



# BROWARD COUNTY BOARD OF RULES AND APPEALS

1 N. University Drive, Suite 3500B, Plantation, FL 33324

P: 954-765-4500 | F: 954-765-4504 [broward.org/CodeAppeals](http://broward.org/CodeAppeals)

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## 2020 Voting Members

### **Chair**

Mr. Daniel Lavrich,  
P.E., S.I., SECB, F.ASCE, F.SEI  
Structural Engineer

### **Vice-Chair**

Mr. Stephen E. Bailey, P.E.  
Electrical Engineer

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Roofing Contractor  
Mrs. Shalanda Giles Nelson,  
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Mr. Daniel Rourke  
Master Plumber  
Mr. Gregg D'Attile,  
Mechanical Contractor  
Mr. Ron Burr  
Swimming Pool Contractor  
Mr. John Sims,  
Master Electrician  
Mr. Dennis A. Ulmer  
Consumer Advocate  
Mr. Abbas H. Zackria, CSI  
Architect  
Mr. Robert A. Kamm, P.E.  
Mechanical Engineer

### **Vacant**

Representative Disabled Community  
Mr. Sergio Pellecer  
Fire Service Professional

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Mr. David Tringo,  
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Mr. William Flett,  
Roofing Contractor

### **Board Attorney**

Charles M. Kramer, Esq.

### **Board Administrative Director**

James DiPietro

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**To:** Members of the Energy Conservation Committee

D. Rice, P.E.	M. Charmin	S. Danchuck	T. Fallon
W. Haygood	E. Jenison	A. Kamm, P.E.	B. Lomel, P.E.
J. Travers	D. Ulmer	B. Volin	A. Zackria, CSI

**From:** Timothy G. de Carion, Chief Energy Code Compliance Officer

**Date:** March 17, 2021 (1:30PM – 3:30PM)

**Subj:** Residential Energy Guidelines

The Chairman of Energy Conservation Committee, Mr. Dave Rice P.E., called for a meeting of the Energy Conservation Committee for the items listed.

## AGENDA

### **Roll Call**

**Approval of Minutes** – February 17, 2021

### **Chairman's Opening Remarks**

### **Chief Energy Code Compliance Officer Opening Remarks**

### **Regular Meeting**

**Item 1: Blower Door Memo** .....Pg. 6 Memo Dated 01/14/2021

**Item 2: Classification for Multifamily Buildings Memo** .....Pg. 8 Memo Dated 03/17/2021

**Item 3: Residential Fenestration Product Rating Submittal Form**...Pg. 10 Form Dated 03/17/2021

### **Item 4: BORA Residential Energy Guidelines (Revision 03/17/2021)**

- A. BORA Residential Energy Guidelines..... Pg. 15
- B. Residential Compliance Forms R405-2020 ..... Pg. 27
- C. Envelope Leakage Report Summary ..... Pg. 42

### **General Discussion**

### **Schedule Next Meeting**

### **Adjournment**

### **Reference Documents for Committee Use**

- Item 1) Blower Door Memo dated 01/14/21
- Item 2) Classification for Multifamily Buildings Memo 03/17/21
- Item 3) Residential Fenestration Product Rating Submittal Form
- Item 4a) BORA Residential Energy Guidelines
- Item 4b) Residential Compliance Forms R405-2020
- Item 4c) Envelope Leakage Report Summary

*Sunshine Law Reminder: Advisory Board members cannot communicate with each other on a possible committee or Board topic outside of a public meeting, per State statute.*



**DRAFT**

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## **MEETING OF THE ENERGY CONSERVATION COMMITTEE**

**Minutes  
February 17, 2021**

### **Call to order:**

Chair David Rice, P.E. called a published meeting of the Broward County Board of Rules and Appeals Energy Conservation Committee to order at 2:02PM.

The roll was called, and the following members were present:

### **Present:**

Mike Charnin	Art Kamm, P.E.	Dennis Ulmer
Samantha Danchuck	Brian Lomel, P.E.	Bob Volin
Tim Fallon	David Rice, P.E.	Abbas Zackria, CSI
Wyatt T. Haygood	John Travers	

Staff: Timothy de Carion, Chief Energy Code Compliance Officer

**A MOTION WAS MADE BY MR. ULMER AND SECONDED BY MR. KAMM TO APPROVE THE JANUARY 19, 2021 ENERGY CONSERVATION COMMITTEE MEETING MINUTES. THE MOTION PASSED BY UNANIMOUS VOTE.**

Chair David Rice, P.E., R.C. Engineering, Inc., explained that the Energy Conservation Committee’s purpose is not to make new codes. The committee can only interpret the existing code.

### **Item 1: Blower Door Memo**

Mr. Timothy de Carion, Broward County Board of Rules and Appeals, shared the “Blower Door Test Report Review” memo that he sent to all Broward County Mechanical Chiefs on January 14, 2021. Mr. de Carion explained that the memo was drafted after he found that Mechanical Final Inspections were being approved without the blower door test report being reviewed and approved by the code official first.

Mr. de Carion said that the Broward County Board of Rules and Appeals for approvals for procedures. Each Building Official decides what the procedures are for their building department, but the blower door test report must be reviewed before the project is approved.

Mr. Art Kamm, P.E., Kamm Consulting, added that the blower door test results should be between no lower than 3 ACH and no lower than 7 ACH. Mr. de Carion agreed, and he mentioned that he added a guide for how to review a blower door test to the Residential Energy Guidelines document.

Mr. Kamm said that he does not recall where an air change rate is to be entered. Mr. de Carion asked Mr. Bob Volin, Air Design Concepts, for his input since he has experience in the area. Mr. Volin explained that he saw it entered in the energy calculations, but he enters the air change rate in the load calculation procedure. Mr. Volin suggested that would be a more accurate way, but it always depends on where the data is coming from. For example, if he were transferring the data from another computer program, he would receive a default number which would more than likely be inaccurate.

Mr. Abbas Zackria, CSI, WZA Architects, asked if every residential project is required to receive a blower door test. Mr. de Carion stated that if it is single-family the only exception is when the home is over three-stories.

**A MOTION WAS MADE BY MR. ZACKRIA AND SECONDED BY MR. VOLIN TO APPROVE THE BLOWER DOOR TEST REPORT REVIEW MEMO SENT OUT ON JANUARY 14, 2021. THE MOTION PASSED BY A 9 TO 1 VOTE.**

Mr. Zackria asked Chair Rice if it was okay to ask Mr. John Travers, City of Fort Lauderdale, about his concerns after voting “no” for the motion. Chair Rice agreed. Mr. Travers explained that he would like to have more time to discuss the matter with his Structural Chief and Mechanical Chief and get their input on the topic.

Chair Rice asked Mr. Travers to discuss it with his chiefs and then report their comments at the next Energy Conservation Committee meeting. Mr. Kamm mentioned that in the code, natural ventilation is acceptable if there is a 4% ratio of windows to floors. If the windows are opened for natural ventilation, he believes that the tighter the house is built, the better it will be. He also asked how the ASHRAE code comes into play with the blower door test. Mr. de Carion explained that the rationale behind the blower door test is that the infiltration to a home is uncontrolled. If a house is built too tightly, there is a risk of chemical exposure. If the house is built too loosely, there is a risk of exposure to moisture.

Chair Rice announced that this subject will be discussed in more detail in Item 3.

## **Item 2: Classification for Multifamily Buildings Memo**

Mr. de Carion shared the “Classification for Multifamily Buildings” memo that he intended to send to all Broward County Plan Reviewers and Inspectors pending that the item was approved during the committee meeting. He explained that it is beneficial for the building owners to utilize the residential code checklist in addition to the commercial code. For buildings that include residential and commercial occupancies, the memo would require multiple compliance reports.

Chair Rice suggested that the memo is tabled until the next Energy Conservation Committee Meeting. Mr. Travers and Mr. Wyatt T. Haygood, City of Parkland, agreed that the memo should be reviewed by the committee members rather than distributing it.

**A MOTION WAS MADE BY MR. TRAVERS AND SECONDED BY MR. HAYGOOD TO TABLE THE “CLASSIFICATION FOR MULTIFAMILY BUILDINGS” MEMO UNTIL THE NEXT ENERGY CONSERVATION COMMITTEE MEETING. THE MOTION PASSED BY UNANIMOUS VOTE.**

Mr. de Carion volunteered to share an interpretation document from the Environmental Protection Agency (EPA) in Montana to the committee members to use as a reference.

**Item 3: BORA Residential Energy Guidelines (Revision 02/17/2021)**

Mr. de Carion informed the committee members that he added a Blower Door Report Checklist to the table of contents and to the Mechanical Checklist section of the Residential Energy Guidelines document.

The committee reviewed the Residential Energy Guidelines – Building Code Administrators Responsibilities Checklist.

Mr. de Carion suggested tabling the discussion for Residential Energy Guidelines – Structural Checklist because it is affected by items in the “Classification for Multifamily Buildings” Memo that will be under review.

The committee moved on to review the Residential Energy Guidelines – Mechanical Checklist. Referencing Code Section R405.5.2 and R405.5.3.3, Mr. Volin mentioned that pertinent information about the building’s windows is often left out of the plans.

Mr. Rice noted the time and suggested that the committee members wrap up the discussion on the Residential Energy Guidelines – Structural Checklist. He mentioned that the committee will always have a lot of material to discuss. He asked the committee members if they would prefer the committee meetings to be held for two hours, rather than an hour and a half, in the future.

Mr. Travers agreed that having two-hour meetings would be helpful as long as there was an intermission in the middle of the meeting.

Mr. Tim Fallon, City of Coral Springs, suggested that if the meetings were moved to two hours, the meetings should start earlier at 1:30PM instead of 2:00PM.

**A MOTION WAS MADE BY MR. RICE TO HOLD ENERGY CONSERVATION COMMITTEE MEETINGS FROM 1:00PM TO 3:00PM.**

Mr. Mike Charmin, City of Plantation, suggested that the motion be amended.

**A MOTION WAS MADE BY MR. FALLON AND SECONDED BY MR. TRAVERS TO AMEND THE PREVIOUS MOTION AND TO HOLD ENERGY CONSERVATION COMMITTEE MEETINGS FROM 1:30PM TO 3:30PM WITH A FIVE-MINUTE BREAK DURING THE MEETING. THE MOTION PASSED BY UNANIMOUS VOTE.**

Before adjourning the meeting, Chair Rice reminded the committee that the code cannot be rewritten by the Energy Conservation Code. The code is only changed by being presented to the full Board and then it must be approved by the State.

Chair Rice added that he would not like to add any expense to the cost of doing business within the current code.

**A MOTION WAS MADE BY MR. TRAVERS AND SECONDED BY MR. KAMM TO ADJOURN THE MEETING. THE MOTION PASSED BY UNANIMOUS VOTE.**

**Adjournment**

Having no further business to go before the Committee, the meeting adjourned at 3:32PM.

**Item 1:**

Blower Door Memo



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Charles M. Kramer, Esq.

#### **Board Administrative Director**

James DiPietro

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Date: 1-14-2021

### MEMORANDUM

From: Timothy G de Carion

To: All Broward County Mechanical Chiefs

Subject: Blower Door Test Report Review

It has come to my attention that "Mechanical Final Inspections" are being approved without the blower door test report first being reviewed and approved by the code official. Please note that according to of the Florida Energy Conservation Code:

#### **FBC-Energy-R402.4.1.2-Testing**

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

Blower Door Test Reports are to be submitted to the building department for review and approval to determine:

- 1) Per **FBC-Residential 303.4** for ventilation rates under three (3ACH), the home requires additional ventilation.
- 2) The home does not exceed the selected design ACH shown on the approved Energy compliance report R405-2020 or if it requires a revised Energy compliance report per **FBC-Energy-R103.4**
- 3) Per **FBC-Energy-R402.4.1.2 Testing** for ventilation rates exceeding seven (7 ACH), the home requires modifications to reduce the air leakage.

No mechanical or building final inspection is to be approved unless the blower door test report is approved by the code official.

If you have any questions, please feel free to call me at 954-765-4500 x9853 or email me [@tdecarion@broward.org](mailto:@tdecarion@broward.org)

Respectfully, Timothy G. de Carion  
Chief Energy Code Compliance Officer

**Item 2:**

Classification for Multifamily Buildings Memo



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Charles M. Kramer, Esq.

#### **Board Administrative Director**

James DiPietro

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Date: 2-17-2021

### MEMORANDUM

From: Timothy G de Carion

To: All Plan Reviewers and Inspectors

Subject: Classification for Multifamily Buildings

After multiple inquires, plan reviews, and job site inspections, it has come to my attention that many “Residential Multifamily Buildings” three stories and under are being classified as “Commercial Buildings” and the incorrect energy compliance forms are being submitted and the incorrect energy code section is being applied.

#### **Energy Code Definitions: FBC-ENERGY-R202**

**COMMERCIAL BUILDING.** For this code, all buildings that are not included in the definition of “residential buildings.”

**RESIDENTIAL BUILDING.** For this code, includes detached one- and two-family dwellings and multiple single-family dwellings (townhouses) as well as Group R-2, R-3 and R-4 buildings three stories or less in height above grade plane.

**Also see: FBC-Energy-R101.5.1**

#### **Important Notes:**

##### **Apartments, Condominiums, and Small Residential Care/Assisted Living Facilities.**

If a Group R-2, R-3 or R-4 is **over** three stories in height above grade plane, it is required to comply with the commercial provisions of the energy code. Group R-2 includes apartments and condominiums where three or more units are attached. Apartments and Condominium units located in buildings **three stories and less in height** above grade plane are considered residential units and are required to comply with the residential provisions of the energy code.

Refer to **Section 310** of the Florida Building Code for Occupancy type descriptions.

**Mixed Occupancy.** Where a building includes both residential and commercial occupancies, each occupancy is separately considered and must meet the applicable provisions of the IECC—Commercial and Residential Provisions. (**C101.4.1**), (**R101.4.1**) and (**C101.5**).

- Multiple compliance reports shall be submitted for the same building.
- Apartments and Condominiums three stories and under in height will require a separate residential compliance form for each dwelling unit.
- Commercial areas in the building will require a separate compliance form.

If you have any questions, please feel free to call me at 954-765-4500 x9853 or email me [@tdecarion@broward.org](mailto:@tdecarion@broward.org)

Respectfully, Timothy G. de Carion  
Chief Energy Code Compliance Officer

**Item 3:**

Residential Fenestration Product Rating Submittal Form



# BROWARD COUNTY

## BOARD OF RULES AND APPEALS

### Residential Fenestration Product Rating Submittal Form

*In accordance with R303.1.3 of the Florida Energy Conservation Code. This form is a tool for the submittal process of the proposed energy product rating for windows, doors, and skylights.*

**Required:**

- 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 this 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*

<u>#</u>	<u>AHRI Directory Number</u>	<u>Description</u>	<u>U-Value</u>	<u>SHGC</u>
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				



<u>Window #</u>	<u>AHRI Directory Number</u>	<u>Description</u>	<u>U-Value</u>	<u>SHGC</u>
12				
13				
14				
15				
16				
17				
18				
19				
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38				



**TABLE R303.1.3(1)  
DEFAULT GLAZED FENESTRATION U-FACTORS**

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT	
			Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

**TABLE R303.1.3(2)  
DEFAULT OPAQUE DOOR U-FACTORS**

DOOR TYPE	U-FACTOR
Uninsulated Metal	1.20
Insulated Metal	0.60
Wood	0.50
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

**TABLE R303.1.3(3)  
DEFAULT WINDOW, GLASS DOOR  
AND SKYLIGHT SHGC AND VT**

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	Clear	Tinted	Clear	Tinted	
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6



# Example

## Compliance Report Checklist

<b>WINDOWS</b>														
Orientation shown is the entered, Proposed orientation.														
✓	#	Wall		Frame	Panels	NFRC	U-Factor	SHGC	Imp	Area	Overhang		Int Shade	Screening
		Ornt	ID								Depth	Separation		
_____	1	W	2	Vinyl	Low-E Double	Yes	0.4	0.25	N	80.0 ft²	0 ft 0 in	0 ft 0 in	IECC 2012	None
_____	2	S	3	Vinyl	Low-E Double	Yes	0.4	0.25	N	80.0 ft²	0 ft 0 in	0 ft 0 in	IECC 2012	None
_____	3	E	4	Vinyl	Low-E Double	Yes	0.4	0.25	N	80.0 ft²	0 ft 0 in	0 ft 0 in	IECC 2012	None
_____	4	N	5	Vinyl	Low-E Double	Yes	0.4	0.25	N	80.0 ft²	0 ft 0 in	0 ft 0 in	IECC 2012	None

**Item 4a:**

**BORA Residential Energy Guidelines**

# BORA Residential Energy Guidelines

## Broward County Board of Rules and Appeals

### Energy Conservation Seventh Edition (2020)



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FBC Seventh Edition (2020),  
Effective December 31, 2020

For BORA Approval  
Revision #2  
3/17/2021

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**Overview**

In order to obtain uniform energy code enforcement in residential buildings in Broward County, the Energy Conservation Committee has developed guidelines to aid jurisdictions in determining which discipline specific code official enforces certain sections of the 2020 Florida Building Code Energy Conservation.

The following code sections regarding enforcement duties are as stated:

***R103.3 & C103.3 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.*

***R103.3.1 & C103.3.1 Approval of construction documents.***

*When the code official issues a permit where construction documents are required, the construction documents shall be endorsed in writing and stamped "Reviewed for Code Compliance."*

***R104.1 & C104.1 General***

*Construction or work for which a permit is required shall be subject to inspection by the code official or his or her designated agent, and such construction or work shall remain accessible and exposed for inspection purposes until approved.*

**Basis for the Guidelines:**

The Florida Building Code Seventh Edition (2020) Energy Conservation for new and existing buildings has designated that the *code official* is responsible for both the construction document approval and construction inspection approval.

Unfortunately, the Florida Building Code Energy Conservation administrative chapters do not designate which *discipline specific code official* will review compliance documents and building plans and inspect specific items for code compliance found in the Energy Conservation Code.

The "building official" or "code official" for energy code purposes shall be defined as: The officer or other designated authority having jurisdiction charged with the administration and enforcement of this standard or a duly authorized representative.

Broward County is unique in that we have individual certified plan review and inspection personnel for each discipline and that a multi-discipline code official is not the norm. Subsequently, uniformity has been lacking in the enforcement of the energy code which created confusion by code officials over which specific disciplines will enforce certain provisions of the code.

This guide can be used as a tool for the Building Official to determine which discipline specific code official will review and inspect specific sections of the Energy Code for code compliance to address those issues. This guide shall not prevent any certified code official with issuing a correction notice for any Energy Code deficiency found in another discipline if they notify the Chief inspector of that discipline of the correction notice.

**Building Code Administrators Responsibilities**

**Plan Review**

- 1. The building official shall appoint a code official to verify that all disciplines have reviewed the plans and the code compliance report for energy code compliance. This code official shall sign the code compliance report stating that the plans have been reviewed by all disciplines and the plans will be inspected according to the FECC.

**Code Section**

R103.3  
R103.3.1  
FS. 553.908

**Certificate of Occupancy**

- 1. The building official shall require that an energy performance level (EPL) display card be completed and signed by the building qualifier that it is accurate and correct before final approval for 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 non-presold residential buildings.

**Code Section**

R401.3  
R405.4.3 #1

**Reporting Schedule**

- 1. 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 compliance form applicable for the code chapter under which compliance is demonstrated (R405-2020). 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 by regular mail or email attachment to [raymond-issa@ufl.edu](mailto:raymond-issa@ufl.edu). Copies shall not exceed 300dpi.

**Code Section**

R103.1.1.2.1  
R103.1.1.2.1.1

**Send reporting form to:**

M. E. Rinker, Sr. School of Construction Management  
University of Florida  
Attn: R. Raymond Issa  
PO Box 115703  
304 Rinker, Third Floor  
Gainesville, FL 32611-5703 USA  
[raymond-issa@ufl.edu](mailto:raymond-issa@ufl.edu)

## BORA Energy Guidelines

### **BORA Structural Checklist**

<b><u>Plan Review Comments</u></b>	<b><u>Code Section</u></b>
<input type="checkbox"/> 1. The energy code compliance report shall include the name and the code version of the compliance software used. The energy compliance software must match the corresponding code version based on the application date.	R405.4.2.1 #6
<input type="checkbox"/> 2. Residential buildings (by definition) which are 3 stories or less in height above grade shall comply with the residential section of the energy code. A residential compliance report shall be submitted for each and every dwelling unit in the building. Commercial areas which are located in multifamily buildings shall comply with the commercial provisions of the energy code and a commercial compliance report shall be submitted for that portion of the building.	R101.2 R101.5.1.1 R101.5.1.2 R101.4.1 C101.4.1
<input type="checkbox"/> 3. The energy code compliance report shall include the building street address and/or other site identification. Batch sampling of report is prohibited. Climate Zone #1 shall be selected for the Broward County area.	R405.4.2.1 #1 R405.4.2 R301.3
<input type="checkbox"/> 4. The energy code compliance report shall include the name of the person who prepared the report and a signature certifying that the proposed design complies with the energy code.	R405.4.2.1 #2 R405.4.2.1 #5
<input type="checkbox"/> 5. The building's owner, or architect, or "owner/agent", shall certify compliance with the Florida Energy Code by signing the prepared energy code compliance report.	R103.1.1.2 R405.4.2.1 #2
<input type="checkbox"/> 6. The energy code compliance report shall have the correct number of bedrooms listed.	R405.5.2
<input type="checkbox"/> 7. Conditioned floor area shall be clearly indicated on the construction documents, and the plans must indicate the locations of the building thermal envelope.	R103.2.1 R405.5.2
<input type="checkbox"/> 8. Window schedules shall be individually numbered and include the proposed "NFRC tested" design U-factors and SHGC values and the numbering system shall match the compliance checklist. Deferred submittals shall use the "BORA Residential Fenestration Submittal Form".	R103.2 #2 R405.4.3 #2
<input type="checkbox"/> 9. Wall section details are to include the proposed ceiling and wall insulation types and R-Values to match the energy code compliance report.	R103.2 #1
<input type="checkbox"/> 10. Air Barrier sealing details and materials used shall be shown on the plans.	R103.2 #8
<input type="checkbox"/> 11. Compliance reports which claim a cool roof option shall provide documentation of testing.	R405.7.2

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<b><u>Rough Inspection Comments</u></b>	<b><u>Code Section</u></b>
<input type="checkbox"/> 1. A continuous air barrier shall be installed to the exterior building thermal envelope.	R402.4.1.1
<input type="checkbox"/> 2. The space between the window/door jambs and framing, and skylights and framing shall be sealed to provide an air-tight barrier on the exterior frame.	R402.4.1.1
<input type="checkbox"/> 3. Ceiling and wall insulation R-Values shall be in installed accordance with plans, manufacturer's instructions, and energy code compliance report. Minimum R-value rates shall not be used where energy code compliance report shows a greater proposed value. Baffling of the attic vent openings shall be provided for blown-in insulation.	R405.5.2 R303.2 R303.2.1
<input type="checkbox"/> 4. Window (Fenestration) efficiency ratings shall be certified and labeled by the manufacturer. Labels should match the proposed design U-Value and SHGC listed on the window schedule and energy code compliance report. 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.	R103.2 #2 R303.1.3 R405.5.3.4 R405.5.2

## BORA Energy Guidelines

### **BORA Structural Checklist**

#### **Final Inspection Comments**

	<b><u>Code Section</u></b>
<input type="checkbox"/> 1. Blown-in insulation must have an insulation certificate posted at or near the opening of the attic in a conspicuous place and insulation certificates must be submitted to the AHJ.	R303.1.1.2 FTCR 460
<input type="checkbox"/> 2. Blown or sprayed insulation shall be installed per inch as proposed on approved plans and energy code compliance report. Blown insulation thickness shall be verified with markers installed every 300 sq. ft. Eave baffles to be verified and attic vents shall not be covered. Sprayed insulation shall be listed and certified by the installation installer.	R303.1.1.2.1 R402.2.3
<input type="checkbox"/> 3. Access-openings, drop-down stairs, or knee wall doors to unconditioned attic spaces shall be sealed and baffled to maintain blown insulation. The attic hatch shall be insulated.	R402.2.4 R402.4
<input type="checkbox"/> 4. Air sealing shall be provided for the interior garage door and the walls that separate conditioned spaces from the garage area shall be sealed.	R402.4.1.1
<input type="checkbox"/> 5. Any changes which effect the energy efficiency of the building made during construction, that are not in compliance with the approved plans and the energy code compliance report, shall be resubmitted for approval as a revised (amended) set of construction documents.	R103.4

Note: This is a minimum checklist. The local AHJ may have additional checklist items.

## BORA Energy Guidelines

### **BORA Mechanical Checklist**

<b><u>Plan Review Comments</u></b>	<b><u>Code Section</u></b>
<input type="checkbox"/> 1. Conditioned floor area shown on energy code compliance report shall match the floor plans.	R405.4.2.1
<input type="checkbox"/> 2. Ceiling types, ceiling areas, and proposed insulation R-values are to be shown on the energy compliance report and shall match the plans, details, and wall sections. Knee walls shall be included as ceiling area and shall be listed separately.	R405.5.2
<input type="checkbox"/> 3. Wall types, area, and R-value shown on energy compliance report shall match the plans, details, and wall sections. Both exterior walls and the adjacent garage wall are to be shown with correct areas and R-Values. Adjacent framed garage walls shall be listed separately into the compliance software.	R405.5.2
<input type="checkbox"/> 4. Window types, areas, and tested design U-Values and SHGC listed on compliance report shall match the propose design on the window schedule. Sliding glass doors and opaque doors with glazing equal to or over 30% of total area are to be included in glazing calculation.	R-405.5.2 R405.5.3.3
<input type="checkbox"/> 5. Window overhang depth (which is the horizontal measure protruding from the building) and the separation (which is the vertical distance from the overhang to the top of the window) must be accurately entered for each window into the compliance report.	R405.5.3.2
<input type="checkbox"/> 6. All floor areas and corresponding R-values such as the floor over the garage area and the first-floor entry area shall be shown on the compliance report.	R405.5.2
<input type="checkbox"/> 7. R-Value of ducts, surface area, and the location of ductwork must be accurately entered into the compliance report. The location of the air handler listed on the compliance report must match the mechanical plans. Verify if the ductwork is classified as “leak free” or default leakage” to determine if duct testing is required and notify permit holder if required.	R405.2 R405.2.3
<input type="checkbox"/> 8. Verify the number of A/C systems, the efficiency rating of each system the size of the equipment and compare it to the equipment schedule and compliance report.	R405.5.2
<input type="checkbox"/> 9. Verify the heater type, size, and fuel source to be either electric, gas or Heat Pump and compare it to the equipment schedule and compliance report.	R405.5.2
<input type="checkbox"/> 10. Energy credits reflected on the compliance report must be shown on the plans. Credits must meet specific required criteria in the code. Possible credits shown are: PSTAT, RB, CV, WHF, CF, HRU, and HP options are to be verified.	R405.7
<input type="checkbox"/> 11. Site plan showing home orientation must match the input data for each wall, door and window. Worst case orientations shall be accepted. HVAC load calculations shall be site specific.	R405.4.2 R405.4.2.1
<input type="checkbox"/> 12. Cooling and Heating load calculations (per zone) (“Manual J Equivalent) shall be submitted and attached to the energy code compliance report. Equipment selected for cooling shall be sized in accordance with Manual S and shall meet the calculated load and not be oversized more than 115% of the total calculated load. Electric resistance furnaces shall be sized within 4 kW of the design requirements.	R403.7 R403.7.1 R403.7.1.2.2
<input type="checkbox"/> 13. Mechanical system design criteria and equipment controls (T-stat) shall be shown on the plans.	R103.2 #4 R103.2 #6
<input type="checkbox"/> 14. Duct sealing, duct and pipe insulation and locations shall be shown on the plans.	R103.2 #7

## BORA Energy Guidelines

### BORA Mechanical Checklist

<u>Rough Inspection Comments</u>	<u>Code Section</u>
<input type="checkbox"/> 1. Building framing cavities shall not be used as ducts or plenums.	R403.3.3.5
<input type="checkbox"/> 2. Air-handling units can only be installed in the attic unless all criteria's of R405 are met. a) The service panel of the equipment shall be located within 6 feet of an attic access. b) The attic access opening is of sufficient size to replace the air handler.	R403.3.6
<input type="checkbox"/> 3. Mechanical system piping shall be insulated to a minimum of R-3. All supply and return ducts not completely inside the <i>building thermal envelope</i> shall be insulated to a minimum of R-6.	R403.4 R405.2
<input type="checkbox"/> 4. All ducts shall be mechanically attached and sealed in accordance with Section C403.2.9.2. The reinforced lining shall be sealed, and the duct collar fitting's integral flange shall be sealed to the rigid duct board using tape or mastic. The reinforced core shall be mechanically attached to the duct fitting by a draw-band. The outer jacket of the 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. Ducts shall be tested at rough or final if duct testing credit is taken.	R403.3.2 C403.2.9.2 R403.3.3 R405.2.3
<input type="checkbox"/> 5. If possible, sufficient space shall be given to install required ceiling and wall insulation around ducts and pipes. Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.	R402.4.1.1
<input type="checkbox"/> 6. New wood burning fireplaces shall have replacement outdoor combustion air.	R402.4.2

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<u>Final Inspection Comments</u>	<u>Code Section</u>
<input type="checkbox"/> 1. HVAC supply and return register boots that penetrate the building thermal envelope shall be sealed to the drywall subfloor, wall covering, or ceiling penetrated by the boot. Penetrations of the air barrier shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location.	R402.4.1.1
<input type="checkbox"/> 2. Sufficient space (about 4 inches) shall be provided adjacent to all mechanical components located in or forming a part of the air distribution system to assure adequate access for: (1) Construction and sealing in accordance with the requirements of Section C403.2.9. (2) Inspection (3) Cleaning and maintenance.	R403.3.2 C403.2.9.3.3
<input type="checkbox"/> 3. The efficiency rating of each system shall be verified by providing the (ARHI) Certificate showing the corresponding model numbers obtained from The Air Conditioning, Heating & Refrigeration Institute directory. ( <a href="http://www.ahridirectroy.org">www.ahridirectroy.org</a> )	R405.4.3 #2 R303.1.2
<input type="checkbox"/> 4. Mechanical closets and enclosed support platforms that form the primary air containment passageways for air distribution systems shall be sealed in accordance with the applicable criteria of this section and Table C403.2.9.2.	R403.3.2 C403.2.9.2
<input type="checkbox"/> 5. Piping insulation exposed to weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance and wind, and shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall not be permitted.	R403.4.1
<input type="checkbox"/> 6. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.	R403.6

**BORA Energy Guidelines**  
**BORA Mechanical Checklist**

**Final Inspection Comments Cont.**

	<b><u>Code Section</u></b>
<input type="checkbox"/> 7. New wood burning fireplaces shall have tight fitting flue dampers or tight-fitting doors. Outdoor combustion air is to be verified as installed per manufacturer's instructions.	R402.4.2 R303.2
<input type="checkbox"/> 8. Air duct leakage testing report shall be submitted when "leak free" duct credit is taken using performance method R405. Test can be performed at rough or post construction.	R405.2.3 R403.3.3
<input type="checkbox"/> 9. Air handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design airflow rate when tested in accordance with ASHRAE 193	R403.3.2.1
<input type="checkbox"/> 10. When an air handler is installed in the attic, a notice shall be placed in the electrical panel.	R403.3.6 #4
<input type="checkbox"/> 11. Any changes made during construction that are not in compliance with the approved plans and energy compliance report (calculations) shall be resubmitted for approval as an amended/revised set of construction documents.	R103.4
<input type="checkbox"/> 12. To determine the required ventilation for a building, an envelope leakage test report shall be submitted for review and approved before final inspection.	R402.4.1.2

**BORA Blower Door Report Checklist**

**Report Review Comments**

	<b><u>Code Section</u></b>
<input type="checkbox"/> 1. The envelope leakage test report form from the approved software, which was submitted at application for permit, shall be used to show compliance with the code.	R101.5.1
<input type="checkbox"/> 2. The envelope leakage test report from the approved software shall have the address and permit number on the report and shall be completed and signed by a qualified tester as specified in the code.	R101.5.1 R402.4.1.2
<input type="checkbox"/> 3. The method of compliance shall be indicated on the form and shall match the method selected when the building permit was issued. Prescriptive compliance cannot be selected where performance based R405 energy calculations have been submitted for compliance.	R101.5.1 R405.2.2 R401.2
<input type="checkbox"/> 4. When the performance based R405 method is selected, the ACH50 rate shall be indicated in the box provided on the test report. (ACH50) design rates are found at the bottom of the front page of the R405 compliance report.	R101.5.1 R405.2.2 R405.4.2
<input type="checkbox"/> 5. The leakage rate shall not exceed seven (7) air changes per hour and show "PASS".	R402.4.1.2
<input type="checkbox"/> 6. The leakage rate exceeding the design rate chosen using R405 performance method shall not "Pass", even though it does not exceed (7) air changes per hour.	R405.2.2 R402.4.1.2
<input type="checkbox"/> 7. Buildings with air changes per hr. (ACH) less than three (3) shall be provided with whole house mechanical ventilation in accordance with the Residential Building Code. and shall be indicated on the test report.	RBC303.4 R403.6 RBC303.4
<input type="checkbox"/> 8. Buildings where whole house mechanical ventilation is required shall submit a revised mechanical plan showing compliance with the Residential Building Code	R103.4 RBC303.4

Note: This is a minimum checklist. The local AHJ may have additional checklist items.

BORA Energy Guidelines  
BORA Plumbing Checklist

<u>Plan Review Comments</u>	<u>Code Section</u>
<input type="checkbox"/> 1. Service water heating appliance size and efficiency shown on the plan must match the size and efficiency proposed on the compliance report. Water-heating equipment installed in residential units shall meet the minimum efficiencies of Table C404.2.	R405.5.2 R403.5.6.2
<input type="checkbox"/> 2. Service water heating appliance size and efficiency must be shown on the plumbing plans. Provide AHRI efficiency documentation for water heaters. (www.ahridirectroy.org).	R103.2 #5 R403.5.6 R405.4.3 #2
<input type="checkbox"/> 3. Gas and oil-fired pool and spa heaters shall have a tested minimum thermal efficiency of 82 percent in accordance with ANSI Z 21.56. Documentation shall be provided.	R103.2 #5 R403.10.4
<input type="checkbox"/> 4. Heat pump pool heaters shall have a minimum COP of 4.0 when tested by a independent laboratory in accordance with AHRI 1160. Documentation shall be provided.	R103.2 #5 R403.10.5
<input type="checkbox"/> 5. If a heated water circulation system is installed, it shall be provided with a circulation pump that will start on demand. The system return pipe shall be a dedicated return pipe or a cold-water supply pipe. Controls shall stop the pump when desired temperature is reached and there is no longer any demand for hot water.	R403.5.1

<u>Rough Inspection Comments</u>	<u>Code Section</u>
<input type="checkbox"/> 1. Sufficient space shall be left for insulation on exterior walls adjacent to showers and tubs.	R402.4.1.1
<input type="checkbox"/> 2. If a heated water circulation system is installed it shall be provided with an accessible circulation pump and the automatic controls, temperature sensors, and manual controls and shall be readily accessible for operation.	R403.5.1

<u>Final Inspection Comments</u>	<u>Code Section</u>
<input type="checkbox"/> 1. Storage water heating equipment efficiencies shall be verified by the model number and match the AHRI provided during plan review. Different equipment efficiencies require a revised compliance document.	R403.5.6.2
<input type="checkbox"/> 2. Electric, gas, and oil type pool and spa heating equipment efficiencies shall be verified and meet the minimum efficiency requirements. Residential pools shall meet the requirements of APSP-15 (Standard for Energy Efficiency for Residential Inground Swimming Pools & Spa's)	R403.10 R403.11 R403.12
<input type="checkbox"/> 3. Gas and oil type water heaters for permanent pools and spas shall be equipped with a vapor retardant cover on or at the water surface or a liquid cover or other means proven to reduce heat loss and be on the job for final inspection. Heat pump and solar type heaters are excluded from this requirement.	R403.10.3
<input type="checkbox"/> 4. A separate valve shall be provided on combustion type gas water heaters to shut off fuel to the main burner.	R403.5.6.1.2
<input type="checkbox"/> 5. Any changes made during construction that are not in compliance with the approved plans and energy compliance report (calculations) shall be resubmitted for approval as an amended/revised set of construction documents.	R103.4
<input type="checkbox"/> 6. The electric power to pool heaters shall be controlled by a readily accessible on-off switch that is an integral part of the heater mounted on the exterior of the heater. Pool and spa equipment shall have time switches or other control methods that can automatically turn off and on according to a preset schedule	R403.10.1 R403.10.2

Note: This is a minimum checklist. The local AHJ may have additional checklist items.

## BORA Energy Guidelines

### BORA Electrical Checklist

#### Plan Review Comments

- |   | <u>Code Section</u>   |
|---|-----------------------|
| <input type="checkbox"/> 1. Comfort heating and service water heating appliance types must match the fuel type chosen on the compliance report.   | R405.4.2              |
| <input type="checkbox"/> 2. The electrical floor plans shall clearly identify all recessed luminaires that are installed in the "Building Thermal Envelope, and shall show sealing details.   | R402.4.5<br>R103.2 #8 |
| <input type="checkbox"/> 3. Recessed lighting shall be IC-rated and <i>labeled</i> as having an air leakage rate not more than 2.0 cfm when tested in accordance with ASTM E283   | R402.4.5              |
| <input type="checkbox"/> 4. The Luminaire Schedule shall clearly identify the "high efficacy lamps". 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. | R404.1.1              |

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#### Rough Inspection Comments

- |  | <u>Code Section</u> |
|--|---------------------|
| <input type="checkbox"/> 1. An air barrier shall be installed behind electrical or communication boxes or air sealed boxes shall be installed. | R402.4.1.1          |

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#### Final Inspection Comments

- |   | <u>Code Section</u> |
|---|---------------------|
| <input type="checkbox"/> 1. Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering. | R402.4.5            |
| <input type="checkbox"/> 2. All installed luminaires are to be installed per the luminaire schedule.  | R404.1              |
| <input type="checkbox"/> 3. A separate switch or a clearly marked SWD type circuit breaker shall be provided to permit the power supplied to electric water heater service systems to be turned off when the home is unoccupied.  | R403.5.6.1.2        |
| <input type="checkbox"/> 4. Any changes made during construction that are not in compliance with the approved plans and energy compliance report (calculations) shall be resubmitted for approval as an amended/revised set of construction documents.  | R103.4              |

Note: This is a minimum checklist. The local AHJ may have additional checklist items.

**Item 4b:**

Residential Compliance Forms R405-2020

## RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST

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

**Applications for compliance with the 2020 Florida Building Code, Energy Conservation via the Residential Simulated Performance Alternative shall include:**

- This checklist
- Form R405-2020 report
- Input summary checklist that can be used for field verification (usually four pages/may be greater)
- Energy Performance Level (EPL) Display Card (one page)
- HVAC system sizing and selection based on ACCA Manual S or per exceptions provided in Section R403.7
- Mandatory Requirements (five pages)

**Required prior to CO:**

- Air Barrier and Insulation Inspection Component Criteria checklist (Table R402.4.1.1 - one page)
- A completed 2020 Envelope Leakage Test Report (usually one page); exception in R402.4 allows dwelling units of R-2 Occupancies and multiple attached single family dwellings to comply with Section C403.9
- If Form R405 duct leakage type indicates anything other than "default leakage", then a completed 2020 Duct Leakage Test Report - Performance Method (usually one page)

DEMONSTRATION PURPOSES ONLY

# 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 Street: Anyplace City, State, Zip: Tampa, FL, 34345 Owner: Energy Gauge Design Location: FL, Tampa	Builder Name: John Q. Hammer Permit Office: Permit Number: Jurisdiction: County: Hillsborough (Florida Climate Zone 2)
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<table border="0" style="width:100%;"> <tr> <td>1. New construction or existing</td> <td>New (From Plans)</td> </tr> <tr> <td>2. Single family or multiple family</td> <td>Detached</td> </tr> <tr> <td>3. Number of units, if multiple family</td> <td>1</td> </tr> <tr> <td>4. Number of Bedrooms</td> <td>3</td> </tr> <tr> <td>5. Is this a worst case?</td> <td>No</td> </tr> <tr> <td>6. Conditioned floor area above grade (ft²)</td> <td>2000</td> </tr> <tr> <td>Conditioned floor area below grade (ft²)</td> <td>0</td> </tr> <tr> <td>7. Windows(320.0 sqft.)</td> <td>Description Area</td> </tr> <tr> <td>a. U-Factor:</td> <td>Dbl, U=0.40 320.00 ft²</td> </tr> <tr> <td>SHGC:</td> <td>SHGC=0.25</td> </tr> <tr> <td>b. U-Factor:</td> <td>N/A ft²</td> </tr> <tr> <td>SHGC:</td> <td></td> </tr> <tr> <td>c. U-Factor:</td> <td>N/A ft²</td> </tr> <tr> <td>SHGC:</td> <td></td> </tr> <tr> <td>Area Weighted Average Overhang Depth:</td> <td>0.000 ft.</td> </tr> <tr> <td>Area Weighted Average SHGC:</td> <td>0.250</td> </tr> <tr> <td>8. Skylights</td> <td>Area</td> </tr> <tr> <td>c. U-Factor:(AVG)</td> <td>N/A ft²</td> </tr> <tr> <td>SHGC(AVG):</td> <td>N/A</td> </tr> <tr> <td>9. Floor Types (2000.0 sqft.)</td> <td>Insulation Area</td> </tr> <tr> <td>a. Slab-On-Grade Edge Insulation</td> <td>R=0.0 200.00 ft²</td> </tr> <tr> <td>b. N/A</td> <td>R= ft²</td> </tr> <tr> <td>c. N/A</td> <td>R= ft²</td> </tr> </table>	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 (ft²)	2000	Conditioned floor area below grade (ft²)	0	7. Windows(320.0 sqft.)	Description Area	a. U-Factor:	Dbl, U=0.40 320.00 ft²	SHGC:	SHGC=0.25	b. U-Factor:	N/A ft²	SHGC:		c. U-Factor:	N/A ft²	SHGC:		Area Weighted Average Overhang Depth:	0.000 ft.	Area Weighted Average SHGC:	0.250	8. Skylights	Area	c. U-Factor:(AVG)	N/A ft²	SHGC(AVG):	N/A	9. Floor Types (2000.0 sqft.)	Insulation Area	a. Slab-On-Grade Edge Insulation	R=0.0 200.00 ft²	b. N/A	R= ft²	c. N/A	R= ft²	<table border="0" style="width:100%;"> <tr> <td>10. Wall Type(1557.4 sqft.)</td> <td>Insulation</td> <td>Area</td> </tr> <tr> <td>a. Concrete Block - Int Insul, Exterior</td> <td>R=6.0</td> <td>1404.40 ft²</td> </tr> <tr> <td>b. Frame - Wood, Adjacent</td> <td>R=13.0</td> <td>153.00 ft²</td> </tr> <tr> <td>c. N/A</td> <td>R=</td> <td>ft²</td> </tr> <tr> <td>d. N/A</td> <td>R=</td> <td>ft²</td> </tr> <tr> <td>11. Ceiling Types (2000.0 sqft.)</td> <td>Insulation</td> <td>Area</td> </tr> <tr> <td>a. Under Attic (Vented)</td> <td>R=38.0</td> <td>2000.00 ft²</td> </tr> <tr> <td>b. N/A</td> <td>R=</td> <td>ft²</td> </tr> <tr> <td>c. N/A</td> <td>R=</td> <td>ft²</td> </tr> <tr> <td>12. Ducts</td> <td></td> <td>R ft²</td> </tr> <tr> <td>a. Sup: Attic, Ret: Attic, AH: Main</td> <td></td> <td>8 400</td> </tr> <tr> <td>13. Cooling systems</td> <td>kBtu/hr</td> <td>Efficiency</td> </tr> <tr> <td>a. Central Unit</td> <td>19.5</td> <td>SEER:14.00</td> </tr> <tr> <td>14. Heating systems</td> <td>kBtu/hr</td> <td>Efficiency</td> </tr> <tr> <td>a. Electric Heat Pump</td> <td>19.5</td> <td>HSPF:8.20</td> </tr> <tr> <td>15. Hot water systems</td> <td></td> <td>Cap: 50 gallons</td> </tr> <tr> <td>a. Electric</td> <td></td> <td>EF: 0.945</td> </tr> <tr> <td>b. Conservation features</td> <td></td> <td>None</td> </tr> <tr> <td>16. Credits</td> <td></td> <td>None</td> </tr> </table>	10. Wall Type(1557.4 sqft.)	Insulation	Area	a. Concrete Block - Int Insul, Exterior	R=6.0	1404.40 ft²	b. Frame - Wood, Adjacent	R=13.0	153.00 ft²	c. N/A	R=	ft²	d. N/A	R=	ft²	11. Ceiling Types (2000.0 sqft.)	Insulation	Area	a. Under Attic (Vented)	R=38.0	2000.00 ft²	b. N/A	R=	ft²	c. N/A	R=	ft²	12. Ducts		R ft²	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. Electric Heat Pump	19.5	HSPF:8.20	15. Hot water systems		Cap: 50 gallons	a. Electric		EF: 0.945	b. Conservation features		None	16. Credits		None
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c. U-Factor:(AVG)	N/A ft²																																																																																																							
SHGC(AVG):	N/A																																																																																																							
9. Floor Types (2000.0 sqft.)	Insulation Area																																																																																																							
a. Slab-On-Grade Edge Insulation	R=0.0 200.00 ft²																																																																																																							
b. N/A	R= ft²																																																																																																							
c. N/A	R= ft²																																																																																																							
10. Wall Type(1557.4 sqft.)	Insulation	Area																																																																																																						
a. Concrete Block - Int Insul, Exterior	R=6.0	1404.40 ft²																																																																																																						
b. Frame - Wood, Adjacent	R=13.0	153.00 ft²																																																																																																						
c. N/A	R=	ft²																																																																																																						
d. N/A	R=	ft²																																																																																																						
11. Ceiling Types (2000.0 sqft.)	Insulation	Area																																																																																																						
a. Under Attic (Vented)	R=38.0	2000.00 ft²																																																																																																						
b. N/A	R=	ft²																																																																																																						
c. N/A	R=	ft²																																																																																																						
12. Ducts		R ft²																																																																																																						
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. Electric Heat Pump	19.5	HSPF:8.20																																																																																																						
15. Hot water systems		Cap: 50 gallons																																																																																																						
a. Electric		EF: 0.945																																																																																																						
b. Conservation features		None																																																																																																						
16. Credits		None																																																																																																						

Glass/Floor Area: 0.160	Total Proposed Modified Loads: 60.15	<b>PASS</b>
	Total Baseline Loads: 60.46	

<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: _____ DATE: _____</p> <p>I hereby certify that this building, as designed, is in compliance with the Florida Energy Code.</p> <p>OWNER/AGENT: _____ 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: _____ DATE: _____</p> <div style="text-align: right;">  </div>
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- 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 requires an Air Barrier and Insulation Inspection Checklist in accordance with R402.4.1.1 and this project requires an envelope leakage test report with envelope leakage no greater than 7.00 ACH50 (R402.4.1.2).
- Compliance requires a roof absorptance test and a roof emittance test in accordance with R405.7.2
- Compliance with a proposed duct leakage Qn requires a 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.

## INPUT SUMMARY CHECKLIST REPORT

PROJECT													
Title:	Example_2020_Florida_Code	Bedrooms:	3	Address Type:	Street Address								
Building Type:	User	Conditioned Area:	2000	Lot #									
Owner Name:	Energy Gauge	Total Stories:	1	Block/Subdivision:									
# of Units:	1	Worst Case:	No	PlatBook:									
Builder Name:	John Q. Hammer	Rotate Angle:	0	Street:	Anyplace								
Permit Office:		Cross Ventilation:	No	County:	Hillsborough								
Jurisdiction:		Whole House Fan:	No	City, State, Zip:	Tampa ,								
Family Type:	Detached				FL , 34345								
New/Existing:	New (From Plans)												
Comment:	Florida Code Example												
CLIMATE													
✓	Design Location	TMY Site	Design Temp 97.5 %	2.5 %	Int Design Temp Winter	Summer	Heating Degree Days	Design Moisture	Daily Temp Range				
_____	FL, Tampa	FL_TAMPA_INTERNATI	39	91	70	75	645.5	54	Medium				
BLOCKS													
Number	Name	Area	Volume										
1	Block1	2000	18000										
SPACES													
Number	Name	Area	Volume	Kitchen	Occupants	Bedrooms	Infil ID	Finished	Cooled	Heated			
1	Main	2000	18000	Yes	3	3	1	Yes	Yes	Yes			
FLOORS													
✓	#	Floor Type	Space	Perimeter	R-Value	Area		Tile	Wood	Carpet			
_____	1	Slab-On-Grade Edge Insulatio	Main	190 ft	0	2000 ft²	----	0.4	0	0.6			
ROOF													
✓	#	Type	Materials	Roof Area	Gable Area	Roof Color	Rad Barr	Solar Absor.	SA Tested	Emitt	Emitt Tested	Deck Insul.	Pitch (deg)
_____	1	Gable or shed	Composition shingles	2108 ft²	332 ft²	Medium	N	0.75	Yes	0.9	Yes	0	18.4
ATTIC													
✓	#	Type	Ventilation	Vent Ratio (1 in)	Area	RBS	IRCC						
_____	1	Full attic	Vented	300	2000 ft²	N	N						
CEILING													
✓	#	Ceiling Type	Space	R-Value	Ins Type	Area	Framing Frac	Truss Type					
_____	1	Under Attic (Vented)	Main	38	Blown	2000 ft²	0.11	Wood					

## INPUT SUMMARY CHECKLIST REPORT

<b>WALLS</b>															
✓ #	Ornt	Adjacent To	Wall Type	Space	Cavity R-Value	Width Ft	In	Height Ft	In	Area	Sheathing R-Value	Framing Fraction	Solar Absor.	Below Grade%	
1	W	Garage	Frame - Wood	Main	13	17	0	9	0	153.0 ft²	0	0.23	0.01	0	
2	W	Exterior	Concrete Block - Int Insul	Main	6	26.26		9		236.3 ft²		0	0.75	0	
3	S	Exterior	Concrete Block - Int Insul	Main	6	43.25		9		389.3 ft²		0	0.75	0	
4	E	Exterior	Concrete Block - Int Insul	Main	6	43.25		9		389.3 ft²		0	0.75	0	
5	N	Exterior	Concrete Block - Int Insul	Main	6	43.25		9		389.3 ft²		0	0.75	0	

  

<b>DOORS</b>											
✓ #	Ornt	Door Type	Space	Storms	U-Value	Width Ft	In	Height Ft	In	Area	
1	N	Insulated	Main	None	.4	5		8		40 ft²	

  

<b>WINDOWS</b>														
Orientation shown is the entered, Proposed orientation.														
✓ #	Ornt	Wall ID	Frame	Panes	NFRC	U-Factor	SHGC	Imp	Area	Overhang Depth	Separation	Int Shade	Screening	
1	W	2	Vinyl	Low-E Double	Yes	0.4	0.25	N	80.0 ft²	0 ft 0 in	0 ft 0 in	IECC 2012	None	
2	S	3	Vinyl	Low-E Double	Yes	0.4	0.25	N	80.0 ft²	0 ft 0 in	0 ft 0 in	IECC 2012	None	
3	E	4	Vinyl	Low-E Double	Yes	0.4	0.25	N	80.0 ft²	0 ft 0 in	0 ft 0 in	IECC 2012	None	
4	N	5	Vinyl	Low-E Double	Yes	0.4	0.25	N	80.0 ft²	0 ft 0 in	0 ft 0 in	IECC 2012	None	

  

<b>GARAGE</b>						
✓ #	Floor Area	Ceiling Area	Exposed Wall Perimeter	Avg. Wall Height	Exposed Wall Insulation	
1	382.8 ft²	382.8 ft²	64 ft	9 ft	11	

  

<b>INFILTRATION</b>								
#	Scope	Method	SLA	CFM 50	ELA	EqLA	ACH	ACH 50
1	Wholehouse	Proposed ACH(50)	.0004	2100	115.21	216.3	.14	7

  

<b>HEATING SYSTEM</b>									
✓ #	System Type	Subtype	Speed	Efficiency	Capacity	Block	Ducts		
1	Electric Heat Pump/	None	Singl	HSPF:8.2	19.5 kBtu/hr	1	sys#1		

  

<b>COOLING SYSTEM</b>									
✓ #	System Type	Subtype	Subtype	Efficiency	Capacity	Air Flow	SHR	Block	Ducts
1	Central Unit/	Split	Singl	SEER: 14	19.5 kBtu/hr	585 cfm	0.75	1	sys#1

**INPUT SUMMARY CHECKLIST REPORT**

<b>HOT WATER SYSTEM</b>															
✓	#	System Type	SubType	Location	EF	Cap	Use	SetPnt	Conservation						
✓	1	Electric	None	Main	0.944999	50 gal	60 gal	120 deg	None						
<b>SOLAR HOT WATER SYSTEM</b>															
✓	FSEC Cert #	Company Name	System Model #			Collector Model #			Collector Area	Storage Volume	FEF				
✓	None	None							ft²						
<b>DUCTS</b>															
✓	#	---- Supply ----			---- Return ----			Leakage Type	Air Handler	CFM 25 TOT	CFM25 OUT	QN	RLF	HVAC #	
✓	1	Attic	8	400 ft²	Attic	100 ft²	Prop. Leak Free	Main	--- cfm	60.0 cfm	0.03	0.50	1	1	
<b>TEMPERATURES</b>															
Programmable Thermostat: N					Ceiling Fans:										
Cooling	<input checked="" type="checkbox"/> Jan	<input checked="" type="checkbox"/> Feb	<input checked="" type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input checked="" type="checkbox"/> Jun	<input checked="" type="checkbox"/> Jul	<input checked="" type="checkbox"/> Aug	<input checked="" type="checkbox"/> Sep	<input checked="" type="checkbox"/> Oct	<input checked="" type="checkbox"/> Nov	<input checked="" type="checkbox"/> Dec			
Heating	<input checked="" type="checkbox"/> Jan	<input checked="" type="checkbox"/> Feb	<input checked="" type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input checked="" type="checkbox"/> Jun	<input checked="" type="checkbox"/> Jul	<input checked="" type="checkbox"/> Aug	<input checked="" type="checkbox"/> Sep	<input checked="" type="checkbox"/> Oct	<input checked="" type="checkbox"/> Nov	<input checked="" type="checkbox"/> Dec			
Venting	<input checked="" type="checkbox"/> Jan	<input checked="" type="checkbox"/> Feb	<input checked="" type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input checked="" type="checkbox"/> Jun	<input checked="" type="checkbox"/> Jul	<input checked="" type="checkbox"/> Aug	<input checked="" type="checkbox"/> Sep	<input checked="" type="checkbox"/> Oct	<input checked="" type="checkbox"/> Nov	<input checked="" type="checkbox"/> Dec			
Thermostat Schedule: FloridaCode 2014															
Schedule Type		Hours													
		1	2	3	4	5	6	7	8	9	10	11	12		
Cooling (WD)	AM	75	75	75	75	75	75	75	75	75	75	75	75	75	
	PM	75	75	75	75	75	75	75	75	75	75	75	75	75	
Cooling (WEH)	AM	75	75	75	75	75	75	75	75	75	75	75	75	75	
	PM	75	75	75	75	75	75	75	75	75	75	75	75	75	
Heating (WD)	AM	72	72	72	72	72	72	72	72	72	72	72	72	72	
	PM	72	72	72	72	72	72	72	72	72	72	72	72	72	
Heating (WEH)	AM	72	72	72	72	72	72	72	72	72	72	72	72	72	
	PM	72	72	72	72	72	72	72	72	72	72	72	72	72	
<b>MASS</b>															
Mass Type				Area		Thickness		Furniture Fraction			Space				
Default(8 lbs/sq.ft.)				0 ft²		0 ft		0.3			Main				

# ENERGY PERFORMANCE LEVEL (EPL) DISPLAY CARD

ESTIMATED ENERGY PERFORMANCE INDEX\* = 99

The lower the EnergyPerformance 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 ft²
3. Number of units, if multiple family	1	b. Frame - Wood, Adjacent	R=13.0	153.00 ft²
4. Number of Bedrooms	3	c. N/A	R=	ft²
5. Is this a worst case?	No	d. N/A	R=	ft²
6. Conditioned floor area (ft²)	2000	11. Ceiling Type and insulation level	Insulation	Area
7. Windows**	Description	Area	R=38.0	2000.00 ft²
a. U-Factor:	U=0.40	320.00 ft²	R=	ft²
SHGC:	SHGC=0.25		R=	ft²
b. U-Factor:	N/A	ft²		
SHGC:				
c. U-Factor:	N/A	ft²		
SHGC:				
d. U-Factor:	N/A	ft²		
SHGC:				
Area Weighted Average Overhang Depth:	0.000 ft.	12. Ducts, location & insulation level	R	ft²
Area Weighted Average SHGC:	0.250	a. Sup: Attic, Ret: Attic, AH: Main	8	400
8. Skylights	Description	Area		
a. U-Factor(AVG):	N/A	ft²		
SHGC(AVG):	N/A			
9. Floor Types	Insulation	Area	13. Cooling systems	kBtu/hr Efficiency
a. Slab-On-Grade Edge Insulation	R=0.0	2000.00 ft²	a. Central Unit	19.5 SEER:14.00
b. N/A	R=	ft²		
c. N/A	R=	ft²	14. Heating systems	kBtu/hr Efficiency
			a. Electric Heat Pump	19.5 HSPF:8.20
			15. Hot water systems	Cap: 50 gallons
			a. Electric	EF: 0.94
			b. Conservation features	None
			None	
			Credits (Performance method)	None

I certify that this home has complied with the Florida Energy Efficiency Code for Building Construction through the above energy saving features which will be installed (or exceeded) 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.

# Florida Building Code, Energy Conservation, 7th Edition (2020)

## Mandatory Requirements for Residential Performance, Prescriptive and ERI Methods

ADDRESS: Anyplace  
Tampa , FL , 34345

Permit Number:

**MANDATORY REQUIREMENTS** - See individual code sections for full details.

### SECTION R401 GENERAL

**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.

### SECTION R402 BUILDING THERMAL ENVELOPE

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

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

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

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

**R402.4.1.2 Testing.** The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding seven air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ANSI/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.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.
3. Interior doors, if installed at the time of the test, shall be open.
4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed.
5. Heating and cooling systems, if installed at the time of the test, shall be turned off.
6. Supply and return registers, if installed at the time of the test, shall be fully open.

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

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

**Exception:** Site-built windows, skylights and doors.

## MANDATORY REQUIREMENTS - (Continued)

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

### Exceptions:

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

- R402.4.5 Recessed lighting.** Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as having an air leakage rate not more than 2.0 cfm (0.944 L/s) when tested in accordance with ASTM E283 at a 1.57 psf (75 Pa) pressure differential. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

## SECTION R403 SYSTEMS

### R403.1 Controls.

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

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

- R403.3.2 Sealing (Mandatory)** All ducts, air handlers, filter boxes and building cavities that form the primary air containment passageways for air distribution systems shall be considered ducts 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.

Duct tightness shall be verified by testing in accordance with ANSI/RESNET/ICC 380 by either individuals as defined in Section 553.993(5) or (7), Florida Statutes, or individuals licensed as set forth in Section 489.105(3)(f), (g) or (i), Florida Statutes, to be "substantially leak free" in accordance with Section R403.3.3.

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

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

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

### Exceptions:

1. A duct air leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope.
2. *Duct testing is not mandatory for buildings complying by Section 405 of this code. Duct leakage testing is required for Section R405 compliance where credit is taken for leakage, and a duct air leakage  $Q_n$  to the outside of less than 0.080 (where  $Q_n$  = duct leakage to the outside in cfm per 100 square feet of conditioned floor area tested at 25 Pascals) is indicated in the compliance report for the proposed design.*

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

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

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

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

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

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

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

## MANDATORY REQUIREMENTS - (Continued)

- R403.5.5 Heat traps (Mandatory).** Storage water heaters not equipped with integral heat traps and having vertical pipe risers shall have heat traps installed on both the inlets and outlets. External heat traps shall consist of either a commercially available heat trap or a downward and upward bend of at least 3 ½ inches (89 mm) in the hot water distribution line and cold water line located as close as possible to the storage tank.
- R403.5.6 Water heater efficiencies (Mandatory).**
- R403.5.6.1.1 Automatic controls.** Service water-heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use. The minimum temperature setting range shall be from 100°F to 140°F (38°C to 60°C).
- R403.5.6.1.2 Shut down.** A separate switch or a clearly marked circuit breaker shall be provided to permit the power supplied to electric service systems to be turned off. A separate valve shall be provided to permit the energy supplied to the main burner(s) of combustion types of service water-heating systems to be turned off.
- R403.5.6.2 Water-heating equipment.** Water-heating equipment installed in residential units shall meet the minimum efficiencies of Table C404.2 in Chapter 4 of the Florida Building Code, Energy Conservation, Commercial Provisions, for the type of equipment installed. Equipment used to provide heating functions as part of a combination system shall satisfy all stated requirements for the appropriate water-heating category. Solar water heaters shall meet the criteria of Section R403.5.6.2.1.
- R403.5.6.2.1 Solar water-heating systems.** Solar systems for domestic hot water production are rated by the annual solar energy factor of the system. The solar energy factor of a system shall be determined from the Florida Solar Energy Center Directory of Certified Solar Systems. Solar collectors shall be tested in accordance with ISO Standard 9806, Test Methods for Solar Collectors, and SRCC Standard TM-1, Solar Domestic Hot Water System and Component Test Protocol. Collectors in installed solar water-heating systems should meet the following criteria:
1. Be installed with a tilt angle between 10 degrees and 40 degrees of the horizontal; and
  2. Be installed at an orientation within 45 degrees of true south.
- R403.6 Mechanical ventilation (Mandatory).** The building shall be provided with ventilation that meets the requirements of the Florida Building Code, Residential, or Florida Building Code, Mechanical, as applicable, or with other approved means of ventilation including: Natural, Infiltration or Mechanical means. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.
- R403.6.1 Whole-house mechanical ventilation system fan efficacy.** When installed to function as a whole-house mechanical ventilation system, fans shall meet the efficacy requirements of Table R403.6.1.
- Exception:** Where an air handler that is integral to tested and listed HVAC equipment is used to provide whole-house mechanical ventilation, the air handler shall be powered by an electronically commutated motor.
- R403.6.2 Ventilation air.** Residential buildings designed to be operated at a positive indoor pressure or for mechanical ventilation shall meet the following criteria:
1. The design air change per hour minimums for residential buildings in ASHRAE 62.2, Ventilation for Acceptable Indoor Air Quality, shall be the maximum rates allowed for residential applications.
  2. No ventilation or air-conditioning system make-up air shall be provided to conditioned space from attics, crawlspaces, attached enclosed garages or outdoor spaces adjacent to swimming pools or spas.
  3. If ventilation air is drawn from enclosed space(s), then the walls of the space(s) from which air is drawn shall be insulated to a minimum of R-11 and the ceiling shall be insulated to a minimum of R-19, space permitting, or R-10 otherwise.

### 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.

**TABLE R403.6.1  
WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY**

FAN LOCATION	AIRFLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY <sup>a</sup> (CFM/WATT)	AIRFLOW RATE MAXIMUM (CFM)
HRV or ERV	Any	1.2 cfm/watt	Any
Range hoods	Any	2.8 cfm/watt	Any
In-line fan	Any	2.8 cfm/watt	Any
Bathroom, utility room	10	1.4 cfm/watt	<90
Bathroom, utility room	90	2.8 cfm/watt	Any

For SI: 1 cfm = 28.3 L/min.

a. When tested in accordance with HVI Standard 916

## MANDATORY REQUIREMENTS - (Continued)

- R403.7.1.1 Cooling equipment capacity.** Cooling only equipment shall be selected so that its total capacity is not less than the calculated total load but not more than 1.15 times greater than the total load calculated according to the procedure selected in Section R403.7, or the closest available size provided by the manufacturer's product lines. The corresponding latent capacity of the equipment shall not be less than the calculated latent load.

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

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

Exceptions:

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

### R403.7.1.2 Heating equipment capacity.

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

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

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

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

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

- R403.8 Systems serving multiple dwelling units (Mandatory).** Systems serving multiple dwelling units shall comply with Sections C403 and C404 of the Florida Building Code, Energy Conservation—Commercial Provisions in lieu of Section R403.

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

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

- R403.10.1 Heaters.** The electric power to heaters shall be controlled by a readily accessible on-off switch that is an integral part of the heater mounted on the exterior of the heater, or external to and within 3 feet (914 mm) of the heater. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with continuously burning ignition pilots.

- R403.10.2 Time switches.** Time switches or other control methods that can automatically turn off and on according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that have built-in time switches shall be in compliance with this section.

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Pumps that operate solar- and waste-heat-recovery pool heating systems.
3. Where pumps are powered exclusively from on-site renewable generation.

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

**Exception:** Where more than 70 percent of the energy for heating, computed over an operation season, is from site-recovered energy, such as from a heat pump or solar energy source, covers or other vapor-retardant means shall not be required.

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

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

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

**R403.13 Dehumidifiers (Mandatory)** If installed, a dehumidifier shall conform to the following requirements:

1. The minimum rated efficiency of the dehumidifier shall be greater than 1.7 liters/ kWh if the total dehumidifier capacity for the house is less than 75 pints/day and greater than 2.38 liters/kWh if the total dehumidifier capacity for the house is greater than or equal to 75 pints/day.
2. The dehumidifier shall be controlled by a sensor that is installed in a location where it is exposed to mixed house air.
3. Any dehumidifier unit located in unconditioned space that treats air from conditioned space shall be insulated to a minimum of R-2.
4. Condensate disposal shall be in accordance with Section M1411.3.1 of the Florida Building Code, Residential.

**R403.13.1 Ducted dehumidifiers.** Ducted dehumidifiers shall, in addition to conforming to the requirements of Section R403.13, conform to the following requirements:

1. If a ducted dehumidifier is configured with return and supply ducts both connected into the supply side of the cooling system, a backdraft damper shall be installed in the supply air duct between the dehumidifier inlet and outlet duct.
2. If a ducted dehumidifier is configured with only its supply duct connected into the supply side of the central heating and cooling system, a backdraft damper shall be installed in the dehumidifier supply duct between the dehumidifier and central supply duct.
3. A ducted dehumidifier shall not be ducted to or from a central ducted cooling system on the return duct side upstream from the central cooling evaporator coil.
4. Ductwork associated with a dehumidifier located in unconditioned space shall be insulated to a minimum of R-6.

## SECTION R404

### ELECTRICAL POWER AND LIGHTING SYSTEMS

**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.

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

# 2020 - AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

**TABLE 402.4.1.1**  
**AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA**<sup>a</sup>

Project Name:	Example_2020_Florida_Code_R405_Reports	Builder Name:	John Q. Hammer	CHECK
Street:	Anyplace	Permit Office:		
City, State, Zip:	Tampa , FL , 34345	Permit Number:		
Owner:	Energy Gauge	Jurisdiction:		
Design Location:	FL, Tampa			
COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA		
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.		
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.		
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.		
Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing shall be sealed.			
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.		
Floors (including above-garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.		
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.		
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.			
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity spaces.		
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.			
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the finished surface.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.		
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.		
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.		
Electrical/phone box or exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.			
HVAC register boots	HVAC supply and return register boots that penetrate building thermal envelope shall be sealed to the sub-floor, wall covering or			
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.			

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

# Envelope Leakage Test Report (Blower Door Test)

## Residential Prescriptive, Performance or ERI Method Compliance

### 2020 Florida Building Code, Energy Conservation, 7th Edition

Jurisdiction:	Permit #:
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**Job Information**

Builder: John Q. Hammer	Community:	Lot: 1A
Address: Anyplace		
City: Tampa	State: FL	Zip: 34845

**Air Leakage Test Results** *Passing results must meet either the Performance, Prescriptive, or ERI Method*

**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.

**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):

$\frac{\text{CFM}(50) \times 60 \div 18000}{\text{Building Volume}} = \text{ACH}(50)$ <p style="text-align: center;"><input type="checkbox"/> <b>PASS</b></p> <p><input type="checkbox"/> When ACH(50) is less than 3, Mechanical Ventilation installation must be verified by building department.</p>	<p><u>Method for calculating building volume:</u></p> <p><input type="radio"/> Retrieved from architectural plans</p> <p><input checked="" type="radio"/> Code software calculated</p> <p><input type="radio"/> Field measured and calculated</p>
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**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 489.105(3)(f), (g), or (i) or an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.
2. Dampers including exhaust, intake, makeup air, 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: \_\_\_\_\_

# Duct Leakage Test Report

## Residential Prescriptive, Performance or ERI Method Compliance 2020 Florida Building Code, Energy Conservation, 7th Edition

Jurisdiction:	Permit #:
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### Job Information

Builder: John Q. Hammer	Community:	Lot: NA
Address: Anyplace		
City: Tampa	State: FL	Zip: 34345

### Duct Leakage Test Results

System 1	_____ cfm25
System 2	_____ cfm25
System 3	_____ cfm25
Sum of others	_____ cfm25
Total of all	_____ cfm25

**Prescriptive Method** cfm25 (Total)

To qualify as "substantially leak free" Qn Total must be less than or equal to 0.04 if air handler unit is installed. If air handler unit is not installed, Qn Total must be less than or equal to 0.03. This testing method meets the requirements in accordance with Section R403.3.3.

Is the air handler unit installed during testing?  YES ( $= \frac{0.04}{Qn}$ )  NO ( $= \frac{0.03}{Qn}$ )

**Performance/ERI Method** cfm25 (Out or Total)

To qualify using this method, Qn must not be greater than the proposed duct leakage Qn specified on Form R405-2020 or R406-2020.

Leakage Type selected on Form R405-2020 (EnergyCalc) or R406-2020	Qn specified on Form R405-2020 (EnergyCalc) or R406-2020
Proposed Leak Free	0.03

\_\_\_\_\_ ÷  $\frac{2000}{\text{Total Conditioned Square Footage}}$  = \_\_\_\_\_ Qn

**PASS**       **FAIL**

Duct tightness shall be verified by testing in accordance with ANSI/RESNET/ICC380 by either individuals as defined in Section 553.993(5) or (7), Florida Statutes, or individuals licensed as set forth in Section 489.105(3)(f), (g) or (i), Florida Statutes.

### Testing Company

Company Name: \_\_\_\_\_ Phone: \_\_\_\_\_

I hereby verify that the above duct leakage testing results are in accordance with the Florida Building Code requirements with the selected compliance path as stated above, either the Prescriptive Method or Performance Method.

Signature of Tester: \_\_\_\_\_ Date of Test: \_\_\_\_\_

Printed Name of Tester: \_\_\_\_\_

License/Certification #: \_\_\_\_\_ Issuing Authority: \_\_\_\_\_

**Item 4c:**  
Envelope Leakage Report Summary

## **2020 Florida Energy Conservation Code Changes**

**R405.2.2** Building air leakage testing. Building or dwelling air leakage testing shall be in accordance with Sections R402.4 through R402.4.1.2. If an air leakage rate below seven air changes per hour at a pressure of 0.2 inch w.g. (50 pascals) is specified for the proposed design, testing shall verify the air leakage rate does not exceed the air leakage rate of the proposed design instead of seven air changes per hour.

**R405.2.3** Duct air leakage testing. In cases where duct air leakage lower than the default  $Q_n$  to outside of 0.080 (where  $Q_n$  = duct leakage to the outside in cfm per 100 square feet of conditioned floor area tested at 25 Pascals) is specified for the proposed design, testing in accordance with Section R403.3.2 shall verify a duct air leakage rate not exceeding the leakage rate of the proposed design. Otherwise, in accordance with Section R403.3.3, duct testing is not mandatory for buildings complying by Section R405.

### **Summary**

The designer of record determines the energy compliance path per R401.2 and provides a compliance report that is either Performance, Prescriptive or ERI method. When filling out the Envelope Leakage Test report, (see below) the method which the designer chose must be selected. The testing agency cannot choose a different method of compliance than the designer. The code was changed in this 2020 cycle to clarify this and make sure that if the designer chose the performance method of compliance the leakage rate that he/she chose was not exceeded. The software places the rate in the box provided. The statement on the form giving these options do not apply to the tester or the contractor to select. It applies to the designer who prepared the compliance document. This selection by the designer also applies to the duct testing leakage rate.

The code official is responsible to review both the Envelope Leakage Test Report and the Duct Leakage Test Report to make sure the proposed design is met and that the reports are accurate and without errors.

Builder: John Q. Hammer Community: Lot: NA

Address: Anyplace

City: Miami State: FL Zip:

**Air Leakage Test Results** *Passing results must meet either the Performance, Prescriptive, or ERI Method*

**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.

**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):

$$\frac{\text{CFM}(50) \times 60 \div 18000}{\text{Building Volume}} = \text{ACH}(50)$$

**PASS**

When ACH(50) is less than 3. Mechanical Ventilation installation

Method for calculating building volume:

- Retrieved from architectural plans
- Code software calculated
- Field measured and calculated

**Duct Leakage Test Results**

System 1	_____ cfm25
System 2	_____ cfm25
System 3	_____ cfm25
Sum of others	_____ cfm25
Total of all	_____ cfm25

**Prescriptive Method** cfm25 (Total)  
To qualify as "substantially leak free" Qn Total must be less than or equal to 0.04 if air handler unit is installed. If air handler unit is not installed, Qn Total must be less than or equal to 0.03. This testing method meets the requirements in accordance with Section R403.3.3.  
Is the air handler unit installed during testing?  YES (\*0.04)  NO (\*0.03)

**Performance/ERI Method** cfm25 (Out or Total)  
To qualify using this method, Qn must not be greater than the proposed duct leakage Qn specified on Form R405-2020 or R406-2020.  
Leakage Type selected on Form R405-2020 (EnergyCalc) or R406-2020 (EnergyCalc) or R406-2020 Qn specified on Form R405-2020 (EnergyCalc) or R406-2020 (EnergyCalc) or R406-2020

$$\frac{\text{Total of all systems} + 2000}{\text{Total Conditioned Square Footage}} = \text{Qn}$$

**PASS**  **FAIL**

Duct tightness shall be verified by testing in accordance with ANSI/RESNET/ICC380 by either individuals as defined in Section 553.993(5) or (7), Florida Statutes, or individuals licensed as set forth in Section 489.105(3)(f), (g) or (i), Florida Statutes.