p>6/10/2015 3:21 PM EnergyGauge® USA - FlaRes2014 - Section R405.4.1 Com</p>	<p>MANDATORY REQUIREMENTS - (Continued)</p> <ul style="list-style-type: none"> ○ R403.6.1.1 Cooling equipment capacity. (continued) 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 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 temperature shall be 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. <p>Exceptions:</p> <ol style="list-style-type: none"> 1. Attached single- and multi-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 multi-family units, the capacity of equipment may be sized in accordance with good design practice. ○ R403.6.1.2 Heating equipment capacity <ul style="list-style-type: none"> ● R403.6.1.2.1 Heat pumps. Heat pumps sizing shall be based on the cooling requirements as calculated according to Section R403.6.1.1 and the heat pump total cooling capacity shall not be more than 1.15 times greater than the design cooling load. ● R403.6.1.2.2 Electric resistance furnaces. Electric resistance furnaces shall be sized within 4 kW of the design requirements calculated according to the procedure selected in Section R403.6.1. ● R403.6.1.2.3 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 R403.6.1. ○ R403.6.1.3 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: <ol style="list-style-type: none"> 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. ○ R403.7 Systems serving multiple dwelling units (Mandatory). Systems serving multiple dwelling units shall comply with Sections C403 and C404 of the Commercial Provisions in lieu of Section R403. ○ R403.8 Snow melt 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 55°F, and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F. ○ R403.9 Swimming pools, Inground spas and portable spas (Mandatory). The energy requirements for residential pools and inground spas shall be as specified in Sections R403.9.1 through R403.9.3 and in accordance with ANSI/APSP-15. The energy requirements for portable spas shall be in accordance with ANSI/APSP-14. <ul style="list-style-type: none"> ○ R403.9.1 Pool and spa heaters. All pool heaters shall be equipped with a readily accessible on-off switch that is mounted outside the heater to allow shutting off the heater without adjusting the thermostat setting. <ul style="list-style-type: none"> ● R403.9.1.1 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 gas or LP gas shall not have continuously burning pilot lights. ● R403.9.1.2 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. ○ R403.9.2 Time switches. Time switches or other control method that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on all heaters and pumps. Heaters, pumps and motors that have built in timers shall be deemed in compliance with this equipment. <p>Exceptions:</p> <ol style="list-style-type: none"> 1. Where public health standards require 24-hour pump operations. 2. Where pumps are required to operate solar- and waste-heat-recovery pool heating systems. 3. Where pumps are powered exclusively from on-site renewable generation. ○ R403.9.3 Covers. Heated swimming pools and inground permanently installed spas shall be equipped with a vapor-retardant cover on or over the water surface or a liquid cover or other means proven to reduce heat loss. <p>Exception: Outdoor pools deriving over 70 percent of the energy for heating from site-recovered energy, such as a heat pump or solar energy source computed over an operating season.</p> ○ RR404.1 Lighting equipment (Mandatory). A minimum of 75 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps or a minimum of 75 percent of permanently installed lighting fixtures shall contain only high efficacy lamps. <p>Exception: Low-voltage lighting shall not be required to utilize high-efficacy lamps.</p> ○ R404.1.1 Lighting equipment (Mandatory). Fuel gas lighting systems shall not have continuously burning pilot lights ○ R405.2 Performance ONLY. All ducts not entirely inside the building thermal envelope shall be insulated to a minimum of R-6. <ul style="list-style-type: none"> ○ R405.2.1 Performance ONLY. Collings shall have minimum insulation of R-19. Where single assembly of the exposed deck and beam type or concrete deck roofs do not have sufficient space, R-10 is allowed. <p>6/10/2015 3:21 PM EnergyGauge® USA - FlaRes2014 - Section R405.4.1 Com Page 3 of 3</p>

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Air Barrier Checklist

FORM R405-2014

RESIDENTIAL ENERGY CON...

**Florida Department
Simulated Perform...**

Applications for compliance with the 2...

Required prior to CO for the Performa...

Air Barrier and Insulation Inspect...
(one page)

areas and types of components, v...
orientation, name and version of t...
completing the compliance report
be used for field verification (usua...

Energy Performance Level (EPL)

Mandatory Requirements(three p...

Required prior to CO for the Perform...

Air Barrier and Insulation Inspect...
(one page)

A completed Envelope Leakage

If Form R405 duct leakage typ...
Form R405 Duct Leakage Tes...

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FORM R405-2014

TABLE 402.4.1.1

AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

Project Name: Cramer GW73-205 NC		Builder Name:
Street: r		Permit Office: Manatee County
City, State, Zip: Bradenton, FL,		Permit Number:
Owner:		Jurisdiction: 511000
Design Location: FL, Sarasota		
COMPONENT	CRITERIA	CHECK
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. Exterior thermal envelope contains a continuous barrier. Breaks or joints in the air barrier shall be sealed. Air-permeable insulation shall not be used as a sealing material.	
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 attic spaces shall be sealed.	
Walls	Corners and headers shall be insulated and the junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top or exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.	
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.	
Floors (including above-garage and cantilevered floors)	Insulation shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier shall be installed at any exposed edge of insulation.	
Crawl space walls	Where provided in lieu of floor insulation, insulation shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	
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 air tight, IC rated, and sealed to the drywall.	
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	Exterior walls adjacent to showers and tubs shall be insulated and the air barrier installed separating them from the showers and tubs.	
Electrical/phone box on	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 sub-floor or drywall.	
Fireplace	An air barrier shall be installed on fireplace walls. Fireplaces shall have gasketed doors	

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Page 1 of 1

Envelope Leakage Test Report



FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION Envelope Leakage Test Report Prescriptive and Performance Method

Project Name: Cramer GW73-205 NC	Builder Name:
Street: r	Permit Office: Manatee County
City, State, Zip: Bradenton, FL	Permit Number:
Design Location: FL, Sarasota	Jurisdiction: 511000

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

CFM(50): _____

ELA: _____

EqLA: _____

ACH: _____

ACH(50): _____

SLA: _____

R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 5 air changes per hour in Climate Zones 1 and 2, 3 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the code official, testing shall be conducted by 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: _____

Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the third party conducting the test and provided to the code official.



BUILDING OFFICIAL: _____
DATE: _____

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Page 1 of 1

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Cramer GW73-205 NC

File View Calculate Reports Registration Support Help Improvement Analysis

Project ID: 19 User Entry Mode

Project Info

Title: Cramer GW73-205 NC Permit Office: Manatee County

Owner: Cramer Permit: _____ Permit Date: _____

Builder: Homes by Towne Jurisdiction: 511000

Rater: Cheryl Stroer Final Inspection Date: _____

Comment: _____ Rater ID: 519

Building Info

Status: New (From Plans) New (Confirmed) Existing (Projected) Existing (Confirmed) Addition

Year of _____

Rotate B _____

Number of Bathrooms: 0

Total Number of Stories: 2

Total Number of Bedrooms: 4

Total Conditioned Area: 3712 sq. ft.

Worst Case
 Yes No

Occupancy
 Single Family Multi Family

Single-family detached

Property Location

Address Type:
 Street Address Lot Information

Street: 712 Rosemary Cir

City: Bradenton State: FL

County: Manatee Zip: _____

Florida Climate Zone: Central

Rating only Info

Development: _____

Model: _____

Post Project

Project Climate Utility Rates Surroundings

Site

Status:

Year of

Rotate B

Number of Bathrooms:

Blower Door Inputs

**FLORIDA ENERGY EFFICIENCY CODE
FOR BUILDING CONSTRUCTION**
Envelope Leakage Test Report
Prescriptive and Performance Method

Project Name: Cramer GW73-205 NC
Street: r
City, State, Zip: Bradenton, FL
Design Location: FL, Sarasota
Builder Name: Manatee County
Permit Office: Manatee County
Permit Number:
Jurisdiction: 511000

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

CFM(50):

ELA:

EqLA:

ACH:

ACH(50):

SLA:

R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate in Climate Zones 1 and 2, 3 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 50 Pascals (50 Pascals). Where required by the code official, testing shall be conducted by an approved third party. Testing shall be signed by the party conducting the test and provided to the code official. Testing shall be performed on the building thermal envelope.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed, beyond the 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: _____

Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the third party conducting the test and provided to the code official.

BUILDING OFFICIAL: _____
DATE: _____

EnergyGauge USA - Cramer GW73-205 NC
Project ID: 19
User Entry Mode

Current infiltration scenario:
 Wholehouse
 Wholehouse infiltration applies to all conditioned spaces.

Data Entry Method:
 Default
 Tested Single Point Blower Door
 Tested Multi Point Blower Door
 Tested Blower Door Results

Infiltration:
 Building Pressure: _____
 Fan Flow: _____
 Calculate/Post

Input Bldg Pressure Fan Flow
 C:194.6 n:0.000 R:0.000

Test Date: 7/ 7/2014
 Tested By: _____

Wind Shielding Wholehouse
 Terrain Parameter: Suburban
 Shielding Coefficient: Suburban

Floors(2) Roof Ceilings(3) Walls(36) Doors(3) Windows(27) Infiltration(1) Sunsp. Mass
 Site Spaces Envelope Equipment Appliances LightsPlugs Other Vehicles

Duct Test



FORM R405-2014

RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST

*Florida Department of Business and Professional Regulation
Simulated Performance Alternative (Performance) Method*

Applications for compliance with the 2014 Florida Building Code, Energy Conservation via the residential Simulated Performance method shall include

- This checklist
- A Form R405 report that documents that the Proposed Design complies with Section R405.3 of the Florida Energy Code. This form shall include a summary page indicating home address, e-ratio and the pass or fail status along with summary areas and types of components, whether the home was simulated as a worst-case orientation, name and version of the compliance software tool, name of individual completing the compliance report (1 page) and an input summary checklist that can be used for field verification (usually 4 pages/may be greater).
- Energy Performance Level (EPL) Display Card (one page)

If Form R405 duct leakage type indicates anything other than "default leakage", then a completed Form R405 Duct Leakage Test Report (usually one page)

(one page)

- A completed Envelope Leakage Test Report(usually one page)
- If Form R405 duct leakage type indicates anything other than "default leakage", then a completed*

FORM R405-2014

FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION
Form R405 Duct Leakage Test Report
Performance Method

Project Name: Cramer GW73-205 NC	Builder Name:
Street: r	Permit Office: Manatee County
City, State, Zip: Bradenton, FL	Permit Number:
Design Location: FL, Sarasota	Jurisdiction: 511000
	Duct Test Time: Post Construction

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	Total House Duct System Leakage	Sum lines 1-4 _____ Divide by _____ (Total Conditioned Floor Area) = _____ (Q_{n,Out})

I hereby certify that the above duct testing performance results demonstrate compliance with the Florida Energy Code requirements in accordance with Section R403.2.2.

Duct tightness shall be verified by testing to Section 803 of the RESNET Standards by an energy rater certified in accordance with Section 553.99.

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- Compliance with a proposed duct leakage Qn requires a Duct Leakage Test Report confirming duct leakage to outdoors, tested in accordance with Section 803 of RESNET Standards, is not greater than 0.030 Qn for whole house.

Residential Energy Efficiency

R403.8 Snow melt system controls (Mandatory).



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Thank You



Questions?