



Residential Energy Code Review



2020 FLORIDA ENERGY CONSERVATION CODE
BROWARD COUNTY BOARD OF RULES AND APPEALS
PROVIDER #0001071
BCAIB #5008780
CILB #0613789



Certified

Residential Energy
Inspector/Plans
Examiner

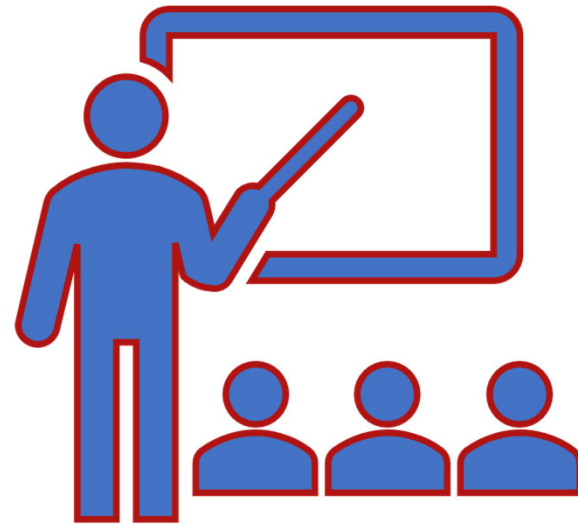
Instructor: Timothy G. de Carion

Position: Chief Energy Code Compliance Officer

Broward County Board of Rules and Appeals

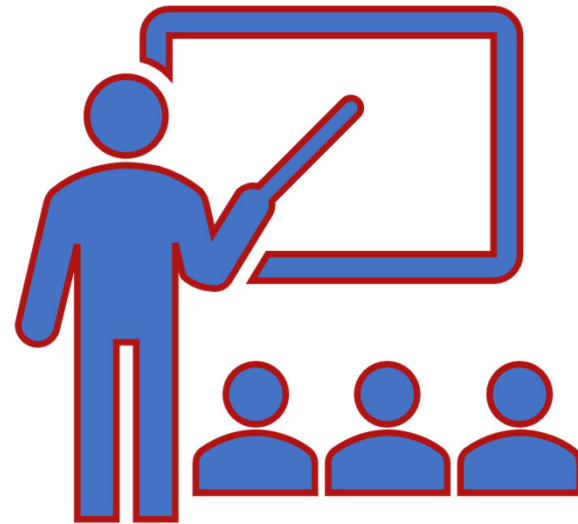
Requirements for Credit

- Report all your license numbers
- You must attend the entire session to get any CEU's.
- You must answer questions throughout session to prove your attendance.
- If you must leave for short time, please use chat feature to log out and back in.
- At the end of this Webinar, please complete the Evaluation form in order to finalize attendance to get your certificate.

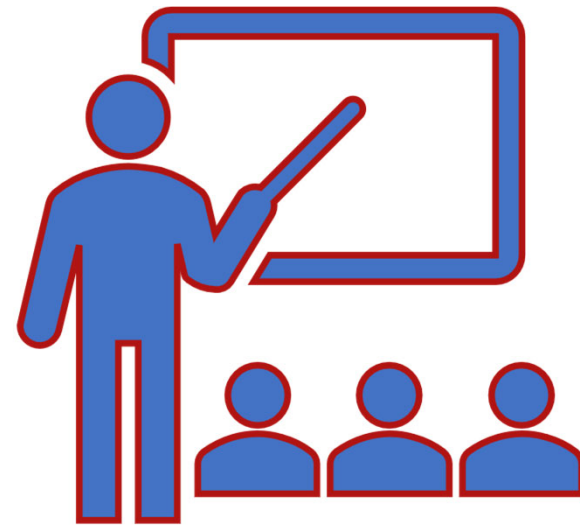


Material to Be Covered

- Finding the Right Code to Use
- Compliance Software and Forms
- What Should be Shown on the Plans
- Making Sure the Job Matches the Compliance Forms



How to Register for a Webinar

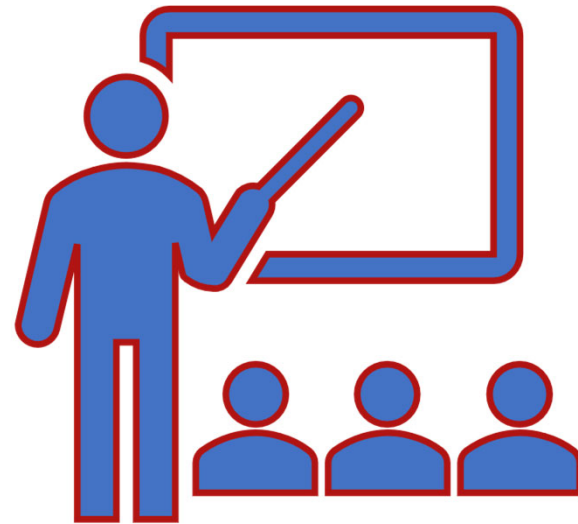


How to Type Your License Numbers

When putting in your License numbers, use a comma.

Correct Example:

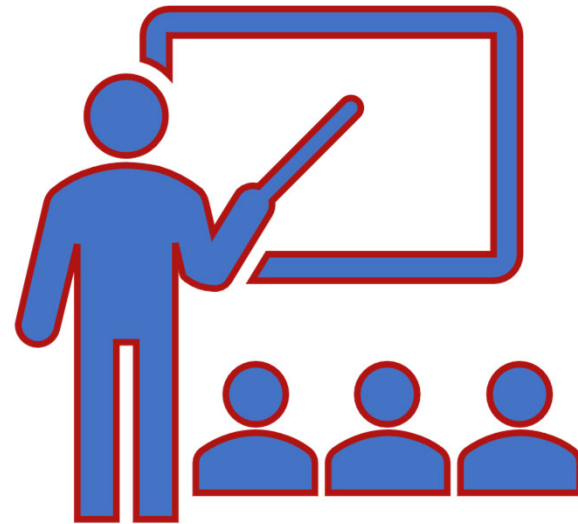
- **CGC1522268, CCC051558, PX3751, BN6485**



How to Type Your License Numbers

Incorrect Examples:

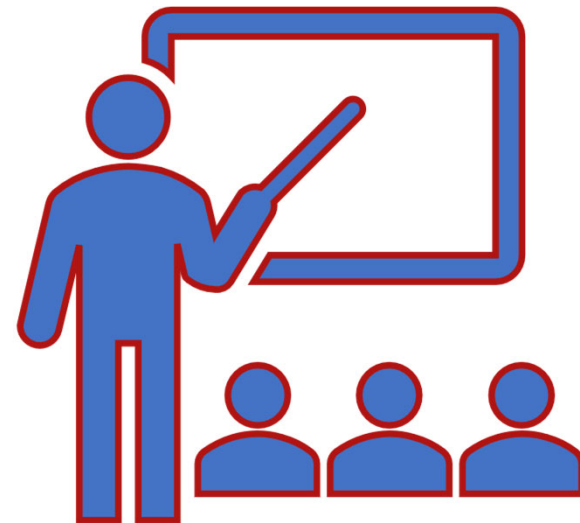
- **CGC1513831. HI6256. BN7890. PX4753.**
- **BU-1400, BN-1859, PX-1211, CGG-019447**
- **Ar-0017178; BN8222; PX4604; US-21-11930**
- **cgc1528212, PX4465, bn7869**
- **PX 137, BN 284 & CGC025697**
- **98-CMP-960-X / BN5947 / PX4242**



How to Type Your License Numbers

Incorrect Examples:

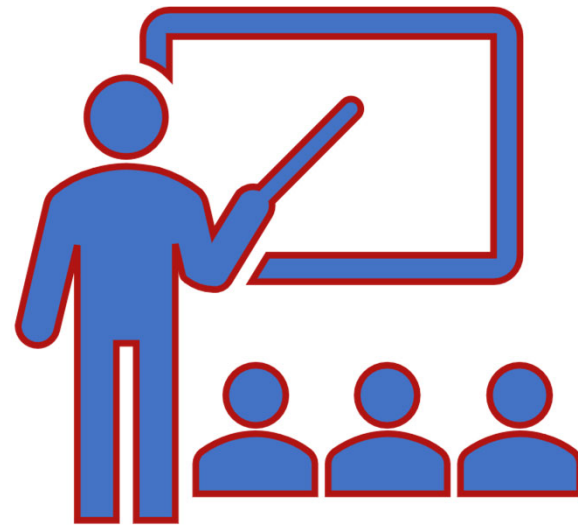
- **BN#7706 CBC#1256998**
- **BN7305 PX4854 CGC1506318**
- **CGC#55926, CBC#54499, HI#2059, BN#5700**



How to Type Your Email Address

Example:

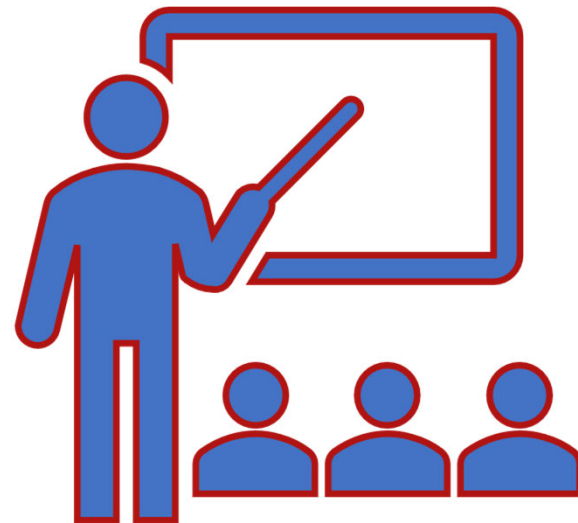
- `Timothy_deCarion@davie-fl.gov`



How to Type Your Email Address

Examples of Errors:

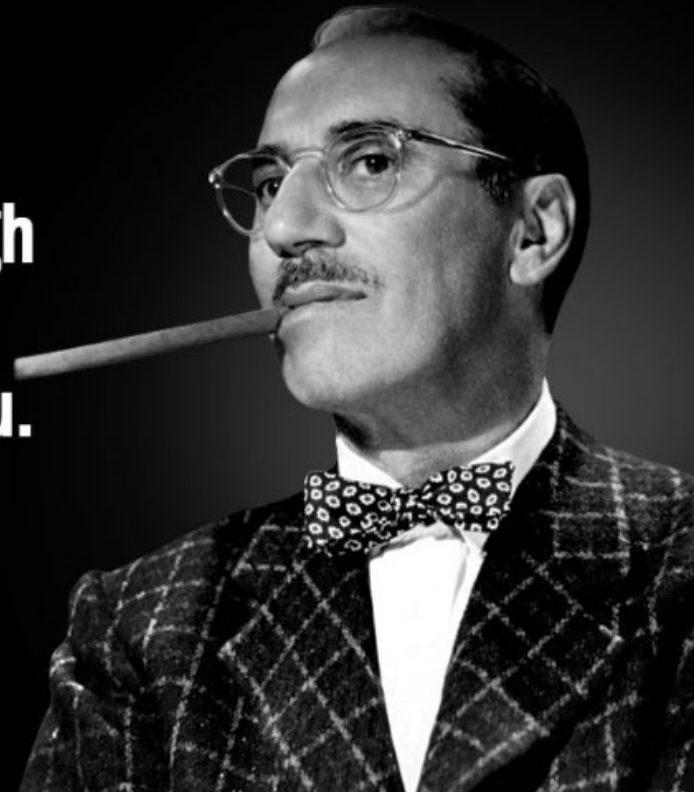
- Gary_Diamond@davie.fl.gov
- p-pedersen@davie-fl.gov
- rgarcia@davie-fl.gov
- raymond_eright@davie-fl.gov
- charles.rizzuto@cobfl.com
- edesimonne710@fmail.com



If you find it **hard to laugh**
at yourself, I would
be happy to **do it for you.**

– *Groucho Marx*

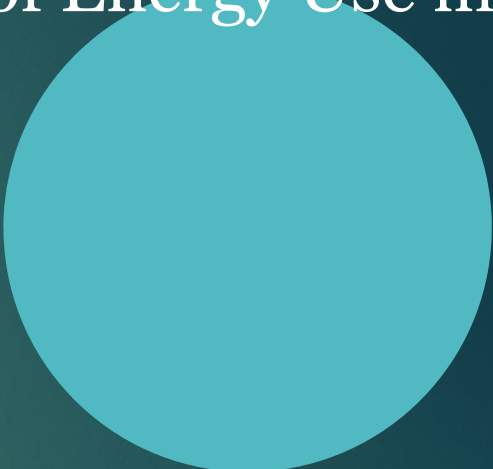
AZ QUOTES



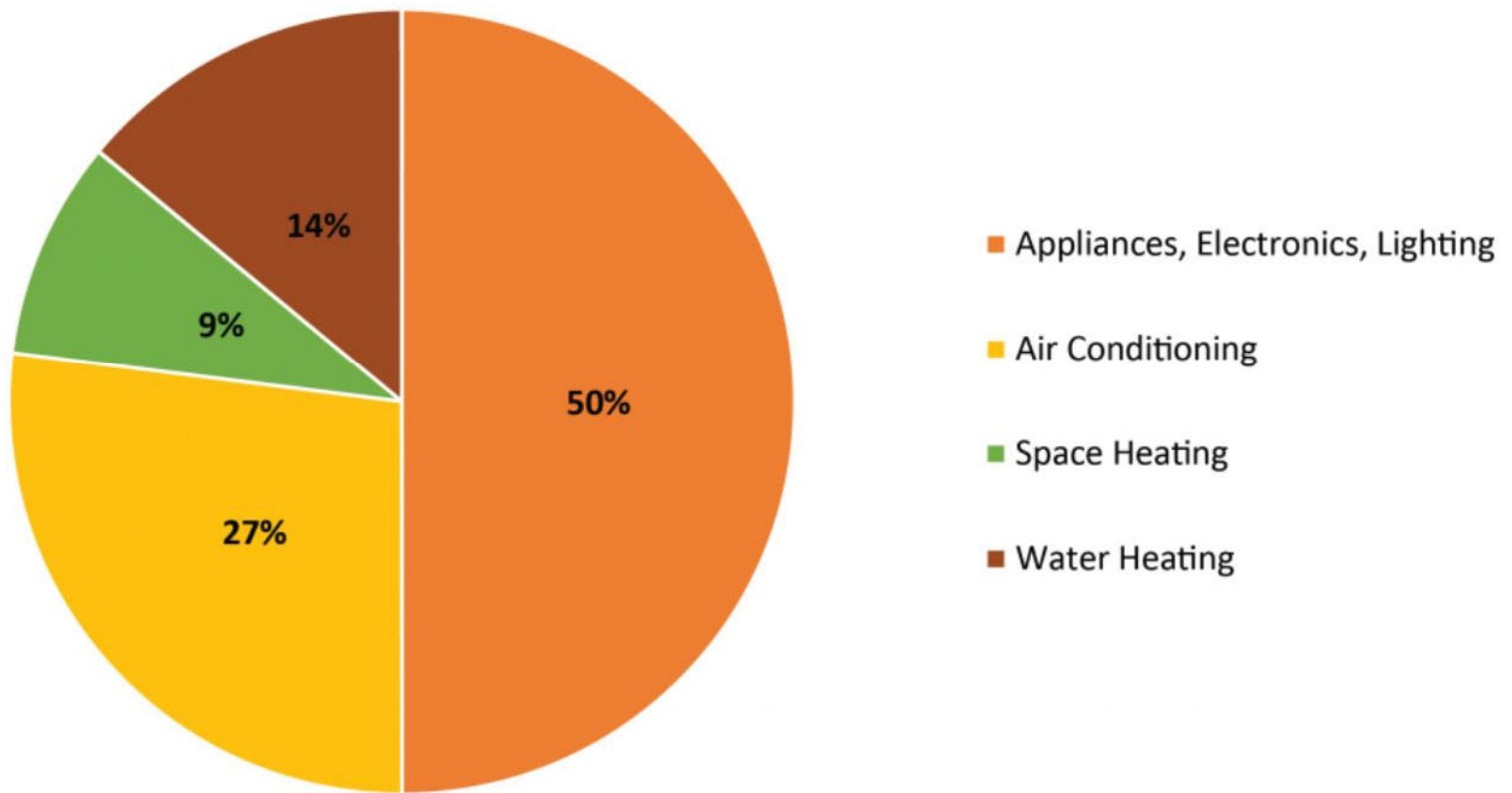


Question:

What Category has the Highest Percentage of Energy Use in a Typical Florida Home?

- A) Air Conditioning
 - B) Space Heating
 - C) Water Heating
 - D) Appliances, Electronics, Lighting
- 

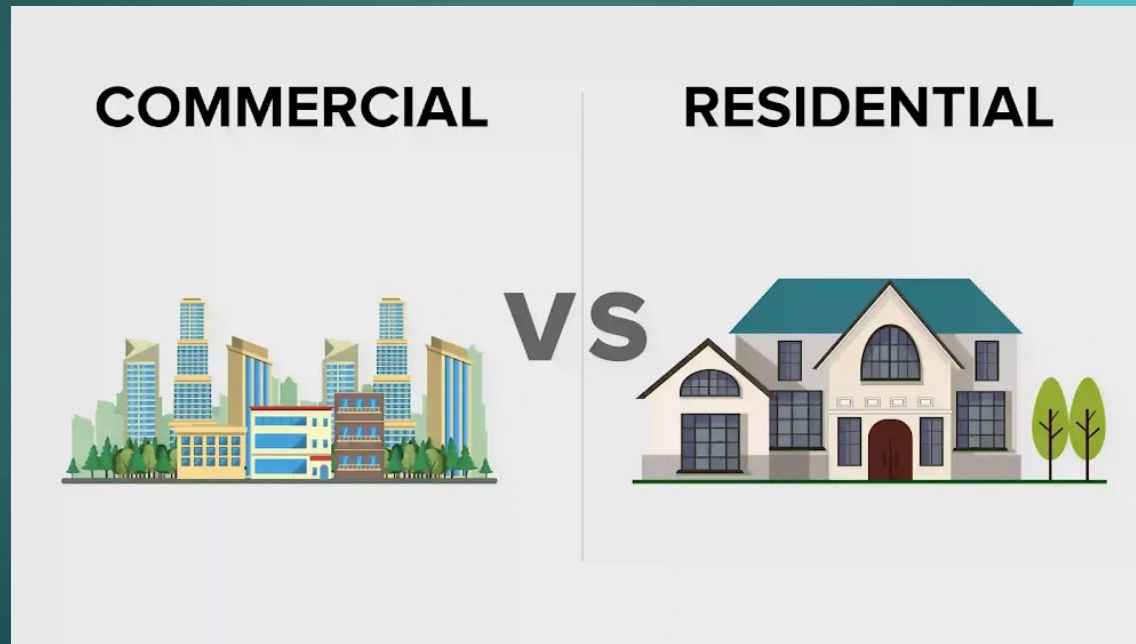
Typical Household Energy Use in Florida



Source: My Florida Home Energy

Finding the Right Code to Use

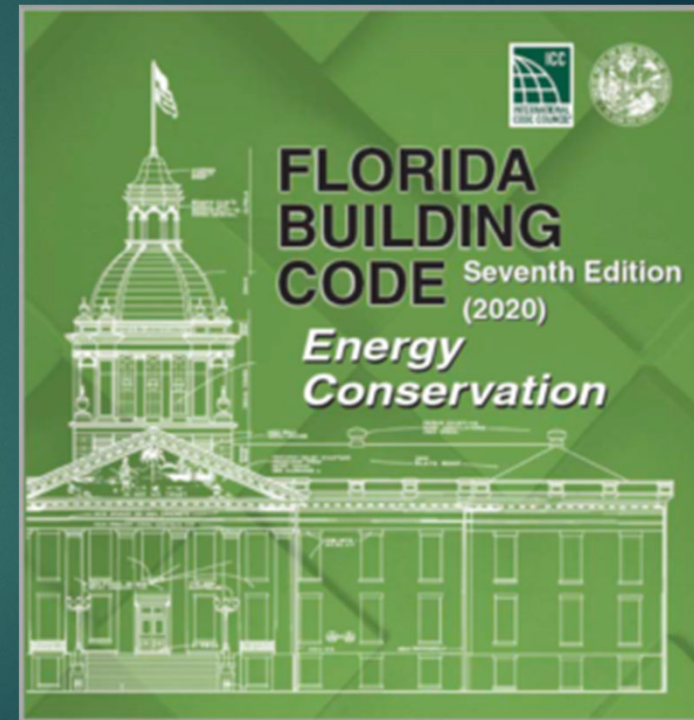
- The Florida Energy Conservation Code has two (2) different Codes in One Binder



Finding the Right Code to Use

Residential and Commercial

- a) Each Code has its own Administrative Section
- b) Each Code has its own Definitions
- c) Each Code has its own General Requirements
- d) Each Code has its own Existing Building Code section
- e) Each Code has its own Referenced Standards and Appendix
- f) Each Code has its own Index



Finding the Right Code to Use

RESIDENTIAL ENERGY EFFICIENCY

R401-General

R402-Building Thermal Envelope

R-403-Systems (Mechanical & Plumbing)

R404-Electrical Power & Lighting Systems

R405-Performance Requirements

RESIDENTIAL PROVISIONS

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What is a Residential Building?

R101.5.1.1, R101.4.1

- One and Two-family Dwellings
- Townhouses of any Size
- R-2(Apt), R-3(Boarding), R-4(Grp. hm), ≤ (3 stories or less)

Note: All buildings that are not classified as “Residential” by the Energy Code definition are considered “Commercial”

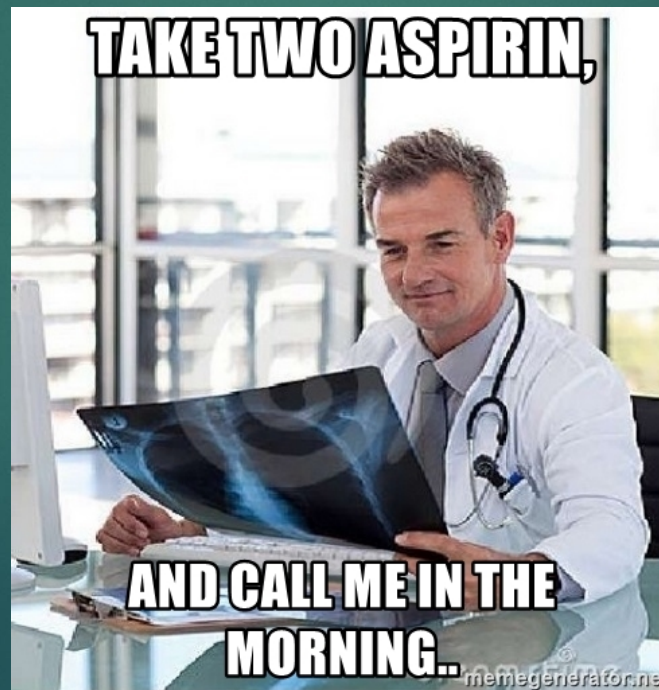
- Finding the Right Code to Use

Differences between a Prescriptive and Performance Code?



- Finding the Right Code to Use

PRESCRIPTIVE CODE



FORM R402

Finding the Right Code to Use

Prescriptive-Based Energy Code

Is an “instructional code” which set standards and then requires that each component is built to that certain standard

Example:

Frame Wall R-value must be R-13

Ceiling Insulation at must be R-30

Prescriptive Based Compliance methods are mandated by a chart or a particular code section.

R401-R404 marked as Prescriptive

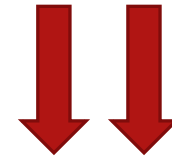


TABLE R402.1.2
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT*

CLIMATE ZONE	FENESTRATION U-FACTOR ^{a,1}	SKYLIGHT ^a U-FACTOR	GLAZED FENESTRATION SHGC ^{b,*}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ^c	FLOOR R-VALUE	BASEMENT ^d WALL R-VALUE	SLAB ^d R-VALUE & DEPTH	CRAWL SPACE ^e WALL R-VALUE
1	NR	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
3	0.35	0.55	0.25	38	20 or 13+5 ^b	8/13	19	5/13 ^f	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5 ^b	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5 ^b	13/17	30 ^f	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10 ^b	15/20	30 ^f	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10 ^b	19/21	38 ^f	15/19	10, 4 ft	15/19

- Finding the Right Code to Use

PERFORMANCE CODE



FORM R405

Finding the Right Code to Use

DESIGNER CHOOSES



Performance-Based Energy Codes

Known as “outcome-based” set standards based upon buildings' actual energy use, rather than on compliance with a stipulated technology or specific design features.

Section R405 Performance Based Compliance allow the designer to choose where they want to save energy for the entire building. Buildings pass or fail the calculation.

Mandatory Minimum's still apply for each item.

Most designers in South Florida use R405 Performance Method of Compliance for New homes.

Finding the Right Code to Use

What Path did they take?



Three Paths to Take

R401.2 Compliance.

Projects shall comply with one of the following:

1. Sections R401 through R404. *PRESCRIPTIVE*
2. Section R405 and the provisions of Sections R401 through R404 labeled “Mandatory.” *PERFORMANCE*
3. An energy rating index approach in Section R406. *ERI (PERFORMANCE)*

What Compliance Forms should they use?




R101.5.1 Compliance materials. The Florida Building Commission shall approve specific computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code. Commission approved code compliance demonstration forms can be found in Table R101.5.1.

Finding the Right Code to Use

approved code compliance demonstration forms can be found in Table R101.5.1.

**TABLE R101.5.1
INDEX TO CODE COMPLIANCE FORMS**

FORM	WHERE FOUND
Form R402	Appendix RD  FOUND IN CODE BOOK
Florida REScheck	Computer printout
Form R405	Commission approved software printout

Finding the Right Code to Use

PRESCRIPTIVE FORMS

Compliance Software and Forms

APPENDIX RD — FORMS

FLORIDA BUILDING CODE, ENERGY CONSERVATION	
Residential Building Thermal Envelope Approach	
R-Value Computation Method	
FORM R402—2020	Florida Climate Zone

PROJECT NAME	BUILDER:
AND ADDRESS:	PERMITTING OFFICE:
OWNER:	JURISDICTION NUMBER:
PERMIT TYPE:	PERMIT NUMBER:
WORST CASE?	NUMBER OF UNITS:
	CONDITIONED FLOOR AREA:

Scope: Compliance with Section R402.1.2 of the *Florida Building Code, Energy Conservation*, shall be demonstrated by the use of Form R402 for single- and multiple-family residences of three stories or less in height, additions to existing residential buildings, alterations, renovations and building systems in existing buildings, as applicable. To comply, a building must meet or exceed all of the energy efficiency requirements and applicable mandatory requirements summarized on this form. If a building does not comply with this method, or by the UA Alternative method, it may still comply under Section R405 or R406 of the *Florida Building Code, Energy Conservation*.

- General Instructions:**
1. Fill in all the applicable spaces of the "INSTALLED" row in the INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT table with the information requested. All "INSTALLED" values must be equal to or more efficient than the required levels. "AVG" indicates an area weighted average is allowed; "LOWEST" indicates the lowest R-value to be installed must be entered.
 2. Complete the tables for air infiltration and installed equipment.
 3. Read the MANDATORY REQUIREMENTS table and check each box to indicate your intent to comply with all applicable items.
 4. Read, sign and date the "Prepared By" certification statement at the bottom of this form. The owner or owner's agent must also sign and date the form.

INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT ¹										
REQUIREMENTS	FENESTRATION U-FACTOR ^{1,4}	SKYLIGHT ¹ U-FACTOR	GLAZED FENESTRATION SHGC ¹	CEILING R-VALUE	WOOD FRAME WALL R-VALUE ²	MASS WALL R-VALUE ²	FLOOR R-VALUE	BASEMENT WALL R-VALUE	SLAB ⁷ R-VALUE & DEPTH	CRAWL SPACE WALL R-VALUE
CLIMATE ZONE 1	NR	0.75	0.25	30	13	3/4	13	0	0	0
CLIMATE ZONE 2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
INSTALLED:	AVG	AVG	AVG	LOWEST	LOWEST	LOWEST	LOWEST	LOWEST	LOWEST	LOWEST

R-Value Calculation Method - [PASS / FAIL]

For Sl: 1 foot - 304.8 mm; NR - No requirement.

(1) R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.

(2) The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. Exception: Skylights may be excluded from glazed fenestration SHGC requirements in Climate Zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.

(3) For impact rated fenestration complying with Section R301.2.1.2 of the *Florida Building Code, Residential* or Section 1609.1.2 of the *Florida Building Code, Building*, the maximum U-factor shall be 0.65 in Climate Zone 2. An area-weighted average of U-factor and SHGC shall be accepted to meet the requirements, and up to 15 square feet of glazed fenestration area are exempted from the U-factor and SHGC requirement based on Section R402.3.1, R402.3.2 and R402.3.3.

(4) One side-hinged opaque door assembly up to 24 square feet is exempted from this U-factor requirement based on Section R402.3.4.

(5) R-values are for insulation material only as applied in accordance with manufacturer's installation instructions.

(6) The second R-value applies when more than half the insulation is on the interior of the mass wall.

(7) R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Climate Zones 1 through 3 for heated slabs.

Air Infiltration: Blower door test is required on the building envelope to verify leakage ≤ 7 ACH50; test report must be provided to code official before CO is issued. *Florida Building Code, Energy Conservation* Section R402.4.1.2 testing exception may apply for additions, alterations, or renovations.

(continued)

Prescriptive Method "Using Form R402" Which Use the Table in the Form for Single Components

Compliance Software and Forms

Prescriptive Method “Total UA” Thermal Envelope Approach

R402.1.5 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 R402.1.4 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table R402.1.2.

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.

Total UA Report-2020
FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION
 Residential Total UA Alternative Method

Project Name: Example_2020_Florida_Code_TotalUA_Reports Builder Name: John Q. Hammer
 Street: Anyplace Permit Office:
 City, State, Zip: Jacksonville, FL 32952 Permit Number:
 Owner: Energy Gauge Jurisdiction:
 Design Location: FL Jacksonville County: Overall (El. Clim. Zone):

1. New construction or existing: New (From Plans) 4. Number of Bedrooms: 3
 2. Single family or multiple family: Detached 5. Conditioned floor area above grade (ft²): 2000
 3. Number of units, if multiple family: 6. Conditioned floor area below grade (ft²): 0

Proposed UA		Baseline UA	
Windows	120.0	Windows	20.0
Doors	16.0	Doors	16.0
Walls	102.8	Walls	102.3
Floor	0.0	Floor	0.0
Ceiling	48.3	Ceiling	60.0
Overall UA	287.1	Overall UA	298.3

Compliance Criteria

Overall UA	287.14	PASS	
Window-to-Floor Area	15.0%	NA	
SHGC Area Weighted	0.250(vert)	PASS	
Air Handler Location	Not attic	PASS	
Duct Insulation	6.000	PASS	
Duct Leakage Total	NA		
Wall Area (ft ²)	1217.4	WALLS	Wall area appears small - please check
Ceiling Area (ft ²)	2000.0	FLOOR	
Floor Area (ft ²)	2000.0	FLOOR	
Common Wall Mass R	N/A		There are no common mass walls in this building
Common Wall Frame R	N/A		There are no common frame walls in this building
Common Floor Low R	N/A		There are no common floors in this building
Common Ceiling Low R	N/A		There are no common ceilings in this building
Window Area (ft ²)	136.0		
Door Area (ft ²)	40.0		

User entry meets requirements of Total UA Calculation Method.

I hereby certify that the design 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 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: _____



12/1/2020 2:30:25 PM EnergyGauge® USA 7.0.00 - FulRes2020 FBC 7th Edition (2020) Compliant Software Page 1 of 2

Compliance Software and Forms

FLORIDA BUILDING CODE, ENERGY CONSERVATION Residential Building Thermal Envelope Approach R-Value Computation Method	
FORM R402—2020	Florida Climate Zone

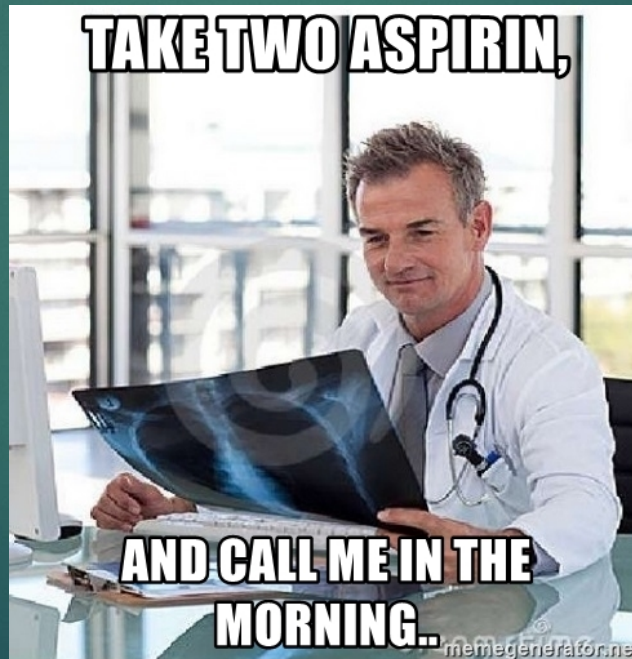
PROJECT NAME AND ADDRESS: OWNER: PERMIT TYPE: WORST CASE?	BUILDER: PERMITTING OFFICE: JURISDICTION NUMBER: PERMIT NUMBER: NUMBER OF UNITS: CONDITIONED FLOOR AREA:
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Scope: Compliance with Section R402.1.2 of the *Florida Building Code, Energy Conservation*, shall be demonstrated by the use of Form R402 for single- and multiple-family residences of three stories or less in height, additions to existing residential buildings, alterations, renovations and building systems in existing buildings, as applicable. To comply, a building must meet or exceed all of the energy efficiency requirements and applicable mandatory requirements summarized on this form. If a building does not comply with this method, or by the UA Alternative method, it may still comply under Section R405 or R406 of the *Florida Building Code, Energy Conservation*.

This Prescriptive Hand Prepared Forms can be used for New SFR, Additions, Alterations, and Renovations to Existing buildings

Are Mostly Used for Small Additions Because of the Cost of Compliance

What Sections of the Code Are Prescriptive?



What Compliance Path should I take?



Prescriptive

R401.2 Compliance.

Projects shall comply with one of the following:

1. Sections R401 through R404. 
2. Section R405 and the provisions of Sections R401 through R404 labeled “Mandatory.”
3. An energy rating index (ERI) approach in Section R406.

Compliance Software and Forms

Prescriptive
Means
“Required”
when using
Form R402

Fill in the “INSTALLED EFFICIENCY LEVEL” column with the information requested. For multiple systems of the same type, indicate the minimum efficient system. All “INSTALLED” values must be equal to or more efficient than the required level. If a listed “SYSTEM TYPE” is not to be installed, write in “N/A” for not applicable.

SYSTEM TYPE	MINIMUM EFFICIENCY LEVEL REQUIRED	INSTALLED EFFICIENCY LEVEL
Air distribution system ¹ Air handling unit Duct R-value	Not allowed in attic Factory Sealed = R-8 (Ducts in unconditioned attics, Diameter ≥ 3 in.) = R-6 (Ducts in unconditioned non attics, Diam. ≥ 3 in.) = R-6 (Ducts in unconditioned attics, Diameter < 3 in.) = R-4.2 (Ducts in unconditioned not attics, Diam. < 3 in.) All ducts are in conditioned space (No minimum)	Location: Factory Sealed? Y/N R-Value (In unc. attic) = R-Value (In unc. non attics) = R-Value (Small ducts in attic) = R-Value (Small ducts in unc) = All in conditioned space? Y/N
Air leakage/Duct test	Air handler installed: Total leakage = 4 cfm/100 s.f. Air handler not installed: Total leakage = 3 cfm/100 s.f.	Total leakage = _____ cfm/100 s.f. Air handler installed? Y/N
Duct testing	Test not required if all ducts and AHU are within the building thermal envelope and for additions or alterations where ducts extended from existing heating and cooling system through unconditioned space are < 40 linear ft.	Test report required? Y/N
Air conditioning systems: Central system ≤ 65,000 Btu/h PTAC Other:	Minimum federal standard required by NAECA ² : SEER 14.0 EER [from Table C403.2.3(3)] See Tables C403.2.3(1)–(11)	SEER (Min)= EER (Min)= Type = Effic. (min) =
Heating systems: Heat pump ≤ 65,000 Btu/h Gas furnace, non-weatherized Oil furnace, non-weatherized Other:	Minimum federal standard required by NAECA ² : HSPF ≥ 8.2 AFUE ≥ 80% AFUE ≥ 83%	HSPF (Min) = AFUE (Min) = AFUE (Min) = Type = Effic. (min) =
Water heating system (storage type): Electric ^{3, 6} Gas fired ^{4, 6} Other (describe) ^{5, 6} :	Minimum federal standard required by NAECA ² : UEF 40 gal. 0.923; 50 gal.: 0.921; 60 gal.: 2.051 UEF 40 gal. 0.580; 50 gal.: 0.563; 60 gal.: 0.766	Capacity = UEF (Min) = UEF (Min) = Type = Effic. (min) =

No stand alone Electric strip heat in Climate Zone 2 (R403.7.2)

Prescriptive Method using Form R402 Requirements

- Ducts greater than 3 inches must be R-8 per R403.3.1
- Air Handlers are not allowed in Attic per R403.3.6
- Hot water pipe must be insulated per R403.5.3

Duct testing is required for new homes and new additions using Prescriptive Method.
EXCEPT:

- If using an existing system and for an addition where the new ductwork is not over 40 linear feet located in unconditioned space.
- Ducts that are inside the thermal envelope are not required to be tested.

Total Leakage of Ducts


4-cfm/100 sq. ft when air handler is installed

3-cfm/100 sq. ft when air handler is not installed

Compliance Software and Forms

approved code compliance demonstration forms can be found in Table R101.5.1.

**TABLE R101.5.1
INDEX TO CODE COMPLIANCE FORMS**

FORM	WHERE FOUND
Form R402	Appendix RD
Florida R X check	Computer printout  NO LONGER APPROVED
Form R405	Commission approved software printout

Compliance Software and Forms

APPROVED PERFORMANCE SOFTWARE

Compliance Software and Forms

approved code compliance demonstration forms can be found in Table R101.5.1.

**TABLE R101.5.1
INDEX TO CODE COMPLIANCE FORMS**

FORM	WHERE FOUND
Form R402	Appendix RD
Florida RES check	Computer printout
Form R405	Commission approved software printout 

MUST BE PURCHASED

Compliance Software and Forms

R101.5.1 Compliance Materials.



2015 IECC ENERGY RATING INDEX REPORT

Property: 124, 10452
City: Denver, CO 80231

Organization: NORSOCO
124, 10452
Denver, CO 80231

Report ID: 101511111

ENERGY STAR v3.1 Home Report

Property: 124, 10452
City: Denver, CO 80231

Organization: NORSOCO
124, 10452
Denver, CO 80231

Report ID: 101511111

Home Energy Rating Certificate

5 Stars Plus Certified

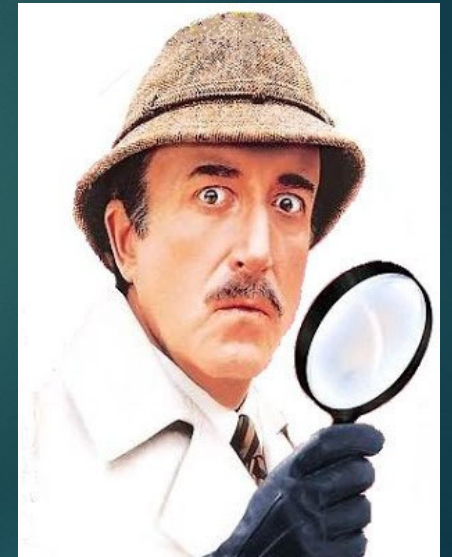
MEERS Index: 42

Estimated Annual Energy Cost			
Use	Monthly	Cost	Percent
Heating	12.0	\$62	7%
Cooling	3.4	\$88	9%
Hot Water	8.7	\$48	5%
Lighting/Appliances	31.9	\$247	85%
Refrigeration	0.5	\$18	1%
Service Charges	0.0	\$10	0%
Total	56.5	\$584	100%

Criteria	
MEERS Index	42
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Rem/Rate Software

What do we look for on the compliance forms at first glance ?




Compliance Software and Forms

405 PERFORMANCE CHECKLIST

BORA Residential Energy Guidelines

Broward County Board of Rules and Appeals

Energy Conservation
Seventh Edition (2020)



FBC Seventh Edition (2020)
Effective August 12, 2021

Pass	<input checked="" type="checkbox"/>	Fail	<input type="checkbox"/>
Pass	<input checked="" type="checkbox"/>	Fail	<input type="checkbox"/>
Pass	<input checked="" type="checkbox"/>	Fail	<input type="checkbox"/>
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Pass	<input type="checkbox"/>	Fail	<input checked="" type="checkbox"/>
Pass	<input checked="" type="checkbox"/>	Fail	<input type="checkbox"/>
Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>



Compliance Software and Forms

Energy Gauge R405
Performance Method
form is a Computer based
Compliance Calculation
for the Entire Building.
The Building Passes or
Fails based on input!

This is not a Heat Load Calculation!!

FORM R405-2022 Supplement
FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION
Florida Department of Business and Professional Regulation - Residential Performance Method

Project Name: Example Home Street: 1 N University Dr. City, State, Zip: Fort Lauderdale, FL, 33324 Owner: Design Location: FL, Fort Lauderdale		Builder Name: Owner Permit Office: Permit Number: Jurisdiction: Miami County: Broward(Florida Climate Zone 1)	
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 above grade (ft ²) Conditioned floor area below grade (ft ²)	New (From Plans) Detached 1 3 No 1216 0	7. Windows(229.2 sqft.) a. U-Factor: SHGC: b. U-Factor: SHGC: c. U-Factor: SHGC: Area Weighted Average Overhang Depth: Area Weighted Average SHGC:	Description Sgl, U=1.11 SHGC=0.39 Sgl, U=1.00 SHGC=0.47 N/A 3.503 ft 0.409
8. Skylights a. U-Factor(AVG) SHGC(AVG):	Description N/A N/A	Area N/A ft ² N/A	9. Floor Types a. Slab-On-Grade Edge Insulation b. N/A c. N/A
Insulation R= 0.0 R= R=	Area 1216.00 ft ² ft ² ft ²	10. Wall Types(1312.0 sqft.) a. Concrete Block - Int Insul, Exterior b. Frame - Wood, Adjacent c. N/A d. N/A	Insulation R=4.1 R=13.0 R=
Area 1108.00 ft ² 204.00 ft ²	11. Ceiling Types(1266.0 sqft.) a. Flat ceiling under att (Vented) b. Knee wall to attic (Vented) c. N/A	Insulation R=30.0 R=30.0 R=	Area 1216.00 ft ² 50.00 ft ²
12. Roof(Comp. Shingles, Vented) a. Sup: Attic, Ret: Hall, AH: Hall b. c.	Deck R=0.0 R 6	13. Ducts, location & insulation level a. Sup: Attic, Ret: Hall, AH: Hall b. c.	R ft ² 225
14. Cooling Systems a. Central Unit	kBTu/hr 25.6	Efficiency SEER2:15.30	15. Heating Systems a. Electric Strip Heat
kBTu/hr	19.1	Efficiency COP: 1.00	16. Hot Water Systems a. Electric b. Conservation features
Cap: 40 gallons UEF: 0.940	None	17. Credits	CF, CV, Pstat
Glass/Floor Area: 0.188		Total Proposed Modified Loads: 50.97 Total Baseline Loads: 60.35	
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 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: _____	




- Compliance requires certification by the air handler unit manufacturer that the air handler enclosure qualifies as certified factory-sealed in accordance with R403.3.2.1.
- Compliance with a proposed duct leakage Qn requires a PERFORMANCE Duct Leakage Test Report confirming duct leakage to outdoors, tested in accordance with ANSI/RESNET/ICC 380, is not greater than 0.030 Qn for whole house.
- Compliance requires a roof absorptance test and a roof emittance test in accordance with R405.7.2
- Compliance requires an Air Barrier and Insulation Inspection Checklist in accordance with R402.4.1.1 and this project requires a PERFORMANCE envelope leakage test report with envelope leakage no greater than 5.00 ACH50 (R402.4.1.2).

Compliance Software and Forms

Small Changes to the Energy Design Using the Performance Method could cause the entire Building to Fail



	17. Credits None CF, CV, Pstat
Glass/Floor Area: 0.188	Total Proposed Modified Loads: 50.97 Total Baseline Loads: 60.35
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: _____	<div style="text-align: center; font-weight: bold; font-size: 1.2em;">PASS</div> <p>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.</p> <div style="text-align: right;">  </div> BUILDING OFFICIAL: _____ DATE: _____

What is The Code Year of Form? UPDATES MATTER!!

2022 Supp.

FORM R405-2022 Supplement
FLORIDA ENERGY EFFICIENCY
Florida Department of Business and Professional Regulation

Project Name:	Example Home
Street:	1 N University Dr.
City, State, Zip:	Fort Lauderdale, FL, 33324
Owner:	
Design Location:	FL, Fort Lauderdale

1. New construction or existing New (F

2020

FORM R405-2020
FLORIDA ENERGY EFFICIENCY
Florida Department of Business and Professional Regulation

Project Name:	Example_2020_Florida_Code_R405_
Street:	Anyplace
City, State, Zip:	Tampa , FL , 34345
Owner:	Energy Gauge
Design Location:	FL, Tampa

2017

FORM R405-2017
FLORIDA ENERGY EFFICIENCY
Florida Department of Business and Professional Regulation

Project Name:	Adley 282
Street:	lot 282 141 Cerise Ct
City, State, Zip:	Daytona beach , FL ,
Owner:	Adley
Design Location:	FL, Daytona Beach


Compliance Software and Forms

Is This Compliance Form For This House? Check the Address and Lot Number

FORM R405-2020

FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION

Florida Department of Business and Professional Regulation - Residential Performance Method

Project Name:	Example_2020_Florida_Code_R405_Reports	Builder Name:	John Q. Hammer
Street:	Anyplace	Permit Office:	
City, State, Zip:	Tampa , FL , 34345 	Permit Number:	
Owner:	Energy Gauge	Jurisdiction:	
Design Location:	FL, Tampa	County:	Hillsborough (Florida Climate Zone 2)

Compliance Software and Forms

What Climate Zone Are We In?

Dade, Monroe, **Broward**, Palm Beach are in **Climate Zone #1**
(Table 301.1)

FORM R405-2020

FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION

Florida Department of Business and Professional Regulation - Residential Performance Method

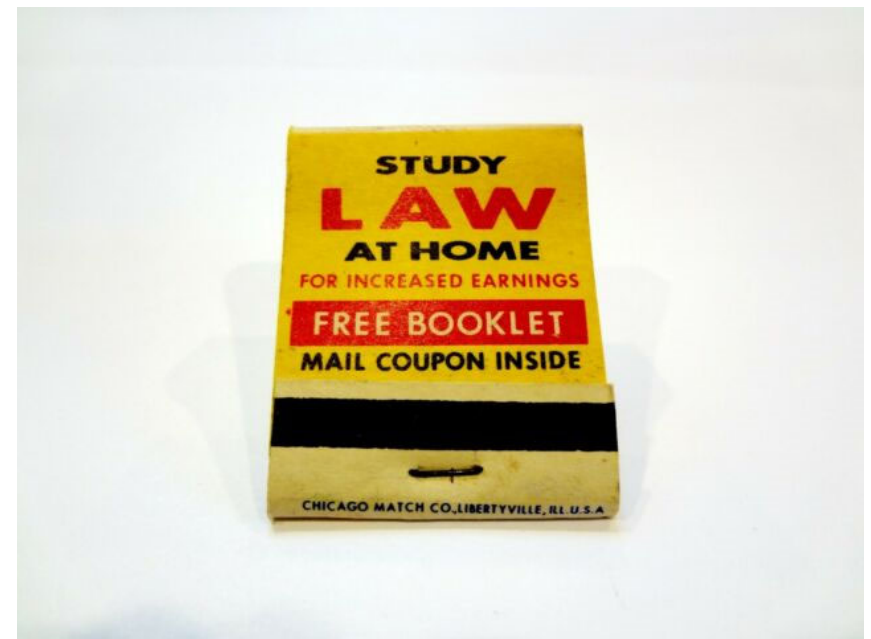
Project Name:	Example_2020_Florida_Code_R405_Reports	Builder Name:	John Q. Hammer
Street:	Anyplace	Permit Office:	
City, State, Zip:	Tampa , FL , 34345	Permit Number:	
Owner:	Energy Gauge	Jurisdiction:	
Design Location:	FL, Tampa	County:	Hillsborough (Florida Climate Zone 2)

January Average Low Temperatures with T-Stat set to 68 degrees

- Billings MO - 14 Degrees (54)
- Atlanta GA - 33 Degrees (35)
- Phoenix AZ - 45 Degrees (23)
- Fort Lauderdale – 59 Degrees (7)

**Anyone can prepare this form!
No qualifications are required!**

R103.1.1.1 Residential **No license or registration** is required to prepare the code compliance form for single-family residential dwellings, duplexes and townhouses.



Compliance Software and Forms

Who prepared the document? Did the Owner/Agent Sign/certify?

Total Baseline Loads: 176.20

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

Digitally signed by

Prepared By

Date: 2022.02.25
11:29:59 -05'00'

Signature

Date

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

Digitally signed by

Owner/Agent Name

Construction Inc) Date: 2022.09.30 13:46:04 -04'00'

Signature

Date

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 Name

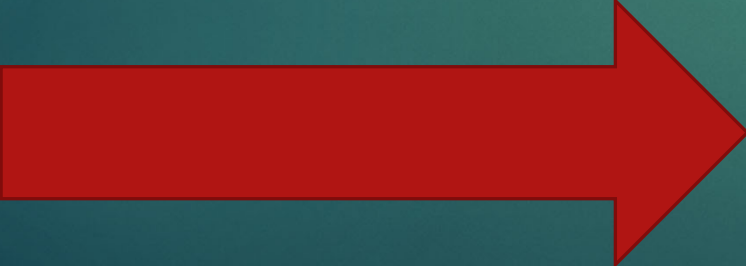
Signature

Date

Compliance Software and Forms

The Software Has Requirements

Preparer Name is
Required by Code

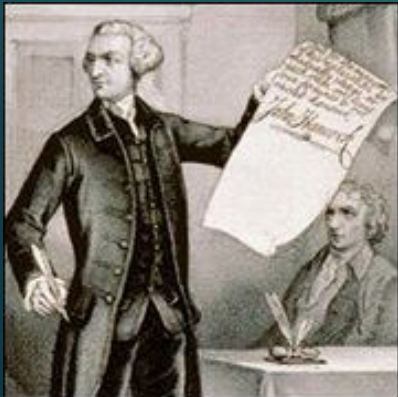


R405.4.2.1 Compliance report for permit application. A compliance report submitted with the application for building permit shall include the following:

1. Building street address, or other building site identification.
2. A statement indicating that the *proposed design* complies with Section R405.3.
3. An inspection checklist documenting the building component characteristics of the *proposed design* as indicated in Table R405.5.2(1). The inspection checklist shall show results for the *proposed design* with user inputs to the compliance software to generate the results.
4. A site-specific energy analysis report that is in compliance with Section R405.3.
5. The name of the individual performing the analysis and generating the report.
6. The name and version of the compliance software tool.

CERTIFICATION AND APPROVAL OF OWNER

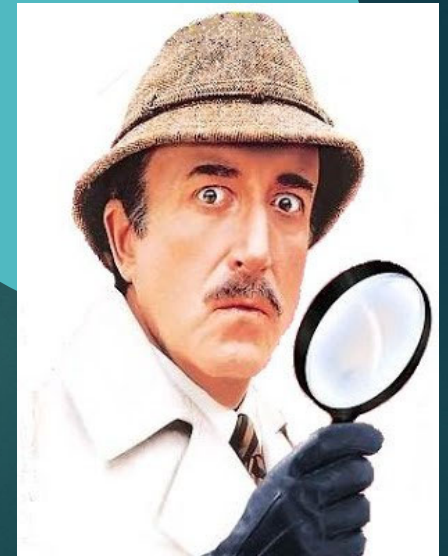
- ▶ **R103.1.1.2** The **building's owner**, the **owner's architect** or other authorized **agent legally designated by the owner** shall certify that the building is in compliance with the code, as per Section 553.907, *Florida Statutes*, "**prior:** to receiving the permit to begin construction or renovation.



Owner or Representative must certify by signing the Energy Compliance Form prior to receiving a Building Permit!!

EXAMINATION OF DOCUMENTS & CHANGES

- ▶ **R103.3 Examination of documents**
- ▶ The **code official** shall examine or cause to be examined the accompanying construction documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances. The **code official** is authorized to utilize a registered design professional, or other *approved* entity not affiliated with the building design or construction, in conducting the review of the plans and specifications for compliance with the code.



Who Will Review the Compliance Report?

ICC Energy Commentary:

The Code Official can delegate review of the construction documents to subordinates. In addition, the code official can retain the services of an outside entity, such as a registered design professional to examine the plans.

Compliance Software and Forms

Did the Code Official Sign?

Total Baseline Loads: 176.26

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

Prepared By [Redacted] [Redacted]
Signature _____ Date _____
Date: 2022.02.25 11:29:59 -05'00'

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

Owner/Agent Name [Redacted] [Redacted]
Signature _____ Date _____
Digitally signed by


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 Name _____
Signature **X** _____ Date _____

Compliance Software and Forms

BORA has Provided a Voluntary Form in the Appendix of the Residential Energy Guidelines To Be Used for Signatures



Appendix C

RESIDENTIAL ENERGY CODE COMPLIANCE REVIEW FORM


PERMIT # _____ ADDRESS _____

METHOD OF COMPLIANCE per R401.2

R402-Prescriptive #1 R406-ERI #3

R405-Performance #2

A review of the plans and specifications covered by this compliance review indicates compliance with the Florida Energy Conservation Code.



DISCIPLINE	NAME	SIGNATURE	DATE
STRUCTURAL			
MECHANICAL			
PLUMBING			
ELECTRICAL			

16

SOLUTIONS

After the Last Plan Examiner has Reviewed the Plans for Energy Compliance, that Code Official shall sign the Compliance Report that the plans indicate Florida Energy Code Compliance by all disciplines.

Are the Energy Calcs on the Job site!

R103.3.1

.....One set of construction documents so reviewed shall be retained by the code official. The other set shall be returned to the applicant, kept at the site of work and shall be open to inspection by the code official or a duly authorized representative.

Energy Calculations Need to be Revised if They don't Match the Job!

Amended construction documents

R103.4 Work shall be installed in accordance with the approved construction documents, and any changes made during construction that are not in compliance with the *approved* construction documents shall be resubmitted for approval as an amended set of construction documents.

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. **The building official shall verify that the EPL display card completed and signed by the builder accurately reflects the plans and specifications submitted to demonstrate code compliance for the building.** A copy of the EPL display card can be found in Appendix RD.

Compliance Software and Forms

Who is the EPL Card for?

The Owner

Are we giving a Copy back to the Builder at CO?

Are we telling the Builder to give this document to the owner at closing?

FORM R405-2020

ENERGY PERFORMANCE LEVEL (EPL) DISPLAY CARD

ESTIMATED ENERGY PERFORMANCE INDEX* = 99

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

Anyplace, Tampa, FL, 34345

1. New construction or existing	New (From Plans)	10. Wall Type and Insulation	Insulation	Area
2. Single family or multiple family	Detached	a. Concrete Block - Int Insul, Exterior	R=6.0	1404.40 ft ²
3. Number of units, if multiple family	1	b. Frame - Wood, Adjacent	R=13.0	153.00 ft ²
4. Number of bedrooms	3	c. N/A	R=	ft ²
5. Is this a worst case?	No	d. N/A	R=	ft ²
6. Conditioned floor area (ft ²)	2000	11. Ceiling Type and insulation level	Insulation	Area
7. Windows**	Description	a. Under Attic (Vented)	R=38.0	2000.00 ft ²
a. U-Factor:	U=0.40	b. N/A	R=	ft ²
SHGC:	SHGC=0.25	c. N/A	R=	ft ²
b. U-Factor:	N/A	12. Ducts, location & insulation level	R	ft ²
SHGC:	N/A	a. Sup. Attic, Ret. Attic, AH: Main	8	400
c. U-Factor:	N/A			
SHGC:	N/A	13. Cooling systems	kBtu/hr	Efficiency
d. U-Factor:	N/A	a. Central Unit	19.5	SEER: 14.00
SHGC:	N/A	14. Heating systems	kBtu/hr	Efficiency
Area Weighted Average Overhang Depth:	0.000 ft.	a. Electric Heat Pump	19.5	HSPF: 8.20
Area Weighted Average SHGC:	0.250			
8. Skylights	Description	15. Hot water systems	Cap: 50 gallons	EF: 0.94
a. U-Factor(AVG):	N/A	a. Electric		
SHGC(AVG):	N/A	b. Conservation features		
9. Floor Types	Insulation	None		
a. Slab-On-Grade Edge Insulation	R=0.0	Credits (Performance method)		None
b. N/A	R=			
c. N/A	R=			

I certify that this home has complied with the Florida Energy Efficiency Code (FEEC) 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: _____



*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 Energy Rating. 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.

Compliance Software and Forms

R103.1.1.2.1 Reporting to entity representing the Florida Building Commission. A reporting form shall be submitted to the local building department by the owner or owner's agent with the submittal certifying compliance with this code. Reporting forms shall be a copy of the front page of the form applicable for the code chapter under which compliance is demonstrated.

R103.1.1.2.1.1 Reporting schedule. It shall be the responsibility of the local building official to forward the reporting section of the proper form to the entity representing the Florida Building Commission on a quarterly basis.



Compliance Software and Forms



Melanie Griffin, Secretary

Florida Building Commission
2601 Blair Stone Road
Tallahassee, Florida 32399-0772
Phone: 850.487.1824 • Fax: 850.414.8436

Ron DeSantis, Governor

February 15, 2022

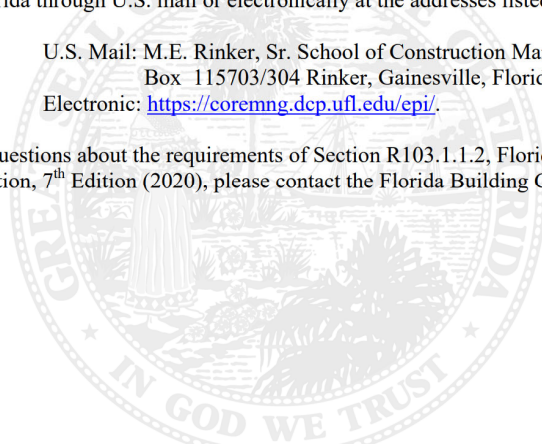
Reminder – Building Officials

RE: Reporting Requirements of Section R103.1.1.2, Florida Building Code, Energy Conservation, 7th Edition (2020)

As per Section R103.1.1.2.1, Florida Building Code, Energy Conservation, 7th Edition (2020), the University of Florida is the entity representing the Florida Building Commission. Pursuant to Section R103.1.1.2.1.1, Florida Building Code, Energy Conservation, 7th Edition (2020), please ensure that the reporting portion of the proper forms are submitted on a quarterly basis to the University of Florida. The reporting portion of the proper forms can be submitted to the University of Florida through U.S. mail or electronically at the addresses listed below:

U.S. Mail: M.E. Rinker, Sr. School of Construction Management, P.O.
Box 115703/304 Rinker, Gainesville, Florida 323611-5703
Electronic: <https://coremng.dcp.ufl.edu/epi/>

If you have any questions about the requirements of Section R103.1.1.2, Florida Building Code, Energy Conservation, 7th Edition (2020), please contact the Florida Building Commission at 850-487-1824.



Compliance Software and Forms

When you choose to comply using the performance-based Form R405 software calculations, you must meet the mandatory provisions of Sections R401 through R404 labeled **“Mandatory.”**

And the provisions of Section R405

What Compliance Path should I take?



Performance

R401.2 Compliance.

Projects shall comply with **one** of the following:

1. Sections R401 through R404.
2. Section R405 and the provisions of Sections R401 through R404 labeled “Mandatory.”
3. An energy rating index (ERI) approach in Section R406.

What are some R405 Mandatory Minimum Requirements?

R405.1

- R-6 ductwork in unconditioned spaces

R405.2.1

- R-19 Ceiling insulation for Attics, &
- R-10 (for exposed beams)

R405.2.2

- Blower door test

R405.5.3.4

- Maximum glass fenestration of SHGC of .50 for climate zone 1 with 4' average overhang exception

Compliance Software and Forms

Mandatory Provisions 401 thru 404

- R401.3 EPL Card
- R402.4 Air Leakage of Building
- R403.1.1 Regular Thermostat
- R403.1.3 Heat Pump W/ Elect Heat
- R403.3.2 Sealing of Ducts/Air Handlers/Closets/Cavities
- R403.3.3 Duct Testing Only when “leak free” is chosen??
- R403.3.5 Building Cavities Framed walls not to be used to transport a
- R403.4 Piping Insulation must be R-3 and protection is required
- R403.5.1 Heated Water Circulation/Heat tape Systems
- R403.5.5 Heat Traps Required
- R403.5.6 Water Heater Eff. Power shut off
- R403.6 Mech Ventilation
- R403.7.1 A/C Sizing
- R403.8 Multiple Dwelling units on one system, Commercial
- R403.10 Pools and Spa's
- R403.13 Dehumidifier
- R404.1 Lighting Up to 90% from 75% or not less than 65L/W

What Compliance Path should I take?



ERI
Method

R401.2 Compliance.

Projects shall comply with **one** of the following:

1. Sections R401 through R404.
2. Section R405 and the provisions of Sections R401 through R404 labeled “Mandatory.”
3. An energy rating index (ERI) approach in Section R406.



R406.4 ERI-based compliance.

The ERI for the *rated design* shall be determined in accordance with ANSI/RESNET/ICC 301, including Addendum A-2019, and be shown to have an ERI less than or equal to the appropriate value listed in Table R406.4.

Compliance Software and Forms

**SECTION R406
ENERGY RATING INDEX
COMPLIANCE ALTERNATIVE**

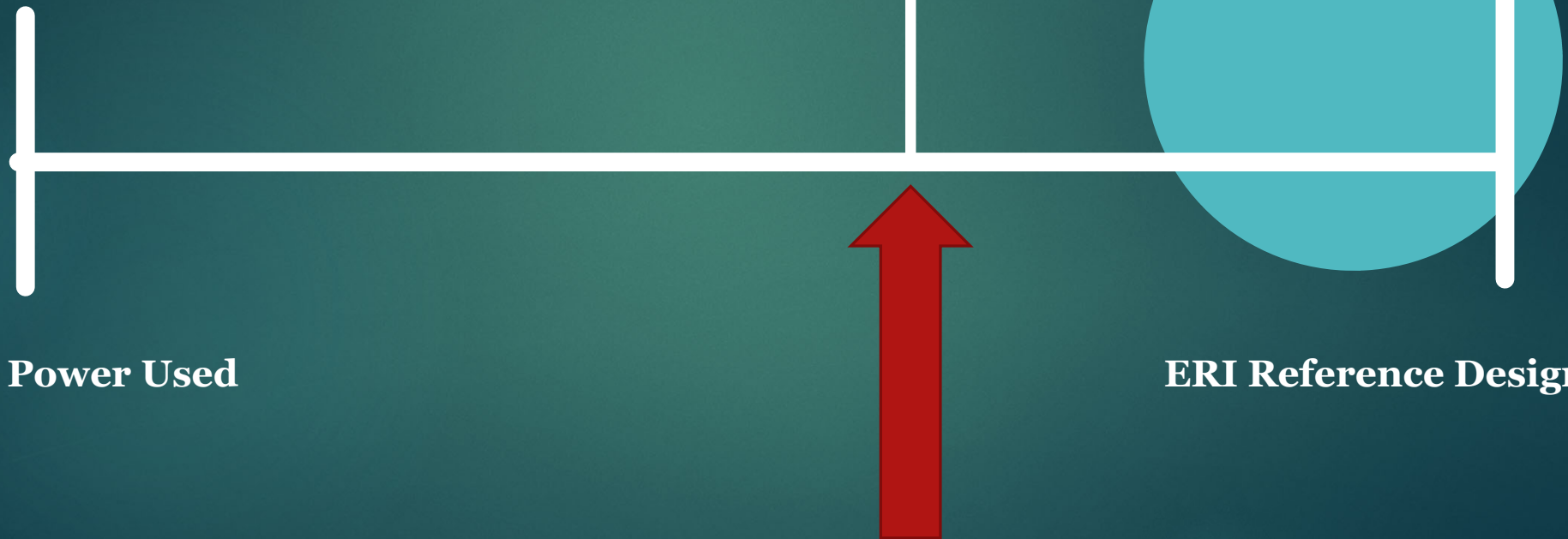
Zero

Energy Rating Index
Climate Zone 1 (58)

100
(2006 ICC)

No Power Used

ERI Reference Design



Compliance Software and Forms

TABLE R406.4 MAXIMUM ENERGY RATING INDEX

CLIMATE ZONE	ENERGY RATING INDEX
1	58
2	58
3	51
4	54
5	55
6	54
7	53
8	53

Compliance Software and Forms

Energy Gauge R406-2020 ERI Method of Compliance

FORM R406-2020
FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION
Residential Energy Rating Index Method Compliance Alternative

Permit Office: _____ Permit Number: _____ Florida Climate Zone: _____
Jurisdiction: _____ County: Miami-Dade _____ Simulation Location: _____
Worst Case orientation: No _____ FL_MIAAMI_INTL _____

Property: _____
Owner: Energy Gauge _____ On-site Renewable Power? No _____
Address: Anyplace _____ Envelope Levels Meet or Exceed: IECC-2009 _____
Miami, FL, _____ R403.5.3 HW Pipe Insulation? Yes _____

R406 Specific Requirements: _____

ERI for this House: **57** **PASS**
Maximum Allowed ERI: **58**
ERI of this House if Built to 2006 Code: **100**

Annual Energy Costs by Use

Estimated Annual Energy Use Breakdown*

Source	Use	Price**	Cost
Electricity	5236 kWh	\$ 0.116	\$ 1072
Natural Gas	0.0 Therms	\$ 1.801	\$ 0
Oil	0.0 Gallons	NA	\$ 0
On-site power production	0.0	NA	\$ 0
			1072

*Based on standard operating conditions
**Energy prices are 2016 state wide averages published by USDOE EIA
**Assumes net metering

Third Party Verifier: _____
This home is provided to meet the Energy Rating Index requirement of Section R406 of the Florida Building Code, Energy Conservation Edition (2020). Other mandatory requirements must also be met.

Name: Robert C. _____
Address: _____
Phone: () _____

BUILDING OFFICIAL: _____
DATE: _____

12/1/2020 2:28:23 PM EnergyGauge® USA 7.0.0 - FlaRes2020 FBC 7th Edition (2020) Compliant Software Page 1 of 2

2015 IECC ENERGY RATING INDEX REPORT

ENERGY STAR v3.1 Home Report

Home Energy Rating Certificate

Registry ID: 11111111
Rating Number: 81212233
Certified Energy Rater: A.S. Spahr
Rating Date: 4/12/16
Rating Ordered For: L.M. Smith

Estimated Annual Energy Cost

Use	MMBtu	Cost	Percent
Heating	12.2	\$82	7%
Cooling	3.4	\$80	9%
Hot Water	9.7	\$40	5%
Lights/Appliances	21.9	\$147	8%
Refrigeration	6.1	\$14	1%
Service Charges		\$100	13%
Total	63.3	\$364	100%

Criteria

This home meets or exceeds the minimum criteria for the following:
IECC ENERGY STAR Version 3.1 Home
2012 International Energy Conservation Code

General Information

Conditioned Area: 1000 sq. ft.
Conditioned Volume: 24000 cubic ft.
Mechanical: Baseboard

Mechanical Systems Features

Heating: Fuel-fired air distribution, Natural gas, 92.0 AFUE
Cooling: Air conditioner, Electric, 14.0 SEER
Water Heating: Instant water heater, Natural gas, 0.80 EF, 0.0 Gal.
Duct Leakage to Outdoors: 68.47 CNGS.
Ventilation System: Balanced, HRV, 75 cfm, 50.0 wpm.
Programmable Thermostat: Heat/Pan; Cool/Heat

Building Shell Features

Ceiling Flat: R-05.0
Walls: Insulated
Roof: Insulated
Foundation: Insulated

Lights and Appliance Features

Refrigerator: Energy Star
Clothes Dryer: Electric
Clothes Dryer: Electric
Clothes Dryer: Electric
Clothes Dryer: Electric

ENERGY STAR v3.1 Home Report

Property: _____
L.A. State: _____
2340 Frontier Ave, Suite 100
Boulder, CO 80501
A.S. Spahr
(303) 444-1419
www.spahr@nresco.com

44 ENERGY STAR v3.1 Home Report
44 ENERGY STAR v3.1 Home Report

1500
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2500
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3500
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2500
2000
1500
1000
500
0

ERI METHOD OF COMPLIANCE REQUIRES A CERTIFIED RATER FOR PLAN REVIEW & JOB SITE INSPECTION

An ERI rater reviews construction plans, completes onsite inspections, and produces a compliance report with the design score. The ERI rater can then provide confirmation to the local Code Official that the residence meets the threshold for code compliance.



Break Time





Question:

True or False

Energy Can be Created and Destroyed?

Law of Conservation of Energy

- ➔ Energy cannot be created or destroyed
- ➔ Energy may change form, but the total amount remains the same



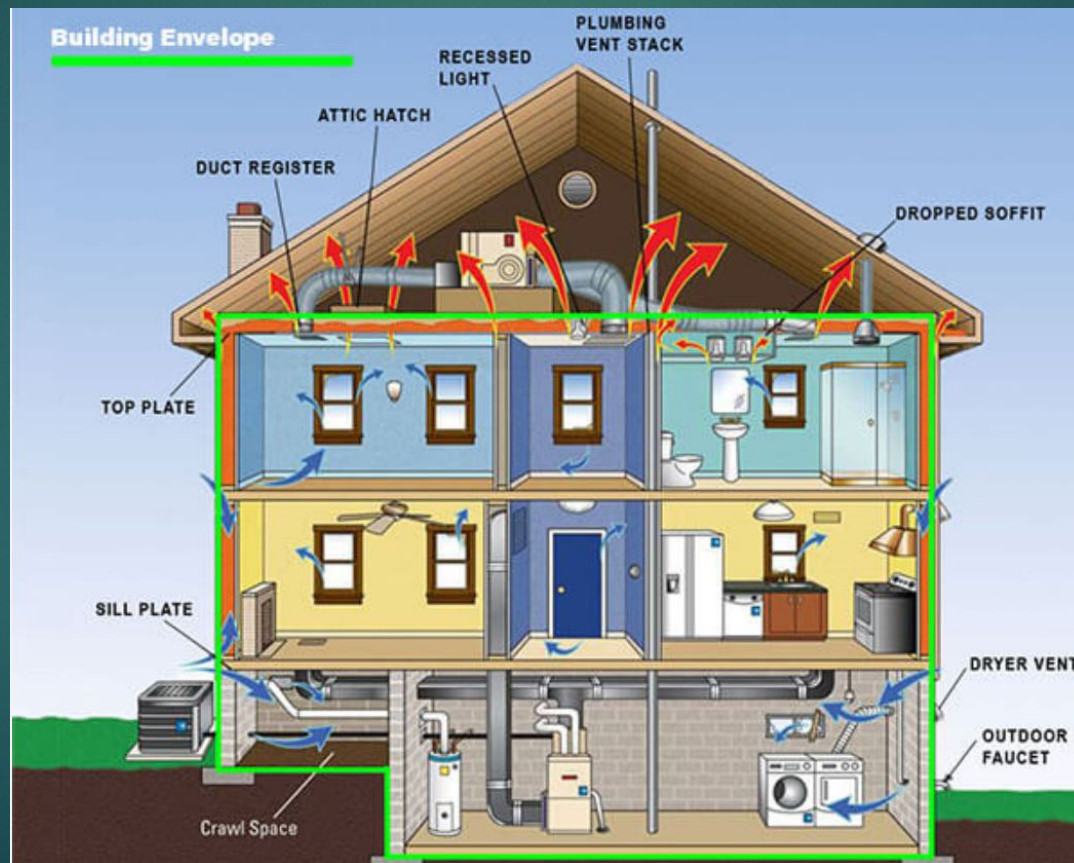
What Should be Shown on the Plans?

What does the Energy Code
to be require on the plans?

What Should be Shown on the Plans?

R103.2.1 Building thermal envelope depiction.


The *building's thermal envelope* shall be represented on the construction documents.



What Should be Shown on the Plans?

R103.2 Information of Construction Documents

► Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Insulation materials and their R-values. 
2. Fenestration U-factors and solar heat gain coefficients (SHGC).
3. Area-weighted U-factor and solar heat gain coefficients (SHGC) calculations.
4. Mechanical system design criteria.
5. Mechanical and service water-heating system and equipment types, sizes and efficiencies.
6. Equipment and system controls.
7. Duct sealing, duct and pipe insulation and location.
8. Air sealing details.

What Should be Shown on the Plans?

R103.2 Information of Construction Documents

1) Insulation materials and their R-Values

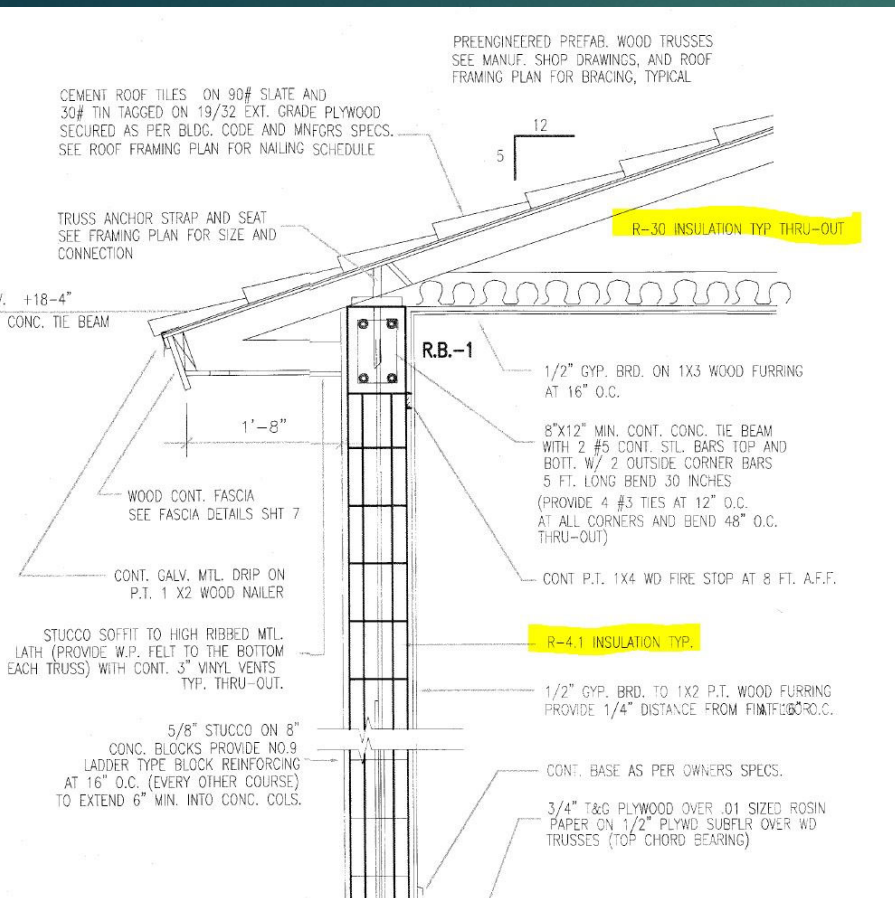
R405 Performance method sometimes has a minimum

R405.2.1 Ceiling insulation.

Ceilings shall have an insulation level of at least **R-19**, space permitting. For the purposes of this code, types of ceiling construction that are considered to have inadequate space to install R-19 include single assembly ceilings of the exposed deck and beam type and concrete deck roofs. Such ceiling assemblies shall be insulated to at least a level of **R-10**.

What Should be Shown on the Plans?

Details must match the Energy Calculations. See Energy Calculations is Prohibited



What Should be Shown on the Plans?

R103.2 Information of Construction Documents

► Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Insulation materials and their R-values.
2. Fenestration U-factors and solar heat gain coefficients (SHGC).
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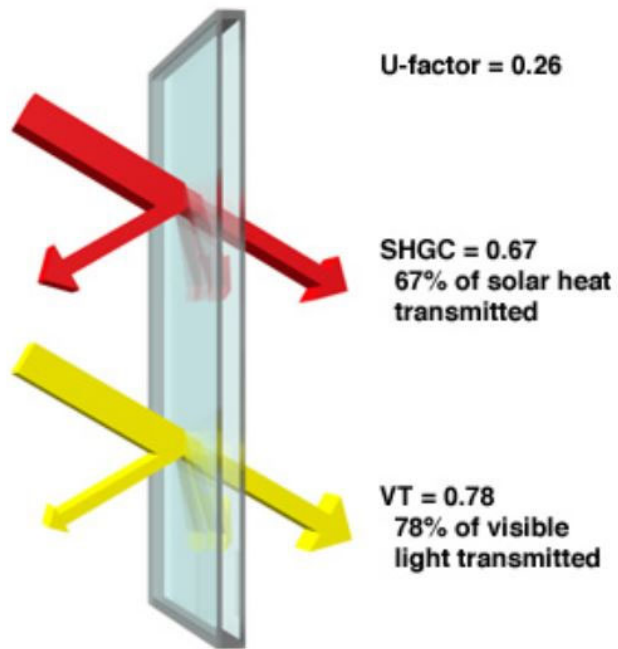
What Should be Shown on the Plans?

R405.5.3.1 Glass areas. All glazing areas of a residence, including windows, sliding glass doors, glass in doors, skylights, etc., shall include the manufacturer's frame area in the total window area. Window measurements shall be as specified on the plans and specifications for the residence.

Exception: When a window in existing exterior walls is enclosed by an addition, an amount equal to the area of this window may be subtracted from the glazing area for the addition for that overhang and orientation.



What Should be Shown on the Plans?



U-factor = 0.26

SHGC = 0.67
67% of solar heat
transmitted

VT = 0.78
78% of visible
light transmitted

Center of Glass Properties

What is a U-Factor?

What is a SHGC?

What is a VT?

What Should be Shown on the Plans?

U-FACTOR (THERMAL TRANSMITTANCE).

The coefficient of heat transmission (air to air) through a building component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films (Btu/h · ft² · °F) [W/(m² · K)].

What Should be Shown on the Plans?

SOLAR HEAT GAIN COEFFICIENT (SHGC).

The ratio of the solar heat gain entering the space through the fenestration assembly to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation that is then reradiated, conducted or convected into the space.

What Should be Shown on the Plans?

R303.1.3 Fenestration product rating.

U-factors of fenestration products shall be determined as follows.

1. For windows, doors and skylights, U-factor ratings shall be determined in accordance with NFRC 100.
2. Where required, garage door U-factors shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

U-factors shall be determined by an accredited, independent laboratory, and **labeled and certified by the manufacturer.**

Products lacking such a *labeled U-factor* shall be assigned a default *U-factor* from Table R303.1.3(1) or R303.1.3(2). The solar heat gain coefficient (SHGC) and *visible transmittance* (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and *labeled* and certified by the manufacturer. Products lacking such a *labeled SHGC* or VT shall be assigned a default SHGC or VT from Table R303.1.3(3).

What Should be Shown on the Plans?

Air Leakage of Windows


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.

What Should be Shown on the Plans?

 National Fenestration Rating Council® CERTIFIED	World's Best Window Co. Series "2000" Casement Vinyl Clad Wood Frame Double Glazing•Argon Fill•Low E ABC-X-1-00001-00001
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S. / I-P) 0.35	Solar Heat Gain Coefficient 0.32
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance 0.51	Air Leakage (U.S. / I-P) 0.2
<small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>	

What Should be Shown on the Plans?

<https://www.nfrc.org/certified-product-directory/>

 Directory Search

Back New Search NFRC Codes

Detailed Product Ratings

GENERAL INFORMATION	
Manufacturer:	Lawson Industries
Series Name:	HS-1200/1250
Operator Type:	HSOX
Air Leakage:	
Ventilation Rating (Standard Screen):	
Ventilation Rating (Enhanced Screen):	

RATINGS INFORMATION	
Request Export	Download File

CPD #	Manufacturer Product Code	U-Factor	SHGC	VT	Condensation Resistance	Air Leakage	Ventilation Rating (Standard Screen)	Ventilation Rating (Enhanced Screen)
LAW-M-14-00001-00001	Cardinal Clear 1/8 -Air- Clear 1/8	0.46	0.59	0.62	46			
LAW-M-14-00001-00002	Cardinal Clear 1/8 -Air- Clear 1/8							
LAW-M-14-00002-00001	Cardinal Clear 1/8 -Air- Lami Clear (1/8-090PVB-1/8)							
LAW-M-14-00002-00002	Cardinal Clear 1/8 -Air- Lami Clear (1/8-090PVB-1/8)	0.46	0.50	0.53	46	Vinyl w/ Reinforcement - Interlock/Vinyl w/ Reinforcement - Interlock, Fill 1: AIR(100), CL, Grid		
LAW-M-14-00002-00003	Cardinal Clear 1/8 -Air- Lami Gray (1/8-030Gry-060Cir-PVB-1/8)	0.46	0.50	0.31	46	Vinyl w/ Reinforcement - Interlock/Vinyl w/ Reinforcement - Interlock, Fill 1: AIR(100), GY, No Grid		
LAW-M-14-00002-00004	Cardinal Clear 1/8 -Air- Lami Gray (1/8-030Brz-060Cir-PVB-1/8)	0.46	0.45	0.27	46	Vinyl w/ Reinforcement - Interlock/Vinyl w/ Reinforcement - Interlock, Fill 1: AIR(100), GY, Grid		
LAW-M-14-00002-00005	Cardinal Clear 1/8 -Air- Lami Bronze (1/8-030Brz-060Cir-PVB-1/8)	0.46	0.49	0.24	46	Vinyl w/ Reinforcement - Interlock/Vinyl w/ Reinforcement - Interlock, Fill 1: AIR(100), BZ, No Grid		
LAW-M-14-00002-00006	Cardinal Clear 1/8 -Air- Lami Bronze (1/8-030Brz-060Cir-PVB-1/8)	0.46	0.44	0.21	46	Vinyl w/ Reinforcement - Interlock/Vinyl w/ Reinforcement - Interlock, Fill 1: AIR(100), BZ, Grid		
LAW-M-14-00003-00001	Cardinal Clear 1/8 -Air- Lami Clear (1/8-090SGP-1/8)	0.45	0.56	0.60	46	Vinyl w/ Reinforcement - Interlock/Vinyl w/ Reinforcement - Interlock, Fill 1: AIR(100), CL, No Grid		
LAW-M-14-00003-00002	Cardinal Clear 1/8 -Air- Lami Clear (1/8-090SGP-1/8)	0.45	0.50	0.54	46	Vinyl w/ Reinforcement - Interlock/Vinyl w/ Reinforcement - Interlock, Fill 1: AIR(100), CL, Grid		
LAW-M-14-00004-00001	Cardinal Clear 3/16 -Air- Clear 3/16	0.46	0.56	0.61	46	Vinyl w/ Reinforcement - Interlock/Vinyl w/ Reinforcement - Interlock, Fill 1: AIR(100), CL, No Grid		
LAW-M-14-00004-00002	Cardinal Clear 3/16 -Air- Clear 3/16	0.46	0.50	0.54	46	Vinyl w/ Reinforcement - Interlock/Vinyl w/ Reinforcement - Interlock, Fill 1: AIR(100), CL, Grid		
LAW-M-14-00005-00001	Cardinal Clear 3/16 -Air- Lami Clear (1/8-090PVB-1/8)	0.47	0.54	0.60	45	Vinyl w/ Reinforcement - Interlock/Vinyl w/ Reinforcement - Interlock, Fill 1: AIR(100), CL, No Grid		

CPD #	U-factor	SHGC	VT	Condensation Resistance	Air Leakage	Ventilation Rating (Standard Screen)	Ventilation Rating (Enhanced Screen)
LAW-M-14-00001-00001	0.46	0.59	0.62	46			

Group ID	Manufacturer Product Code	Frame/Sash Type	Glazing Layers	Low-E	Gap Widths	Spacer	Gap Fill	Grid	Divider	Tint
1	Cardinal Clear 1/8 -Air- Clear 1/8	V/WA	2		0.639	P1-S	Fill 1: AIR(100)	N	-	CL

What Should be Shown on the Plans?

Building
Departments may
use the form
found in the
Residential
Energy
Guidelines

Appendix A

Residential Fenestration Product Rating Submittal Form

In accordance with R405.4.3 #2 of the Florida Energy Conservation Code, this form is a tool for the submittal process to document the proposed energy product rating for windows, doors, and skylights.

Recommended for Review:

- Copy of the approved energy compliance report "window checklist" showing each fenestration design rating (U-value and SHGC) for all fenestration in the entire building.
- A list of the NFRC "Certified Product Directory" number of each window showing the U-Value and SHGC on the attached form. These numbers can be found on the NFRC site: <https://search.nfrc.org/search/searchDefault.aspx>

Notes:

- Products not listed in the NFRC directory shall be tested by an accredited, independent laboratory in accordance with FECC R303.1.3. Products not tested and lacking certification and labeling shall be assigned a default rating from the energy tables.
- Products submitted that do not match the approved energy window checklist shall require a revised energy compliance report or window submittal per FECC R103.4

#	NFRC Directory Number	Description	U-Value	SHGC
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

What Should be Shown on the Plans?

R405.5.3.4 Maximum Fenestration SHGC.

- ▶ **The Proposed Design must have either an area-weighted average maximum fenestration SHGC of 0.50 or a window area-weighted average overhang depth of 4.0 feet or greater (all conditioned space windows must be included in the calculation). The area-weighted average maximum fenestration *U*-factor permitted using tradeoffs from Section R402.1.5 or R405 shall be 0.48 in Climate Zones 4 and 5 and 0.40 in Climate Zones 6 through 8 for vertical fenestration, and 0.75 in Climate Zones 4 through 8 for skylights. The area-weighted average maximum fenestration SHGC permitted using tradeoffs from Section R405 in Climate Zones 1 through 3 shall be 0.50.**



What Should be Shown on the Plans?

WEIGHTED AVERAGE MUST BE .50 OR LESS FOR CLIMATE ZONE 1

FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION																																													
Florida Department of Business and Professional Regulation - Residential Performance Method																																													
Project Name: Example_2014_Florida_Code_Jacksonville		Builder Name: John Q. Hammer																																											
Street: 66 Any Place		Permit Office:																																											
City, State, Zip: Jacksonville, FL,		Permit Number:																																											
Owner: Energy Gauge		Jurisdiction:																																											
Design Location: FL, Jacksonville		County: Duval (Florida Climate Zone 2)																																											
<p>1. New construction or existing: New (From Plans)</p> <p>2. Single family or multiple family: Single-family</p> <p>3. Number of units, if multiple family: 1</p> <p>4. Number of Bedrooms: 3</p> <p>5. Is this a worst case?: No</p> <p>6. Conditioned floor area above grade (ft²): 2000</p> <p>Conditioned floor area below grade (ft²): 0</p> <p>7. Windows(300.0 sqft.)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Description</th> <th style="width: 50%;">Area</th> </tr> </thead> <tbody> <tr> <td>a. U-Factor: Sgl. U=0.40 SHGC: SHGC=0.25</td> <td style="text-align: right;">300.00 ft²</td> </tr> <tr> <td>b. U-Factor: N/A SHGC:</td> <td style="text-align: right;">ft²</td> </tr> <tr> <td>c. U-Factor: N/A SHGC:</td> <td style="text-align: right;">ft²</td> </tr> <tr> <td>d. U-Factor: N/A SHGC:</td> <td style="text-align: right;">ft²</td> </tr> </tbody> </table> <p>Area Weighted Average Overhang Depth: 0.000 ft</p> <p>Area Weighted Average SHGC: 0.250</p>		Description	Area	a. U-Factor: Sgl. U=0.40 SHGC: SHGC=0.25	300.00 ft²	b. U-Factor: N/A SHGC:	ft²	c. U-Factor: N/A SHGC:	ft²	d. U-Factor: N/A SHGC:	ft²	<p>9. Wall Types (1520.3 sqft.)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Insulation</th> <th style="width: 50%;">Area</th> </tr> </thead> <tbody> <tr> <td>a. Frame - Wood, Exterior</td> <td style="text-align: right;">R=13.0 1384.30 ft²</td> </tr> <tr> <td>b. Frame - Wood, Adjacent</td> <td style="text-align: right;">R=13.0 136.00 ft²</td> </tr> <tr> <td>c. N/A</td> <td style="text-align: right;">R= ft²</td> </tr> <tr> <td>d. N/A</td> <td style="text-align: right;">R= ft²</td> </tr> </tbody> </table> <p>10. Ceiling Types (2000.0 sqft.)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Insulation</th> <th style="width: 50%;">Area</th> </tr> </thead> <tbody> <tr> <td>a. Under Attic (Vented)</td> <td style="text-align: right;">R=38.0 2000.00 ft²</td> </tr> <tr> <td>b. N/A</td> <td style="text-align: right;">R= ft²</td> </tr> <tr> <td>c. N/A</td> <td style="text-align: right;">R= ft²</td> </tr> </tbody> </table> <p>11. Ducts</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">R</th> <th style="width: 50%;">ft²</th> </tr> </thead> <tbody> <tr> <td>a. Sup: Main, Ret: Main, AH: Main</td> <td style="text-align: right;">6 400</td> </tr> </tbody> </table> <p>12. Cooling systems</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">kBTu/hr</th> <th style="width: 50%;">Efficiency</th> </tr> </thead> <tbody> <tr> <td>a. Central Unit</td> <td style="text-align: right;">17.3 SEER:14.00</td> </tr> </tbody> </table> <p>13. Heating systems</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">kBTu/hr</th> <th style="width: 50%;">Efficiency</th> </tr> </thead> <tbody> <tr> <td>a. Natural Gas Furnace</td> <td style="text-align: right;">26.1 AFUE:0.80</td> </tr> </tbody> </table> <p>14. Water systems</p> <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>Natural Gas</td> <td style="text-align: right;">Cap: 40 gallons EF: 0.615</td> </tr> </tbody> </table> <p>15. Credits: None</p>		Insulation	Area	a. Frame - Wood, Exterior	R=13.0 1384.30 ft²	b. Frame - Wood, Adjacent	R=13.0 136.00 ft²	c. N/A	R= ft²	d. N/A	R= ft²	Insulation	Area	a. Under Attic (Vented)	R=38.0 2000.00 ft²	b. N/A	R= ft²	c. N/A	R= ft²	R	ft²	a. Sup: Main, Ret: Main, AH: Main	6 400	kBTu/hr	Efficiency	a. Central Unit	17.3 SEER:14.00	kBTu/hr	Efficiency	a. Natural Gas Furnace	26.1 AFUE:0.80	Natural Gas	Cap: 40 gallons EF: 0.615
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b. Conservation features	None																																												

What Should be Shown on the Plans?

R405.5.3.3 Doors with glazing.

For doors that are opaque or where the glass is less than one-third of the area of the door, the total door area shall be included in the door calculation. For unlabeled sliding glass doors or when glass areas in doors are **greater than or equal to one-third of the area of the door**, the glazing portion **shall be included in the glazing calculation** and the opaque portion of the door shall be included in the door calculation. When glass areas in doors are greater than or equal to one-third of the area of the door, the door shall be included in the glazing calculation as a total fenestration using the tested *U*-factor and solar heat gain coefficient.



What Should be Shown on the Plans?

Overhangs make a big difference in Heat Gain

WINDOWS

Orientation shown is the entered orientation (=>) changed to As Built (rotated 180 degrees).

✓	#	Ornt	Wall ID	Frame	Panes	NFRC	U-Factor	SHGC	Imp	Area	Overhang		Int Shade	Screening
											Depth	Separation		
_____	1	E=>W	2	Metal	Low-E Double	Yes	0.58	0.35	Y	24.0 ft²	2 ft 0 in	0 ft 6 in	None	None
_____	2	S=>N	6	Metal	Low-E Double	Yes	0.58	0.35	Y	16.4 ft²	2 ft 0 in	0 ft 6 in	None	None
_____	3	S=>N	7	Metal	Low-E Double	Yes	0.58	0.35	Y	24.0 ft²	2 ft 0 in	0 ft 6 in	None	None
_____	4	W=>E	8	Metal	Low-E Double	Yes	0.56	0.32	Y	72.0 ft²	8 ft 0 in	0 ft 6 in	None	None
_____	5	N=>S	9	Metal	Low-E Double	Yes	0.58	0.35	Y	16.4 ft²	2 ft 0 in	0 ft 6 in	None	None
_____	6	W=>E	10	Metal	Low-E Double	Yes	0.58	0.35	Y	24.0 ft²	2 ft 0 in	0 ft 6 in	None	None
_____	7	N=>S	13	Metal	Low-E Double	Yes	0.58	0.35	Y	12.0 ft²	2 ft 0 in	0 ft 6 in	None	None
_____	8	N=>S	15	Metal	Low-E Double	Yes	0.58	0.35	Y	16.4 ft²	2 ft 0 in	0 ft 6 in	None	None

What Should be Shown on the Plans?

R405.5.3.2 Overhangs.

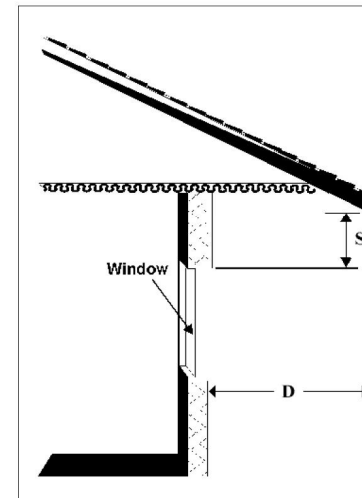
Overhang effect is measured by “Overhang Separation”, which is the vertical measure of the distance from the top of a window to the bottom of the overhang.

Note: The “Overhang Depth” is the horizontal measure from the wall to end of the overhang



Overhang Note

Determine overhang depth (D) and separation (S) as shown in the figure below:



What Should be Shown on the Plans?

Area Weighted Average Overhang

1. New construction or existing	New (From Plans)	
2. Single family or multiple family	Detached	
3. Number of units, if multiple family	1	
4. Number of Bedrooms	3	
5. Is this a worst case?	No	
6. Conditioned floor area above grade (ft ²)	2000	
Conditioned floor area below grade (ft ²)	0	
7. Windows(320.0 sqft.)	Description	Area
a. U-Factor:	U=0.40	320.00 ft ²
SHGC:	SHGC=0.25	
b. U-Factor:	N/A	ft ²
SHGC:		
c. U-Factor:	N/A	ft ²
SHGC:		
Area Weighted Average Overhang Depth:		0.000 ft.
Area Weighted Average SHGC:		0.250
8. Skylights	Area	
c. U-Factor:(AVG)	N/A	ft ²
SHGC:(AVG):	N/A	
9. Floor Types (2000.0 sqft.)	Insulation	Area
a. Slab-On-Grade Edge Insulation	R=0.0	2000.00 ft ²
b. N/A	R=	ft ²
c. N/A	R=	ft ²
10. Wall Types(1557.4 sqft.)	Insulation	Area
a. Concrete Block - Int Insul, Exterior	R=6.0	1404.40 ft ²
b. Frame - Wood, Adjacent	R=13.0	153.00 ft ²
c. N/A	R=	ft ²
d. N/A	R=	ft ²
11. Ceiling Types (2000.0 sqft.)	Insulation	Area
a. Under Attic (Vented)	R=38.0	2000.00 ft ²
b. N/A	R=	ft ²
c. N/A	R=	ft ²
12. Ducts		R ft ²
a. Sup: Attic, Ret: Attic, AH: Main		8 400
13. Cooling systems	kBtu/hr	Efficiency
a. Central Unit	19.5	SEER:14.00
14. Heating systems	kBtu/hr	Efficiency
a. Heat Pump	19.5	HSPF:8.20
15. Hot water systems		
a. Electric		Cap: 50 gallons
		EF: 0.945
b. Conservation features		None
16. Credits		None

What Should be Shown on the Plans?

R103.2 Information of Construction Documents

► Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Insulation materials and their R-values.
2. Fenestration U-factors and solar heat gain coefficients (SHGC).
3. Area-weighted U-factor and solar heat gain coefficients (SHGC) calculations.
4. Mechanical system design criteria. ←
5. Mechanical and service water-heating system and equipment types, sizes and efficiencies.
6. Equipment and system controls.
7. Duct sealing, duct and pipe insulation and location.
8. Air sealing details.

What Should be Shown on the Plans?

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.

FOUND ON THE HEATING AND COOLING LOAD CALCULATIONS

What Should be Shown on the Plans?

R403.7 Heating and cooling equipment

R403.7.1 Equipment sizing (Mandatory).

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* heating and cooling calculation methodologies, 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.**

What Should be Shown on the Plans?

R103.2 Information of Construction Documents

▶ Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Insulation materials and their R-values.
2. Fenestration U-factors and solar heat gain coefficients (SHGC).
3. Area-weighted U-factor and solar heat gain coefficients (SHGC) calculations.
4. Mechanical system design criteria.
5. Mechanical and service water-heating system and equipment types, sizes and efficiencies.
6. Equipment and system controls.
7. Duct sealing, duct and pipe insulation and location.
8. Air sealing details.

What Should be Shown on the Plans?

SEER₂ MUST BE SHOWN ON ALL PLANS SUBMITTED AFTER JANUARY 1, 2023

FORM R405-2022 Supplement
FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION
 Florida Department of Business and Professional Regulation - Residential Performance Method

Project Name: Example Home		Builder Name: Owner	
Street: 1 N University Dr.		Permit Office:	
City, State, Zip: Fort Lauderdale, FL, 33324		Permit Number:	
Owner:		Jurisdiction: Miami	
Design Location: FL, Fort Lauderdale		County: Broward(Florida Climate Zone 1)	

		New (From Plans)	
1.	New construction or existing		
2.	Single family or multiple family		Detached
3.	Number of units, if multiple family		1
4.	Number of Bedrooms		3
5.	Is this a worst case?		No
6.	Conditioned floor area above grade (ft ²)		1216
	Conditioned floor area below grade (ft ²)		0
7.	Windows(229.2 sqft.)	Description	Area
a.	U-Factor:	Sgl, U=1.11	175.18 ft ²
	SHGC:	SHGC=0.39	
b.	U-Factor:	Sgl, U=1.00	54.00 ft ²
	SHGC:	SHGC=0.47	
c.	U-Factor:	N/A	ft ²
	SHGC:		
	Area Weighted Average Overhang Depth:	3.503 ft	
	Area Weighted Average SHGC:	0.409	
8.	Skylights	Description	Area
	U-Factor:(AVG)	N/A	N/A ft ²
	SHGC:(AVG):	N/A	
9.	Floor Types	Insulation	Area
a.	Slab-On-Grade Edge Insulation	R= 0.0	1216.00 ft ²
b.	N/A	R=	ft ²
c.	N/A	R=	ft ²
10.	Wall Types(1312.0 sqft.)	Insulation	Area
a.	Concrete Block - Int Insul, Exterior	R=4.1	1108.00 ft ²
b.	Frame - Wood, Adjacent	R=13.0	204.00 ft ²
c.	N/A		
d.	N/A		
11.	Ceiling Types(1266.0 sqft.)	Insulation	Area
a.	Flat ceiling under att (Vented)	R=30.0	1216.00 ft ²
b.	Knee wall to attic (Vented)	R=30.0	50.00 ft ²
c.	N/A		
12.	Roof(Comp, Shingles, Vented)	Deck R=0.0	1235 ft ²
13.	Ducts, location & insulation level		R ft ²
a.	Sup: Attic, Ret: Hall, AH: Hall		6 225
b.			
c.			
14.	Cooling Systems	kBtu/hr	Efficiency
a.	Central Unit	25.6	SEER2:15.30
15.	Heating Systems	kBtu/hr	Efficiency
a.	Electric Strip Heat	19.1	COP:1.00
16.	Hot Water Systems		
a.	Electric	Cap: 40 gallons	UEF: 0.940
b.	Conservation features		
17.	Credits		None CF, CV, Pstat

Glass/Floor Area: 0.188 Total Proposed Modified Loads: 50.97
 Total Baseline Loads: 60.35

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 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: _____
--	--



What Should be Shown on the Plans?

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.....

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.

What Should be Shown on the Plans?

CAPACITIES ON THE AHRI ARE NOMINAL CAPACITIES



Certificate of Product Ratings

AHRI Certified Reference Number: 5550388 Date: 3/17/2014

Product: Split System: Air-Cooled Condensing Unit, Coil with Blower

Outdoor Unit Model Number: 14AJM25

Indoor Unit Model Number: RHLL-HM2417+RCSL-H*2417

Manufacturer: RHEEM SALES COMPANY, INC.

Trade/Brand name: RHEEM, RHEEM, RHEEM/RTG

Series name:

Manufacturer responsible for the rating of this system combination is RHEEM SALES COMPANY, INC.

Rated as follows in accordance with AHRI Standard 210/240-2008 for Unitary Air-Conditioning and Air-Source Heat Pump Equipment and subject to verification of rating accuracy by AHRI-sponsored, independent, third party testing:

Cooling Capacity (Btuh):	24600*
EER Rating (Cooling):	13.00
SEER Rating (Cooling):	16.00
IEER Rating (Cooling):	



* Ratings followed by an asterisk (*) indicate a voluntary rerate of previously published data, unless accompanied with a WAS, which indicates an involuntary rerate.

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AHRI does not endorse the product(s) listed on this Certificate and makes no representations, warranties or guarantees as to, and assumes no responsibility for, the product(s) listed on this Certificate. AHRI expressly disclaims all liability for damages of any kind arising out of the use or performance of the product(s), or the unauthorized alteration of data listed on this Certificate. Certified ratings are valid only for models and configurations listed in the directory at www.ahridirectory.org.


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The information for the model cited on this certificate can be verified at www.ahridirectory.org, click on "Verify Certificate" link and enter the AHRI Certified Reference Number and the date on which the certificate was issued, which is listed above, and the Certificate No., which is listed at bottom right.

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CERTIFICATE NO.: 130395721253308184

MANUFACTURER	CARRIER
CONDENSING UNIT MODEL	CA14NA030
AIR HANDLER MODEL	FB4CNP030
SUPPLY CFM	1000
EXT. ST. PRESS	0.4
HEAT KW	8
TOTAL COOLING CAP. (BTUH)	27,300
SENSIBLE COOLING CAP. (BTUH)	22,600
LATENT COOLING CAP. (BTUH)	4,700
SEER	15.0
ELECTRICAL SERVICE	230/1/60
AHU MIN CIRC AMPS	48.5
AHU MAX BREAKER	50
G.U. MIN CIRC AMPS	16.8
G.U. MAX BREAKER	25



What Should be Shown on the Plans?

R403.7.1.1 Cooling equipment capacity

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.

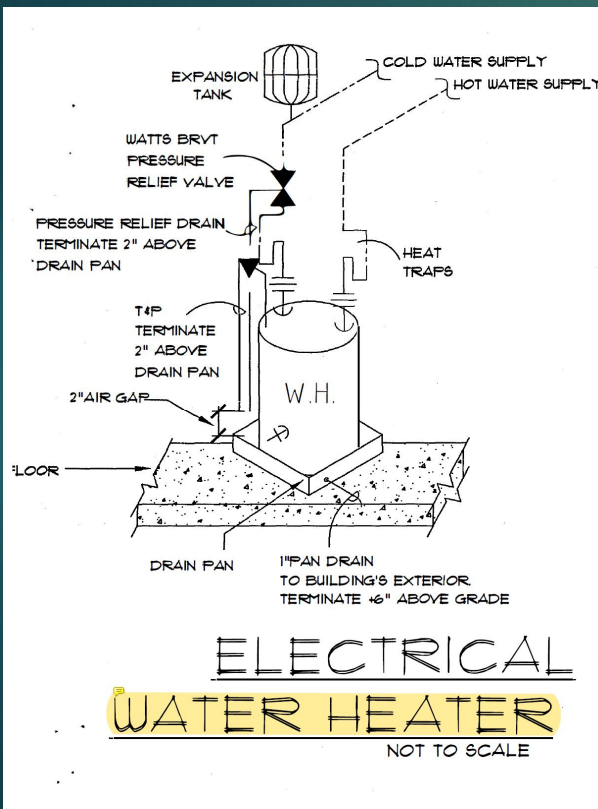
Design values for entering wet-bulb and dry-bulb temperatures shall be for the indoor dry bulb and relative humidity used for the load calculation and shall be adjusted for return side gains if the return duct(s) is installed in an unconditioned space.

R103.2 Information of Construction Documents

▶ Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Insulation materials and their R-values.
2. Fenestration U-factors and solar heat gain coefficients (SHGC).
3. Area-weighted U-factor and solar heat gain coefficients (SHGC) calculations.
4. Mechanical system design criteria.
5. Mechanical and service water-heating system and equipment types, sizes and efficiencies.
6. Equipment and system controls.
7. Duct sealing, duct and pipe insulation and location.
8. Air sealing details.

What Should be Shown on the Plans?



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.

What Should be Shown on the Plans?

PERFORMANCE DATA SHEETS FROM MANUFACTURER ARE ALLOWED TO BE SUBMITTED

C404.2 Service water-heating equipment performance efficiency.

Water-heating equipment and hot water storage tanks shall meet the requirements of Table C404.2. **The efficiency shall be verified through data furnished by the manufacturer of the equipment or through certification under an *approved* certification program.** Water-heating equipment also intended to be used to provide space heating shall meet the applicable provisions of Table C404.2.

What Should be Shown on the Plans?

How do I verify if the water heater meets the efficiency requirement?

The screenshot shows the AHRI website interface. On the left, there are search filters for AHRI Certified Reference Number, Brand Name (A. O. SMITH), Model Number, Energy Source (Electric Resistance), Heater Type (Storage), First Hour Rating (GPH), and Max GPM. The main content area displays a table titled "Residential Water Heaters" with columns for AHRI Certified Reference Number, Old AHRI Reference Number, Model Status, Brand Name, Series Name, Model Number, Energy Source, Heater Type, Usage Bin, and AHRI Certified Ratings (First Hour Rating (GPH), Max GPM, Uniform Energy Factor, Nominal Capacity (gal), DOE Rated Storage Volume (gal), Input (MBtu/h), Input (kW), UED Recovery Efficiency, %), and Elig For Fed Tax Cre.

AHRI Certified Reference Number	Old AHRI Reference Number	Model Status	Brand Name	Series Name	Model Number	Energy Source	Heater Type	Usage Bin	AHRI Certified Ratings							Elig For Fed Tax Cre
									First Hour Rating (GPH)	Max GPM	Uniform Energy Factor	Nominal Capacity (gal)	DOE Rated Storage Volume (gal)	Input (MBtu/h)	Input (kW)	
8083330		Active	SMITH	(E,P)NS-30		Resistance	Storage	Usage	43	0.91	26	20		4.5	98	
8083338		Active	A. O. SMITH	(E,P)NS-30		Electric Resistance	Storage	Low Usage	47	0.89	30	27		4.5	98	
8083339		Active	A. O. SMITH	(E,P)NT-40		Electric Resistance	Storage	Medium Usage	53	0.92	40	36		4.5	98	
8083340		Active	A. O. SMITH	(E,P)NS-40		Electric Resistance	Storage	Medium Usage	55	0.92	40	37		4.5	98	
8083341		Active	A. O. SMITH	(E,P)NLB-40		Electric Resistance	Storage	Medium Usage	51	0.92	38	35		4.5	98	
8083342		Active	A. O. SMITH	(E,P)NL-40		Electric Resistance	Storage	Low Usage	50	0.89	38	35		4.5	98	

What Should be Shown on the Plans?



Certificate of Product Ratings

AHRI Certified Reference Number : 206221410 Date : 02-24-2021 Model Status : Active

Brand Name : A. O. SMITH

Model Number : ENT-50-1**

Rated as follows in accordance with Department of Energy (DOE) Water Heater test procedures as published in the latest edition of the Code of Federal Regulations, 10 CFR Part 430 Subpart B Appendix E and subject to verification of rating accuracy by AHRI-sponsored, independent, third party testing:

First Hour Rating (GPH) : 62

Uniform Energy Factor : 0.92

The following data is for reference only and is not certified by AHRI

Energy Source : Electric Resistance

Heater Type : Storage

Usage Bin : Medium Usage

Nominal Capacity (gal) : 50

DOE Rated Storage Volume (gal) : 46

Input (kW) : 4.5

Recovery Efficiency, (%) : 98

Heat Traps : Yes

**Active Model Status are those that an AHRI Certification Program Participant is currently producing AND selling or offering for sale; OR new models that are being marketed but are not yet being produced "Production Stopper" Model Status are those that an AHRI Certification Program Participant is no longer producing BUT is still selling or offering for sale. Ratings that are accompanied by WAS indicate an involuntary re-rate. The new published rating is shown along with the previous (i.e. WAS) rating.

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CERTIFICATE VERIFICATION

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CERTIFICATE NO.: 132586484255299952



What Should be Shown on the Plans?

PERFORMANCE DATA SHEETS FROM MANUFACTURER ARE ALLOWED TO BE SUBMITTED

The new degree of comfort®

PERFORMANCE® Electric Specifications

Fuel Type	Description	Nominal Gallon Capacity	Rated Gallon Capacity	Model Number	Recovery in G.P.H. 90° F Rise	First Hour Rating (Gallons)	Tank Height A	Height to Water Conn. B	Diameter C	Ship Weight (LBS.)	Uniform Energy Factor (UEF)
Electric	Tall	50	45	XE50T06ST45U1	21	61	58-7/8	61-5/8	20-1/4	121	0.93
Electric	Medium	50	45	XE50M06ST45U1	21	61	48	50-1/2	23	132	0.93
Electric	Short	47	43	XE47S06ST45U1	21	54	32	34	26-1/4	148	0.93
Electric	Tall	40	36	XE40T06ST45U1	21	54	60-3/4	63-5/8	19-1/4	109	0.93
Electric	Medium	40	36	XE40M06ST45U1	21	53	48-1/4	50-1/2	20-1/4	106	0.93
Electric	Medium	40	36	XE40M06ST38U1	17	52	48-1/4	50-1/2	20-1/4	106	0.93
Electric	Short	38	35	XE38S06ST45U1*	21	51	31-1/2	34	23	108	0.92
Electric	Short	38	35	XE38S06ST38U1*	17	49	31-1/2	34	23	108	0.91
Electric	Short	36	33	XE36S06ST45U0	21	46	31-1/2	33	24-1/4	118	0.92
Electric	Short	36	33	XE36S06ST38U0	17	34	31-1/2	33	24-1/4	118	0.92
Electric	Tall	30	27	XE30T06ST45U1	21	46	47-1/2	50-3/8	19	92	0.92
Electric	Tall	30	27	XE30T06ST38U1	17	36	47-1/2	50-3/8	19	92	0.92
Electric	Medium	30	27	XE30M06ST45U1	21	45	37-1/2	40-1/2	20-1/4	92	0.90
Electric	Short	30	27	XE30S06ST45U1**	21	46	30	32	19-3/4	110	0.92
Electric	Short	30	27	XE30S06ST38U1**	17	33	30	32	19-3/4	110	0.92
Electric	Short	28	25	XE28S06ST45U0	21	45	30	31-1/8	23	95	0.92
Electric	Short	28	25	XE28S06ST38U0	17	45	30	31-1/8	23	95	0.92
Electric	Short	20	N/A	XE20S06ST38U0	17	N/A	31-1/2	31-1/2	17	62	N/A

What Should be Shown on the Plans?

UEF ON THE AHRI OR DATA SHEET SHALL MATCH THE ENERGY FORM

FORM R405-2022 Supplement
FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION
 Florida Department of Business and Professional Regulation - Residential Performance Method

Project Name: Example Home		Builder Name: Owner	
Street: 1 N University Dr.		Permit Office:	
City, State, Zip: Fort Lauderdale, FL, 33324		Permit Number:	
Owner:		Jurisdiction: Miami	
Design Location: FL, Fort Lauderdale		County: Broward(Florida Climate Zone 1)	

1. New construction or existing	New (From Plans)	10. Wall Types(1312.0 sqft.)	Insulation	Area
2. Single family or multiple family	Detached	a. Concrete Block - Int Insul. Exterior	R=4.1	1108.00 ft ²
3. Number of units, if multiple family	1	b. Frame - Wood, Adjacent	R=13.0	204.00 ft ²
4. Number of Bedrooms	3	c. N/A		
5. Is this a worst case?	No	d. N/A		
6. Conditioned floor area above grade (ft ²)	1216	11. Ceiling Types(1266.0 sqft.)	Insulation	Area
Conditioned floor area below grade (ft ²)	0	a. Flat ceiling under att (Vented)	R=30.0	1216.00 ft ²
7. Windows(229.2 sqft.)	Description	b. Knee wall to attic (Vented)	R=30.0	50.00 ft ²
a. U-Factor:	Sgl, U=1.11	c. N/A		
SHGC:	SHGC=0.39	12. Roof(Comp. Shingles, Vented) Deck	R=0.0	1235 ft ²
b. U-Factor:	Sgl, U=1.00	a. Flat ceiling under att (Vented)	R	ft ²
SHGC:	SHGC=0.47	b. Sup. Attic, Ret: Hall, AH: Hall	6	225
c. U-Factor:	N/A	c.		
SHGC:		14. Cooling Systems	kBtu/hr	Efficiency
Area Weighted Average Overhang Depth:	3.503 ft	a. Central Unit	25.6	SEER2:15.30
Area Weighted Average SHGC:	0.409	15. Heating Systems	kBtu/hr	Efficiency
8. Skylights	Description	a. Electric Strip Heat	19.1	COP:1.00
U-Factor(AVG)	N/A	16. Hot Water Systems		
SHGC(AVG)	N/A	a. Electric	Cap: 40 gallons	UEF: 0.940
9. Floor Types	Insulation	b. Conservation features	None	
a. Slab-On-Grade Edge Insulation	R= 0.0	17. Credits	CF, CV, Pstat	
b. N/A	R=			
c. N/A	R=			

Glass/Floor Area: 0.188	Total Proposed Modified Loads:	50.97	PASS
	Total Baseline Loads:	60.35	

I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Energy Code.	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.
PREPARED BY: _____	BUILDING OFFICIAL: _____
DATE: _____	DATE: _____
I hereby certify that this building, as designed, is in compliance with the Florida Energy Code.	
OWNER/AGENT: _____	
DATE: _____	

- Compliance requires certification by the air handler unit manufacturer that the air handler enclosure qualifies as certified factory-sealed in accordance with R403.3.2.1.
- Compliance with a proposed duct leakage Qn requires a PERFORMANCE Duct Leakage Test Report confirming duct leakage to outdoors, tested in accordance with ANSI/RESNET/ICC 380, is not greater than 0.030 Qn for whole house.
- Compliance requires a roof absorptance test and a roof emittance test in accordance with R405.7.2
- Compliance requires an Air Barrier and Insulation Inspection Checklist in accordance with R402.4.1.1 and this project requires a PERFORMANCE envelope leakage test report with envelope leakage no greater than 5.00 ACH50 (R402.4.1.2).

What Should be Shown on the Plans?

EFFICICENCY RATINGS MUST BE VERIFIED

- ▶ **R405.6.3 Input values**
- ▶ When calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from an *approved* source.

What Should be Shown on the Plans?

The Energy Efficiency Ratings of the A/C, the Windows, the Water Heater are to be on the plans. The documentation to prove the efficiency of the items are required by code.

R405.4.3 Additional documentation. The *code official* shall be permitted to require the following documents:

1. Verification that an EPL display card signed by the builder providing the building component characteristics of the *proposed design* will be provided to the purchaser of the home at time of title transfer.
2. Documentation of the component efficiencies used in the software calculations for the *proposed design*.

What Should be Shown on the Plans?

R103.2 Information of Construction Documents

▶ Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Insulation materials and their R-values.
2. Fenestration U-factors and solar heat gain coefficients (SHGC).
3. Area-weighted U-factor and solar heat gain coefficients (SHGC) calculations.
4. Mechanical system design criteria.
5. Mechanical and service water-heating system and equipment types, sizes and efficiencies.
6. Equipment and system controls. ←
7. Duct sealing, duct and pipe insulation and location.
8. Air sealing details.

What Should be Shown on the Plans?

CONTROLS ARE TO BE SHOWN

THERMOSTATS FOR A/C SYSTEMS



CONTROLS FOR HOT WATER
RECIRCULATING SYSTEMS



What Should be Shown on the Plans?

R103.2 Information of Construction Documents

▶ Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Insulation materials and their R-values.
2. Fenestration U-factors and solar heat gain coefficients (SHGC).
3. Area-weighted U-factor and solar heat gain coefficients (SHGC) calculations.
4. Mechanical system design criteria.
5. Mechanical and service water-heating system and equipment types, sizes and efficiencies.
6. Equipment and system controls.
7. Duct sealing, duct and pipe insulation and location.
8. Air sealing details.



What Should be Shown on the Plans?

Show how ducts will be sealed and the R-value to be installed

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 or 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.



What Should be Shown on the Plans?

R405.2 (Mandatory)

All Supply and Return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6



Ducts shall be mechanically attached, sealed, and insulated so as not to produce condensation

**TABLE C403.2.9.2
DUCT SYSTEM CONSTRUCTION AND SEALING**

Sealing

Attaching

Inner core sealed and attached

<p>Flexible duct systems, nonmetal</p>	<p>All duct collar fittings shall have a minimum $\frac{5}{8}$-inch (16 mm) integral flange for sealing to other components and a minimum 3-inch (76 mm) shaft for insertion into the inner duct core.</p> <p>Flexible ducts having porous inner cores shall not be used.</p> <p>Exception: Ducts having a nonporous liner between the porous inner core and the outer jacket. Fastening and sealing requirements shall be applied to such intermediate liners.</p>	<p>Flexible nonmetal ducts shall be joined to all other air distribution system components by either terminal or intermediate fittings.</p> <p>Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked 181B-C.</p> <p>See Section 603.10 of the <i>Florida Building Code, Mechanical</i>, for duct support requirements.</p>
<p>Duct core to duct fitting</p>	<p>The reinforced lining shall be sealed to the duct fitting using one of the following sealing materials, which conforms to the approved closure and mechanical attachment requirements of Section C403.2.9.3:</p> <ol style="list-style-type: none"> 1. Gasketing. 2. Mastic, mastic-plus-embedded fabric or mastic ribbons. 3. Pressure-sensitive tape. 4. Aerosol sealants, provided that their use is consistent with UL 181. 	<p>The reinforced core shall be mechanically attached to the duct fitting by a drawband installed directly over the wire-reinforced core and the duct fitting. The duct fitting shall extend a minimum of 2 inches (51 mm) into each section of duct core. When the flexible duct is larger than 12 inches (303 mm) in diameter or the design pressure exceeds 1-inch water gauge, the drawband shall be secured by a raised bead or indented groove on the fitting.</p>
<p>Duct outer jacket to duct collar fitting</p>	<p>The outer jacket of a flexible duct section shall be secured at the juncture of the air distribution system component and intermediate or terminal fitting in such a way as to prevent excess condensation. The outer jacket of a flexible duct section shall not be interposed between the flange of the duct fitting and the flexible duct, rigid fibrous glass duct board or sheet metal to which it is mated.</p>	



C403.2.9.3.7 Approved closure systems Tapes.

Tapes shall be applied such that they extend not less than 1 inch onto each of the mated surfaces and shall totally cover the joint. When used on rectangular ducts, tapes shall be used only on joints between parallel rigid surfaces and on right angle joints.

Need one (1) inch Mating surface for Tape



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.**

1/2” Wall Required



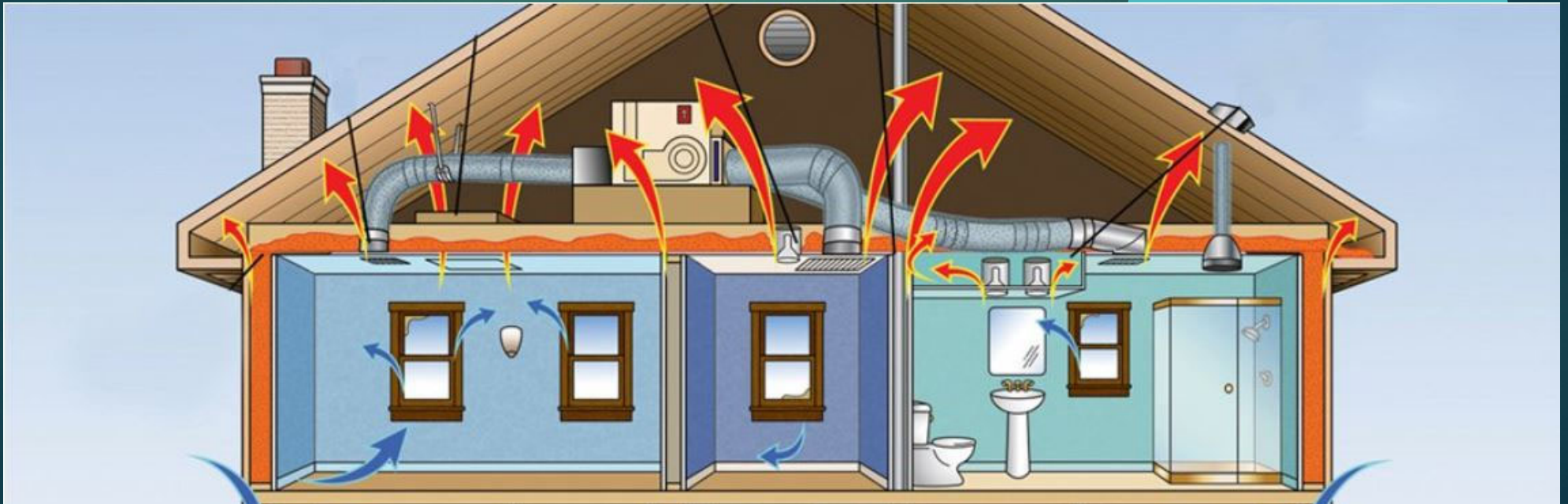
R103.2 Information of Construction Documents

▶ Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Insulation materials and their R-values.
2. Fenestration U-factors and solar heat gain coefficients (SHGC).
3. Area-weighted U-factor and solar heat gain coefficients (SHGC) calculations.
4. Mechanical system design criteria.
5. Mechanical and service water-heating system and equipment types, sizes and efficiencies.
6. Equipment and system controls.
7. Duct sealing, duct and pipe insulation and location.
8. Air sealing details.

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.



Openings Into the Building

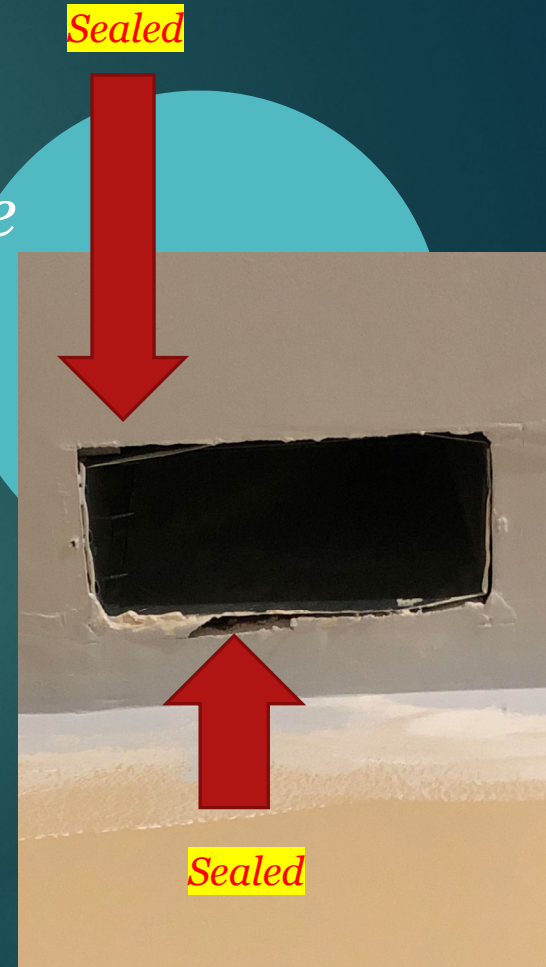


Open or Closed-cell
Spray Foam with a
minimum density
of 1.5 pcf



TABLE R402.4.1.1
AIR BARRIER AND INSULATION INSTALLATION
HVAC Register Boots

*HVAC supply and return register boots that penetrate building thermal envelope shall be **sealed** to the subfloor, wall covering, or ceiling penetrated by the boot.*





Making Sure the Job Matches the Compliance Forms

Making Sure the Job Matches the Compliance Forms

R104.2.5 Final inspection.

The *building* shall have a final inspection and shall not be occupied until *approved*. The final inspection shall include **verification** of the installation of all required *building* systems, **equipment** and controls and their proper operation and the required number of high-efficacy lamps and fixtures.

R404.1 Lighting Equipment (Mandatory).

Not less than 90 percent of the lamps in permanently installed luminaires shall have an efficacy of at least 45 lumens-per-watt or shall utilize lamps with an efficacy of not less than 65 lumens-per-watt.



Recessed Lighting

Recessed light fixtures installed in the building thermal envelope shall be sealed to the finished surface.

R402.4.5

*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***

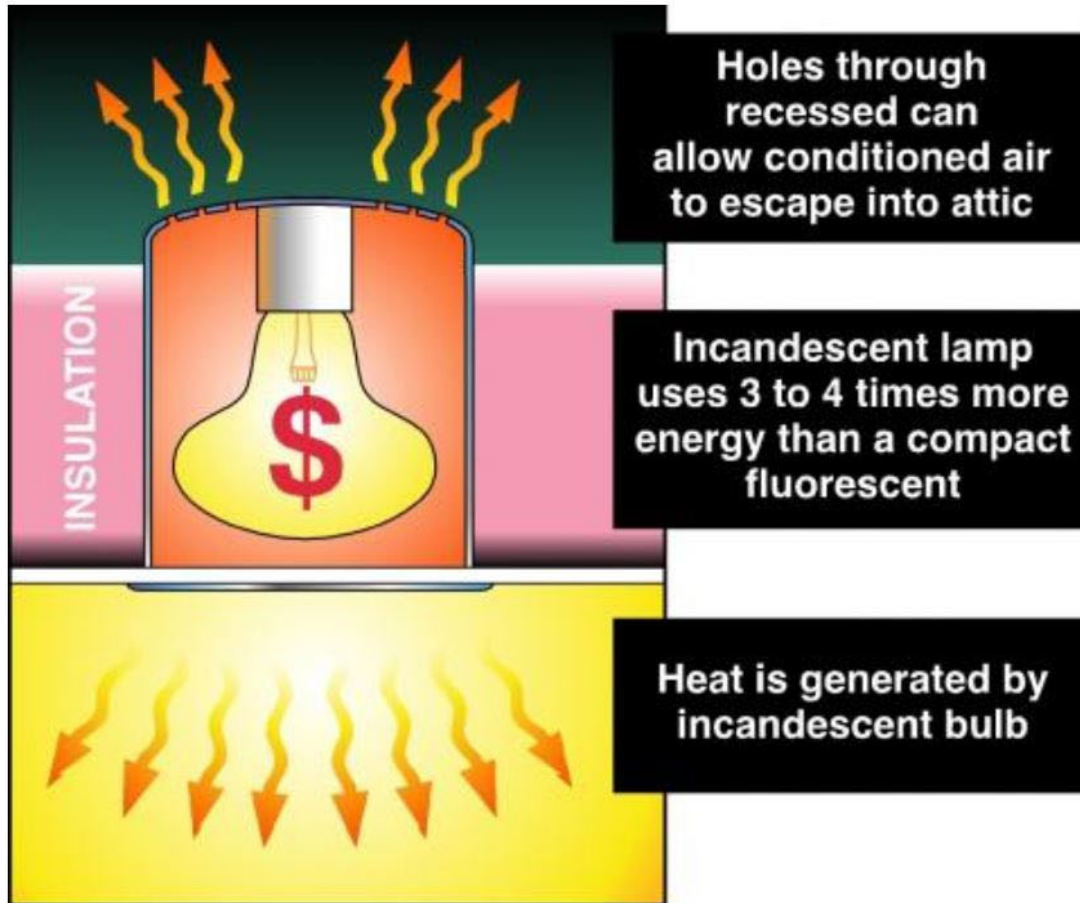
recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.





“Must be ICAT Rated”
(Insulation Contact)
(Airtight)
“Must be tested as Airtight”

Non-ICAT-rated recessed lights waste energy



**Not
Allowed!**

Blower Door Testing



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/RESNET/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.

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.



Testing Values higher than what is shown on the Energy Calc's must "Fail" regardless if the Blower Door test is under 7ACH

Glass/Floor Area: 0.188	Total Proposed Modified Loads: 50.97	PASS
	Total Baseline Loads: 60.35	
<p>I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Energy Code.</p> <p>PREPARED BY: _____</p> <p>DATE: _____</p> <p>I hereby certify that this building, as designed, is in compliance with the Florida Energy Code.</p> <p>OWNER/AGENT: _____</p> <p>DATE: _____</p>		<p>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.</p>  <p>BUILDING OFFICIAL: _____</p> <p>DATE: _____</p>

- Compliance requires certification by the air handler unit manufacturer that the air handler enclosure qualifies as certified factory-sealed in accordance with R403.3.2.1.
- Compliance with a proposed duct leakage Qn requires a **PERFORMANCE Duct Leakage Test Report** confirming duct leakage to outdoors, tested in accordance with ANSI/RESNET/ICC 380, is not greater than 0.030 Qn for whole house.
- Compliance requires a roof absorptance test and a roof emittance test in accordance with R405.7.2
- Compliance requires an Air Barrier and Insulation Inspection Checklist in accordance with R402.4.1.1 and this checklist requires a **PERFORMANCE envelope leakage test report** with envelope leakage no greater than 5.00 ACH50



Blower Door Test Reports must be reviewed by a Mechanical Code Official to determine if Mechanical Ventilation is Required

Envelope Leakage Test Report (Blower Door Test)
Residential Prescriptive, Performance or ERI Method Compliance
2020 Florida Building Code, Energy Conservation, 7th Edition

Jurisdiction: Miami	Permit #:
Job Information	
Builder: Owner	Community: Lot: NA
Address: 1 N University Dr.	
City: Fort Lauderdale	State: FL Zip: 33324
Air Leakage Test Results <i>Passing results must meet either the Performance, Prescriptive, or ERI Method</i>	
<input type="radio"/> PRESCRIPTIVE METHOD -The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 7 air changes per hour at a pressure of 0.2 inch w.g. (50 Pascals) in Climate Zones 1 and 2.	
<input checked="" type="radio"/> PERFORMANCE or ERI METHOD -The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding the selected ACH(50) value, as shown on Form R405-2020 (Performance) or R406-2020 (ERI), section labeled as infiltration, sub-section ACH50, ACH(50) specified on Form R405-2020-Energy Calc (Performance) or R406-2020 (ERI): 5.000	
$\frac{\text{CFM}(50)}{\text{Building Volume}} \times 60 \times 9728 = \text{ACH}(50)$ <p style="text-align: center;">PASS</p>	
<input type="checkbox"/> When ACH(50) is less than 3, Mechanical Ventilation installation must be verified by building department.	
R402.4.1.2 Testing. Testing shall be conducted in accordance with ANSI/RESNET/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 488.105(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, back draft 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.	
Testing Company	
Company Name: _____ Phone: _____ I hereby verify that the above Air Leakage results are in accordance with the 2020 7th Edition Florida Building Code Energy Conservation requirements according to the compliance method selected above.	
Signature of Tester: _____ Date of Test: _____ Printed Name of Tester: _____ License/Certification #: _____ Issuing Authority: _____	

2/17/2023 9:38:10 AM EnergyGauge® USA 7.0.00 - FlaRes2020 FBC 7th Edition (2020) Compliant Software Page 1 of 1



R303.4 Mechanical ventilation. Where the air infiltration rate of a dwelling unit is less than 3.00 air changes per hour where tested with a blower door at a pressure of 0.2 inch w.c. (50 Pa) in accordance with **Section R402.4.1.2** of the Florida Building Code, Energy Conservation, the dwelling unit shall be provided with whole-house mechanical ventilation in accordance with **Section M1507.3**

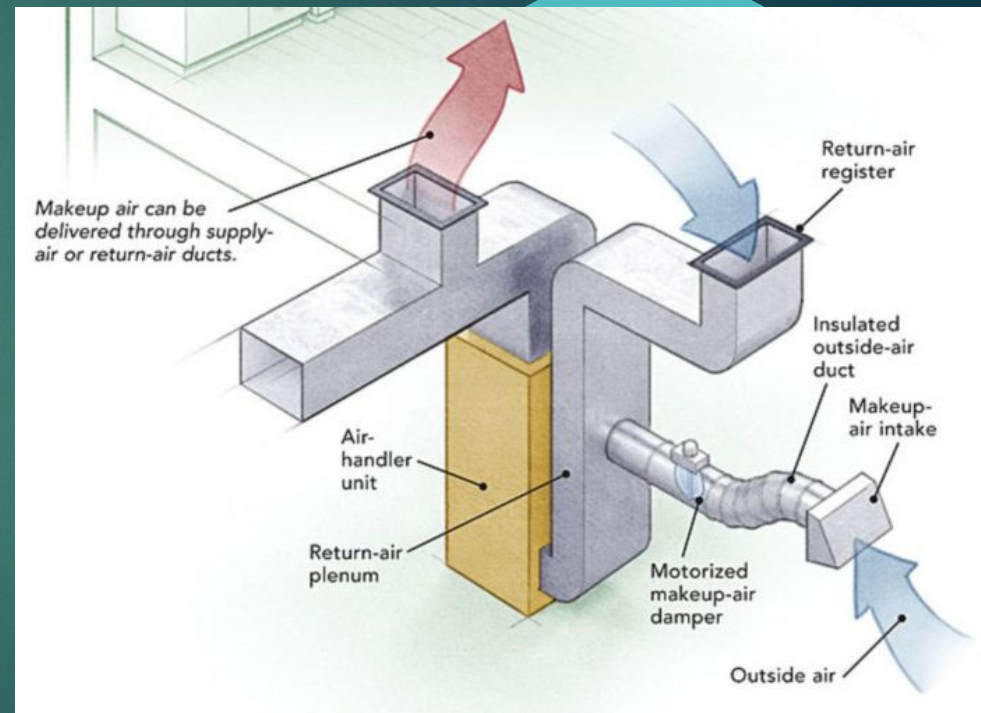


“Residential Building Code”

M1507.3.1 System design.

The whole-house ventilation system shall consist of one or more supply or exhaust fans, or a combination of such, and associated ducts and controls. Local exhaust or supply fans are permitted to serve as such a system.

Outdoor air ducts connected to the return side of an air handler shall be considered as providing supply ventilation.



R405 Performance Based Energy Credits



What are some Credits that can be taken?



R405.7 Credit Options

- 7.1 Radiant Barrier (RB)
- 7.2 Cool Roof- *Tested Product*
- 7.4 Cross Ventilation-(CV) - *Calculation Required*
- 7.5 Whole House Fan-(WHF)
- 7.6 Ceiling Fan Option- (CF)-*See Blade Table*
- 7.7 Heat Recovery Unit-(HR)
- 7.8 Heat Pump
- Programmable T-Stat



**TABLE R405.7.6
FAN SIZING TABLE**

LONGEST WALL LENGTH (feet)	MINIMUM FAN SIZE (inches)
= 12	36
> 12–16	48
> 16–17.5	52
> 17.5–25	56
> 25	2 fans (minimum of 48 inches each)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- **Ceiling fans must be correctly sized to receive credit**
- **Ceiling fans must be installed at the final inspection**
- **No credit for Ceiling fan boxes!!**



Questions &
Comments?