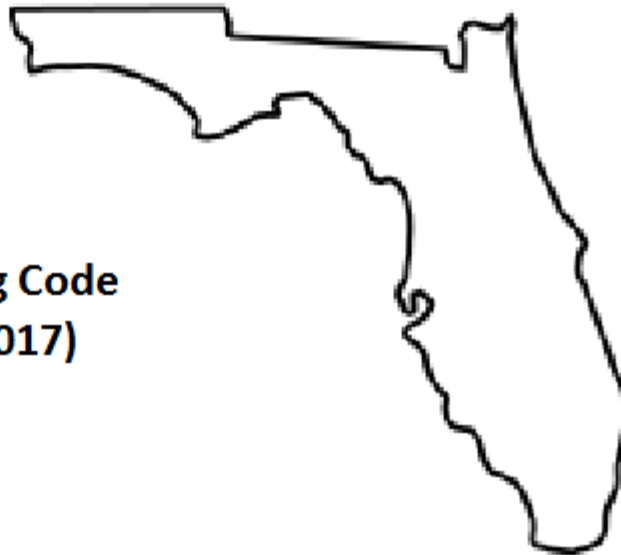


# RIGHT - ENERGY® Florida 2017

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Compliance Supplement Instruction Guide

**Florida Building Code  
Sixth Edition (2017)**





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# Right-Suite® Universal Right-Energy® Florida 2017 Compliance Supplement

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## Approval for Compliance

Right-Energy Florida 2017 is a module within Wrightsoft's Right-Suite Universal (RSU) software program that supports demonstration of compliance with the Florida Energy Code Energy Conservation, Sixth Edition (2017) ("Code"). The Code applies to residential buildings and the buildings' sites and associated systems and equipment.

Note also that Right-Energy® Florida 2017 is approved only for *residential, stand-alone, single-family* compliance. RSU includes non-residential loads and duct design methods. However, the Florida Building Commission specifies distinct procedures for building types other than those listed above and these are not yet supported in Right-Energy® Florida 2017.

Right-Suite® Universal with the Right-Energy® Florida 2017 module may be used to show compliance with the Florida Energy Code only when the following reference documents are readily available to the program user:

- Florida Energy Code
- Energy Simulation Tool Approval: Technical Assistance Manual (TAM 2017-1.0)

## Overview

The Florida Energy Code Energy Conservation, Sixth Edition (2017) (Code) allows compliance using either a prescriptive or performance method. The prescriptive method is found in the Code (see Related Publications). The performance method provides additional flexibility. The current release of Right-Energy® Florida 2017 supports the Performance method for residential, stand-alone, single-family buildings only.

The performance method uses building modeling software to demonstrate compliance by comparing the calculated energy use of the project building (called the Proposed Design) to that of a building with the same geometry but with reference energy performance characteristics (the Standard Design). The Code (see Related Publications) explains how the Proposed and Standard Designs are determined. If you have questions about how the software models a building feature, refer to the Code.

This manual is a guide to the use of Right-Energy® Florida 2017. The manual assumes working knowledge of RSU operation. In addition, knowledge of the Code is helpful. The Code is extensive and complex. Right-Energy® Florida 2017 will help you efficiently prepare compliance documents, but as the submittal author, you are responsible for their content.

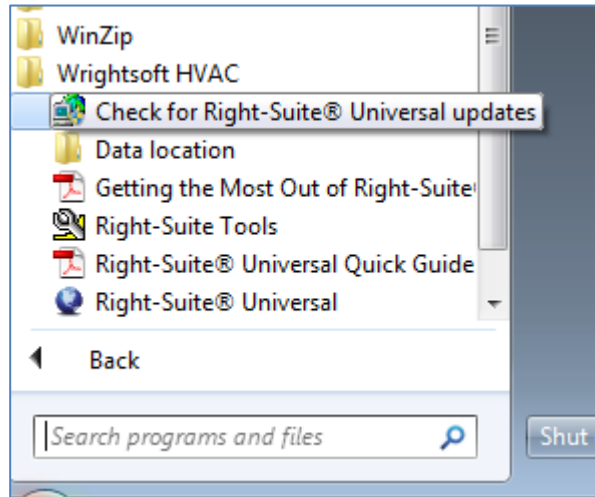
### Obtaining and Installing Right-Energy® Florida 2017

Right-Energy® Florida 2017 is a licensed feature of Right-Suite Universal, meaning you must either add that feature to your existing license or order it if you are a new user. See [www.wrightsoft.com](http://www.wrightsoft.com) for information on ordering and downloading the program.

If you are a new user of RSU, you should take some time to learn operation of the program before diving into Florida 2017 compliance. See the Right-Draw® and Load Calculations chapters (at least) of the *RSU Quick Guide* and refer to *Getting the Most Out of Right-Suite® Universal* Chapters 1 – 9. These documents are available under the Help menu choice in RSU (as is this Compliance Supplement). Also useful is the extensive set of training videos available via [www.wrightsoft.com/university](http://www.wrightsoft.com/university).

Note that RSU is distributed under several product names. For example, a version for Carrier dealers is published using the ComfortBuilder name. The function of Right-Energy® Florida 2017 is *identical* in these custom versions, so all information in this Compliance Supplement is applicable to all RSU customizations and the Florida Building Commission certification approval applies to all.

You can verify that your installed copy of RSU is current and obtain updates if needed by using the “Check for Right-Suite Universal updates” choice in the Wrightsoft HVAC folder of All Programs (folder and application names will differ in customized versions), as shown here --



Note that even if you have a license for Right-Energy® Florida 2017, some compliance-related inputs may not be visible. **On the Options menu, the choice “Enable Right-Energy® Florida 2017 UI” must be checked for all inputs to be available.** If your project does not require compliance analysis, you may wish to leave this option un-checked.

### Related Publications

The Florida Building Commission makes available several publications that document in detail the standards and compliance procedures. These, along with a wealth of additional information, can be downloaded at no cost via <http://www.FloridaBuilding.org/c/default.aspx>.

### 2017 Compliance

- *Florida Building Code, Energy Conservation, 6<sup>th</sup> Edition (2017)* (ISBN: 978-1-60983-695-5) contains the official code adopted by the Florida Building Commission.
- *Energy Simulation Tool Approval Technical Assistance Manual (TAM-2017-1.0, June 15, 2017)* explains the guidelines for approval of the compliance tools (compliance software programs) used to demonstrate compliance with the Florida Building Code (also contains sample compliance forms).

Documents can also be purchased from the Energy Commission publications website - <http://www.FloridaBuilding.org/c/default.aspx>

## File Locations

RSU places the PDF of the Florida 2017 reports in the same folder as the source RSU project.

For example, for a project named SimpleHouse.rup located in Wrightsoft HVAC, the report PDF file (after running compliance reports) would be:

```
Wrightsoft HVAC
  SimpleHouse.rup
  SimpleHouse-Performance.pdf
```

## Florida 2017 Data in Right-Suite Universal

Right-Suite Universal (RSU) has traditionally been aimed at design tasks – loads calculations and duct layout, for example. In contrast, Florida Building Code 2017 compliance procedures support energy efficiency and embody many carefully crafted rules about analysis assumptions. From the RSU point of view, there are two classes of data --

- **Equivalent data** are items that RSU uses and can be also be used for Florida 2017 compliance. Examples include surface areas and HVAC equipment types.
- **Florida 2017-only data** are items that are needed for compliance but have no other uses in RSU. A simple example is the project's windows can have impact rated glass. For this situation, new screens or input fields have been added to RSU.

The compliance implications of specific RSU inputs are discussed in the Input Details section of this Supplement. It must be again emphasized that Florida 2017 Compliance procedures are not simple. Care must be used to make sure your RSU project accurately reflects the residence. **The report produced by the analysis is the sole information used by building officials for inspection and enforcement.** What appears on RSU screens or reports is useful for checking your work but ultimately has no compliance significance unless it is properly represented on the Florida 2017 Compliance reports.

## Mandatory Requirements

Note that there are a number of Mandatory requirements specified in the Code. These requirements apply when compliance is demonstrated using either prescriptive or performance methods. When you start the compliance run, RSU will check that your project complies with the Mandatory Requirements. If any fail, they will be noted in the list on the screen along with the Code reference that applies. Some of the Mandatory Requirements will prevent the compliance from running. Some are allowed under certain circumstances. You should review the referenced Code section to confirm that your project meets these circumstances. There are cases where RSU will model projects that include features that do not satisfy all Mandatory Requirements. Beware! It is your responsibility to ensure your design meets all of the requirements of the Code, including a Pass from Right-Energy® Florida 2017. See Appendix A. Mandatory Requirements for a list of the Mandatory Requirements that are checked prior to running the compliance.

## Checklist for Compliance Submittal

The forms and documentation needed for compliance submittal include an electronic version of the Compliance reports. The first page of this set of reports is a checklist of the other reports. Supporting documentation that could also be required are the RSU load calculation reports, the roofing material rating from the Cool Roof Rating Council, solar water heating documentation to support a modeled solar fraction, AHRI certified efficiency of cooling, heating and/or water heating equipment, NFRC certified U-factor and Solar Heat Gain Coefficient for windows and skylights, Air Barrier and Insulation Inspection Component Criteria Report, Envelope Leakage Test Report, and Duct Leakage Test Report.

## Terminology

**Proposed Design.** The building that you draw in RSU is called the Proposed Design. The energy use of the Proposed Design is compared to the Standard Design to determine if the building complies with the standards.

**Standard Design.** Right-Energy® Florida 2017 creates a version of the proposed building that has the features of the Code in the specified climate zone to establish the allowed energy budget or Standard Design. The Standard Design is compared to the Proposed Design.

RSU will look up the appropriate climate zone based on the Weather Location in the Project Information Screen.

Detailed information about how the Standard Design is established can be found in the *Florida Building Code, Sixth Edition (2017), Energy Conservation*.

**Mandatory Requirements.** Projects for the performance compliance method should comply with section R405 and the provisions identified as Mandatory in section R401 through R404 of the Code. Any requirement that is Mandatory (some are modeled, some are not) shouldn't be removed from the proposed building.

**Climate Zone.** Florida has 2 Climate Zones. The Climate Zone can be found in the Code, Table R301.1, by looking up the county. The Climate Zone determines the measures that are part of the building's Standard Design. In RSU, the Climate Zone is selected automatically based on the Weather Location.



Counties in Florida Climate Zone 1	Broward, Collier, Hendry, Lee, Miami-Dade, Monroe, Palm Beach
Counties in Florida Climate Zone 2	Alachua, Baker, Bay, Bradford, Brevard, Calhoun, Charlotte, Citrus, Clay, Columbia, DeSoto, Dixie, Duval, Escambia, Flagler, Franklin, Gadsden, Gilchrist, Glades, Gulf, Hamilton, Hardee, Hernando, Highlands, Hillsborough, Holmes, Indian River, Jackson, Jefferson, Lafayette, Lake, Leon, Levy, Liberty, Madison, Manatee, Marion, Martin, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Pasco, Pinellas, Polk, Puntam, Santa Rosa, Sarasota, Seminole, St. Johns, St. Lucie, Sumter, Suwannee, Taylor, Union, Volusia, Wakulla, Walton, Washington

## Procedures in Brief

This section is a brief guide on how to perform Florida 2017 compliance analysis in Right-Suite Universal (RSU) using the Right-Energy® Florida 2017 module. The goal is to walk through the process without getting into the details. Two other sections follow that provide information from additional viewpoints –

- Step-by-step Example shows how to enter and perform compliance analysis on a simple project.
- Detailed Input Description fully documents all inputs related to Florida 2017 compliance.

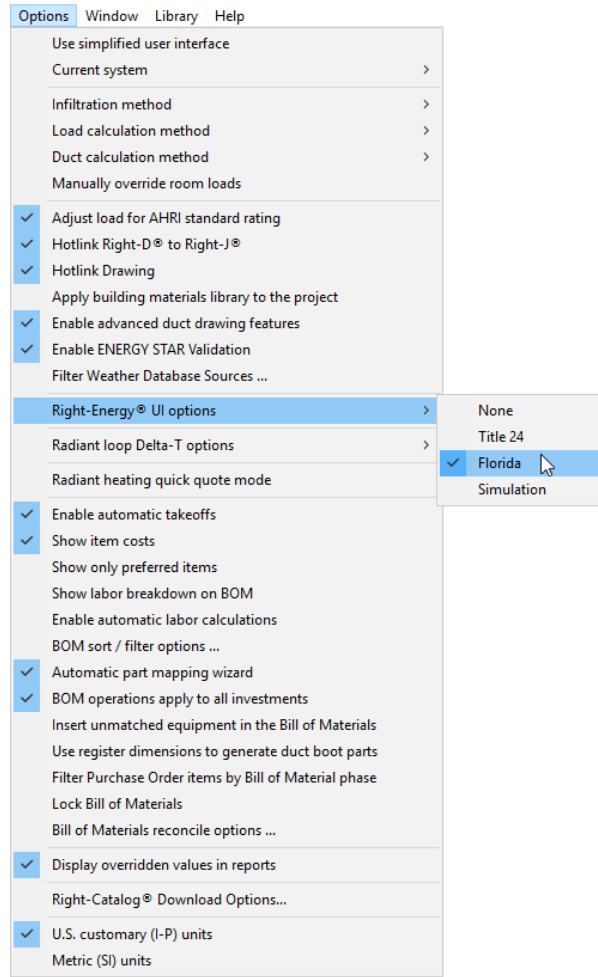
There are only two major steps involved in preparing a building for Florida 2017 Code compliance:

1. Enter the building data for the load calculation
2. Enter the energy data for Florida 2017 Code compliance

## Enter project data

Start a new project in RSU (or open an existing one).

From the **Options** menu at the top of the RSU screen, make sure that **'Right-Energy® UI options | Florida'** is checked -- this enables some project inputs that are used only for Florida 2017 and disables some project inputs that are not used for Florida 2017.



If that option is missing or grey, you may need to update your software or make sure your license has Right-Energy® Florida 2017 enabled. Go to **Help | Licensing** to see your support subscription expiration date (it must be current to update) and licensed features. To add/renew your WSS or add Right-Energy® Florida 2017, contact sales at [sales@wrightsoft.com](mailto:sales@wrightsoft.com) or 1-800-225-8697 ext. 3.

Using Right-Draw and other input screens, enter the description of the residence to be analyzed. Information required includes –

### Project Information Screen

1. Building address (including the zip code), Contractor information, front orientation, number of bedrooms, weather location

### Right-Draw Construction Screens and Property Sheets

2. Conditioned floor area and average ceiling height
3. Attic/roof details including roofing material
4. Ceilings below attic and vaulted ceiling R-values
5. Wall areas, orientation, and construction details,
6. Door areas and orientation
7. Slab or raised floor area and construction details
8. Window and skylight areas, orientation, U-factor, Solar Heat Gain Coefficient
9. Building overhang and side fin shading

### Equipment Screens

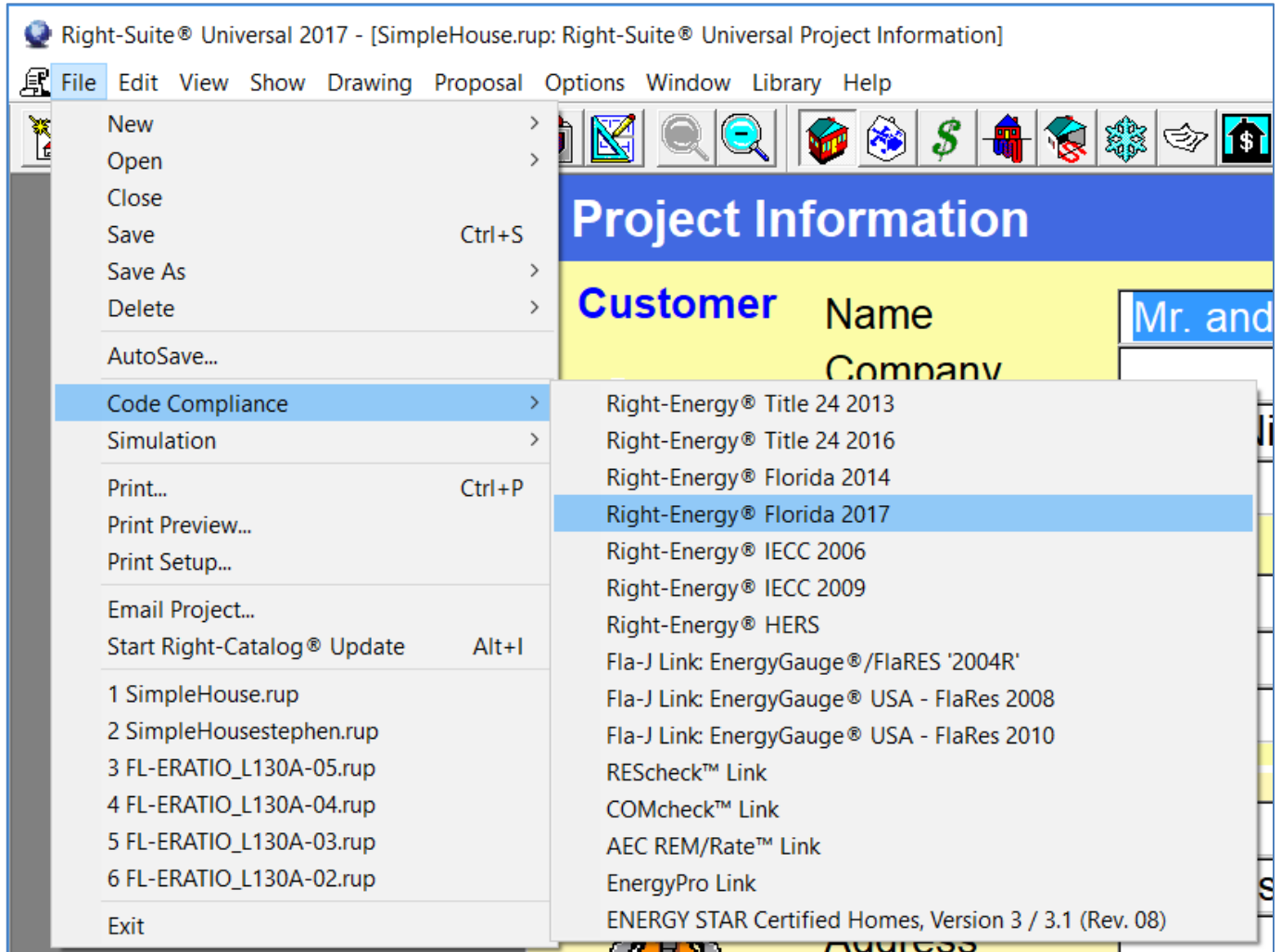
10. Mechanical heating and cooling equipment type and efficiency
11. Distribution system location and construction details
12. Domestic water heating system details, including type of water heating equipment, fuel type, efficiency, distribution system details.

### Zone Information Screen

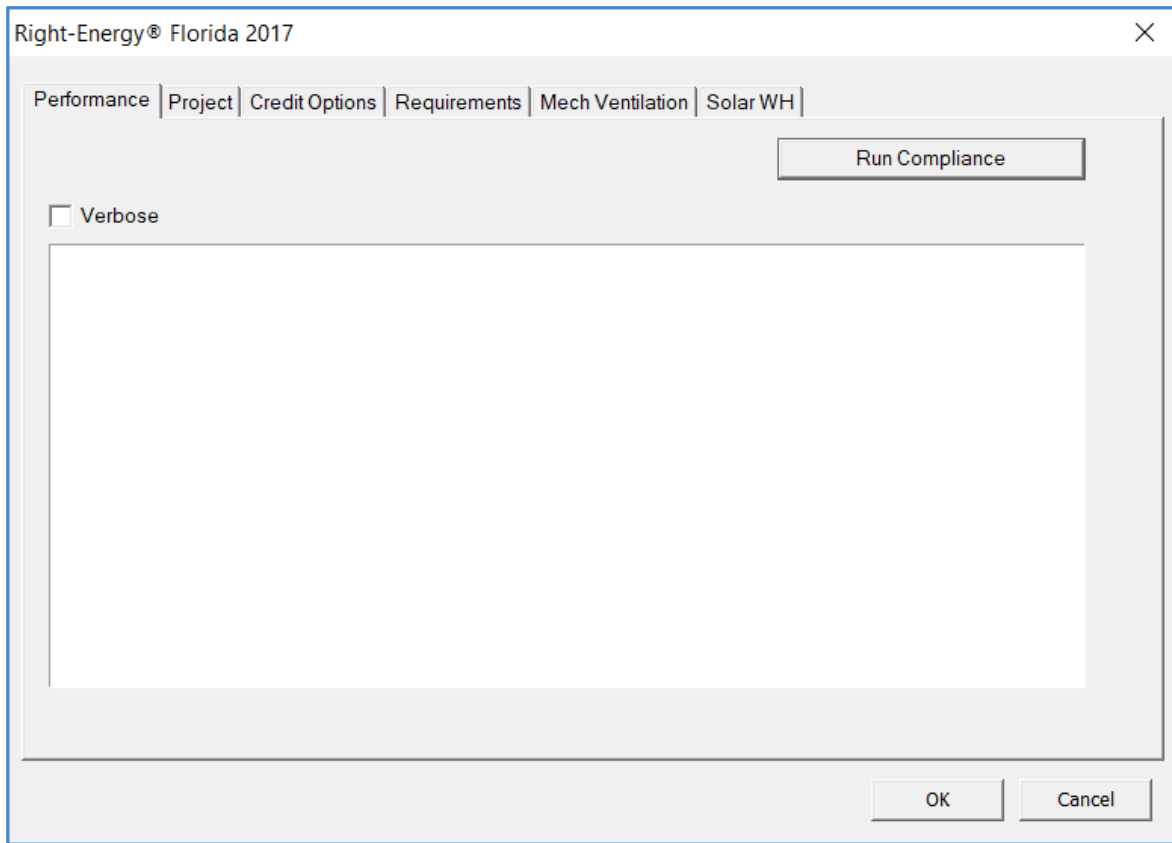
13. Method for providing mechanical ventilation

As discussed under *Florida 2017 Data in Right-Suite Universal*, much of the required information is available in RSU, so you need enter only standard data that would be typically used for load calculations. The main example of this type of information is surface areas and constructions – the required Right-Energy® Florida 2017 data is derived directly from the Right-Draw drawing and properties.

There are a number of screens that capture information specific to Florida 2017 analysis. These are accessed via the Code Compliance choice on the File menu --



This choice brings you to the following --

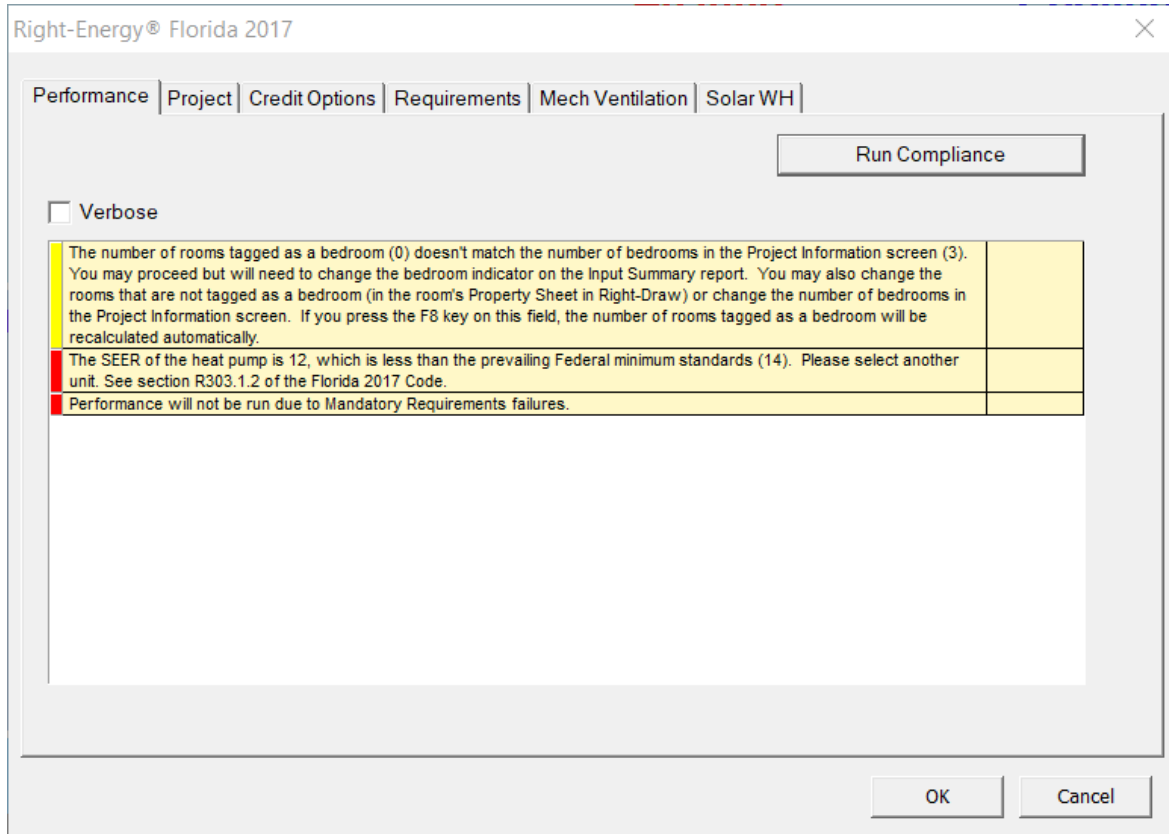


The various tabs allow input of Florida 2017 specific information not found on other RSU screens. See Step-by-Step Example and Detailed Input Description for specifics.

## Run Compliance

Once input has been prepared, save your work (via File | Save) and then press Run Compliance on the Run tab of the Right-Energy® Florida 2017 Performance screen (shown above).

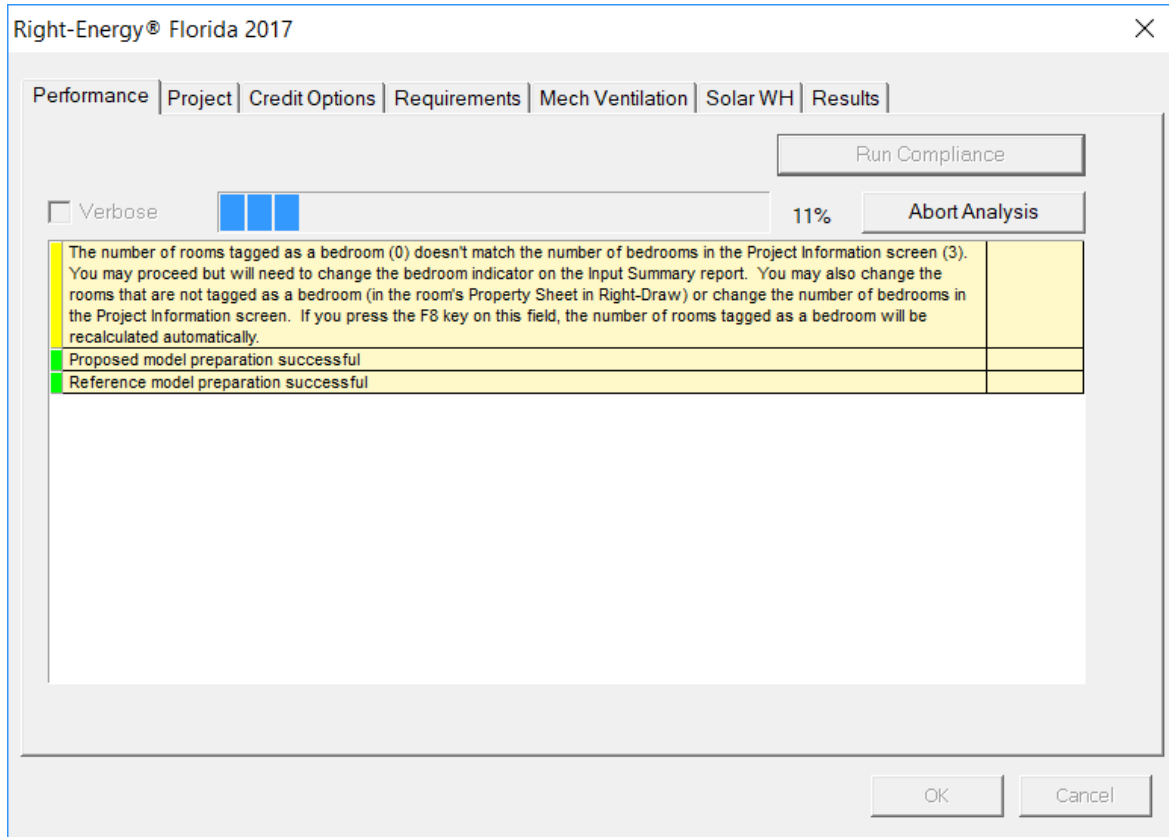
At this point, Right-Energy® Florida 2017 gathers information from the RSU project. Right-Energy® Florida 2017 then checks the Mandatory requirements. Any error or warnings for the Mandatory requirements are shown in a window on the Performance tab. If there are no errors in the Mandatory requirements, the compliance run will begin. Any error or warnings for the compliance run are also shown in a window on the Performance tab --



Warning messages are shown with a yellow tag, as circled above. Warnings do not prevent the run from proceeding, but should be investigated (see Appendix A and B).

Error messages have a red tag. The run will not proceed if there are errors.

When the analysis gets underway, a small progress bar will appear to keep you informed of run progress --





When the run is complete, the overall energy model results are displayed. PASS or FAIL is shown near the lower right corner of this screen.

The screenshot shows the 'Results' tab of the Right-Energy Florida 2017 software. It displays a 'Compliance Summary' table comparing 'Proposed' and 'Reference' values for various energy metrics. The overall status is 'PASS'.

	Proposed			Reference		
	Load (MBtu/yr)	Fuel (MBtu/yr)	Electricity (kWh)	Load (MBtu/yr)	Fuel (MBtu/yr)	Electricity (kWh)
Heating energy	0.70	0.00	86.96	3.53	0.00	396.98
Heating fan			9.84			45.53
Cooling energy	51.40		3652.99	54.73		3859.66
Cooling fan			707.57			756.10
DHW	7.57	0.00	831.62	7.57	0.00	3027.91
<b>Total</b>	<b>59.67</b>	<b>0.00</b>	<b>5288.98</b>	<b>65.84</b>	<b>0.00</b>	<b>8086.18</b>

	Prop.	Ref.	e-Ratio
Heating	0.77	3.53	0.219
Cooling	51.71	54.73	0.945
DHW	2.15	7.57	0.284
<b>Total</b>	<b>54.63</b>	<b>65.84</b>	<b>0.830</b>

Project name: SimpleHouse  
Run date: 10/06/2017 13:13:07

**PASS**

Buttons: Print, OK, Cancel

Click on the 'Print' button to generate and view the reports. When the reports are generated, you are given the opportunity to view the reports (not shown here, see Appendix C for an example). The reports are generated as a PDF document that you can view and print if you have a PDF viewer. The PDF document will be generated in the same folder as the original RSU project (.rup) file. The exact location of the PDF document will appear in the screen below.

The dialog box titled 'Compliance Report' contains the following text:

PDF compliance report successfully generated (C:\Documents\Wrightsoft HVAC\SimpleHouse-Performance.pdf).

Would you like to view the report?

Buttons: Yes, No

### Investigating errors

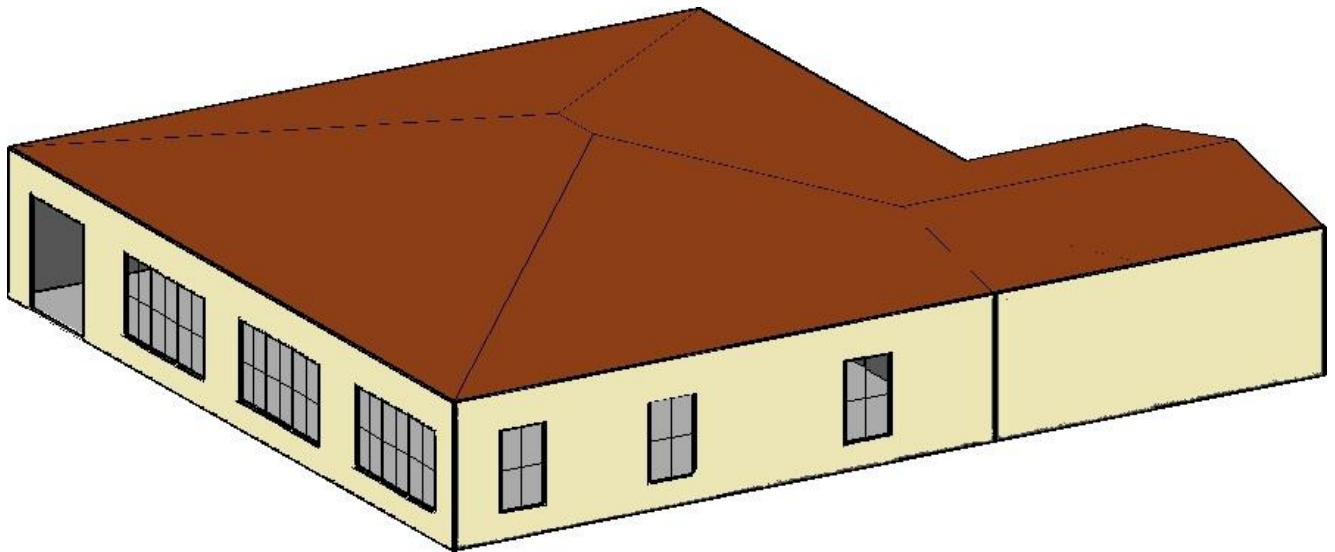
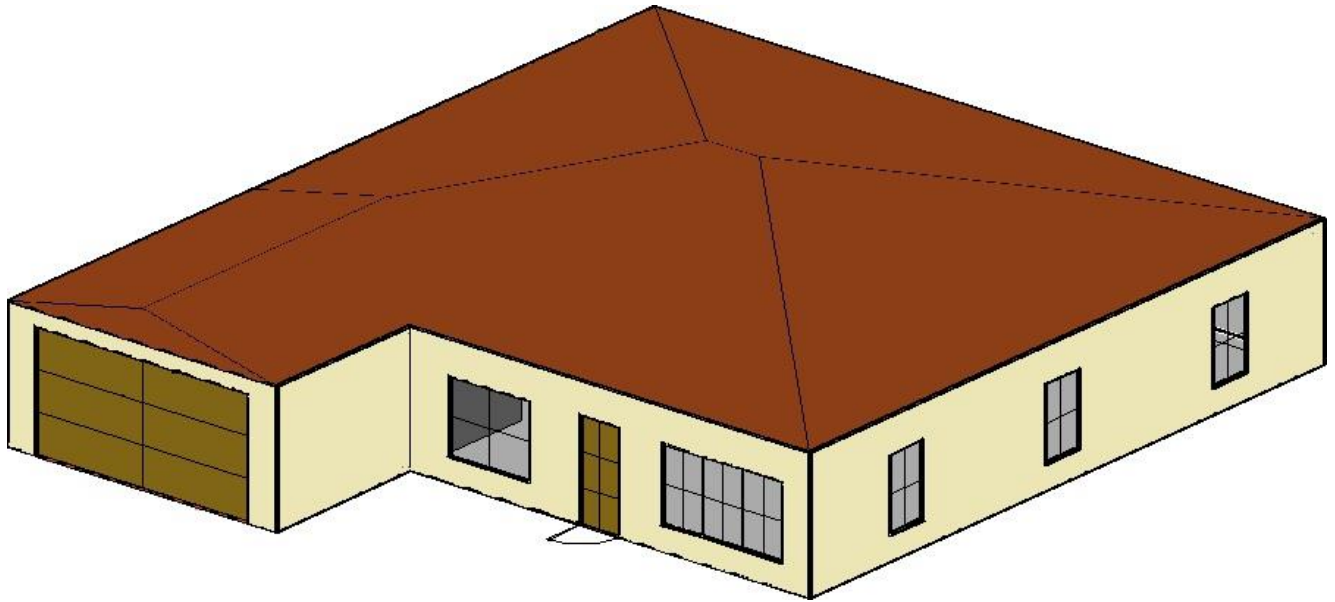
Some errors are self-explanatory and can be immediately corrected via changes to the RSU project. Others may require you to review the Code to determine exactly what needs to be changed.

### Next steps

Once you have completed a run and achieved PASS, you should review the printed reports (both RSU and Compliance reports) carefully to verify that they accurately represent your project. You should make corrections and re-run as needed.

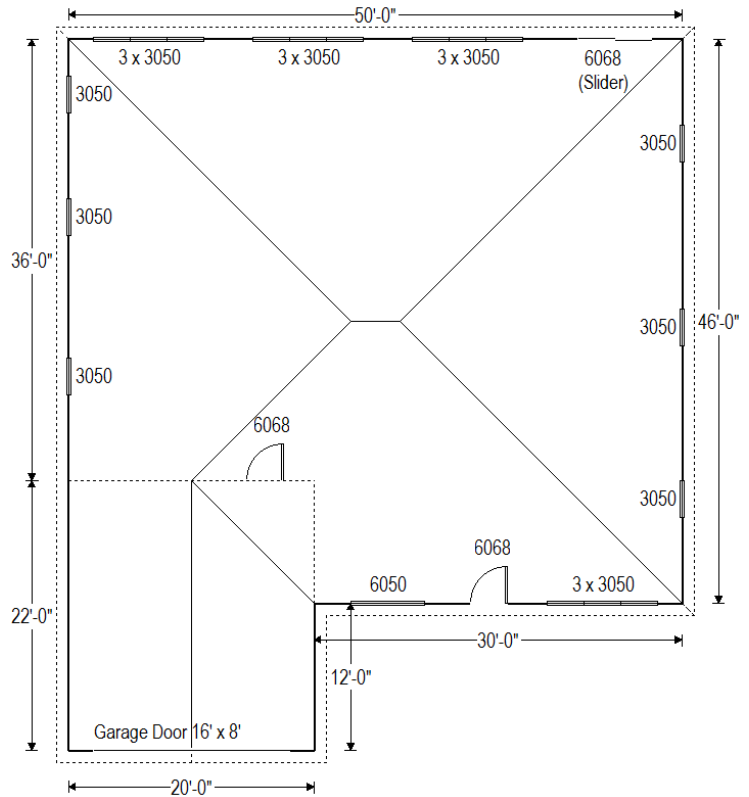
## Step-by-Step Example

This example will take you through the steps necessary to prepare a project for Florida 2017 Compliance in RSU. The house pictured below has a living area, 9-ft ceilings with an attic above, and a slab-on-grade floor. There is also an unconditioned garage with an attic above. It is located in Tampa.



Example Building Overview

Envelope Area Description	
Component	Description
Ceiling height	9 ft
Conditioned floor area	2100 ft <sup>2</sup>
Conditioned volume	18,900 ft <sup>3</sup>
Gross areas	
Slab	2100 ft <sup>2</sup>
Slab perimeter	162 ft
Ceiling	2100 ft <sup>2</sup> , vent attic
Front wall (South)	270 ft <sup>2</sup>
Front garage wall	180 ft <sup>2</sup> , shaded
Left wall (West)	324 ft <sup>2</sup>
Left garage wall	90 ft <sup>2</sup> , shaded
Back wall (North)	450 ft <sup>2</sup>
Right wall (East)	414 ft <sup>2</sup>
Front door	20 ft <sup>2</sup>
Door from garage	20 ft <sup>2</sup>
Garage door	128 ft <sup>2</sup>
Overhangs	1 ft



Building Material Description (required additions in custom layer mode in <b>bold</b> )	
Component	Description
Exterior Wall (Main House)	Frame wall, R4 exterior insulation finishing system, R-15 cavity insulation, 2x4 wood framing, 16" on center, 1/2" gypsum board interior finish
Partition Wall (Main House)	Frame wall, 1/2" gypsum board exterior finish, r-15 cavity insulation, 2x4 wood framing, 16" on center, 1/2" gypsum board interior finish
Exterior Wall (Garage)	Frame wall, stucco exterior, 2x4 wood framing, 16" on center, 1/2" gypsum board interior finish
Ceiling (Main House)	Attic ceiling, tile roof, vented attic with radiant barrier, r-38 ceiling insulation, 2x4 wood framing, 16" on center, 1/2" gypsum board interior finish
Ceiling (Garage)	Attic ceiling, tile roof, air gap, vented attic with radiant barrier, r-0 ceiling insulation, 2x4 wood framing, 16" on center, 1/2" gypsum board interior finish
Floor (all)	Slab floor on grade, light dry soil, no insulation, 80% Carpet / 20% Bare
Doors (3068)	Wood door, solid core
Garage Door	Wood door, overhead wood panel
Windows (all)	U-0.32, SHGC-.25, Shading as follows: Overhang 1' horizontally out and 1.33' vertically up

## Getting Started

- Start RSU or start a new project from the default template
- Select **Options | Right-Energy® UI options | Florida** from the RSU menu. This will limit and add input fields in RSU to those that pertain to Florida 2017 compliance.

## Customer Information

- Select **Show | Project Information** from the main menu
- Enter 'Mr. and Mrs. Henry Wagner' as the Customer name (or any name you wish).
- Enter '1516 Ninth Street' for the Customer Address
- Enter 'Tampa' for the Customer City
- Enter 'FL' for the Customer State
- Enter '33601' for the Customer Zip code
- All other Customer Information fields are optional for the purposes of successfully using Right-Energy® Florida 2017, though may be required for submittals

## Contractor/Designer Information

- Select 'Contractor' from the drop-down list in the section below the Customer information. Enter the name and/or company of the contractor that will be building this project. The name will appear on the Right-Energy® Florida 2017 reports. All of the other Contractor/Designer information fields are optional for the purposes of successfully using Right-Energy® Florida 2017, though may be required for submittals. They will appear on the standard RSU reports.

## Site

- Check the "Same as customer" box. Enter the County (Hillsborough for this example) and Lot #. These will appear on the Right-Energy® Florida 2017 reports.

## Job

- Select the Orientation as the 'Front Door' faces 'North'
- Enter 3 for the number of bedrooms (use the <F8> key to override if needed)
- Enter the appropriate Jurisdiction.

<b>Job</b>	Number	
	Date/Prep.By	Nov 06, 2013
	Orientation	Front Door
	Plan #	
	Jurisdiction	

faces: South


Number of bedrooms < 3 >

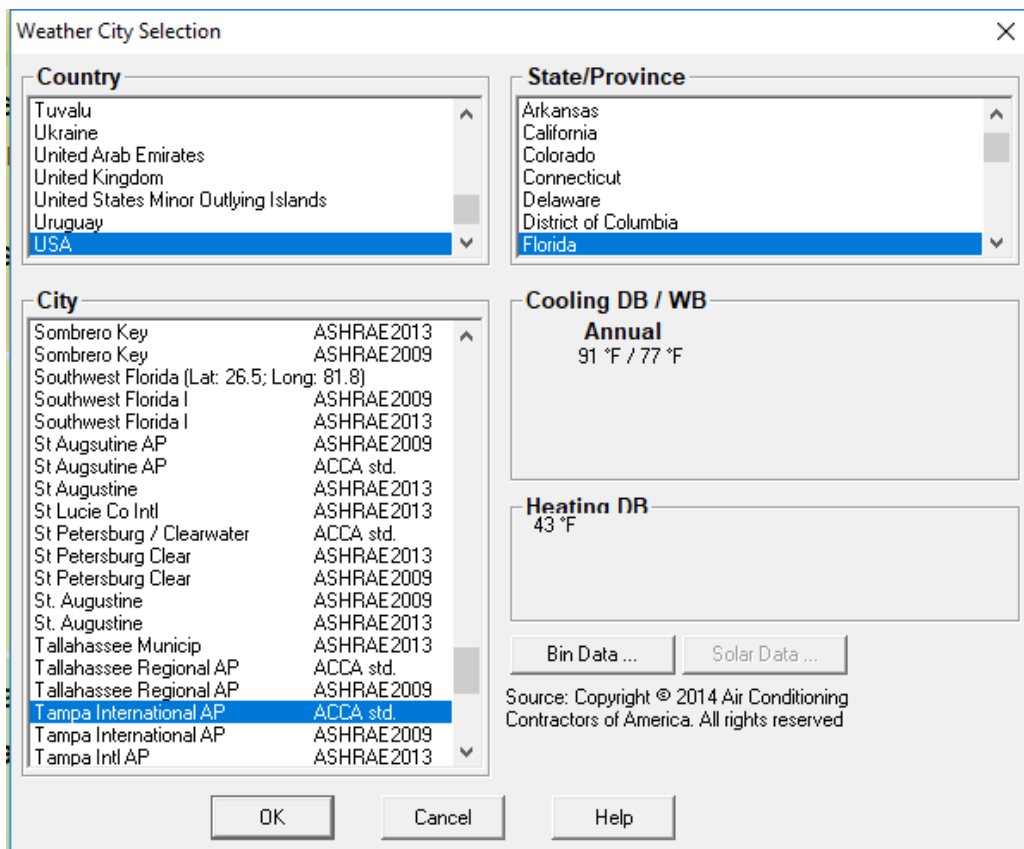
## Save

- Select **File | Save As | Project ...** to save the project before we go any further. Enter whatever project name you like – SimpleHouse.rup, for example. It is good practice to save the project periodically as you enter data. If something should happen, the saved project can be recovered – saving you from having to re-enter the data.

## Weather Location

The weather location is (indirectly) required for Florida 2017 Compliance, since a Manual J load calculation is required and to lookup the Climate Zone.

- Scroll down to the ‘Weather location’ in the ‘Location’ section.
- Click on the  button to the right of the ‘Weather location’ field.
- Select ‘Tampa International AP, Florida’. RSU includes weather data from a number of sources. There will be several Tampa choices. Select the one that has ‘ACCA std.’ next to it (unless you know that your inspector will accept other sources). Click the ‘OK’ button.



- You may notice the 'Earth temperature city' on the Project Information Screen. This is used by Right-Loop for geothermal loop calculations. You may ignore this for this example.
- Scroll down to the 'Conditions' section and verify the Heating Dry bulb temperature and Cooling Annual (Jul) Dry Bulb, Daily Range, Wet Bulb/Relative Humidity

**Conditions**

**Heating**  
 Dry bulb [ 43 ] °F      Wind speed [ 15.0 ] mph

**Cooling** Annual      Wind speed [ 7.5 ] mph

Month	DB (°F)	Daily range (°F)	WB (°F)	RH (%)	Daylight saving	Irrad ( Btu/ft <sup>2</sup> )	Avg DB (°F)	Mains (°F)
Annual (Jul)	91.0	10.0	77.0	54	<input checked="" type="checkbox"/>	0	0.0	60.0

- The weather information we have selected is used to calculate the load. However, the Performance method requires hourly weather information to do the energy simulations. Right-Energy® Florida 2017 will automatically select the correct TMY3 hourly weather file based on the Site Zip Code of the project. The selected TMY3 file will be identified in the final compliance reports.

### Right-Draw®

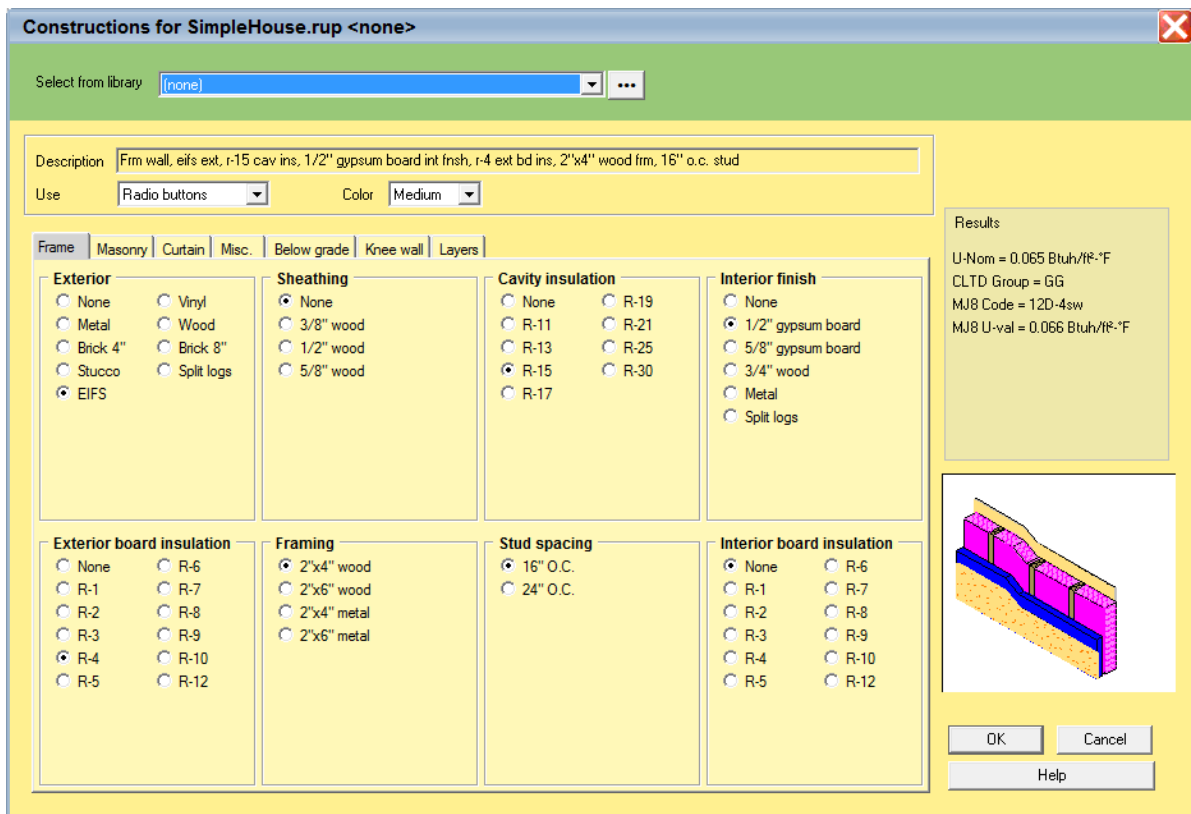
- Select **Show | Right-Draw®** to display the Right-Draw screen.
- We'll define constructions first. Find the Default Construction bar at the top of the drawing screen:



- Each button points to a different type of material (wall, ceiling, floor, window, and door)
- Default Materials are a *starting point*. Changes can be made after the building is drawn

## Default Wall

- Click on the wall type in the Default Construction bar (right middle)
- Select 'Radio buttons' from 'Use' drop down. Select the 'Frame' tab.
- Select the following radio button options:
  - **Color:** Medium
  - **Exterior:** EIFS; **Sheathing:** None
  - **Cavity insulation:** R-15
  - **Interior finish:** ½" gypsum board
  - **Exterior board insulation:** R-4
  - **Framing:** 2" x 4" wood
  - **Stud spacing:** 16" O.C.
  - **Interior board insulation:** None
- Click the 'OK' button to accept this construction and return to the Right-Draw screen.





## Default Ceiling

- Click on the ceiling type in the Default Construction bar (top left)

Constructions for Supplement finished 6-25-14.rup <none>

Select from library:

Description:

Use:  Color:

Flat Roof/Ceiling | Sloped Roof/Ceiling | **Ceiling under Attic** | Ceiling Partition | Layers

<b>Roof material</b> <input type="radio"/> Asphalt shingles <input type="radio"/> Wood shingles <input type="radio"/> Wood shakes <input checked="" type="radio"/> Tile, slate, concrete <input type="radio"/> Metal <input type="radio"/> Tar and gravel <input type="radio"/> Membrane	<b>Roof insulation</b> <input checked="" type="radio"/> None <input type="radio"/> R-2 <input type="radio"/> R-3 <input type="radio"/> R-4 <input type="radio"/> R-5 <input type="radio"/> R-6 <input type="radio"/> R-7 <input type="radio"/> R-8 <input type="radio"/> R-10 <input type="radio"/> R-12 <input type="radio"/> R-15 <input type="radio"/> R-17 <input type="radio"/> R-18 <input type="radio"/> R-20 <input type="radio"/> R-22 <input type="radio"/> R-25 <input type="radio"/> R-28 <input type="radio"/> R-31 <input type="radio"/> R-35	<b>Attic type</b> <input type="radio"/> Unvented <input type="radio"/> Unvented w/ radiant bar <input type="radio"/> Vented <input checked="" type="radio"/> Vented w/ radiant bar <input type="radio"/> Fan vented <input type="radio"/> Fan vented w/ radiant bar <input type="radio"/> Encapsulated	<b>Ceiling insulation</b> <input type="radio"/> None <input type="radio"/> R-7 <input type="radio"/> R-11 <input type="radio"/> R-13 <input type="radio"/> R-15 <input type="radio"/> R-19 <input type="radio"/> R-21 <input type="radio"/> R-25 <input type="radio"/> R-28 <input type="radio"/> R-30 <input checked="" type="radio"/> R-38 <input type="radio"/> R-44 <input type="radio"/> R-50 <input type="radio"/> R-56
<b>Ceiling finish</b> <input type="radio"/> None <input checked="" type="radio"/> 1/2" gypsum board <input type="radio"/> 5/8" gypsum board <input type="radio"/> 3/4" wood <input type="radio"/> Metal <input type="radio"/> Suspended, plaster board <input type="radio"/> Suspended, fiber board <input type="radio"/> Suspended, acoustical <input type="radio"/> Suspended, foam board	<b>Suspended ceiling insulation</b> <input checked="" type="radio"/> None <input type="radio"/> R-2 <input type="radio"/> R-4 <input type="radio"/> R-6 <input type="radio"/> R-7 <input type="radio"/> R-11 <input type="radio"/> R-19 <input type="radio"/> R-30	<b>Plenum</b> <input checked="" type="radio"/> Dead air <input type="radio"/> Return air	<b>Results</b> U-Nom = 0.027 Btuh/ft <sup>2</sup> ·F CLTD Group = 30 MJ8 Code = 16ER-38td MJ8 U-val = 0.026 Btuh/ft <sup>2</sup> ·F

OK Cancel Help

- Select 'Medium' from the Color drop-down list.
- Click on the 'Ceiling under Attic' tab
- Select the following radio button options:
  - Color:** Medium
  - Roof material:** Tile, slate, concrete
  - Roof insulation:** None
  - Attic type:** Vented w/ radiant bar
  - Ceiling insulation:** R-38
  - Ceiling finish:** ½" gypsum board
- Click the 'OK' button to accept this construction and return to the Right-Draw screen.

Note that the 'Attic type' above is for the load calculation. The 'Attic Type' in the Input Summary Report will be either 'Full attic' if the building has an unconditioned attic (a room that has the room type set to 'Uncond Attic') or 'No attic' if the building doesn't have an unconditioned attic.

An 'Encapsulated Attic' is a tightly sealed attic that has foam insulation under the deck and on the gables (and knee walls, when applicable) and is an unconditioned space. See ACCA Manual J Eighth Edition, Appendix 4, Section A4-17 for details.

## Default Floor

- Click on the floor type in the Default Construction bar (bottom left).

**Constructions for SimpleHouse.rup <none>**

Select from library: (none)

Description: Bg floor, light dry soil, on grade depth, carp 80% fir frsh

Use: Radio buttons

Exterior Floor | Floor Partition | **On/Below Grade** | Layers

**Soil type**

- Light dry
- Heavy dry or light damp
- Heavy damp

**Edge insulation**

- None
- 1.5'
- Edge
- 2'
- 8"
- 3'
- 1'
- 4'
- 16"

**Slab insulation**

- None
- Perimeter interior
- Full interior
- Perimeter exterior
- Full exterior

**Edge ducts**

- None
- Perimeter ducts

**Below grade depth**

- On grade
- 5'
- 1.5'
- 6'
- 2'
- 6.5'
- 3'
- 8'
- 4'
- 10'

**Edge insulation R-value**

- R-3
- R-10
- R-5
- R-15
- R-7
- R-20

**Slab insulation R-value**

- R-3
- R-18
- R-5
- R-20
- R-8
- R-22
- R-10
- R-25
- R-12
- R-28
- R-15
- R-30

**Floor finish**

- None
- Carpet
- 80% carpet / 20% bare
- Tile
- Hardwood
- Vinyl

**F280 wall insulation**

- None
- 2' below grade interior
- Full interior
- 2' below grade exterior
- Full exterior

**F280 wall insulation R-value**

- R-3
- R-18
- R-5
- R-20
- R-8
- R-22
- R-10
- R-25
- R-12
- R-28
- R-15
- R-30

**Results**

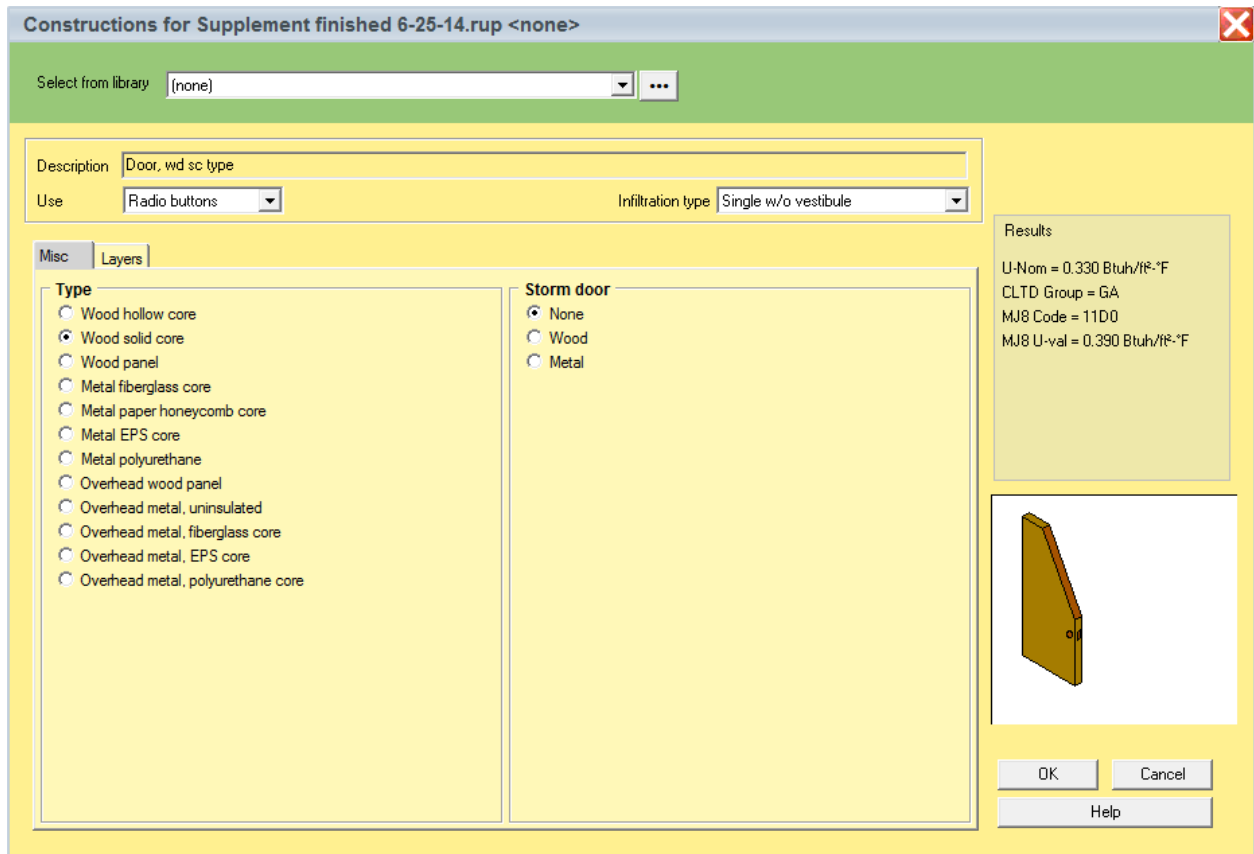
U-Nom = 0.485 Btu/h/ft²·F  
 CLTD Group = Z  
 MJ8 Code = 22A-tpl  
 MJ8 U-val = 0.000 Btu/h/ft²·F

OK Cancel Help

- Select 'Radio buttons' from 'Use' drop down. Select the 'On/Below Grade' tab.
- Select the following radio button options:
  - Soil type:** Light dry
  - Below grade depth:** On grade
  - Edge insulation:** None
  - Slab insulation:** None
  - Edge ducts:** None
  - Floor finish:** 80% carpet / 20% bare
- Click the 'OK' button to accept this construction and return to the Right-Draw screen.

## Default Door

- Click on the door type in the Default Construction bar (bottom right).



- Select 'Radio buttons' from 'use' drop down. Select the 'Misc' tab.
- Select the following radio button options:
  - Type:** Wood solid core
  - Storm Door:** None
- Click the 'OK' button to accept this construction and return to the Right-Draw screen.

## Default Window

- Click on the glazing type in the Default Construction bar (middle right)

Constructions for SimpleHouse.rup <none>

Select from library: (none)

Description: 2 glazing, clr low-e outr, air gas, insulated vinyl frm mat, clr innr, 1/4" gap, 1/4" thk

Use: Custom values

Custom

Glazing type: Clear

Number of glazings (not including storm window): 1

NFRG rated  Has storm window

Without storm window: U-value 0.320, SHGC 0.25

With storm window: U-value 0.320, SHGC 0.25

Frame type: None

Results

SHGC w/o storm = 0.25  
U-val w/o storm = 0.320  
MJ8 Code = 2 glazing, clr low-e  
MJ8 SHGC w/o storm = 0.25  
MJ8 U-val w/o storm = 0.320

Picture Not Available

OK Cancel Help

- Select 'Custom values' from the drop-down list at the top of the screen.
- Select 'Clear' for the Glazing type, check the NFRG rated box, enter 0.320 for the U-value, enter 0.25 for the SHGC, enter 1 for the Number of glazings, un-check the Has storm window, and set the Frame type to 'None'.
- Click the 'OK' button to accept this construction and return to the Right-Draw screen.

## Default Partition Ceiling and Vaulted Ceiling

These last two default constructions are found in a different screen.

- Click on the 'More constructions ...' button to the right of the Default Door button.

Construction Type	Description
Partition Wall	Frm wall, stucco ext, r-13 cav ins, 2"x4" wood frm, 16" o.c. stud
Partition Ceiling	Attic ceiling, asphalt shingles roof mat, r-31 roof ins, r-30 ceil ins
Partition Floor	Flr floor, frm flr, 6" thkns, carpet flr fnsh, r-2 ext ins, r-19 cav ins, tight crwl ovr, r-11 wall insul
Vaulted Ceiling	Rf/clg ceiling, asphalt shingles roof mat, wd cons, r-6 deck ins, 1" thkns
Skylight	Sky glazing, small, wood curb, no shaft lgt shaft, wd sash
Interior Wall	Frm wall, stucco ext, r-13 cav ins, 2"x4" wood frm, 16" o.c. stud

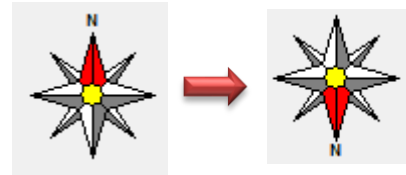
Buttons: OK, Cancel

- Click on the Partition Ceiling button and enter the following in the 'Ceiling under Attic' tab:
- Select the following radio button options to be consistent with the ceiling construction on page 26:
  - **Color:** Medium
  - **Roof material:** Tile, slate, concrete
  - **Roof insulation:** None
  - **Attic type:** Vented w/ radiant bar
  - **Ceiling insulation:** R-38
  - **Ceiling finish:** ½" gypsum board
- Click on the 'OK' button to return to the 'Additional default constructions' screen.

- Click on the Vaulted Ceiling button and enter the following in the ‘Sloped Roof/Ceiling’ tab:
  - **Color:** Medium
  - **Roof material:** Tile, slate, concrete
  - **Structure:** Wood deck
  - **Deck insulation:** None
  - **Ceiling finish:** None
  - **Structure thickness:** 1”
  - **Ceiling insulation:** None
- Click on the ‘OK’ button to return to the ‘Additional default constructions’ screen.
- Click on the ‘OK’ button to return to the Right-Draw screen.

## Orientation

- We’ll set the orientation of the building first. Double-click on the bottom point of the compass rosette. This can be done at any time during the design. However, be aware that if we were to do this after the building was drawn, the building would be rotated.

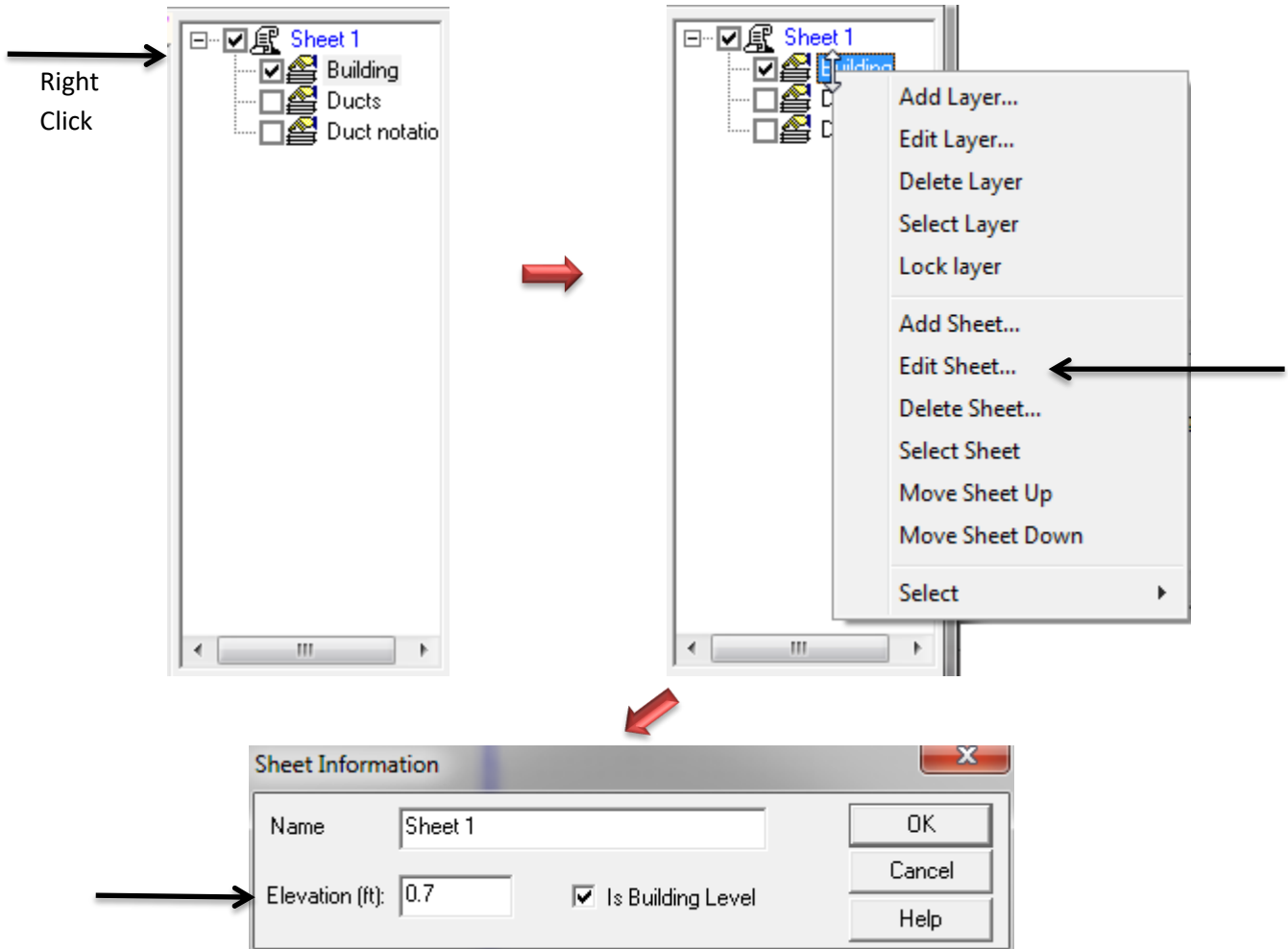


That is, the orientation of the windows would be changed by 180 degrees – North-facing windows would face South, East-facing would face West, etc. Setting the orientation now is just a convenience so that our drawing is easy to draw.

## Elevation

Before we start adding rooms, we need to set the height above grade of the floor in these rooms. **This is an important factor for Florida 2017 purposes.**

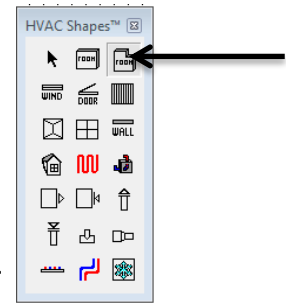
- Click the right mouse button on 'Sheet 1' in the list of Sheets and Layers on the right.
- Select 'Edit Sheet ...' from the menu that appears.



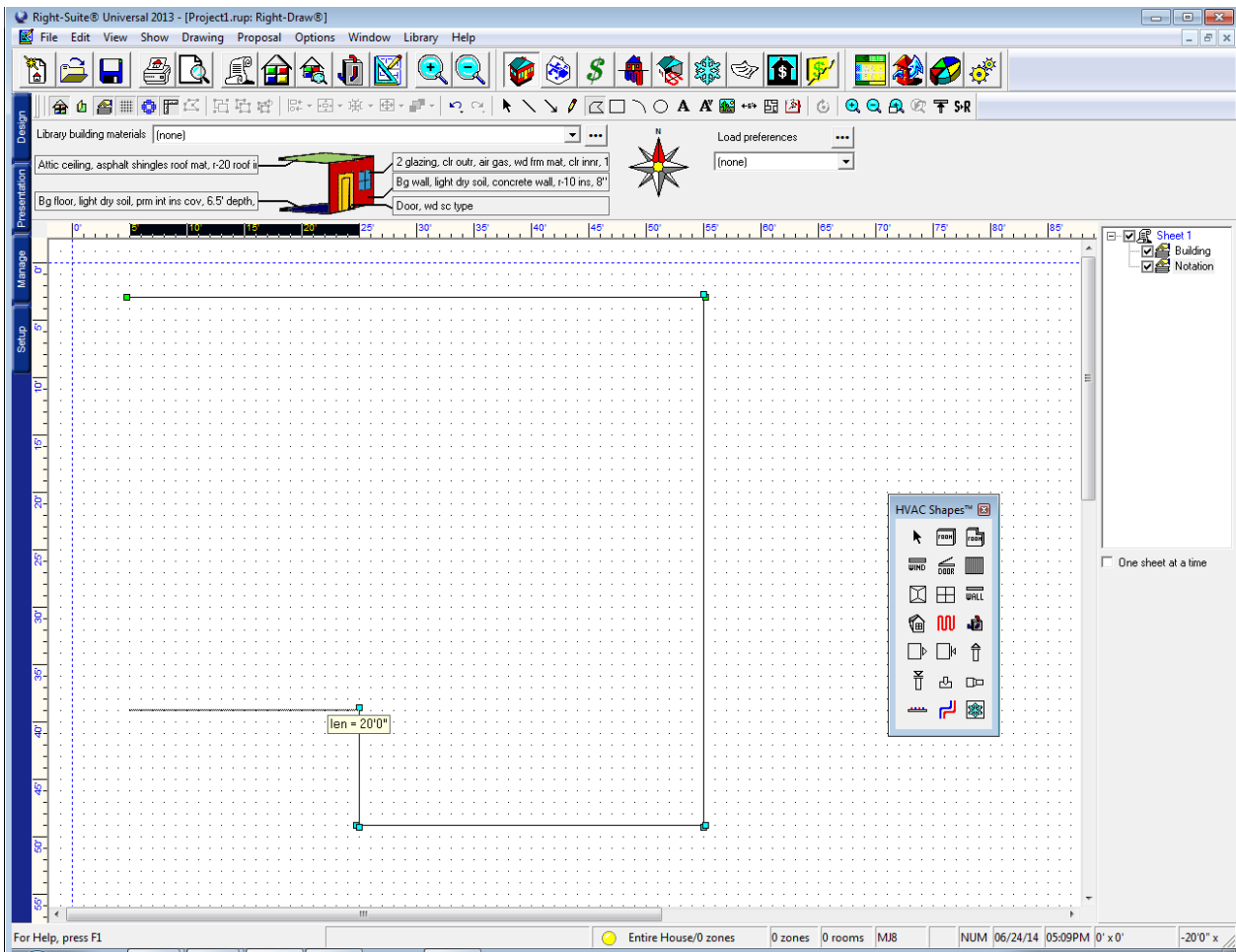
- Enter 0.7 ft for the Elevation.
- Click the 'OK' button to return to the drawing.

## Draw the Living Space

- Click on the Room Wall by Wall tool on the HVAC Shapes™ toolbar  
If the HVAC Shapes™ toolbar isn't visible, select **Drawing | Show HVAC Shapes™ toolbox** in the RSU menu.
- Start your cursor in the upper left hand corner of the drawing area
- Left click, hold, and drag to the right. A dimension will appear.  
Go 50' and let go of the left mouse button. This will set your first wall in place.
- No longer holding left click, drag the cursor in a straight line (see tip 1 below) down 46' and tap left click. The second wall will be drawn.
- Continue this process: Left 30', Up 10', Left 20', and up 36'
- Once you click on the place you started, this will "close the loop" and you'll be left with your space



**TIP #1: Holding the shift key while you draw linear objects such as walls will lock them into 90 and 45 degree angles.**

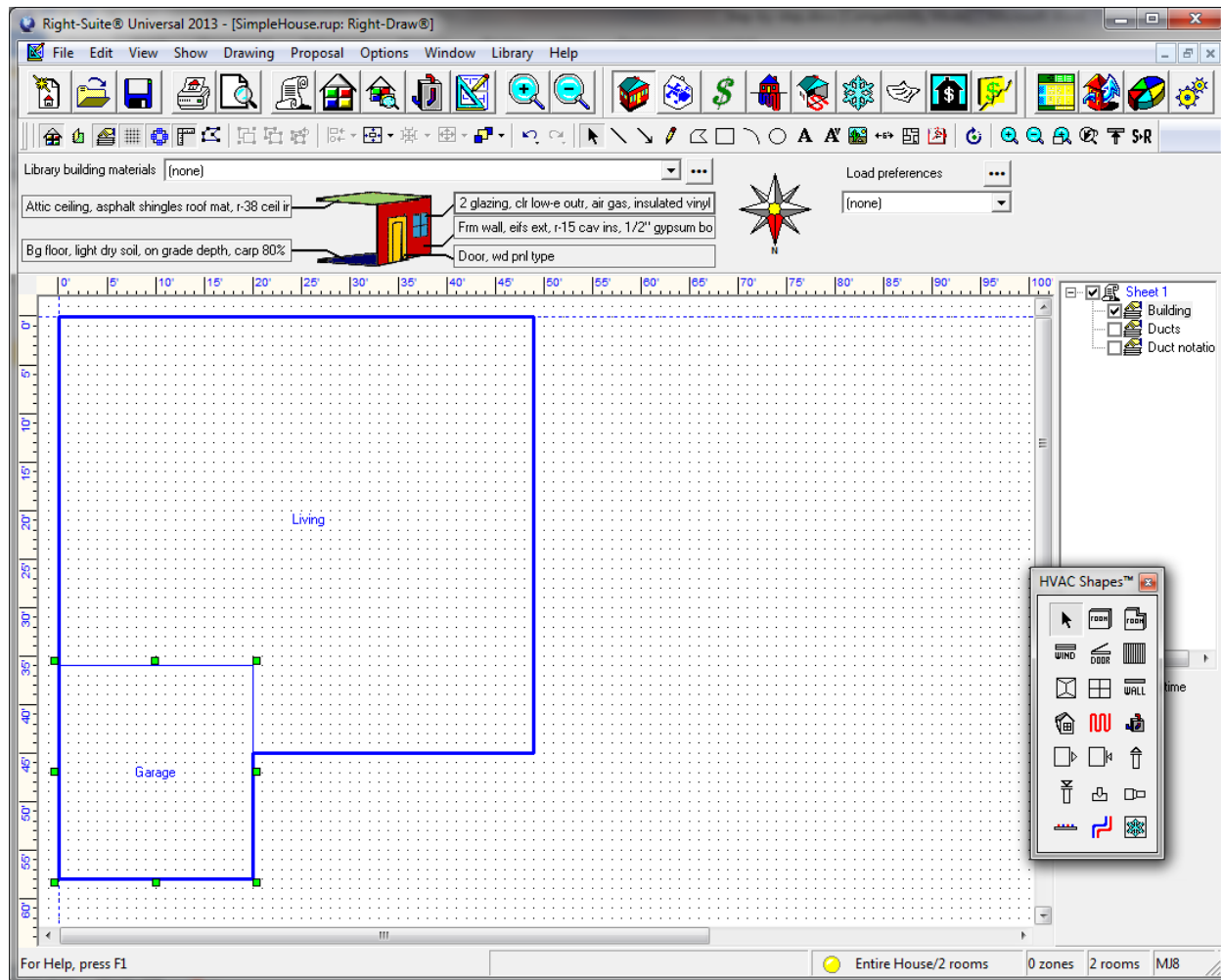




**TIP #2: Right clicking will “close the loop” of the room from wherever you are. This is useful for drawing the very last wall and as a “bail out” (giving you a room you can then delete and start over) if you get turned around while using this tool.**

## Draw the Garage

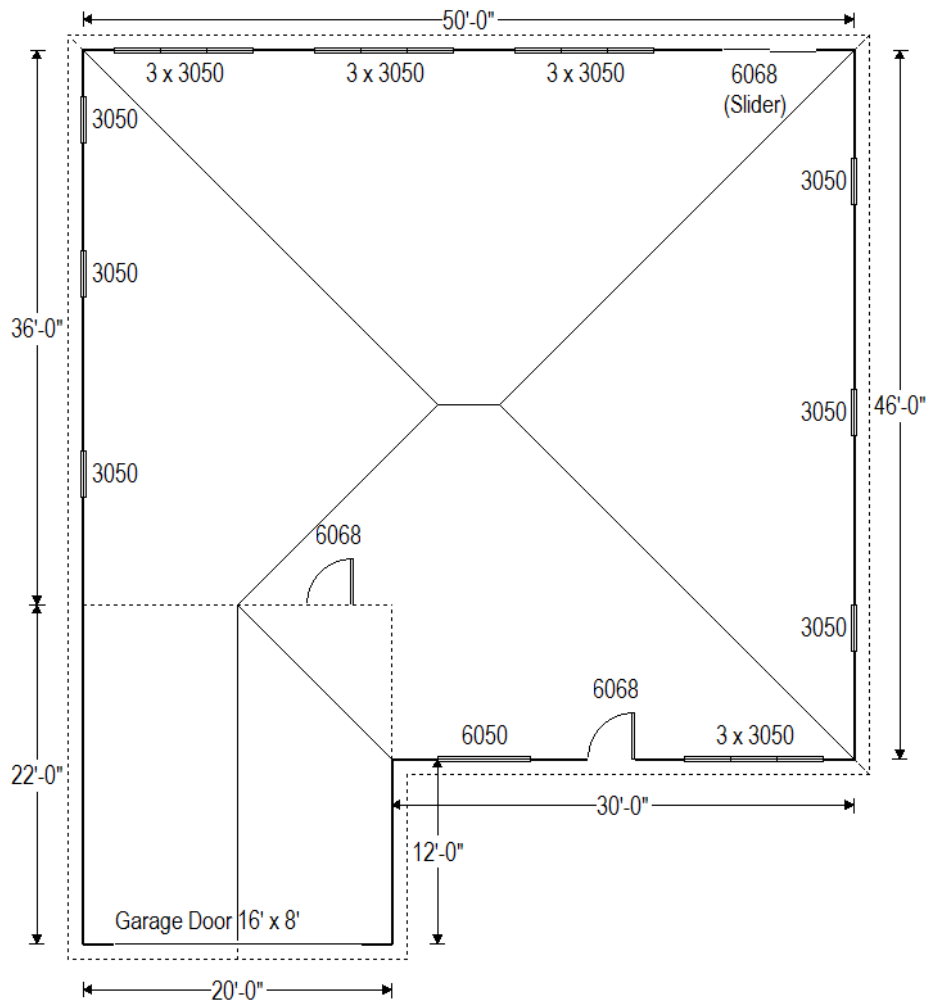
- Click on the Room tool on the HVAC Shapes toolbar and draw a 20’ wide by 22’ high room. Fit it into the notch that we just made.



- To rename the rooms, simply left click on the rooms (not the room names) and start typing.

## Draw the Doors and Windows (excluding the overhead garage door)

- Simply drag and drop windows from the HVAC Shapes Box wherever there are windows in the plan. We'll add the details like size and shade later.
- There are 4 Windows on the North/Front wall, 3 each on the left/right/east/west, and 10 on the back/south wall (including 1 for the sliding glass door). The location of the window in the wall does not affect the calculations but here's another look at the diagram for context:

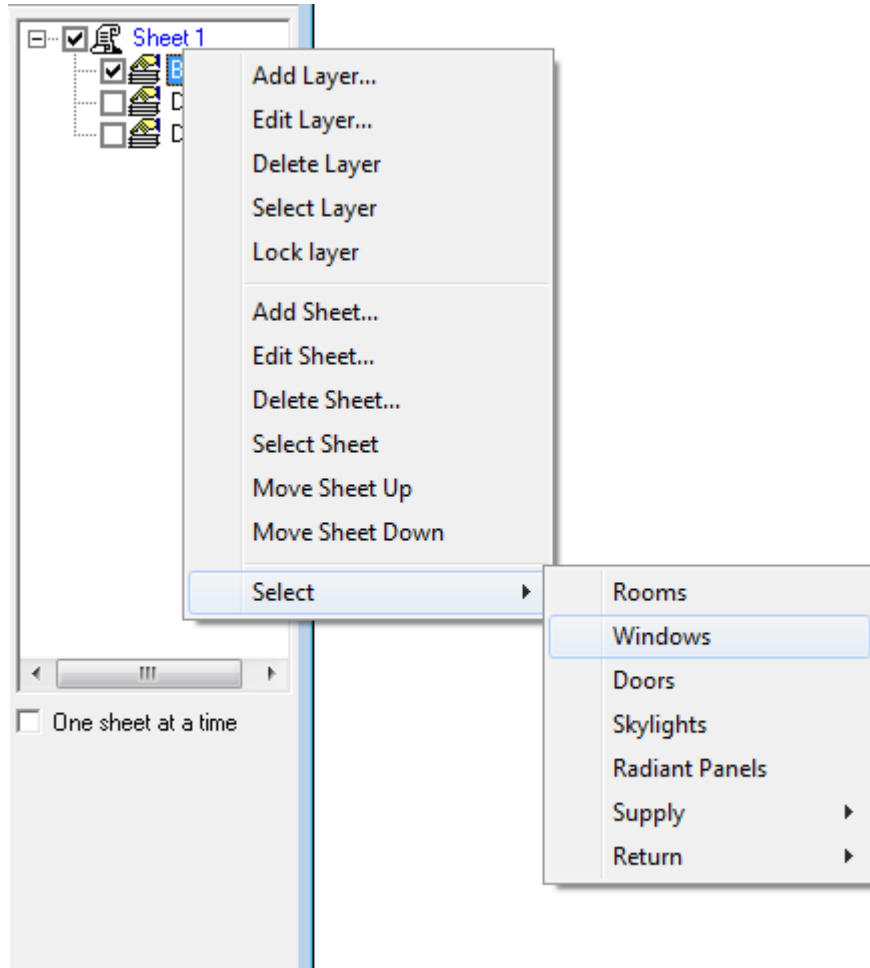


- For doors we'll use a copy trick. Drag and drop a door from the HVAC Shapes to the drawing where it belongs (north/front wall or living/garage partition).
- Right click on the door to view its properties. Change the height to 6'8" (note the calculator that pops up on its own when you type a ' (single quote) or " (double quote) symbol- it'll convert foot (') and inch (") notation to decimal feet once you click okay or enter).

- Hold the Ctrl key on the keyboard and drag this edited door to the other location. When you move an object while holding Ctrl, it will copy rather than move it. (You can also repeat the previous 2 steps to create the 2 doors).

## Properties (Windows)

- Click the right mouse button anywhere on the drawing screen to see the Property Sheet.
- Right click on the sheet on the right side of the draw screen (from the elevation step) and use the 'select' option at the bottom of that menu to select all of the windows on this floor of our building.

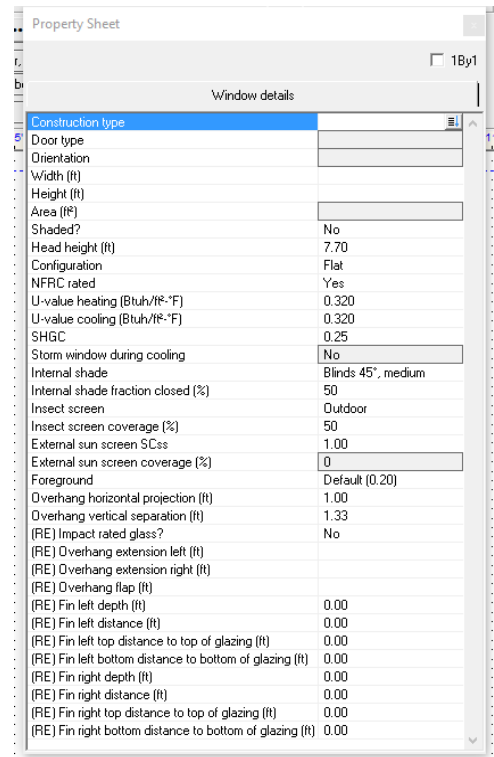


- While 2 of our windows are different sizes the vast majority of our windows are identical, and even those that are different have a lot of things in common with the rest. This will allow us to set all of these common settings in one go.

**Note 1:** Most of these windows have unique overhang settings (the left and right overhang extension in particular). As determining the left and right extension of each window would be very time consuming, we will be using the worst case (smallest amount of shade) applied to every window in this example. As this is a

disadvantage, if the building passes with the worst case shading, adding individual shade would not prove to be worthwhile for most users. If the building does not pass this measure could be considered. If individual shading is desired or required, simply click each window with the Property Sheet open and adjust individually.

- If you have not closed the Property Sheet as instructed you will now see the Window Details. If you have closed the Property Sheet, simply right click one of the now selected windows.
- Set **Width 3.0; Height 5.0; Head height 7.70; Internal shade: Blinds 45° medium; Internal shade fraction closed: 50; Insect screen 'Outdoor'; Overhang horizontal projection 1.00; Overhang vertical separation 1.33 ft.** (see example right)
- With the property sheet still open, click outside of the building to unselect all of the windows.
- With the property sheet still open, click on the 6050 window in the north/front of the house (between the garage and the front door). It should be the only window selected. Change the **Width 6.0**. You could also set fin shade from the garage, but we will see if we can pass without it (see note above).
- With the property sheet still open, click on the sliding glass door on the back/south wall. Change the **Width 6.0 Height 6.7 (or 6'8")**.



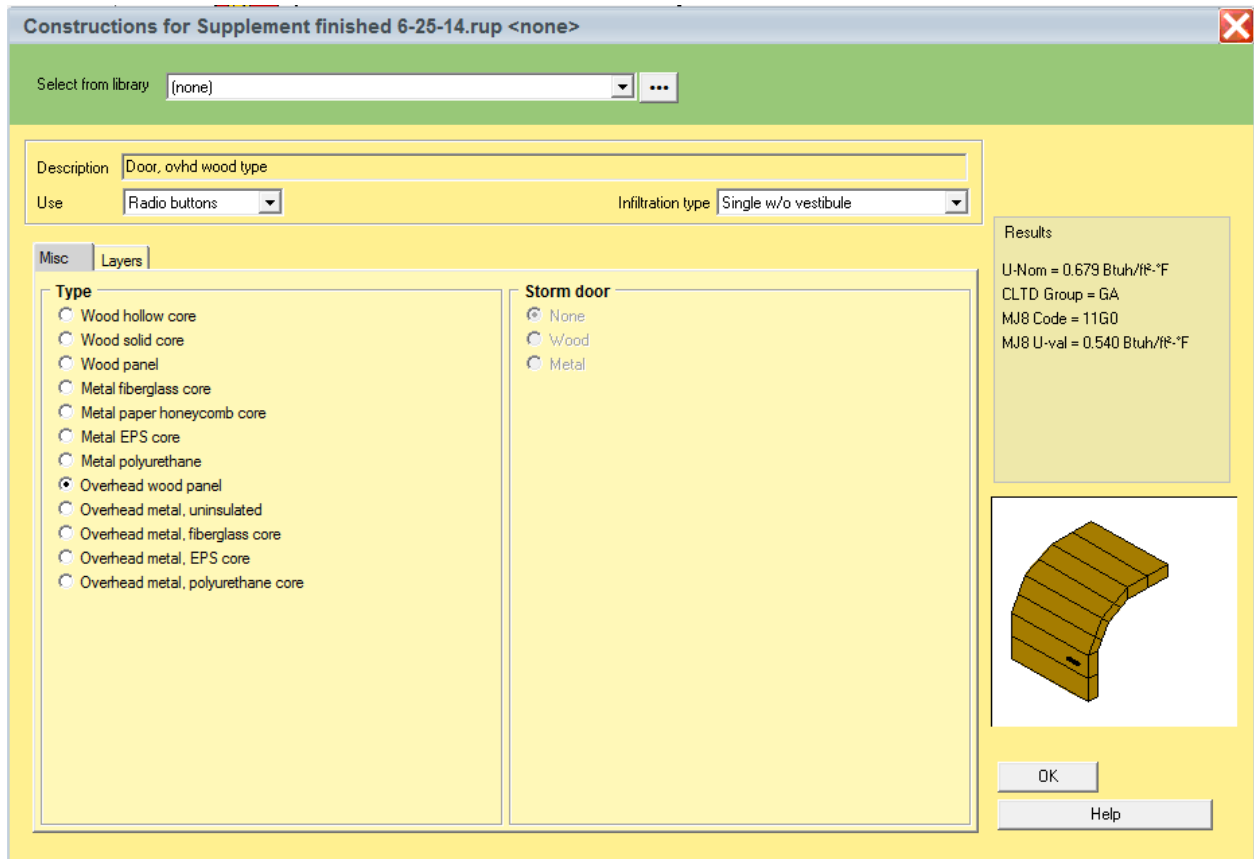
**Optional:** For both compliance and load purposes, having the right size, u-value, SHGC, and shade settings is enough for proper calculations. However, some users prefer to make the slider **look like** a slider. For this:

- With only the slider selected, click on construction type and change to radio buttons mode.
- Select **Type: Sliding Glass Door** and click 'Okay'. Any tab (except 'Block') and any other radio buttons should have no effect as we have set **NFRC rated: Yes** (see note 2). Check the U-Value and SHGC fields on the property sheet to be sure (should be 0.32, 0.32, and 0.25 respectively as above).
- The window on the drawing will now look like a sliding door.

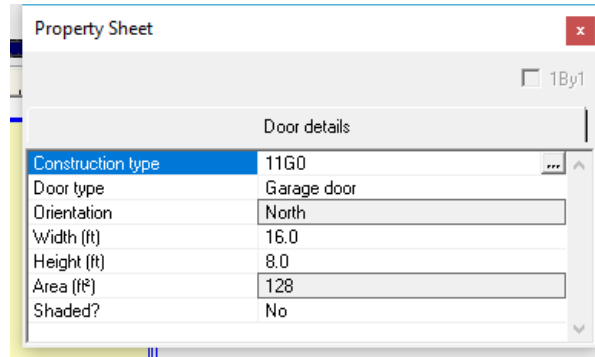
**Note 2:** The construction type field automatically selects the U-Value and SHGC fields. When using Custom Values you can directly input that information. If you use radio buttons, you can also input that same information directly to the property sheet by designating **NFRC Rated: Yes**. Either way, what matters is the U-Value and SHGC.

## Properties (Overhead Garage Door)

- With the Property Sheet still open drag and drop a door into place (or select it if you already have)
- Click on 'Construction type' at the type to display the Door Construction screen
- Select 'Radio buttons' from the drop-down list at the top of the screen
- Change the **Type**: Overhead wood panel.

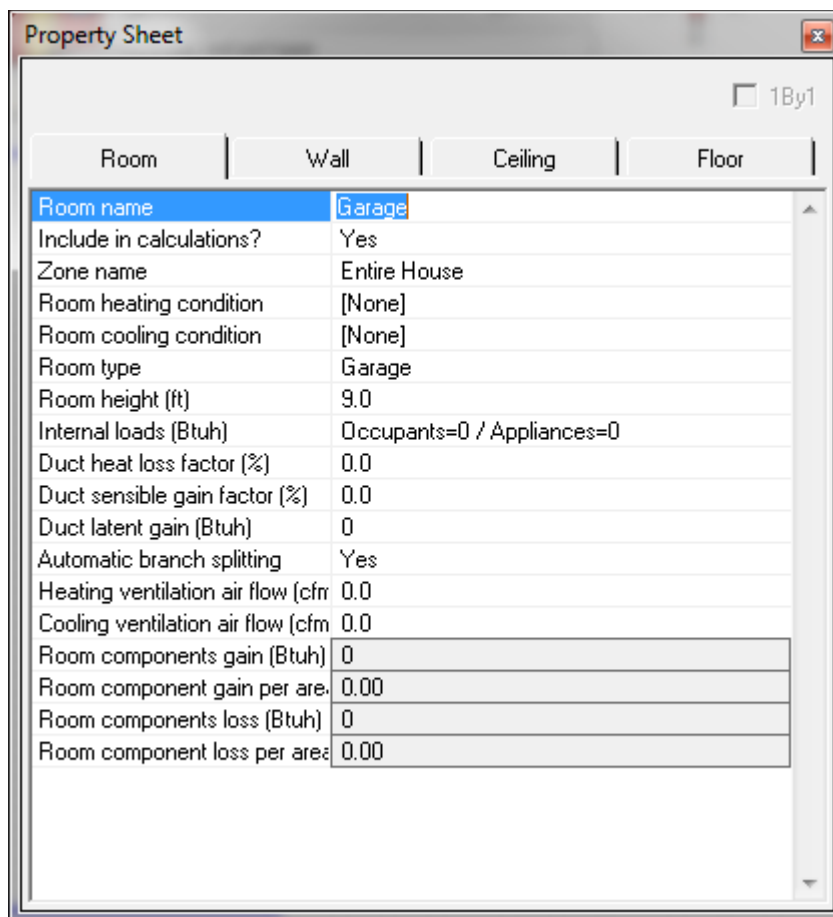


- Click on the 'OK' button to return to the Property Sheet.
- Select 'Garage door' for the Door type.
- In the Property Sheet, set the Width to 16.0' and the Height to 8.0'. Once you do this, you may need to reposition the door on the drawing.



### Properties (Garage-General)

- With the Property Sheet open click on the Garage (if the property sheet isn't open- right click).
- Go to the room tab. Set **Include in calculations?:** Yes; **Room heating condition:** None; **Room cooling condition:** None; **Room type:** Garage; **Room Height:** 9



## Properties (Garage- Exterior Wall)

- With the Garage Property Sheet still open (right click Garage if not) click on the 'Wall' tab
- Click on the Wall 1, type field. (Wall 1 is exterior wall by default)
- Select 'Stucco' for the Exterior and 'None' for the Cavity and Exterior board insulation.

- Click the 'OK' button to return to the drawing screen.

## Properties (Garage- Ceiling below Attic)

- With the Garage Property Sheet still open (right click Garage if not) click on the 'Ceiling' tab
- Click on the 'Ceiling type' field
- Use the following radio button options:: **Roof material:** Tile, slate, concrete; **Roof insulation:** none; **Attic type:** Vented w/ radiant bar; **Ceiling insulation:** None; **Ceiling finish:** ½" gypsum board

Constructions for Supplement finished 6-25-14.rup <none>

Select from library

Description

Use  Color

Flat Roof/Ceiling | Sloped Roof/Ceiling | **Ceiling under Attic** | Ceiling Partition | Layers

**Roof material**

- Asphalt shingles
- Wood shingles
- Wood shakes
- Tile, slate, concrete
- Metal
- Tar and gravel
- Membrane

**Roof insulation**

- None
- R-2
- R-3
- R-4
- R-5
- R-6
- R-7
- R-8
- R-10
- R-12
- R-15
- R-17
- R-18
- R-20
- R-22
- R-25
- R-28
- R-31
- R-35

**Attic type**

- Unvented
- Unvented w/ radiant bar
- Vented
- Vented w/ radiant bar
- Fan vented
- Fan vented w/ radiant bar
- Encapsulated

**Ceiling insulation**

- None
- R-7
- R-11
- R-13
- R-15
- R-19
- R-21
- R-25
- R-28
- R-30
- R-38
- R-44
- R-50
- R-56

**Ceiling finish**

- None
- 1/2" gypsum board
- 5/8" gypsum board
- 3/4" wood
- Metal
- Suspended, plaster board
- Suspended, fiber board
- Suspended, acoustical
- Suspended, foam board

**Suspended ceiling insulation**

- None
- R-2
- R-4
- R-6
- R-7
- R-11
- R-19
- R-30

**Plenum**

- Dead air
- Return air

Results

U-Nom = 0.405 Btuh/ft²·F  
 CLTD Group = 30  
 MJ8 Code = 16ER-0td  
 MJ8 U-val = 0.408 Btuh/ft²·F

OK Cancel Help

- Click the 'OK' button to return to the drawing screen and the Garage Property Sheet.

## Properties (Garage- Floor)

- Click on the 'Floor' tab and then click on the 'Floor type' field.
- Select 'None' for the 'Floor finish'.
- Click on the 'OK' button to accept the change and return to the Property Sheet.



## Properties (Garage-Living Partition Wall)

As load on this wall is experienced by the conditioned space, we find this wall in the Living area properties.

**Note:** The material we need cannot be exactly described using the radio buttons alone. We will need to use the ‘Custom Layers’ option from the use field, **but before we do we should get the material as close as possible using the radio buttons method to save considerable time and effort.**

- With the Property Sheet still open, click on the main ‘Living’ room and click the ‘Wall’ tab
- Click on the ‘Wall 2 type’ field. While still in radio buttons mode, Select the following options: **Exterior:** Stucco; **Sheathing:** None; **Cavity insulation:** R-15; **Interior finish:** ½” gypsum board; **Exterior board insulation:** None; **Framing:** 2” x 4” wood; **Stud spacing:** 16” O.C.; **Interior board insulation:** None.
- Select ‘Custom layers’ from the list at the top of the screen.
- Double-click on the ‘Stucco’ material and select ‘GypBd’ from the list of materials. Click the ‘Select’ button to transfer the change to the Custom Layers screen. Change the thickness to 0.50. Press the ‘Tab’ key and then click the ‘OK’ button to return to the drawing screen.

Constructions for T04R12 rup.rup <none>

Select from library (none)

Description: Frm wall, r-15 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood frm, 16" o.c. stud

Use: Custom layers Color: Medium

Layers

Add Add framed Del Up Down

L#	Material	FrameF	Thick (in)	Cond (Btu/ft <sup>2</sup> ·°F)	Dens (lb/ft <sup>3</sup> )	SpHt (Btu/lb·°F)	R (ft <sup>2</sup> ·°F/Btu)	Weight (lb/ft <sup>2</sup> )	HC (Btu/ft <sup>2</sup> ·°F)
	Outside surface						0.17		
1	GypBd		0.50	0.092	49.9	0.26	0.45	2.08	0.54
2	Framed	0.25	3.50	0.031	7.5	0.39	9.31	2.19	0.85
	WoodFrm (25%)		3.50	0.067	30.0	0.39	4.35	8.75	3.41
	R15 (75%)		3.50	0.019	0.0	0.00	15.00	0.00	0.00
3	GypBd		0.50	0.092	49.9	0.26	0.45	2.08	0.54
	Inside surface						0.68		
	Totals		4.50	0.037	16.9	0.30	11.07	6.35	1.93

Results

U-Nom = 0.088 Btu/h/ft<sup>2</sup>·°F  
 CLTD Group = GC  
 MJ8 Code = Frm wall, r-15 cav  
 MJ8 U-val = 0.088 Btu/h/ft<sup>2</sup>·°F

OK Cancel Help

- Click the ‘OK’ button on the Partition Adjacent Conditions screen that is displayed to accept the defaults.

## Attic Rooms

Attics do not need to be entered for calculating heating and cooling loads. However, The Florida 2017 Code requires information about the attic. So, we will add unconditioned rooms for the attic above the Living room and Garage.

1. Select **Show | Right-Draw®** from the RSU menu.
2. We will add another Sheet to the drawing for the attic rooms. Click the right mouse button on 'Sheet 1' in the list of Sheets and Layers on the right side of the screen. Select 'Add Sheet...' from the menu that appears.
3. Enter 'Attic' for the Sheet name. Enter '9' for the Elevation. Leave 'Is Building Level' checked. Click the 'OK' button to return to the drawing.



4. Click on the Attic Sheet that you just created. Any rooms you add will be put in the Attic Sheet rather than the Sheet 1 Sheet. Leave the Sheet 1 Sheet checked (visible) so that you can trace the rooms.
5. Draw a room on top of the Living room. Use the 'Room wall by wall' HVAC Shape like you did when you added the Living room. Name the room 'Living attic'.
6. Click the right mouse button over the 'Living attic' room that you just created to display its Property Sheet.
7. Click on the 'Room' tab. Set the following options: **Include in calculations?:** Yes; **Room heating condition:** [None]; **Room cooling condition:** [None]; **Room type:** Uncond Attic; **Room height:** 0.

Note that since we have indicated that this is an unconditioned attic, the Florida 2017 reports will show the attic type as 'Full attic'. If there are no rooms that are of the 'Uncond Attic' type, the Florida 2017 reports will show the attic type as 'No attic'.

Property Sheet x

1By1

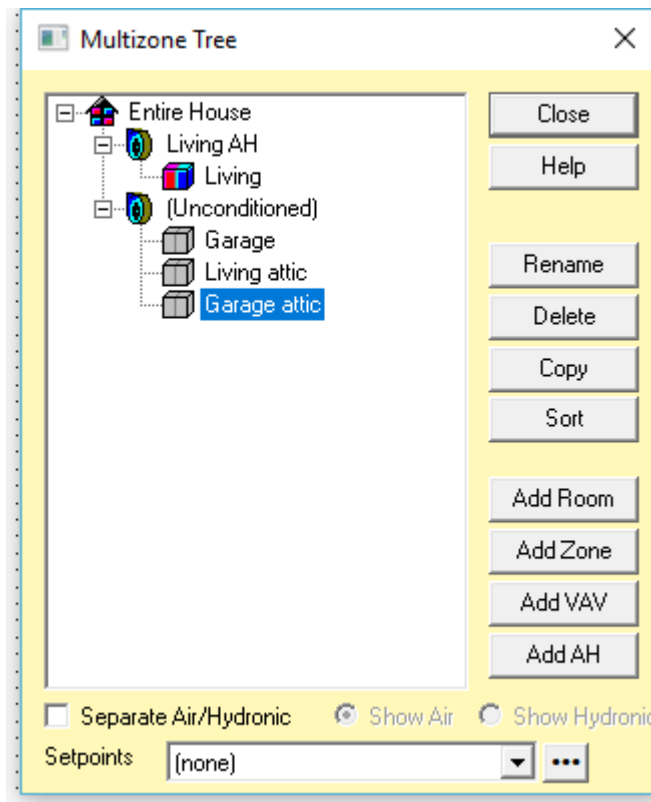
Room	Wall	Ceiling	Floor
Room name	Living attic		
Include in calculations?	Yes		
Zone name	(Unconditioned)		
Room heating condition	[None]		
Room cooling condition	[None]		
Room type	Uncond Attic		
Room height (ft)	0.0		
Internal loads (Btuh)	Occupants=0 / Appliances=0		
Duct heat loss factor (%)	0.0		
Duct sensible gain factor (%)	0.0		
Duct latent gain (Btuh)	0		
Automatic branch splitting	Yes		
Heating ventilation air flow (cfm)	0.0		
Cooling ventilation air flow (cfm)	0.0		
Room components gain (Btuh)	0		
Room component gain per area (Btuh/ft <sup>2</sup> )	0.00		
Room components loss (Btuh)	0		
Room component loss per area (Btuh/ft <sup>2</sup> )	0.00		

8. Draw another room on top of the Garage room. Name the room 'Garage attic'.
9. In the Property Sheet for the 'Garage attic' room that you just created, change the Room Properties to the same as in step 7 above.

## Creating the Air Handlers

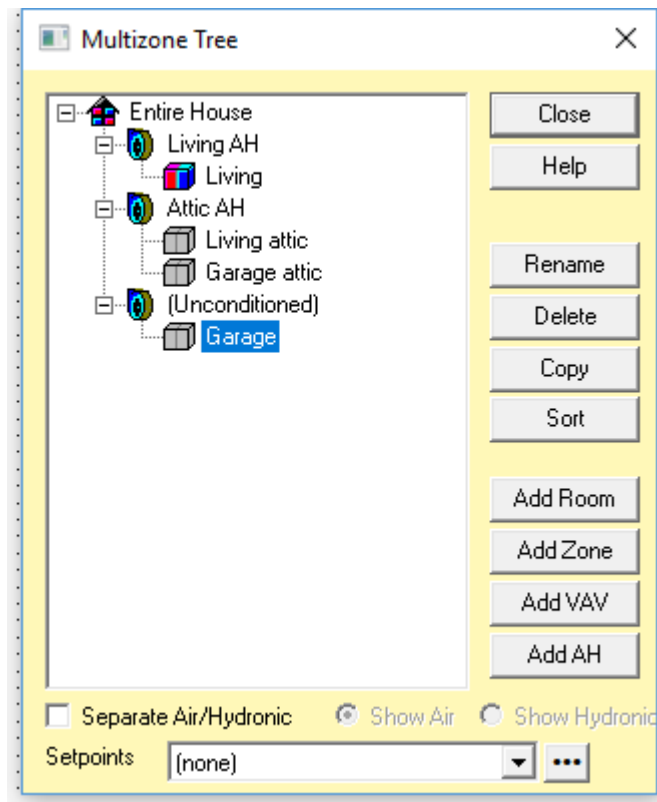
For Florida energy calculations, the attic rooms need to be grouped together. We do this with an ‘unconditioned’ air handler. The garage also needs its own ‘unconditioned’ air handler. In total, we need to create 3 air handlers.

10. Select **Show | Multizone** from the RSU menu.
11. Click the right mouse button on the Living room and select ‘Add AH...’ from the menu that appears. Type ‘Living AH’ for the name of the air handler and click the ‘OK’ button.



12. Click on the (Unconditioned) air handler and click the ‘Rename’ button on the right of the screen. Type ‘Attic AH’ for the new name. Click anywhere else (the Garage room, for example) on the Multizone Tree screen to set the new name. Renaming this air handler will allow it to be separate from the attic air handler.

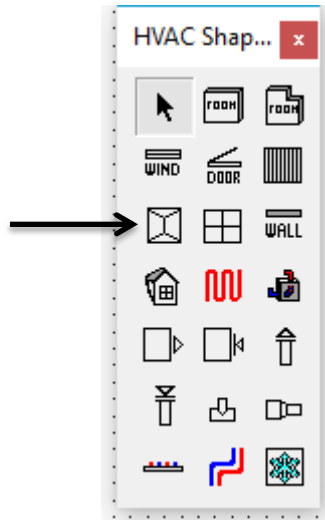
13. Click on the Garage room and click the 'Add AH' button. A new air handler named '(Unconditioned)' will be created with the Garage in it.



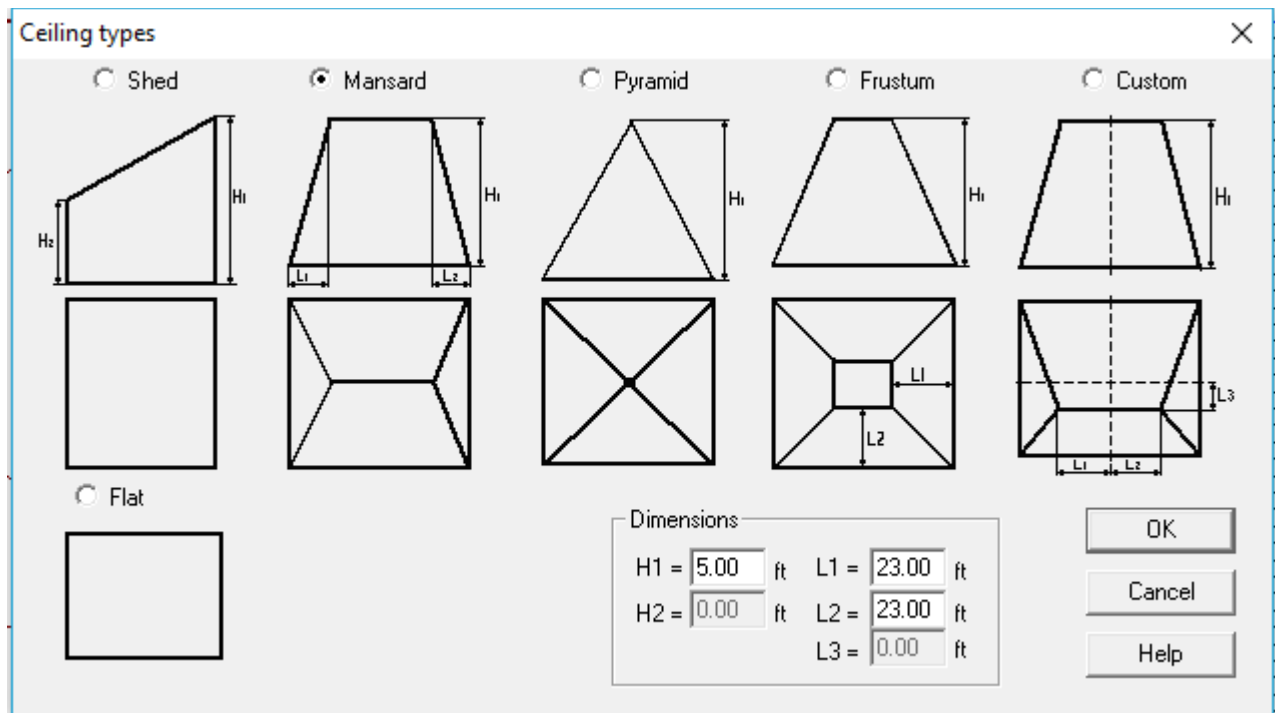
## Roof


Now we need to add the roof to the attic rooms. Make sure that the Attic sheet is selected on the list of Sheets and Layers on the right.

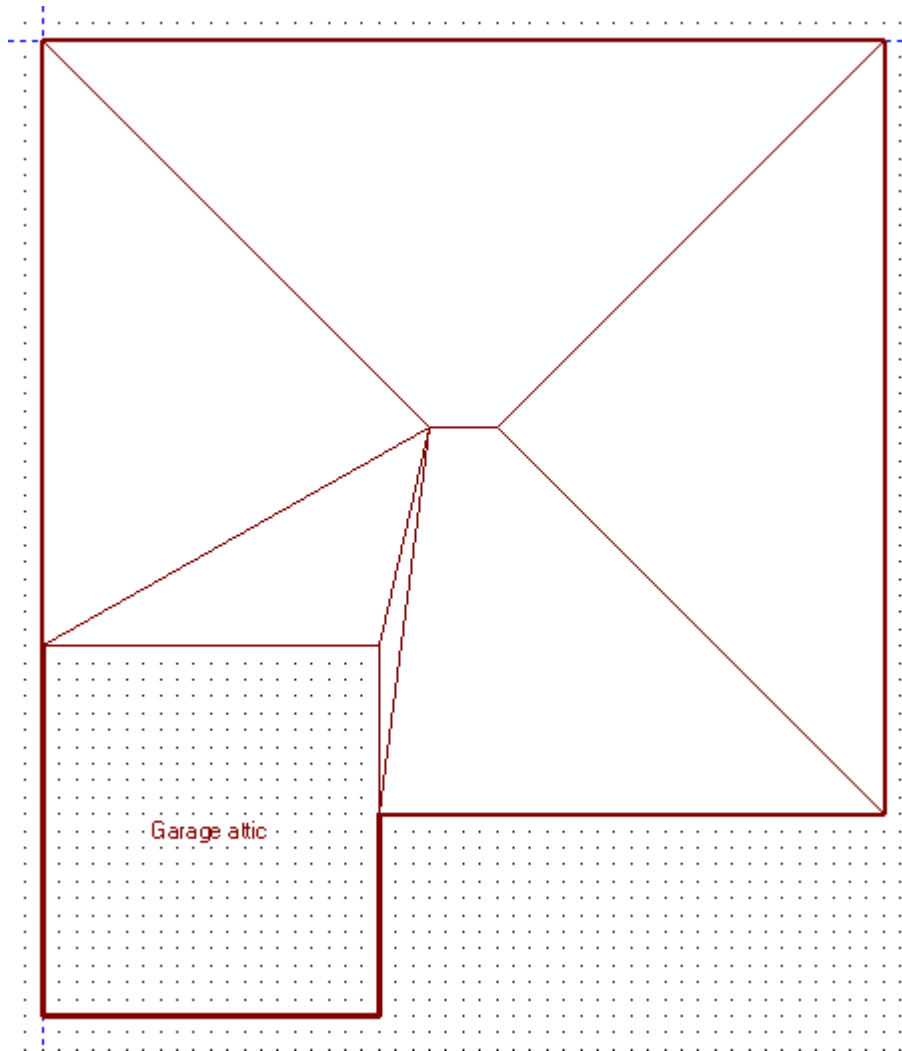
1. Click on the Ceiling HVAC Shape on the HVAC Shapes toolbar.



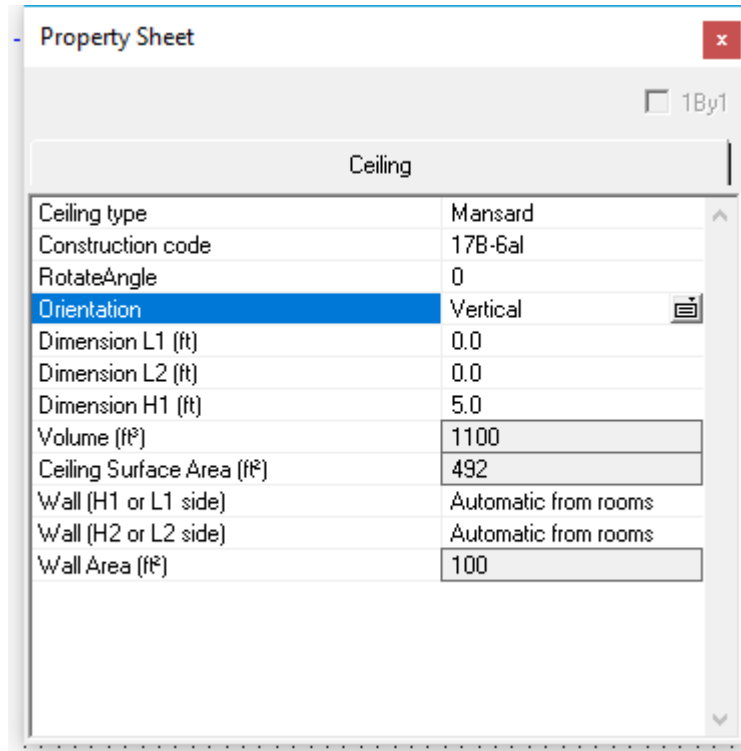
2. Draw a roof over the Living attic room. Just a rectangular one for now. We will re-shape it a little later.
3. A screen will be displayed for you to describe the roof.



4. Select the 'Mansard' type at the top of the screen. Enter 5 for the H1 dimension. Enter 23 for both the L1 and L2 dimensions.
5. Click the 'OK' button to return to the drawing screen.
6. We need to change the shape of the roof to match the shape of the room. We will use the 'Edit Points' feature of Right-Draw. Click on the 'Edit points' button -  on the Drawing toolbar (just under the RSU toolbar toward the top of the screen). When you do this, the green handles on the corners of the roof will change to black points.
  - To move a point, click on it and drag it to the new location.
  - To delete a point, hold the Ctrl key down and click on the point that you want to delete.
  - To add a point, click on a line and drag the new point to the new location.
  - If you make a mistake, you can press Ctrl-Z to undo it.
7. Change the shape of the roof to match the shape of the Living attic room.

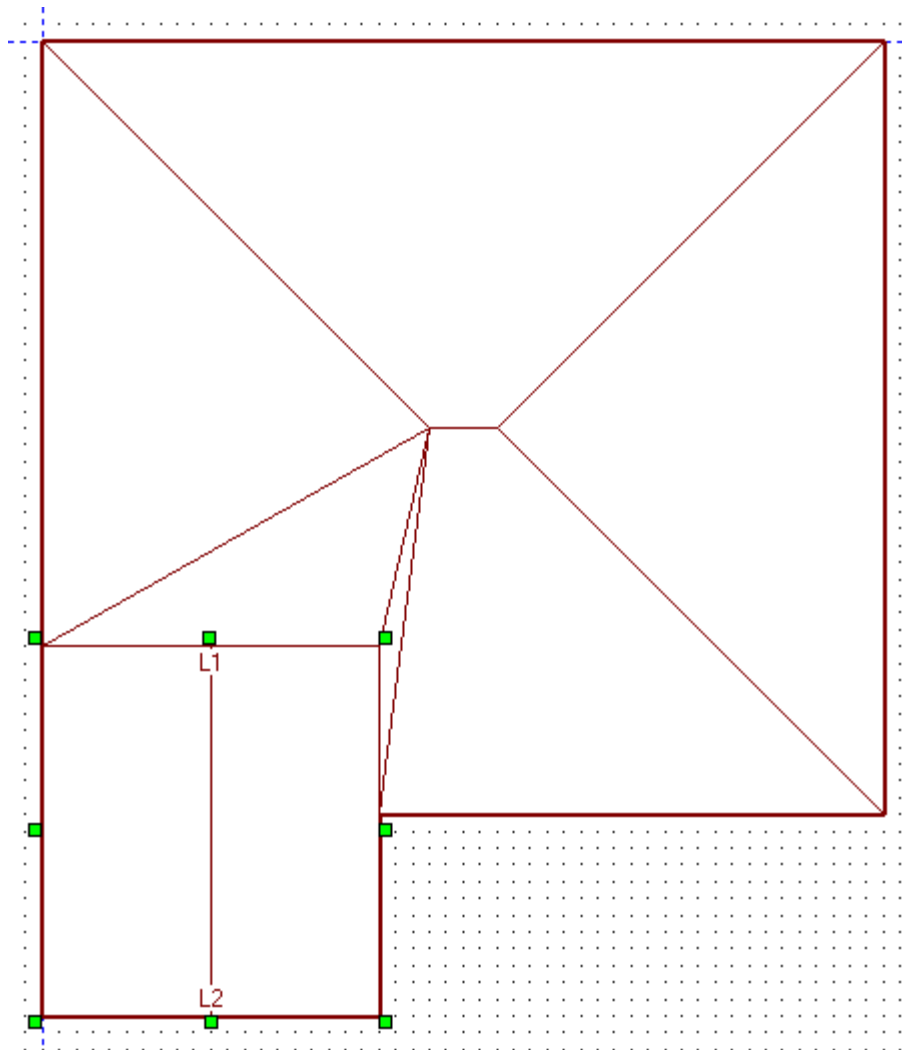


8. Draw another Ceiling over the Garage attic room. Select the Mansard type, enter 5 for the H1 dimension and 0 for both the L1 and L2 dimensions. It's just a rectangle, so it is easier to draw.
9. We need to rotate the roof over the Garage attic so that the ridge runs up and down rather than left and right. Click the right mouse button over the Garage attic roof to display the property sheet.





10. The roof ridge is now correct.



Note that the roof type in the Input Summary report will be derived from the characteristics of the ceiling/roof that you just drew:

Roof type	Derivation
Flat	Roof pitch is less than 5 degrees
Shed or Gable	Roof pitch is greater than 5 degrees and the gable area is greater than zero
Hip	Roof pitch is greater than 5 degrees and the gable area is zero

### Other Load Options

There are other settings important to the load calculations that are not otherwise required for Florida 2017 Code compliance. So, we won't cover them here. They are, however, necessary for an accurate load calculation, which

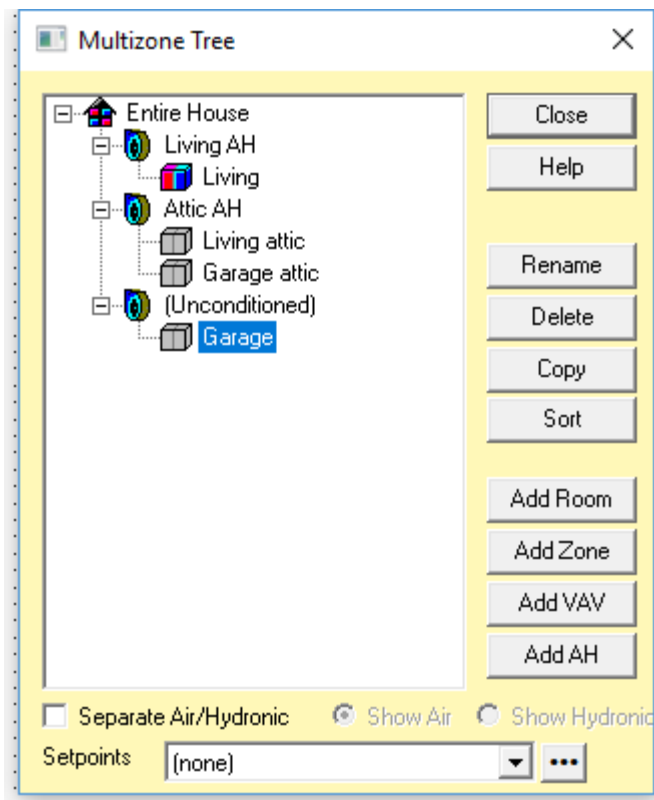
is required by the Code. Please refer to the **Getting the Most Out of Right-Suite® Universal** manual for complete details.

- Internal Gains: 4 occupants and 1200 Btuh for appliances
- Duct Load:
  - **Supply: Location:** Conditioned space; **Roof Material:** Tile, slate, or concrete; **Roof color:** Medium; **Configuration:** Trunk and branch, perimeter outlets; **Sealing:** Extreme; **Insul R:** 8.0; **Heating air temp:** 100°
  - **Return: Location:** Conditioned space; **Roof Material:** Tile, slate, or concrete; **Roof color:** Medium; **Configuration:** Trunk and branch; **Sealing:** Extreme; **Insul R:** 8.0
- Infiltration **Heating ACH** 0.41; **Cooling ACH** 0.21 (7 ACH at 50 Pa)

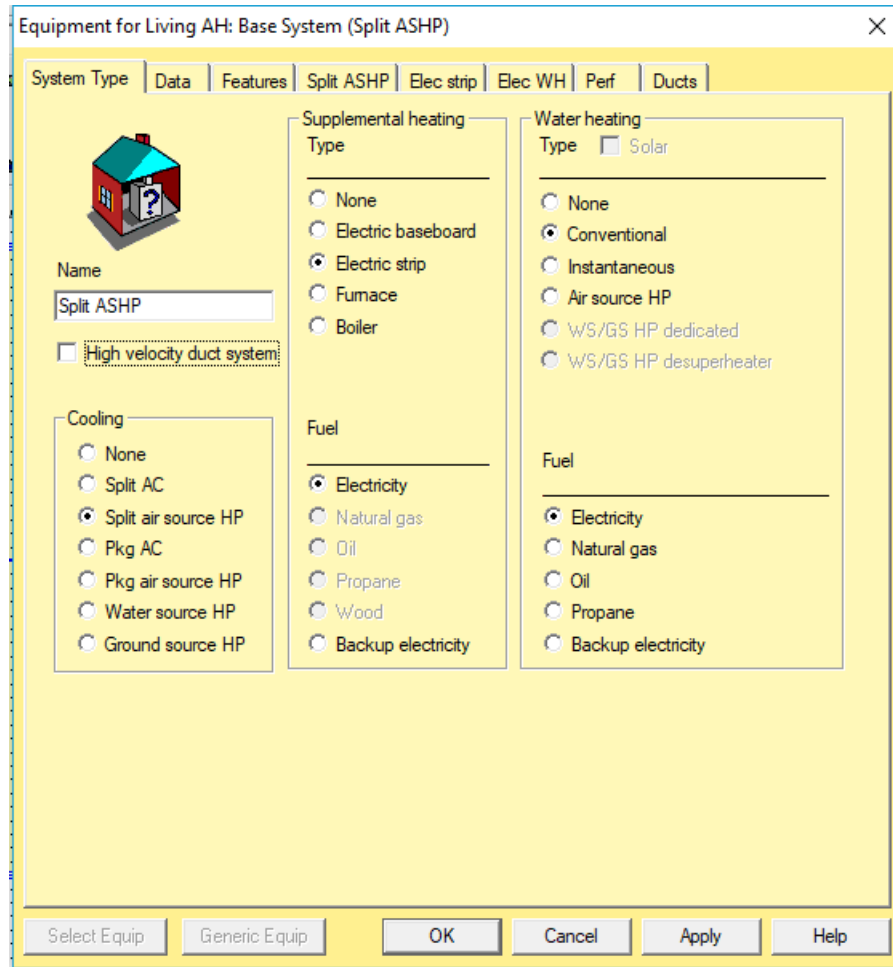
### Equipment (System Type)

RSU can now calculate the load and we can select equipment. Since the attic and garage are both unconditioned, we need to select the air handler for the Living room.

- Select **Show | Multizone** to display the Multizone Tree screen. You can see that the Living room is in the air handler named 'Living AH'. You can name this air handler if you wish.
- Click on the 'Living AH' air handler. This will allow us to select equipment for this air handler.



- Select **Show | Equipment** from the top menu.



- Select the following radio buttons: **Cooling:** Split air source HP; **Heating Type:** Electric strip; **Heating Fuel:** Electricity; **Water Heating Type:** Conventional; **Water Heating Fuel:** Electricity. The last checkbox will not be available when the Florida Right-Energy® UI options is selected.

**Note:** You can select any type of equipment, but just as we’ve dictated Tampa design conditions for example purposes, we’re dictating the equipment types.

### Equipment (Split ASHP Tab)

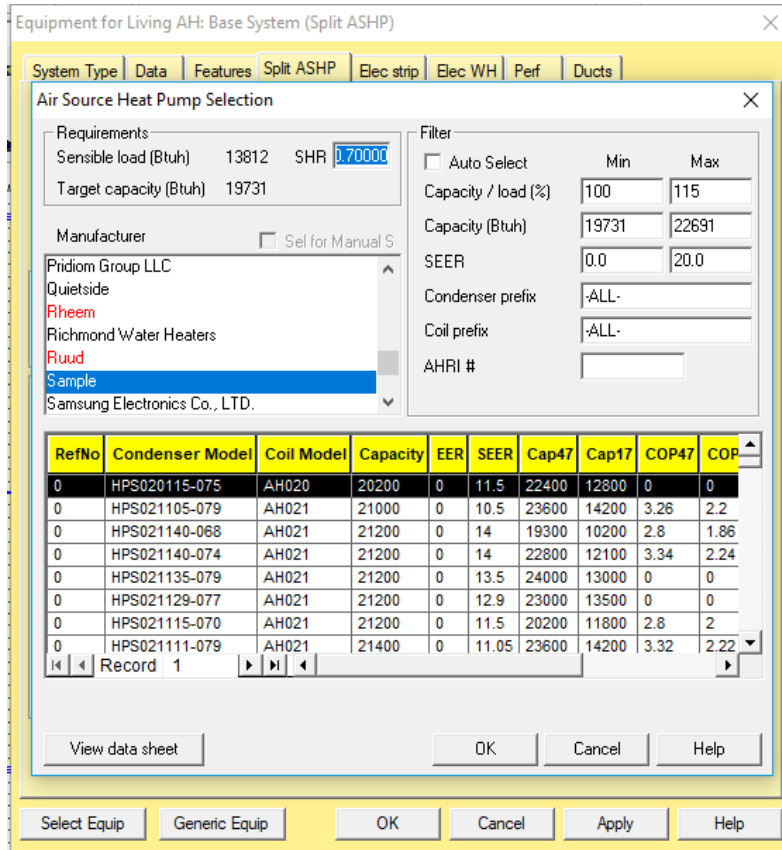
Normally, you would select whatever equipment you are going to use in this building. The easiest way to do this is clicking on the ‘Select Equip’ button and using RSU’s integrated AHRI database. See our other support documentation (especially our video ‘Manually Selecting Equipment’ at [http://www.wrightsoft.com/university/rsu\\_video\\_tutorials\\_series\\_1/equipment\\_and\\_operating\\_cost/manually\\_selecting\\_equipment.aspx](http://www.wrightsoft.com/university/rsu_video_tutorials_series_1/equipment_and_operating_cost/manually_selecting_equipment.aspx)).

So as not to play favorites with particular brands, we'll be using the Sample equipment manufacturer (included with RSU) for this example.

- Click on the 'Split ASHP' tab
- Click on the 'Select Equip' button (bottom left)
- In the 'Manufacturer' list, scroll down to 'Sample' and click on it. The list of available equipment manufactured by Sample will appear in the bottom half of the screen. The first one in the list will be the first unit that has a rated capacity that is greater than the Target capacity at the top of the screen. This is just a convenience to help you select. It is not necessarily true that the first unit in the list will meet Manual S requirements. There isn't extended performance available for Sample, so the 'Sel for Manual S' checkbox isn't 'check-able'. The manufacturers that have extended performance data available appear in red in the Manufacturer list. When the 'Sel for Manual S' checkbox is checked, the list of equipment will change to only units that meet Manual S requirements for your project's loads. The list will have the capacities (sensible and latent) at the design conditions of your project. Note that the Florida 2017 Code requires that equipment that meets the prevailing minimum efficiency standards be used. There are units in this list that may not meet this criterion. When this manual was written, the prevailing minimum efficiencies for split air source heat pumps in Florida were 14 SEER and 8.2 HSPF. For now we will select the Condenser Model HPS020115-075 and Coil Model AH020 even though the SEER is only 11.5. We will change it in the next section.

**Note:** You can adjust the filters in the Filter section of this screen to only show equipment that is close to what you are looking for. For example, if you enter 35.0 for the Minimum SEER and 45.0 for the maximum SEER, only units that have a SEER between 35.0 and 45.0 will be displayed in the list. If no units are displayed when you do this, just 'widen the spread' between the minimum and maximum until one that you want is displayed.

**Note:** If this were an actual design with real world equipment you would be responsible for checking that the CFM and subsequent fan wattage matched your design criteria as the designer may be making adjustments to these to meet Manual S requirements.



- Click 'OK' to select the unit and transfer the data to the Split ASHP screen.

- The SEER and HSPF are not sufficient for Florida 2017 compliance. When you do real projects, you would not be able to use this unit. For the purposes of this example, we will change this data manually.
- In the Ratings section in the lower right corner, change the SEER to 14 and the HSPF to 8.2.
- For the load calculation to be complete, a duct system must be generated. The static pressure that is available is needed to size the ducts. This is entered on this screen. When you do a real project, the data sheet for the equipment you select will have this data. For this example, we will use 0.5. Enter 0.5 in the Cooling Static pressure field:

Equipment for Living AH: Base System (Split ASHP)

System Type | Data | Features | Split ASHP | Elec strip | Elec WH | Perf | Ducts

Type  
 Manufacturer: Sample  
 Trade name: SampCorp  
 Condenser model / PN: HPS020115-075  
 Coil model / PN: AH020  
 AHRI ref.: 0

Target Capacities (Btuh)  
 Heating: 16767  
 Cooling sensible: 14557  
 Cooling latent: 5247

Air Distribution  
 Heating=Cooling  
 Estimated AVF (cfm): 673  
 Design AVF: [673] cfm  
 Static pressure: [0.50] in H2O → [0.50] in H2O

Detailed Performance  
 2 stage

	Stage 1		Stage 2		
Heating (Btuh, COP)					
17°F	12800	2.25	0		0.00
35°F	16704	2.64	0		0.00
47°F	22400	3.32	0		0.00
62°F					
Fan (cfm, W)	673	246	0	0	
Cooling (Btuh, Sens, EER)					
67°F					
82°F	21443	15010	12.38	0	0.00
95°F	20200	14140	10.65	0	0.00
Fan (cfm, W)	673	246	0	0	
Cont.fan (cfm, W)	269	74	Cont.fan	<input type="checkbox"/> Heat	<input type="checkbox"/> Cool

Controls  
 Low temp off/on (°F): -99 / -99  
 Backup: BU cycles  
 Capacity balance (°F): 36.1  
 Economic balance: -99.0

Ratings  
 HSPF: 8.20  
 EER: 10.65 SEER: 14.00  
 SHR: 0.70000 Sound: 0

Select Equip | Generic Equip | OK | Cancel | Apply | Help

## Equipment (Elec strip)

- Click on the 'Elec strip tab
- Click on the 'Select Equip' button (bottom left)

The screenshot shows the 'Electric Strip Selection' dialog box. The 'Requirements' section shows 'Target capacity (Btuh)' as 15458 and the 'Auto Select' checkbox is checked. The 'Manufacturer' list includes National Comfort Products, Nordyne, Nutone, Payne, Rheem, Ruud, and Sample. The 'Model' field contains 'SES1234' and the 'Input (kW)' field contains '4.5'. The 'View data sheet' button is visible at the bottom left of the dialog. The main window has buttons for 'Select Equip', 'Generic Equip', 'OK', 'Cancel', 'Apply', and 'Help'.

In this screen, enter the data associated with the unit that you intend to use. Note that if you check the 'Auto Select' checkbox at the top of the screen (next to the Target capacity), the 'Input (kW)' field will be filled in with the required kW. If this exact size isn't available, uncheck the checkbox and change the 'Input (kW)' for the unit that you want to use.

- Check the 'Auto Select' checkbox.

- Fill in the rest of the data in this screen (as above) and click the 'OK' button to transfer the data to the 'Elec strip' screen.

### Equipment (Solar WH)

Solar hot water heating systems usually have equipment associated with the solar side (collector, tank, pump, etc.) as well as a conventional hot water heating unit that is used for backup (e.g. when the sun isn't out). RSU has a database of both conventional hot water heaters and solar components. However, when preparing a project for Florida 2017 compliance, you should use the special solar hot water screen rather than the standard RSU Solar WH screen.

Note that the Florida 2017 Code has specific requirements for solar water heating systems. Please review R403.5.6.2.

### Backup component

The backup component should be sized to meet the entire hot water load requirements.

1. In the Electric water heater tab (Elec WH), enter the following information in the 'Ratings' box as above:  
**Manufacturer:** Sample; **Model:** 50400616076; **Tank size (gal):** 40; **Input (kWh):** 4.5; **Energy factor:** 0.960;  
**1<sup>st</sup> hour (gal):** 60; **Recovery efficiency (%):** 77.

Equipment for Living AH: Base System (Split ASHP)

System Type | Data | Features | Split ASHP | Elec strip | **Elec WH** | Perf | Ducts

**Type**

Manufacturer: Sample

Trade name:

Model: 50400616076

AHRI ref no.:

**Ratings**

Tank size (gal): 40      Energy factor: 0.960

Input (kWh): 4.5      1st hour (gal): 60

Recovery efficiency (%): 77

Capacity (MBtu/h):      COP:      Dedicated WS/GS heat pump:

Select Equip    Generic Equip    OK    Cancel    Apply    Help



Note that when RSU is not in Right-Energy® Florida 2017 mode, the above screen has additional inputs for estimating water usage. However, the Florida 2017 Code has specific use information that it uses. Therefore, those fields do not appear when in this mode.

2. When you do your own projects, you can click on the ‘Select Equip’ button at the bottom of the screen and select the hot water heater from the database.

### Solar component

The solar component will be handled when the compliance is run.

### Equipment (Ducts)

The Ducts tab of the Equipment screen has data that is used only for Right-Energy® Florida 2017 simulations.

1. Click on the ‘Ducts tab.

The screenshot shows a software dialog box titled "Equipment for Living AH: Base System (Split ASHP)". It has several tabs: "System Type", "Data", "Features", "Split ASHP", "Elec strip", "Elec WH", "Perf", and "Ducts". The "Ducts" tab is active. Inside the dialog, there is a section labeled "Simulation only!" and a "Distribution" section. The "Leakage type" is set to "Default Leakage". Under "Distribution", there are two columns: "Heating" and "Cooling". Each column has a "Distribution type" dropdown set to "Ducted Air", a "DSE" input field with the value "0.88", a "Duct location" dropdown set to "Living AH", a "Surface area (ft²)" input field (with values "219.1" for Heating and "14.7" for Cooling), an "Insulation R-value (ft²·F/Btuh)" input field (with values "8.0" for Heating and "6.0" for Cooling), and an "Air handler location" dropdown set to "Living AH". At the bottom of the dialog are buttons for "Select Equip", "Generic Equip", "OK", "Cancel", "Apply", and "Help".

- a. Select ‘Default Leakage’ from the ‘Leakage type’ drop-down list. Select ‘Ducted Air’ from each of the drop-down lists for ‘Distribution type’. The required default DSE (distribution system efficiency) will be looked up and placed in the DSE fields. If the values are 0, reselect ‘Ducted Air’ and the default values will be entered.

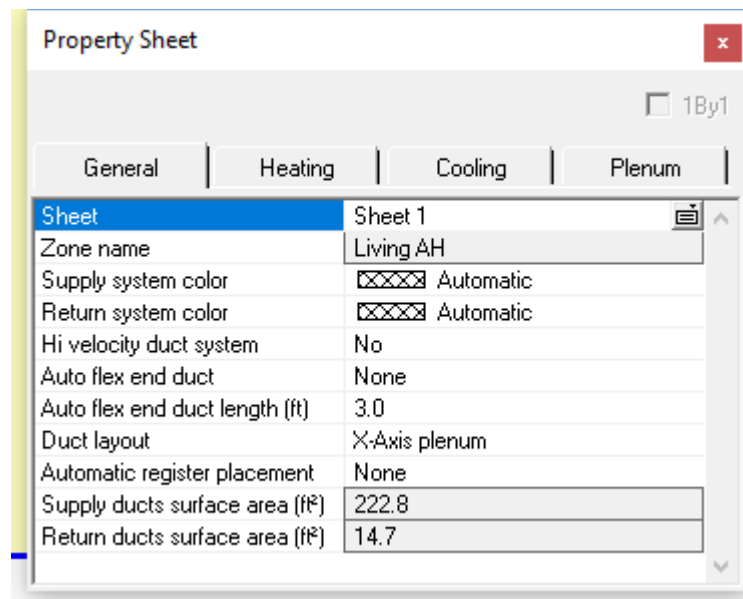
The other choices for ‘Leakage type’ are: ‘Proposed Qn’ and ‘Proposed Leak Free’. When either of these 2 choices is made, you may select the ‘Duct location’ from the drop-down lists.

2. Enter 8 for the Supply and Return Insulation R-values.
3. If you have the Right-D module and you have entered the available static pressure in the cooling equipment screen, the duct surface area fields will be filled in. If you do not have Right-D, you may enter the surface areas of the supply and return ducts by overriding these fields. Highlight the field that you want to change and press the F8 key. The brackets will change from square brackets ('[' and ']') to angle brackets ('<' and '>'). You will then be able to enter the values.
4. Click the 'OK' button to exit from the Equipment screen.

## Duct System

Now we need to generate a duct system. Make sure you are in the Right-Draw screen. Make sure that the 'Ducts' layer in Sheet 1 is checked in the Sheets and Layers section on the right side of the screen. You should see a small square in the middle of the 'Living' room. This represents the equipment. If you can't see it, uncheck the 'Attic' layer in the Sheets and Layers section. You should also see a number of squares with an X in them. These represent the supply registers. There will also be one square with a diagonal line through it. This represents the return register.

1. Drag the supply registers to where you would like them (for example next to the windows).
2. Right click on the equipment square to display its Property Sheet.
3. On the 'General' tab, select 'X-Axis plenum' for the 'Duct layout'.



4. Close the Property Sheet and a duct system will be drawn.

## Final Entries and Compliance

We are now ready to set the values and run the compliance.

- Select **File | Code Compliance | Right-Energy® Florida 2017** from the menu at the top.

## Compliance (Project)

There are some project-wide entries that are used for Florida 2017 code compliance only. These entries can be entered in the Project tab.

1. Click on the Project tab

Right-Energy® Florida 2017

Performance | **Project** | Credit Options | Requirements | Mech Ventilation | Solar WH

Title	Right-Energy® Florida 2014 Example	Year Constructed	2017
Street	1516 Ninth Street	Bedrooms	3
City, State, Zip	Tampa, FL 33601	Bathrooms	1
Owner	Mr. and Mrs. Henry Wagner	Address type	Street address
Design Location	Tampa International AP, FL, US	Family Type	Single-Family
Lot#	Lot 410-111	New/existing	New (From Plans)
Subdivision	Lexington Crossing	Terrain	Ocean/Lake
Platbook	111-11	Shielding	Suburban
Jurisdiction	Hillsborough County	Permit Office	Tampa
Builder Name	Wrightsoft	Permit Number	2222-1
Comment	Pre-construction		

OK Cancel

Note that this screen also displays the project-wide entries that we entered in the Project Information screen. All of this information will appear on the Florida 2017 reports.

2. Enter all of the information on this screen.

## Compliance (Credit Options)

- Click on the 'Credit Options' tab.

You can select the optional Florida 2017 Credit Options here.

- When you select either IRCC or Radiant Barrier, the Roof Deck Emittance field will be enabled. Please confirm that this value represents your project. See Section R405.7.1 in the Code for installation requirements.
- When you check the 'Cool Roof' box, the Solar Absorptance and Thermal Emittance fields will be enabled. Please confirm that this value represents your project. See Section R405.7.2 in the Code for installation requirements.
- Attic ventilation. If your project has an unvented attic, check the 'Unvented Attic' checkbox. Otherwise select the 'Ventilation Ratio' from the dropdown list. If you select 'Custom...', enter the custom ratio that you want to use. For this example, we will leave the checkbox unchecked (indicating that we have a vented attic) and leave the 'Vent Ratio' set to '0.003 (1 to 300)'. See Section R405.7.3 in the Code for installation requirements.
- Check the 'Ceiling Fan' checkbox if you want to use the ceiling fan option. See Section R405.7.6 in the Code for installation requirements.
- Check the 'Water Heater Recovery' checkbox if you wish to claim that option. See Section R405.7.7 in the Code for installation requirements.

For this example, we will select the Solar Water Heating.

1. Click on the **Solar Water Heating** checkbox. The Solar WH tab will appear.
2. Click on the Solar WH tab.

The screenshot shows a software window titled "Right-Energy® Florida 2017" with a close button (X) in the top right corner. Below the title bar is a navigation menu with tabs: "Performance", "Project", "Credit Options", "Requirements", "Mech Ventilation", and "Solar WH". The "Solar WH" tab is selected and highlighted with a black arrow. The main content area is titled "Solar Water Heating System" and contains the following fields:

FSEC Certificate Number	12345
Company Name	Sample
System Model	SSWS-678
Collector Model	SSWC-123
Collector Area (ft <sup>2</sup> )	35.0
Storage Volume (gal)	70.0
FEF	3.0

At the bottom right of the window are "OK" and "Cancel" buttons.

All of the information on this screen is required for Florida 2017 Code compliance. You must use a solar hot water system that is rated by the Florida Solar Energy Center (FSEC). FSEC certifies systems. The Certificate Number can be determined from the *Florida Solar Energy Center Directory of Certified Solar Systems*. See <https://tcp.fsec.ucf.edu/Certification/Ratings/RatingssummaryPage.aspx>.

## Compliance (Requirements)

We are now ready to select the Mandatory Requirements.

- Click on the 'Requirements' tab.

Right-Energy® Florida 2017

Performance | Project | Credit Options | **Requirements** | Mech Ventilation | Solar WH

Mandatory Requirements

See individual code sections for full details.

Has new wood-burning fireplaces

Has outdoor combustion air

Has tight-fitting flue dampers

Building framing cavities (walls, floors, ceilings) are NOT used for ducts or plenums

Storage water heaters are equipped with heat traps in accordance with R403.5.6.

HVAC Equipment meets Manual S requirements

Single assembly ceilings are insulated in accordance with R405.2.1.

OK Cancel

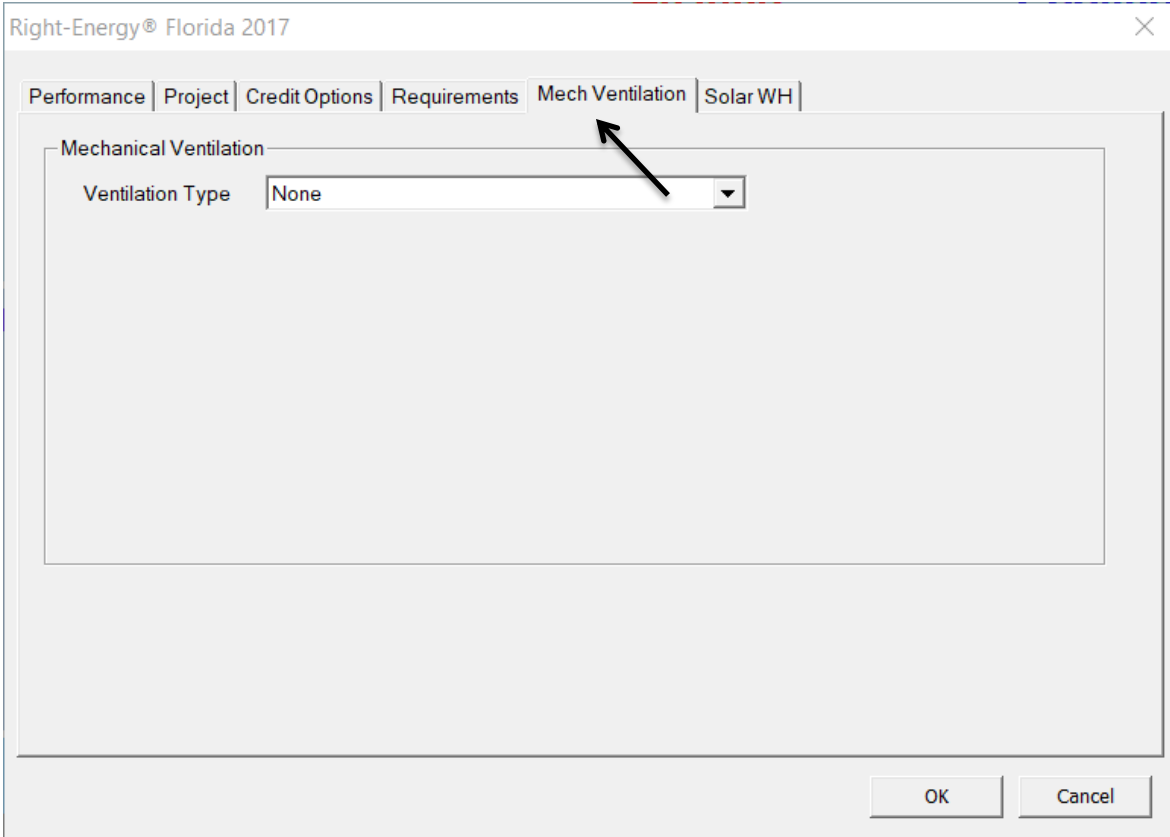
This screen shows items that are required by the Florida 2017 Code that RSU doesn't cover. Most everything on this screen is selected by a checkbox. They are set to pass the Mandatory Requirements of the Florida 2017 Code when the checkboxes are checked.

- If your project has fireplaces, you should check the box at the top. The 2 checkboxes below that will become active. The Florida 2017 Code requires that both of those 2 checkboxes be checked. You should confirm that they represent the conditions of your project and check them. If they are not checked, the compliance will not run.
- You should also confirm that the next 3 check boxes represent your project and make sure that the checkboxes are checked.
- The next item pertains to single assembly ceilings. The requirements are different for this type of ceiling construction. See the section in the Code for details. We will leave it unchecked for this example.

## Mechanical Ventilation

We are now ready to set the mechanical ventilation.

- Click on the 'Mech Ventilation' tab.



The screenshot shows a software window titled "Right-Energy® Florida 2017" with a close button (X) in the top right corner. The window contains several tabs: "Performance", "Project", "Credit Options", "Requirements", "Mech Ventilation", and "Solar WH". The "Mech Ventilation" tab is selected and highlighted. Below the tabs, the "Mechanical Ventilation" section is visible, containing a "Ventilation Type" dropdown menu with "None" selected. A black arrow points to the dropdown arrow. At the bottom right of the window, there are "OK" and "Cancel" buttons.

The Ventilation Type that you select from the drop-down list will determine what other data is required. For Ventilation Type 'None', there is no other data required.

- Select 'Separate Ventilation Fans' from the drop-down list.

Right-Energy® Florida 2017

Performance | Project | Credit Options | Requirements | Mech Ventilation | Solar WH

Mechanical Ventilation

Ventilation Type: **Separate Ventilation Fans**

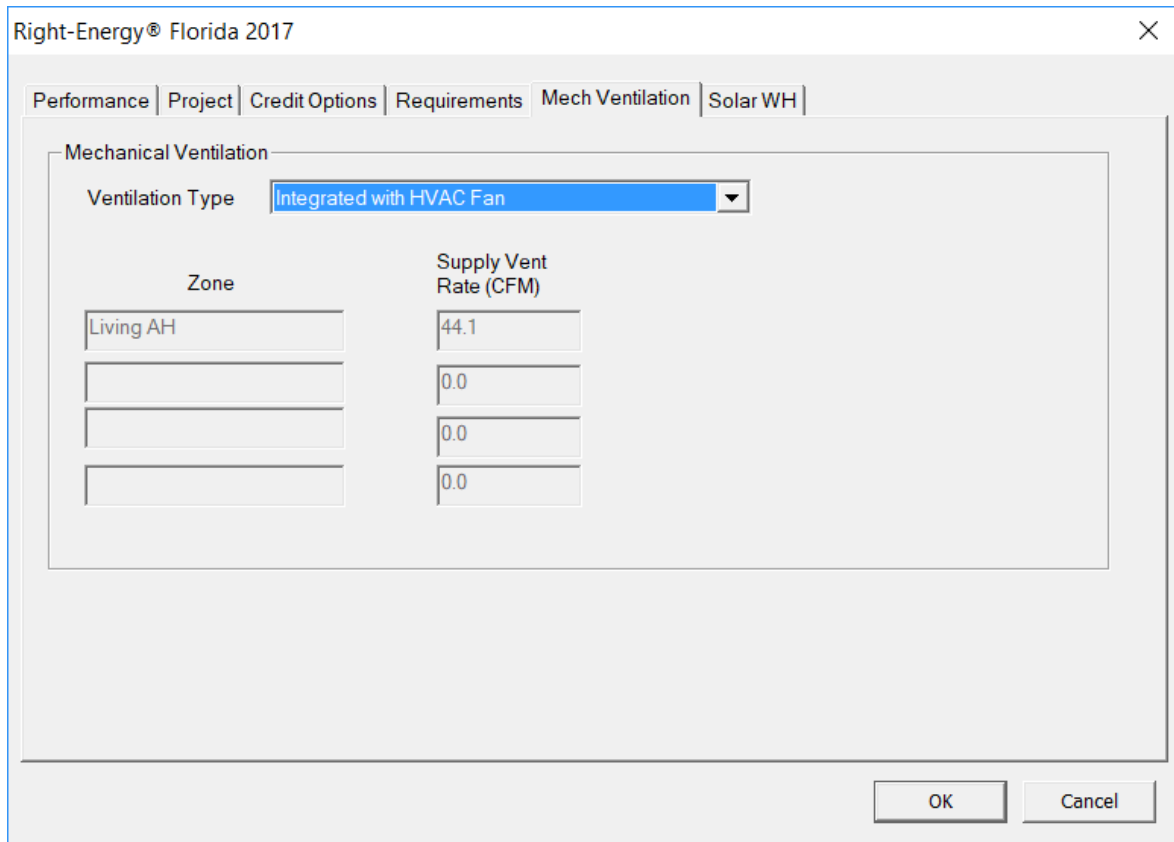
Fans	cfm	W/cfm	Count	Type	ERV Sens Efficiency (%)	Zone
1	0.0	0.000	1	Exhaust	0.0	Living AH
2	0.0	0.000	1	Exhaust	0.0	Living AH
3	0.0	0.000	1	Exhaust	0.0	Living AH
4	0.0	0.000	1	Exhaust	0.0	Living AH

OK Cancel


Now you can specify up to 4 types of fans for your project. These are fans that are not integrated with the heating and cooling equipment.



- Select 'Integrated with HVAC Fan' from the drop-down list.



The values in this screen will be filled in from RSU's ventilation screen. You would go to this screen before you open the Right-Energy® Florida 2017 screen.

- Click the OK button to close the Right-Energy® Florida 2017 screen.
- Select **Show | Multizone** from the RSU menu to display the Multizone screen.
- Select the 'Living AH' air handler, since this is the air handler that has equipment associated with it.
- Close the Multizone screen and select **Show | Zone Information** from the RSU menu to display the Zone Information screen.
- In the 'System Characteristics' section, click on the  button next to 'Central vent type' to display the Central Vent System Details screen.

	Heating	Cooling
Type	Outside air	Outside air
Recovery effectiveness		
Sensible (SER)	0 %	0 %
Latent (LER)	0 %	0 %
Leaving air state		
Dry bulb temperature	43 °F	91 °F
Humidity ratio	32.8 gr/lb	118.2 gr/lb

- Select 'Outside air' from the drop-down lists for Heating and Cooling.
- Click the 'OK' button to transfer your selection to RSU.
- Select the Ventilation Method that you want to use from the drop-down list in the 'Ventilation' section.

The 'Central vent supply AVF' and 'Exhaust AVF' for Heating and Cooling will be displayed in the 'Ventilation' section. These values will also be transferred to the 'Mech Ventilation' page of the Right-Energy® Florida 2017 screen.

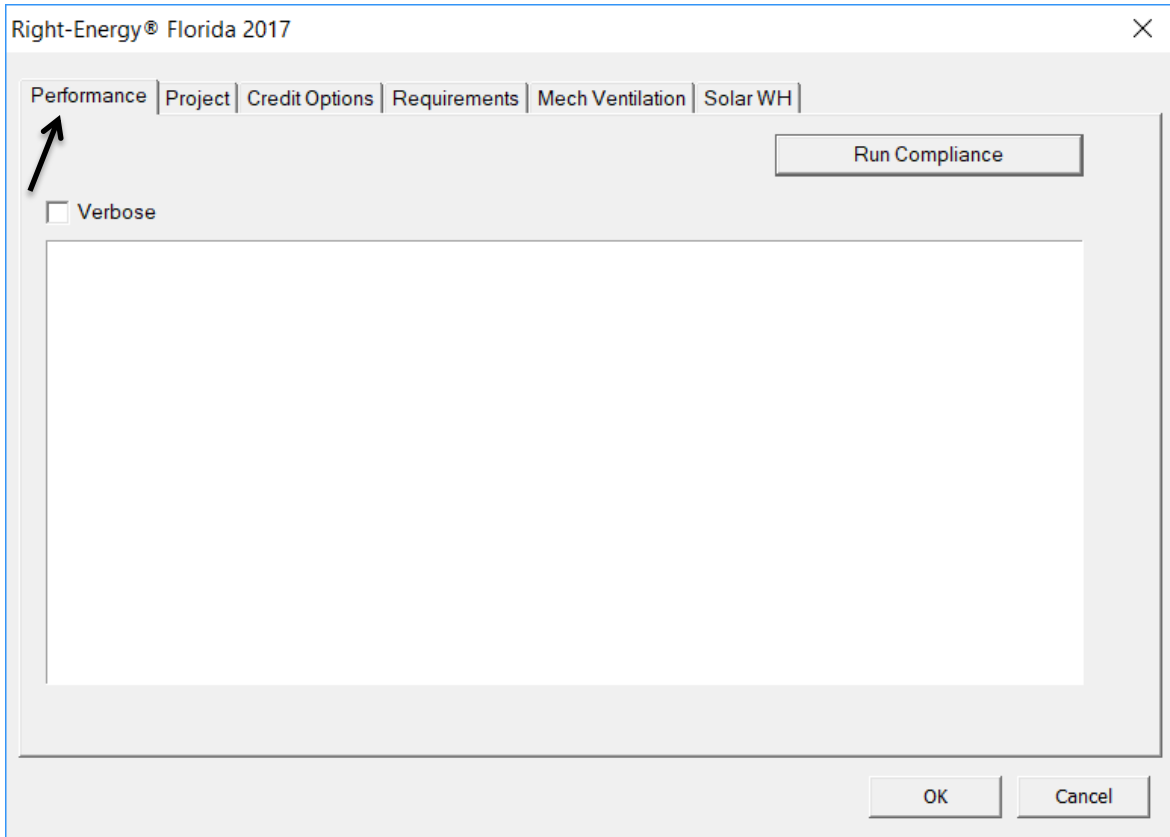
- Select **File | Code Compliance | Right-Energy® Florida 2017** from the RSU menu.
- Click on the 'Mech Ventilation' tab.

Note that the Supply Vent Rate has been transferred from the Zone Information screen.

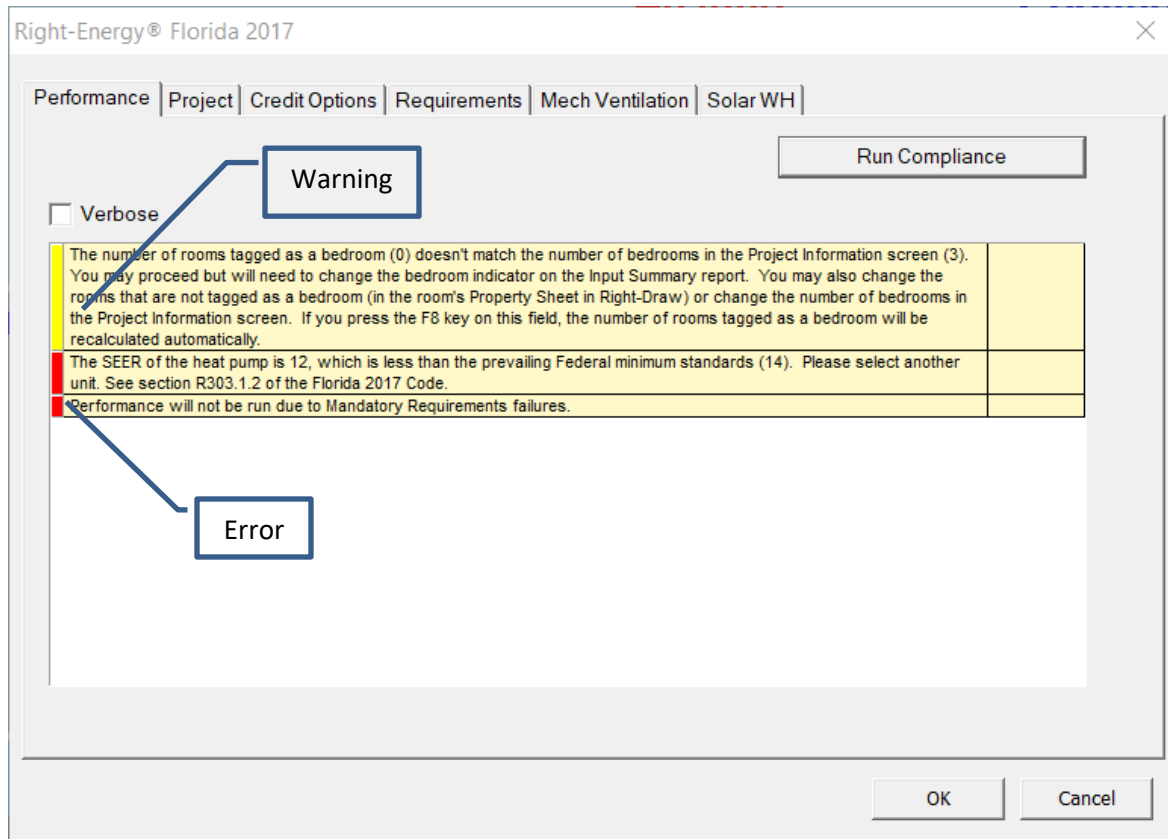
## Compliance (Run Performance)

We are now ready to perform the Performance compliance calculations.

- Click on the 'Performance' tab.



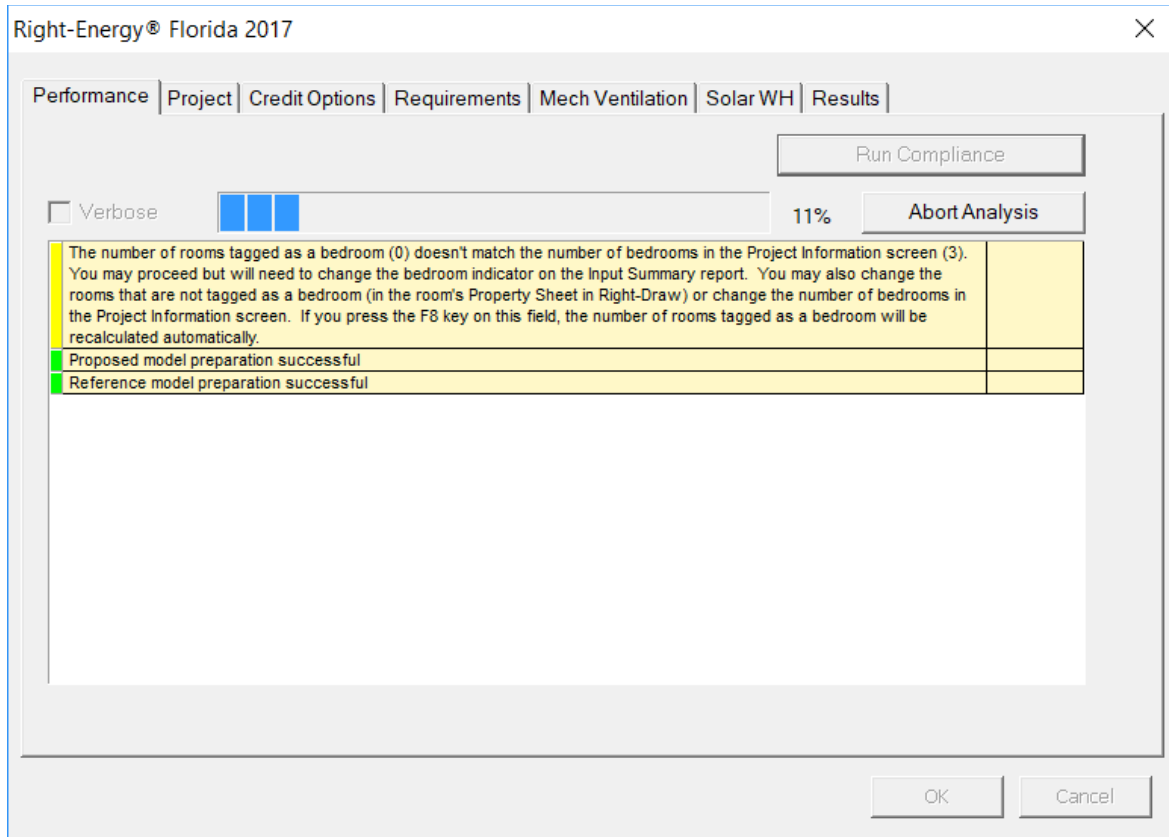
- Click the 'Run Compliance' button.
- If RSU finds any warnings or errors prior to running the simulation, such as a building material that cannot be mapped, you will see them in this window.



- Warning messages are shown with a yellow tag, as indicated above. Warnings do not prevent the run from proceeding, but should be investigated.
- Error messages have a red tag. The run will not proceed if there are errors.
- Messages with a green tag are just for information.

## Compliance (Reports)

When the analysis gets underway, a small progress bar will appear to keep you informed of run progress --



When the run is complete, the overall energy model results are displayed. PASS or FAIL is shown near the bottom of this screen.

The screenshot shows the 'Results' tab of the Right-Energy Florida 2017 software. It displays a 'Compliance Summary' table comparing 'Proposed' and 'Reference' values for various energy metrics. The overall result is 'PASS'.

	Proposed			Reference		
	Load (MBtu/yr)	Fuel (MBtu/yr)	Electricity (kWh)	Load (MBtu/yr)	Fuel (MBtu/yr)	Electricity (kWh)
Heating energy	0.70	0.00	86.96	3.53	0.00	396.98
Heating fan			9.84			45.53
Cooling energy	51.40		3652.99	54.73		3859.66
Cooling fan			707.57			756.10
DHW	7.57	0.00	831.62	7.57	0.00	3027.91
<b>Total</b>	<b>59.67</b>	<b>0.00</b>	<b>5288.98</b>	<b>65.84</b>	<b>0.00</b>	<b>8086.18</b>

	Prop.	Ref.	e-Ratio
Heating	0.77	3.53	0.219
Cooling	51.71	54.73	0.945
DHW	2.15	7.57	0.284
<b>Total</b>	<b>54.63</b>	<b>65.84</b>	<b>0.830</b>

Project name: SimpleHouse  
Run date: 10/06/2017 13:13:07

**PASS**

Buttons: Print, OK, Cancel

Click on the 'Print' button to generate and view the reports. When the reports are generated, you are given the opportunity to view the reports (not shown here, see Appendix C for an example). The reports are generated as a PDF document that you can view and print if you have a PDF viewer. The PDF document will be generated in the same folder as the original RSU project (.rup) file. The exact location of the PDF document will appear in the screen below.

The dialog box titled 'Compliance Report' contains the following text:

PDF compliance report successfully generated (C:\Documents\Wrightsoft HVAC\SimpleHouse-Performance.pdf).

Would you like to view the report?

Buttons: Yes, No

## Detailed Input Description

This section provides specific details about Right-Suite Universal (RSU) inputs that are used by Right-Energy® Florida 2017.

If you are a new RSU user, you should refer to other documentation to become familiar with general input capabilities. In particular, note the use of overrides (activated using the F8 key) that allow altering default input values.

### Project Information Screen

This screen should be filled out just like it would for the load calculations. Pay careful attention to the following:

- Note that the Florida Climate zone is linked to the Weather Location project data. You have to select the Weather Location in the Project Information Screen.
- In the 'Customer' section, enter the Name, Address, City State, Zip Code
- In the 'Contractor' section, enter the Name and/or Company.
- In the 'Site' section, you can check the checkbox at the top to copy the information that is in the 'Customer' section. Enter the County and Lot info. (if appropriate).
- In the 'Job' section, the Orientation information is used for documentation only and does not modify or effect modeled surface orientations.
- Number of bedrooms is important for Florida 2017. The default value is derived from Right-Draw room type property. You should override the default if it is not correct.
- Enter the Jurisdiction in the Job section.
- The Weather location is not needed for Florida 2017 compliance. However, it is good practice to select appropriate weather data for the building location. With accurate weather data, you can use all the other features of RSU, such as load calculations, duct design, and equipment operating cost comparison (assuming you have any required module licenses). It is also used to derive the Climate Zone.

### Zone Information Screen

The zone information screen includes information about ventilation. This information is used *only* for loads calculations.

### Infiltration

Infiltration data for compliance is entered on the normal RSU Infiltration screen.

### Right-Draw®

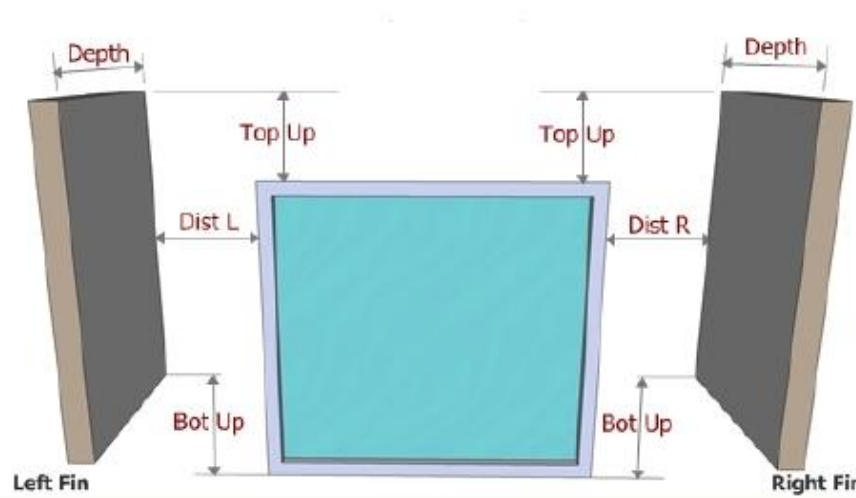
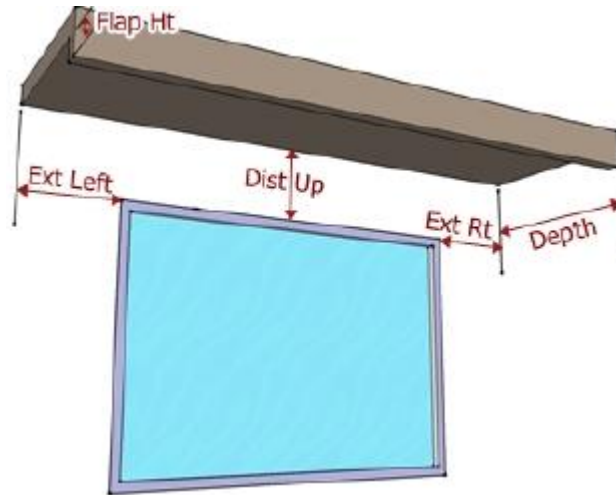
Drawing procedures are identical to those used for loads calculations. Right-Energy® Florida 2017 models the house at the zone level (not room level), so if you are not doing room-by-room load calculations (e.g. for duct design), you do not need to draw each room (i.e., draw the building as if you are doing a block load).

Right-Energy® Florida 2017 combines all rooms within each zone, so compliance analysis will work correctly with or without room level input.

Pay careful attention to the following:

- When adding sheets, be sure that the 'Elevation' is accurate. RSU doesn't require the elevations to be real, just in ascending order to determine which sheet is above which. For compliance, however, the actual elevation is needed. This means that even the lowest level may not be at 0 elevation. If the floor is 3" above grade, you need to indicate that. If the floor is slab-on-grade, use the thickness of the slab as the elevation.
- Even though attics don't need to be entered for RSU load calculations, they need to be entered for Florida 2017 compliance. Draw a room (or rooms) in a separate level and set the room type to 'Unconditioned attic'. If there are no walls in the attic, set the room height to zero. Set the 'Room heating condition' and 'Room cooling condition' to 'None'. Make sure the rooms below the attic and the attic rooms themselves have the ceiling construction set to a 'ceiling below attic' construction. Also be sure to add a Right-Draw Ceiling with the appropriate roof type. If you have other rooms that are unconditioned (like a garage), put the attic rooms in a separate zone.
- **Room property sheet:** Set the Room type. Attics, bedrooms and garages are particularly important for compliance. If you do not draw each room, be sure to override Number of bedrooms on the Project Information screen.
- **Wall property sheet:** Wall constructions (accessible via the [...] buttons on e.g. Wall 1, type) provide many standard constructions plus some recently added for consistency with Right-Energy® Florida 2017. EIFS (exterior insulating finish system) is a new choice – to use it you must select EIFS (under Exterior) and the appropriate Exterior board insulation (to represent the foam layer of the system).
- **Ceiling property sheet:** For ceilings under an attic, wood shakes; tile, slate, concrete; and metal roof materials will include an air gap under the roof. Other roof materials do not include an air gap. Therefore, if you have another roof material selected, and there is an air gap, you will need to switch to 'Custom layers' and add an air gap manually.
- **Floor property sheet:** For 'On/Below Grade' floors, there is an option for '80% carpet / 20% bare' in the Floor finish group. This is the Right-Energy® Florida 2017 default for slab floor construction.
- **Window property sheet:** The construction and dimensions of the window are used in compliance. The width, height, and head height are needed for compliance, as well as the presence of an insect screen. There is an additional option of 'Impact rated glass'. If you are using this type of glass in your project, be sure to indicate it here. The Florida 2017 Code requirements are different for this type of glass than for other types. There are more overhang options needed than there are for RSU load calculations:





Enter these values in the Property Sheet for the window (see below).

Property Sheet

18y1

Window details

Construction type	
Door type	
Orientation	
Width (ft)	
Height (ft)	
Area (ft²)	
Shaded?	No
Head height (ft)	7.70
Configuration	Flat
NFRC rated	Yes
U-value heating (Btuh/ft²·F)	0.320
U-value cooling (Btuh/ft²·F)	0.320
SHGC	0.25
Storm window during cooling	No
Internal shade	Blinds 45°, medium
Internal shade fraction closed (%)	50
Insect screen	Outdoor
Insect screen coverage (%)	50
External sun screen SCss	1.00
External sun screen coverage (%)	0
Foreground	Default (0.20)
Overhang horizontal projection (ft)	1.00
Overhang vertical separation (ft)	1.33
(RE) Impact rated glass?	No
(RE) Overhang extension left (ft)	
(RE) Overhang extension right (ft)	
(RE) Overhang flap (ft)	
(RE) Fin left depth (ft)	0.00
(RE) Fin left distance (ft)	0.00
(RE) Fin left top distance to top of glazing (ft)	0.00
(RE) Fin left bottom distance to bottom of glazing (ft)	0.00
(RE) Fin right depth (ft)	0.00
(RE) Fin right distance (ft)	0.00
(RE) Fin right top distance to top of glazing (ft)	0.00
(RE) Fin right bottom distance to bottom of glazing (ft)	0.00

### Equipment Screens

You need to select heating, cooling, and DHW equipment for compliance. Select **Show | Equipment** from the main RSU menu to display the Equipment Screen.

In this screen, enter the cooling, heating, and water heating equipment types. You will select the specific units in other screens.

Right-Energy® Florida 2017 handles split and packaged air-conditioning and heat pump HVAC systems.

**Air Source Heat Pump Selection**

Requirements  
 Sensible load (Btuh) 13654 SHR 0.70000  
 Target capacity (Btuh) 19506

Manufacturer  Sel for Manual S  
 Pridiom Group LLC  
 Quietside  
 Rheem  
 Richmond Water Heaters  
 Ruud  
 Sample  
 Samsung Electronics Co., LTD.

Filter  
 Auto Select  
 Capacity / load (%) Min 100 Max 115  
 Capacity (Btuh) 19506 22432  
 SEER 0.0 20.0  
 Condenser prefix -ALL-  
 Coil prefix -ALL-  
 AHRI #

RefNo	Condenser Model	Coil Model	Capacity	EER	SEER	Cap47	Cap17	COP47	COF
0	HPS020115-075	AH020	20200	0	11.5	22400	12800	0	0
0	HPS021105-079	AH021	21000	0	10.5	23600	14200	3.26	2.2
0	HPS021140-068	AH021	21200	0	14	19300	10200	2.8	1.86
0	HPS021129-077	AH021	21200	0	12.9	23000	13500	0	0
0	HPS021140-074	AH021	21200	0	14	22800	12100	3.34	2.24
0	HPS021115-070	AH021	21200	0	11.5	20200	11800	2.8	2
0	HPS021135-079	AH021	21200	0	13.5	24000	13000	0	0
0	HPS021132-082	AH021	21400	0	13.2	23800	13300	0	0

Record 1

View data sheet OK Cancel Help

The Split AC tab contains detailed information about the air conditioner. To select the specific unit, click the 'Select Equip' button. The fan cfm and Watts must be carefully chosen.

Equipment for Living AH: Base System (Split ASHP)

System Type | Data | Features | Split ASHP | Elec strip | Elec WH | Perf | Ducts

**Type**

Manufacturer: Sample

Trade name:

Model: 50400616076

AHRI ref no.:

**Ratings**

Tank size (gal): 40      Energy factor: 0.960

Input (kWh): 4.5      1st hour (gal): 60

Recovery efficiency (%): 77

EWT (°F):      Capacity (MBtuh):      COP:

Dedicated WS/GS:      heat pump:

Select Equip    Generic Equip    OK    Cancel    Apply    Help

The Gas WH tab has information about the specific water heating unit. Click the 'Select Equip' button to select the unit.

### Additional Considerations

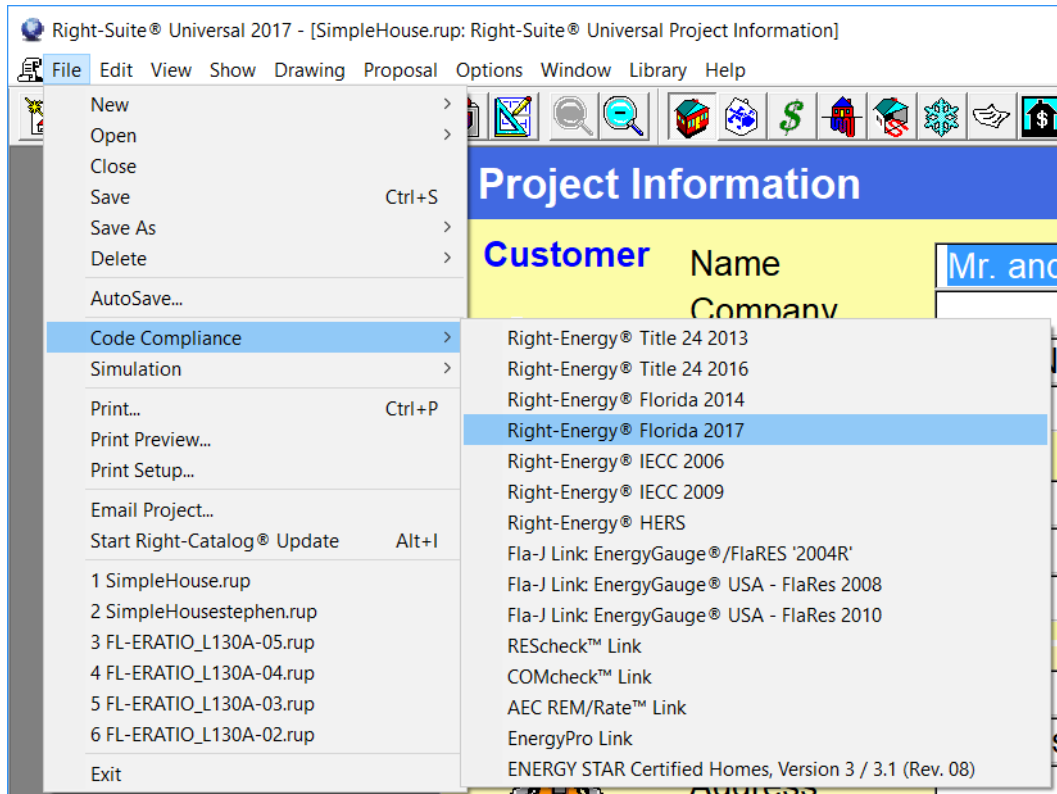
**Attics** – Attics are not normally explicitly described in RSU. However, they need to be defined for compliance. RSU will generate a default attic when there is a 'Ceiling under Attic' in the building and an attic is not defined above it. Wood shakes; tile, slate, concrete; and metal roof materials will include an air gap under the roof. Other roof materials do not include an air gap. Therefore, if you have another roof material selected, and there is an air gap, you will need to switch to 'Custom layers' and add an air gap.

**Garages** – Garages are usually not conditioned and, therefore, not considered for load calculations. However, compliance requires that they be defined. When you enter an attached garage, be sure to set the following in the Room Property Sheet for the garage:

1. Set 'Include in calculations?' to 'Yes'.
2. Set the 'Room heating condition' and 'Room cooling condition' to '[None]'.
3. Set the 'Room type' to 'Garage'.

## Right-Energy® Florida 2017 Screens

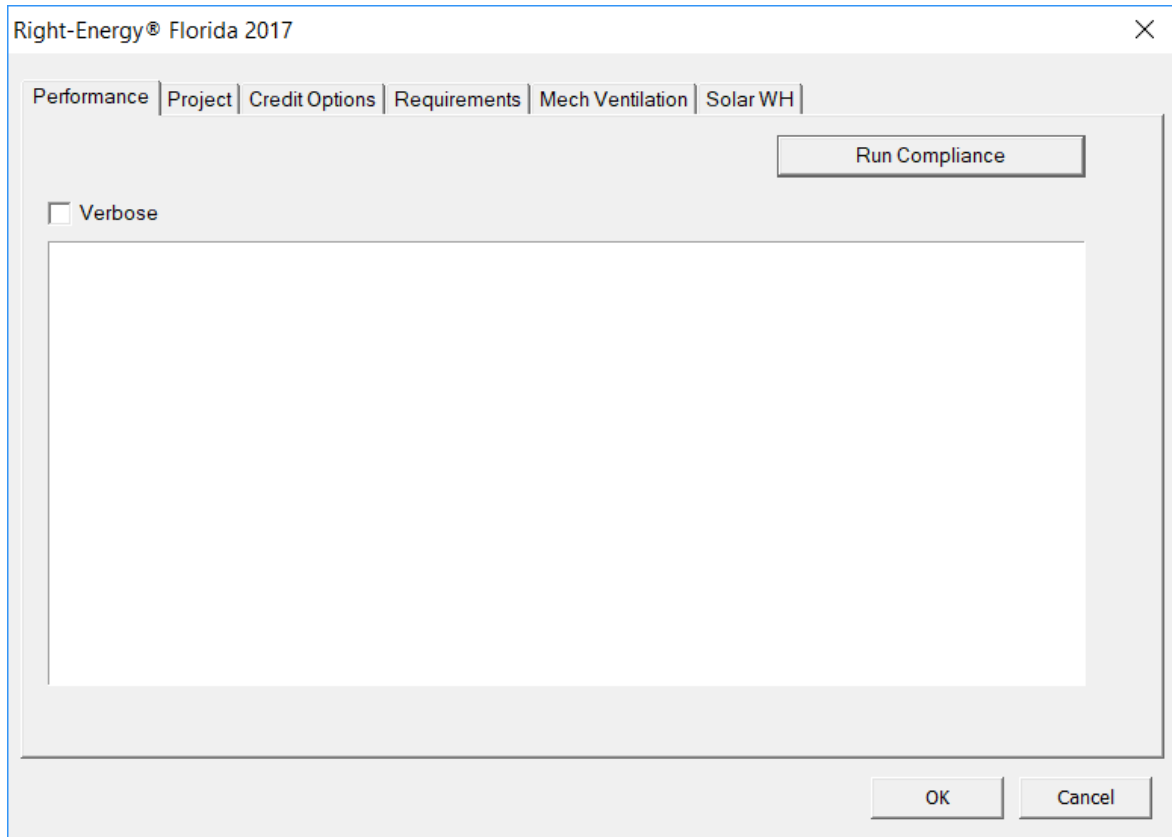
A number of screens capture input that is used *only* for Florida 2017 compliance. In some cases, default information is provided from elsewhere in RSU, but no data entered here has any effect on other RSU calculations.



This will display the following screen that provides a number of tabbed property page screens.

## Performance

As explained under Procedure in Brief, the Performance tab allows initiation of the Performance method compliance calculations and displays error messages. The other tabs contain inputs that are required for Florida 2017 compliance, but are not available in RSU.



## Appendix A. Mandatory Requirements

The following Mandatory Requirements are checked prior to performing a compliance run. Errors (tagged red on the Florida 2017 Code Compliance screen) will prevent the compliance from being run. These must be corrected and the compliance re-run. Warnings (tagged yellow on the Florida 2017 Code Compliance screen) will not prevent the compliance from being run. However, you should review the message and the Code carefully to be sure that you comply.

The following Mandatory Requirements are checked prior to performing a compliance run:

Requirement	Code reference	Description	Prevents compliance from running
Climate zone		Must be 1 or 2. This is derived by RSU from the selected Weather Location in the Project Information Screen.	Yes
Site state, Weather Location state		The Site State and Weather Location state must be 'FL'. These are in the Project Information Screen.	Yes
Infiltration ACH	R402.4.1.2	The building or dwelling unit shall be tested and verified as having in air leakage rate of not exceeding 7 air changes per hour in Climate Zones 1 and 2. Note that this requirement changed in the 2016 Addendum to the Florida 2017 Code.	Yes
Fireplaces must use outdoor combustion air	R402.4.2	Please change this option in the Requirements tab of the Right-Energy® Florida 2017 screen.	Yes
Fireplaces must use flue dampers	R402.4.2	Please change this option in the Requirements tab of the Right-Energy® Florida 2017 screen.	Yes
Supplementary heating equipment controls	R403.1.3	The supplementary heating equipment cannot run when the heat pump can meet the load by itself. Set the controls in the heat pump page of the Equipment Screen	Yes
Building framing cavities as ducts	R403.3.5	Building framing cavities shall not be used as ducts or plenums.	Yes
Air handler in attic	R403.3.6	Air handlers can be in the attic when several conditions are met. See the code for these conditions.	No
Hot water heater heat traps	R403.5.5	Heat traps must be used with storage water heaters. Please check the checkbox in the Right-Energy Right-Energy® Florida 2017 Florida 2017 Screen	Yes
Solar water heating systems	R403.5.6.2.1	Solar water heating systems must be rated (FEF) and certified (FSEC Cert.) by the Florida Solar Energy Center. Please enter this information in the Solar WH tab in the Right- Energy® Florida 2017 Florida 2017 screen.	Yes
Load calculation method	R403.7	The Manual J load calculation method must be used. Select this in the Options menu.	Yes



<b>Requirement</b>	<b>Code reference</b>	<b>Description</b>	<b>Prevents compliance from running</b>
Equipment specified	R403.7	The make, model, and capacities must be selected. Enter this data in the Equipment Screens.	Yes
Equipment capacities	R403.7	Equipment capacities must be between the low and high limits. See the code for details and exceptions.	No
Equipment size to Manual S	R403.7	Heating and cooling equipment shall be sized in accordance with ACCA Manual S. Please check the box in the Right-Energy Right-Energy® Florida 2017 Florida 2017 screen.	Yes
Ceiling insulation	R405.2.1	Ceiling insulation is below the required minimum. Change the ceiling construction.	Yes
Equipment efficiencies	R303.1.2	Equipment efficiencies must be at least the prevailing Federal minimum standards.	Yes

## Appendix B. Error Messages

When you run a compliance, RSU does a 'consistency check and a Mandatory Requirements check before running the compliance. Consistency Check messages probably won't prevent the compliance from running. However, if the message indicates a condition that you weren't expecting, you should correct it.

### Consistency Checks

- Rooms in an unconditioned attic must ALL be in a separate zone and have the 'Uncond Attic' type set in the Room's Property Sheet in Right-Draw®. RSU will check to see if this condition is true. If it finds a room that is set to 'Uncond Attic', it will check to make sure that all of the other rooms in that zone are set to 'Uncond Attic'. If not, it will display the following message in the Right-Energy® Florida 2017 screen:

Zone 'xxx' contains rooms of type 'Uncond Attic', however not all rooms in this zone have type 'Uncond Attic'.

When you run a compliance, the Mandatory Requirements will be checked before the compliance is run. There may be error and warning messages in the Run tab of the Right-Energy® Florida 2017 screen during this operation. The messages should be self-explanatory and they give the section of the Code for further explanation.

When the compliance starts, you probably won't get any errors. The purpose of the Mandatory Requirements check is to ensure that the compliance will run successfully. However, you may occasionally get error messages during the compliance run. The message on the screen will indicate that 'Data retrieval failed...'. This indicates that the simulation itself could not complete.

If you get an error message that you cannot decipher, please call Wrightsoft technical support at 800-225-8697 or email us at [support@wrightsoft.com](mailto:support@wrightsoft.com).

### Footnotes on the Form R405-2017 Summary Report

At the bottom of the Form R405-2017 Summary Report, there will be a series of footnotes. These footnotes are reminders of further action required. Some appear based on inputs that you have provided.

The first two appear on all reports:

- Compliance requires certification by the air handler unit manufacturer that the air handler enclosure qualifies as certified factory-sealed in accordance with R402.2.2.1.
- Compliance requires an Air Barrier and Insulation Inspection Checklist in accordance with R402.4.1.1 and starting July 1, 2017, this project requires an envelope leakage test report with envelope leakage no greater than 7.0 ACH50 (R402.4.1.2).

If you selected the Cool Roof option in the Credit Options tab of the Right-Energy® Florida 2017 screen, the following will appear as a footnote:

- Compliance requires a roof absorptance test and roof emittance test in accordance with R405.7.2.

If you selected Proposed Qn for the Leakage type on the Ducts tab of the Equipment screen, the following will appear as a footnote:

- Compliance with a proposed duct leakage Qn requires a Duct Leakage Test Report confirming duct leakage to outdoors, tested in accordance with Section 803 of RESNET Standards, is not greater than x.xxx Qn for whole house.  
Note that 'x.xxx' above will be replaced with the Qn value that you entered on the Ducts tab.

If you selected Proposed Leak Free for the Leakage type on the Ducts tab of the Equipment screen, the following will appear as a footnote:

- Compliance with a proposed leak free duct leakage requires a Duct Leakage Test Report confirming duct leakage to outdoors, tested in accordance with Section 803 of RESNET Standards, is not greater than 0.030 Qn for whole house.  
Note that '0.030' above is a Code requirement and cannot be modified.

## Appendix C. Sample Compliance Documentation

**RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST****Florida Department of Business and Professional Regulation  
Simulated Performance Alternative (Performance) Method**

**Applications for compliance with the 2017 Florida Building Code, Energy Conservation via the residential Simulated Performance method shall include:**

- A Form 405 report that documents that the Proposed Design complies with Section R405.3 of the Florida Energy Code. This form shall include a summary page indicating home address, e-ratio and the pass or fail status along with summary areas and types of components, whether the home was simulated as a worst-case orientation, name and version of the compliance software tool, name of individual completing the compliance report (1 page) and an input summary checklist that can be used for field verification (usually 4 pages/may be greater)
- Energy Performance Level (EPL) Display Card (one page)
- HVAC system sizing and selection based on ACCA Manual S or per exceptions provided in Section R403.7
- Mandatory Requirements (five pages)

**Required prior to CO for the Performance method:**

- Air Barrier and Insulation Inspection Component Criteria checklist (Table 402.4.1.1 - one page)
- A completed Envelope Leakage Test Report (usually one page)
- If Form R405 duct leakage type indicates anything other than "default leakage", then a completed Form R405 Duct Leakage Test Report (usually one page).

# FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION


## Florida Department of Business and Professional Regulation - Residential Performance Method

Project Name: Right-Energy® Florida 2014 Example Street: 1516 Ninth Street City, State, Zip: Tampa, FL 33601 Owner: Design Location: FL, Tampa International AP	Builder Name: Wrightsoft Permit Office: Tampa Permit Number: 2222-1 Jurisdiction: Hillsborough County County: Hillsborough (Florida Climate Zone 2)
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<table style="width: 100%;"> <tr> <td>1. New construction or existing</td> <td colspan="2">New (From Plans)</td> </tr> <tr> <td>2. Single family or multiple family</td> <td colspan="2">Single-Family</td> </tr> <tr> <td>3. Number of units, if multiple family</td> <td colspan="2">1</td> </tr> <tr> <td>4. Number of bedrooms</td> <td colspan="2">3</td> </tr> <tr> <td>5. Is this a worst case?</td> <td colspan="2">No</td> </tr> <tr> <td>6. Conditioned floor area above grade (ft²)</td> <td colspan="2">2100.00</td> </tr> <tr> <td>    Conditioned floor area below grade (ft²)</td> <td colspan="2">0</td> </tr> <tr> <td>7. Windows (340 ft²)</td> <td>Description</td> <td>Area (ft²)</td> </tr> <tr> <td>    a. U-Factor:</td> <td>Sgl, U=0.032</td> <td>299.58</td> </tr> <tr> <td>        SHGC:</td> <td>SHGC=0.25</td> <td></td> </tr> <tr> <td>    b. U-Factor:</td> <td>Dbl, U=0.032</td> <td>40.56</td> </tr> <tr> <td>        SHGC:</td> <td>SHGC=0.25</td> <td></td> </tr> <tr> <td>    c. U-Factor:</td> <td></td> <td></td> </tr> <tr> <td>        SHGC:</td> <td></td> <td></td> </tr> <tr> <td>    d. U-Factor:</td> <td></td> <td></td> </tr> <tr> <td>        SHGC:</td> <td></td> <td></td> </tr> <tr> <td>    Area Weighted Average Overhang Depth:</td> <td>0.877 ft</td> <td></td> </tr> <tr> <td>    Area Weighted Average SHGC:</td> <td>0.312</td> <td></td> </tr> <tr> <td>8. Floor types (2100.00 ft²)</td> <td>Insulation</td> <td>Area (ft²)</td> </tr> <tr> <td>    a. Bg floor, light dry soil, on grade</td> <td>R=0.0</td> <td>2100.00</td> </tr> <tr> <td>    b. N/A</td> <td>R=</td> <td></td> </tr> <tr> <td>    c. N/A</td> <td>R=</td> <td></td> </tr> </table>	1. New construction or existing	New (From Plans)		2. Single family or multiple family	Single-Family		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)	2100.00		Conditioned floor area below grade (ft²)	0		7. Windows (340 ft²)	Description	Area (ft²)	a. U-Factor:	Sgl, U=0.032	299.58	SHGC:	SHGC=0.25		b. U-Factor:	Dbl, U=0.032	40.56	SHGC:	SHGC=0.25		c. U-Factor:			SHGC:			d. U-Factor:			SHGC:			Area Weighted Average Overhang Depth:	0.877 ft		Area Weighted Average SHGC:	0.312		8. Floor types (2100.00 ft²)	Insulation	Area (ft²)	a. Bg floor, light dry soil, on grade	R=0.0	2100.00	b. N/A	R=		c. N/A	R=		<table style="width: 100%;"> <tr> <td>9. Wall types (1728 ft²)</td> <td>Insulation</td> <td>Area (ft²)</td> </tr> <tr> <td>    a. Frm wall, eifs ext, r-15 ca</td> <td>19.0</td> <td>1458.00</td> </tr> <tr> <td>    b. Frm wall, stucco ext, r-15</td> <td>15.0</td> <td>270.00</td> </tr> <tr> <td>    c. N/A</td> <td>R=</td> <td></td> </tr> <tr> <td>    d. N/A</td> <td>R=</td> <td></td> </tr> <tr> <td>10. Ceiling types (2100 ft²)</td> <td>Insulation</td> <td>Area (ft²)</td> </tr> <tr> <td>    a. Attic ceiling, asphalt s</td> <td>R=30.0</td> <td>2100.00</td> </tr> <tr> <td>    b. N/A</td> <td>R=</td> <td></td> </tr> <tr> <td>    c. N/A</td> <td>R=</td> <td></td> </tr> <tr> <td>11. Ducts</td> <td>R</td> <td>Area (ft²)</td> </tr> <tr> <td>    a. Sup:Living AH/Ret:Living AH/AH:Living AH</td> <td>8.0</td> <td>222.79</td> </tr> <tr> <td>    b.</td> <td></td> <td></td> </tr> <tr> <td>12. Cooling systems</td> <td>kBtu/hr</td> <td>Efficiency</td> </tr> <tr> <td>    a. Split air source heat pump</td> <td>20.2</td> <td>SEER: 14.0</td> </tr> <tr> <td>13. Heating systems</td> <td>kBtu/hr</td> <td>Efficiency</td> </tr> <tr> <td>    a. Split air source heat pump</td> <td>22.4</td> <td>HSPF: 8.2</td> </tr> <tr> <td>14. Hot water systems</td> <td></td> <td></td> </tr> <tr> <td>    a. Electric conventional (40 gal)</td> <td></td> <td>Cap: 40 gal EF: 0.96</td> </tr> <tr> <td>    b. Conservation features</td> <td></td> <td>Solar: FEF=3.0</td> </tr> <tr> <td>15. Credits</td> <td colspan="2">Cool Roof; Solar WH</td> </tr> </table>	9. Wall types (1728 ft²)	Insulation	Area (ft²)	a. Frm wall, eifs ext, r-15 ca	19.0	1458.00	b. Frm wall, stucco ext, r-15	15.0	270.00	c. N/A	R=		d. N/A	R=		10. Ceiling types (2100 ft²)	Insulation	Area (ft²)	a. Attic ceiling, asphalt s	R=30.0	2100.00	b. N/A	R=		c. N/A	R=		11. Ducts	R	Area (ft²)	a. Sup:Living AH/Ret:Living AH/AH:Living AH	8.0	222.79	b.			12. Cooling systems	kBtu/hr	Efficiency	a. Split air source heat pump	20.2	SEER: 14.0	13. Heating systems	kBtu/hr	Efficiency	a. Split air source heat pump	22.4	HSPF: 8.2	14. Hot water systems			a. Electric conventional (40 gal)		Cap: 40 gal EF: 0.96	b. Conservation features		Solar: FEF=3.0	15. Credits	Cool Roof; Solar WH	
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Glass/Floor area: 0.162
Total Proposed Modified Loads: 54.63
PASS

Total Baseline Loads: 65.84

<p>I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Energy Code.</p> <p>PREPARED BY: _____</p> <p>DATE: _____</p> <p>I hereby certify that this building, as designed, is in compliance with the Florida Energy Code.</p> <p>OWNER/AGENT: _____</p> <p>DATE: _____</p>	<p>Review of the plans and specifications covered by this calculation indicates compliance with the Florida Energy Code. Before construction is completed, this building will be inspected for compliance with Section 553.908 Florida Statutes.</p> <div style="text-align: right;">  </div> <p>BUILDING OFFICIAL: _____</p> <p>DATE: _____</p>
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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 R403.2.2.1.
- Compliance requires an Air Barrier and Insulation Inspection Checklist in accordance with R402.4.1.1 and starting July 1, 2017, this project requires an envelope leakage test report with envelope leakage no greater than 7.0 ACH50 (R402.4.1.2).
- Compliance requires a roof absorptance test and roof emittance test in accordance with R405.7.2.

# Building Input Summary Report

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

WINDOWS														
✓ #	Ornt	Wall ID	Frame	Panes	NFRC	U-Factor	SHGC	Storms	Area	Depth	Overhang Separation	Interior Shade	Screening	
1	N	1	None	Single (Clear)	Yes	0.032	0.25	No	14.6ft²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
2	N	1	None	Single (Clear)	Yes	0.032	0.25	No	30.0ft²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
3	N	1	None	Single (Clear)	Yes	0.032	0.25	No	30.0ft²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
4	E	2	None	Single (Clear)	Yes	0.032	0.25	No	45.0ft²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
5	S	3	Wood	Double (Clear)	Yes	0.032	0.25	No	40.6ft²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
6	S	3	None	Single (Clear)	Yes	0.032	0.25	No	135ft²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	
7	W	4	None	Single (Clear)	Yes	0.032	0.25	No	45.0ft²	1 ft 0 in	1 ft 4 in	Blinds 45°	outdoor	

GARAGE						
✓ #	Floor Area	Ceiling Area	Exposed Wall Perimeter	Avg. Wall Height	Exposed Wall Insulation	
1	440 ft²	440 ft²	54 ft	9 ft	19	

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

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

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

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

SOLAR HOT WATER SYSTEM						
✓ FSEC Cert #	Company Name	System Model #	Collector Model #	Collector Area	Storage Volume	FEF
12345	Sample	SSWS-678	SSWC-123	35.0 ft²	70.0 gal	3.0

DUCTS												
✓ #	Location	--- Supply --- R-Value	Area	--- Return --- Location	Area	Leakage Type	Air Handler	CFM 25 Out	Percent Leakage	QN	RLF	HVAC # Heat Cool
1	Living AH	8.0	223 ft²	Living AH	15 ft²	Default Leakage	Living AH	(Default)	6.00			1 1

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



# ENERGY PERFORMANCE LEVEL (EPL) DISPLAY CARD

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

1516 Ninth Street, Tampa, FL 33601

<p>1. New construction or existing 2. Single family or multiple family 3. Number of units, if multiple family 4. Number of bedrooms 5. Is this a worst case? 6. Conditioned floor area (ft<sup>2</sup>)</p>	<p>New (From Plans) Single-Family 1 3 No 2100.00</p>	<p>9. Wall Types a. Frm wall, eifs ext, r-15 ca b. Frm wall, stucco ext, r-15 c. N/A d. N/A</p>	<p>Insulation 19.0 15.0 R= R=</p>	<p>Area (ft<sup>2</sup>) 1458.00 270.00</p>
<p>7. Windows** a. U-Factor: SHGC: b. U-Factor: SHGC: c. U-Factor: SHGC: d. U-Factor: SHGC: Area Weighted Average Overhang Depth: Area Weighted Average SHGC:</p>	<p>Description Sgl, U=0.032 SHGC=0.25 Dbl, U=0.032 SHGC=0.25  0.877 ft 0.312</p>	<p>Area (ft<sup>2</sup>) 299.58 40.56</p>	<p>10. Ceiling Types a. Attic ceiling, asphalt s b. N/A c. N/A</p>	<p>Insulation R=30.0 R= R=</p> <p>Area (ft<sup>2</sup>) 2100.00</p>
<p>8. Floor Types a. Bg floor, light dry soil, on grade b. N/A c. N/A</p>	<p>Insulation R=0.0 R= R=</p>	<p>Area (ft<sup>2</sup>) 2100.00</p>	<p>11. Ducts a. Sup:Living AH/Ret:Living AH/AH:Living AH</p>	<p>R 8.0</p> <p>Area (ft<sup>2</sup>) 222.79</p>
			<p>12. Cooling systems a. Split air source heat pump b.</p>	<p>kBtu/hr 20.2</p> <p>Efficiency SEER: 14.0</p>
			<p>13. Heating systems a. Split air source heat pump b.</p>	<p>kBtu/hr 22.4</p> <p>Efficiency HSPF: 8.2</p>
			<p>14. Hot water systems a. Electric conventional (40 gal)  b. Conservation features Solar:FEF=3.0</p>	<p>Cap: 40 gal EF: 0.96</p>
			<p>15. Credits Cool Roof;Solar WH</p>	

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

Builder Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Address of New Home: \_\_\_\_\_ City/FL Zip: \_\_\_\_\_



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

Florida Department of Business and Professional Regulations  
Residential Whole Building Performance and Prescriptive Methods

ADDRESS: 1516 Ninth Street  
Tampa, FL 33601

PERMIT #: 2222-1

**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 compliance for the building. A copy of the EPL display card can be found in Appendix RD.
- **R402.4 Air leakage (Mandatory).** The building thermal envelope shall be constructed to limit air leakage in accordance with the requirements of Sections R402.4.1 through R402.4.5.

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

- **R402.4.1 Building thermal envelope.** The building thermal envelope shall comply with Sections R402.4.1.1 and R402.4.1.2. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.
  - **R402.4.1.1 Installation.** The components of the building thermal envelope as listed in Table R402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table 402.4.1.1, as applicable to the method of construction. Where required by the code official, an approved third party shall inspect all components and verify compliance.
  - **R402.4.1.2 Testing.** The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding seven air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ANSI/RESET/ICC 380 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Testing shall be conducted by either individuals as defined in Section 553.993(5) or (7), Florida Statutes or individuals licensed as set forth in Section 489.105(3)(f), (g), or (i) or an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope.

**Exception:** Testing is not required for additions, alterations, renovations, or repairs, of the building thermal envelope of existing buildings in which the new construction is less than 85 percent of the building thermal envelope.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.
  2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.
  3. Interior doors, if installed at the time of the test, shall be open.
  4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed.
  5. Heating and cooling systems, if installed at the time of the test, shall be turned off.
  6. Supply and return registers, if installed at the time of the test, shall be fully open.
- **R402.4.2 Fireplaces.** New wood-burning fireplaces shall have tight-fitting flue dampers 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)**

- **R403.2.2.1 Sealed air handler.** Air handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design air flow rate when tested in accordance with ASHRAE 193.
- **R403.2.3 Building Cavities (Mandatory).** Building framing cavities shall not be used as ducts or plenums.
- **R403.3 Mechanical system piping insulation (Mandatory).** Mechanical system piping capable of carrying fluids above 105°F (41°C) or below 55°F (13°C) shall be insulated to a minimum of R-3.,
  - **R403.3.1 Protection of piping insulation.** Piping insulation exposed to weather shall be protected 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 Circulating hot water systems (Mandatory).** Circulating hot water systems shall be provided with an automatic or readily accessible manual switch that can turn off the hot-water circulating pump when the system is not in use.
- **R403.4.3 Heat traps (Mandatory).** Storage water heaters not equipped with integral heat traps and having vertical pipe risers shall have heat traps installed on both the inlets and outlets. External heat traps shall consist of either a commercially available heat trap or a downward and upward bend of at least 3 1/2 inches (89 mm) in the hot water distribution line and cold water line located as close as possible to the storage tank.
- **R403.4.4 Water heater efficiencies (Mandatory).** Water heater efficiencies
  - **R403.4.4.1 Storage water heater temperature controls**
    - **R403.4.4.1.1 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).
    - **R403.4.4.1.2 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.
  - **R403.4.4.2 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 Section R403.4.4.2.1.
    - **R403.4.4.2.1 Solar water heating system.** Solar systems for domestic hot water production are rated by the annual solar energy factor of the system. The solar energy factor of a system shall be determined from the Florida Solar Energy Center Directory of Certified Solar Systems. Solar collectors shall be tested in accordance with ISO Standard 9806, Test Methods for Solar Collectors, and SRCC Standard TM-1, Solar Domestic Hot Water System and Component Test Protocol. Collectors in installed solar water heating systems should meet the following criteria:
      1. Be installed with a tilt angle between 10 degrees and 40 degrees of the horizontal; and
      2. Be installed at an orientation within 45 degrees of true south.
- **R403.5 Mechanical ventilation (Mandatory).** The building shall be provided with ventilation that meets the requirements of the Florida Building Code, Residential or Florida Building Code, Mechanical, as applicable, or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.
  - **R403.5.1 Whole-house mechanical ventilation system fan efficacy.** Mechanical ventilation system fans shall meet the efficacy requirements of Table R403.5.1.
 

**Exception:** Where mechanical ventilation fans are integral to tested and listed HVAC equipment, they shall be powered by an electronically commutated motor.
  - **R403.5.2 Ventilation air.** Residential buildings designed to be operated at a positive indoor pressure or for mechanical ventilation shall meet the following criteria:
    1. The design air change per hour minimums for residential buildings in ASHRAE 62, Ventilation for Acceptable Indoor Air Quality, shall be the maximum rates allowed for residential applications.
    2. No ventilation or air-conditioned system make air shall be provided to conditioned space from attics, crawlspaces, attached closed garages or outdoor spaces adjacent to swimming pools or spas.
    3. If ventilation air is drawn from enclosed spaces(s), then the walls of the space(s) from which air is drawn shall be insulated to a minimum of R-11 and the ceiling shall be insulated to a minimum of R-19, space permitting, or R-10 otherwise.
- **R403.6 Heating and cooling equipment (Mandatory).** The following sections are mandatory for cooling and heating equipment.
  - **R403.6.1 Equipment sizing.** Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on the equipment loads calculated in accordance with ACCA Manual J or other approved 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 which affect equipment sizing. System sizing calculations shall not include loads created by local intermittent mechanical ventilation such as standard kitchen and bathroom exhaust systems.
  - **R403.6.1.1 Cooling equipment capacity.** Cooling only equipment shall be selected so that its total capacity is not less than the calculated total load, but not more than 1.15 times greater than the total load calculated according to the procedure selected in Section 403.6, 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.

**MANDATORY REQUIREMENTS - (Continued)**

- **R403.6.1.1 Cooling equipment capacity. (continued)** The published value for AHRI total capacity is a nominal, rating-test value and shall not be used for equipment sizing. Manufacturer's expanded performance data shall be used to select cooling-only equipment. This selection shall be used to select cooling-only equipment. This selection shall be based on the outdoor design dry bulb temperature for the load calculation (or entering water temperature for water-source equipment), the blower cfm provided by the expanded performance data, the design value for entering wet bulb temperature and the design value for entering dry bulb temperature.

Design values for entering wet bulb and dry bulb temperature shall be 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 multi-family residential equipment sizing may be selected so that its cooling capacity is less than the calculated total sensible load but not less than 80 percent of that load.
2. When signed and sealed by a Florida-registered engineer, in attached single- and multi-family units, the capacity of equipment may be sized in accordance with good design practice.

○ **R403.6.1.2 Heating equipment capacity**

- **R403.6.1.2.1 Heat pumps.** Heat pumps sizing shall be based on the cooling requirements as calculated according to Section R403.6.1.1 and the heat pump total cooling capacity shall not be more than 1.15 times greater than the design cooling load.
- **R403.6.1.2.2 Electric resistance furnaces.** Electric resistance furnaces shall be sized within 4 kW of the design requirements calculated according to the procedure selected in Section R403.6.1.
- **R403.6.1.2.3 Fossil fuel heating equipment.** The capacity of fossil fuel heating equipment with natural draft atmospheric burners shall not be less than the design load calculated in accordance with Section R403.6.1.

- **R403.6.1.3 Extra capacity required for special occasions.** Residences requiring excess cooling or heating equipment capacity on an intermittent basis, such as anticipated additional loads caused by major entertainment events, shall have equipment sized or controlled to prevent continuous space cooling or heating within that space by one or more of the following options:
  1. A separate cooling or heating system is utilized to provide cooling or heating to the major entertainment areas.
  2. A variable capacity system sized for optimum performance during base load periods is utilized.

- **R403.7 Systems serving multiple dwelling units (Mandatory).** Systems serving multiple dwelling units shall comply with Sections C403 and C404 of the Commercial Provisions in lieu of Section R403.

- **R403.8 Snow melt system controls (Mandatory).** Snow and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 55°F, and no precipitation is falling and an automatic or manual control that will allow shut off when the outdoor temperature is above 40°F.

- **R403.9 Swimming pools, inground spas and portable spas (Mandatory).** The energy requirements for residential pools and inground spas shall be as specified in Sections R403.9.1 through R403.9.3 and in accordance with ANSI/APSP-15. The energy requirements for portable spas shall be in accordance with ANSI/APSP-14.

- **R403.9.1 Pool and spa heaters.** All pool heaters shall be equipped with a readily accessible on-off switch that is mounted outside the heater to allow shutting off the heater without adjusting the thermostat setting.

- **R403.9.1.1 Gas and oil-fired pool and spa heaters.** All gas- and oil-fired pool and space heaters shall have a minimum thermal efficiency of 82 percent for heaters manufactured on or after April 16, 2013 when tested in accordance with ANSI Z 21.56. Pool heaters fired by natural gas or LP gas shall not have continuously burning pilot lights.

- **R403.9.1.2 Heat pump pool heaters.** Heat pump pool heaters shall have a minimum COP of 4.0 when tested in accordance with AHRI 1160, Table 2, Standard Rating Conditions-Low Air Temperature. A test report from an independent laboratory is required to verify procedure compliance. Geothermal swimming pool not required to meet this standard.

- **R403.9.2 Time switches.** Time switches or other control method that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on all heaters and pumps. Heaters, pumps and motors that have built in timers shall be deemed in compliance with this equipment.

**Exceptions:**

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

- **R403.9.3 Covers.** Heated swimming pools and inground permanently installed spas shall be equipped with a vapor-retardant cover on or at the water surface or a liquid cover or other means proven to reduce heat loss.

**Exception:** Outdoor pools deriving over 70 percent of the energy for heating from the site-recovered energy, such as a heat pump or solar energy source computed over an operating season.

- **R404.1 Lighting equipment (Mandatory).** A minimum of 75 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps or a minimum of 75 percent of permanently installed lighting fixtures shall contain only high efficacy lamps.

**Exception:** Low-voltage lighting shall not be required to utilize high-efficacy lamps.

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

- **R405.2 Performance ONLY.** All ducts not entirely inside the building thermal envelope shall be insulated to a minimum of R-6.

- **R405.2.1 Performance ONLY.** Ceilings shall have minimum insulation of R-19. Where single assembly of the exposed deck and beam type or concrete deck roofs do not have sufficient space, R-10 is allowed.

## MANDATORY REQUIREMENTS - (Continued)

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

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

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

Exceptions:

1. Attached single- and multiple-family residential equipment sizing may be selected so that its cooling capacity is less than the calculated total sensible load but not less than 80 percent of that load.
  2. When signed and sealed by a Florida-registered engineer, in attached single- and multiple-family units, the capacity of equipment may be sized in accordance with good design practice.
- o **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.
- o **R403.7.1.3 Extra capacity required for special occasions.** Residences requiring excess cooling or heating equipment capacity on an intermittent basis, such as anticipated additional loads caused by major entertainment events, shall have equipment sized or controlled to prevent continuous space cooling or heating within that space by one or more of the following options:
1. A separate cooling or heating system is utilized to provide cooling or heating to the major entertainment areas.
  2. A variable capacity system sized for optimum performance during base load periods is utilized.
- **R403.8 Systems serving multiple dwelling units (Mandatory).** Systems serving multiple dwelling units shall comply with Sections C403 and C404 of the IECC—Commercial Provisions in lieu of Section R403.
- **R403.9 Snow melt and ice system controls (Mandatory).** Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F (10°C), and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F (4.8°C).
- **R403.10 Pools and permanent spa energy consumption (Mandatory).** The energy consumption of pools and permanent spas shall be in accordance with Sections R403.10.1 through R403.10.5.
- o **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.
- o **R403.10.2 Time switches.** Time switches or other control methods that can automatically turn off and on according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that have built-in time switches shall be in compliance with this section.
- Exceptions:
1. Where public health standards require 24-hour pump operations.
  2. Pumps that operate solar- and waste-heat-recovery pool heating systems.
  3. Where pumps are powered exclusively from on-site renewable generation.
- o **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.
- o **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.

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

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

## Section R404

### ELECTRICAL POWER AND LIGHTING SYSTEMS

- **R404.1 Lighting equipment (Mandatory).** Not less than 75 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps or not less than 75 percent of the permanently installed lighting fixtures shall contain only high-efficacy lamps.
  - o **Exception:** Low-voltage lighting.
  - o **R404.1.1 Lighting equipment (Mandatory).** Fuel gas lighting systems shall not have continuously burning pilot lights.



TABLE 402.4.1.1

**AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA**

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

# FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION

## Envelope Leakage Test Report Performance Methods

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

Regression Data:

C: \_\_\_\_\_ n: \_\_\_\_\_ R: \_\_\_\_\_

Single or Multi Point Test Data:

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

### Leakage Characteristics

Required ACH(50) from

FORM R405-2017: \_\_\_\_\_

Tested ACH(50)\*: \_\_\_\_\_

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

**402.4.1.2 Testing option.** The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 7 air changes per hour in Climate Zones 1 and 2. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Testing shall be conducted by either individuals as defined in Section 553.993(5) or (7), Florida Statutes or individuals licensed as set forth in Section 489.105(3)(f), (g), or (i) or an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope.

During testing:

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


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

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

DATE: \_\_\_\_\_

Testing shall be conducted by either individuals as defined in Section 553.993(5) or (7), Florida Statutes or individuals licensed as set forth in Section 489.105(3)(f), (g), or (i) or an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official.



**BUILDING OFFICIAL:** \_\_\_\_\_

**DATE:** \_\_\_\_\_



# FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION

## Form R405 Duct Leakage Test Report Performance Method

Project Name: Right-Energy® Florida 2014 Example Street: 1516 Ninth Street City, State, Zip: Tampa, FL 33601 Design Location: FL, Tampa International AP	Builder: Wrightsoft Permit Office: Tampa Permit Number: 2222-1 Jurisdiction: Hillsborough County Duct Test Time: Post Construction
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Required Duct Leakage from FORM R405-2017 \_\_\_\_\_ Qn (Out)

### Duct Leakage Test Results

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

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

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

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

DATE: \_\_\_\_\_

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



BUILDING OFFICIAL: \_\_\_\_\_

DATE: \_\_\_\_\_

# Reference Home Characteristics

1516 Ninth Street  
Tampa, FL 33601

Title: SimpleHouse2  
FLBase2014

TMY City: FL\_Tampa\_Intl\_AP

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