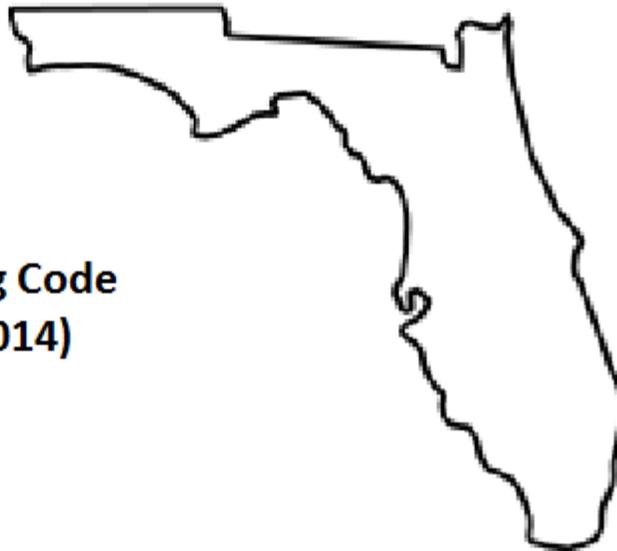


RIGHT - ENERGY® Florida 2014

Compliance Supplement Instruction Guide

**Florida Building Code
Fifth Edition (2014)**





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Right-Suite® Universal Right-Energy® Florida 2014 Compliance Supplement

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Approval for Compliance

Right-Energy Florida 2014 is a module within Wrightsoft's Right-Suite Universal (RSU) software program that supports demonstration of compliance with the Florida Energy Code Energy Conservation, Fifth Edition (2014) ("Code"). The Code applies to residential buildings and the buildings' sites and associated systems and equipment.

Note also that Right-Energy Florida 2014 is approved only for *residential* 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 supported in Right Energy Florida 2014.

Right-Suite® Universal with the Right-Energy® Florida 2014 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 2014-1.0)

Overview

The Florida Energy Code Energy Conservation, Fifth Edition (2014) (Code) allows compliance using either a prescriptive or performance method. The prescriptive method is found in the Code (see Related Publications). Performance method compliance provides additional flexibility. This 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 prescriptive requirements applied (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.

All applications that demonstrate performance method compliance use a common core analysis system called Compliance Manager. Compliance Manager implements rules that derive the Standard Design, performs energy simulations and other calculations, and generates standard reports. Compliance Manager is developed and promulgated by the Energy Commission.

This manual is a guide to the use of Right-Energy Florida 2014. The manual assumes working knowledge of RSU operation. In addition, knowledge of the Code is a pre-requisite. The Code is extensive and complex. Right-Energy Florida 2014 will help you efficiently prepare compliance documents, but as the submittal author, you are responsible for their content.

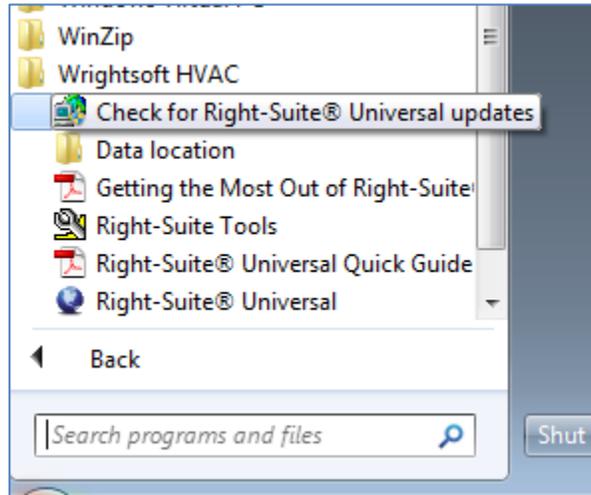
Obtaining and Installing Right-Energy® Florida 2014

Right-Energy Florida 2014 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. **Note that Right-Energy Florida 2014 requires an internet connection to operate while RSU generally does not.** See 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 2014 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.

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 2014 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 2014, some compliance-related inputs may not be visible. On the Options menu, the choice “Enable Right-Energy® Florida 2014 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>.

2014 Compliance

- *Florida Building Code, Energy Conservation, 5th Edition (2014)* (ISBN: 978-1-60983-565-1, March 2015) contains the official code adopted by the Florida Building Commission.
- *Energy Simulation Tool Approval Technical Assistance Manual (TAM-2014-1.0, June 15, 2014 revised June 30, 20104)* 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>

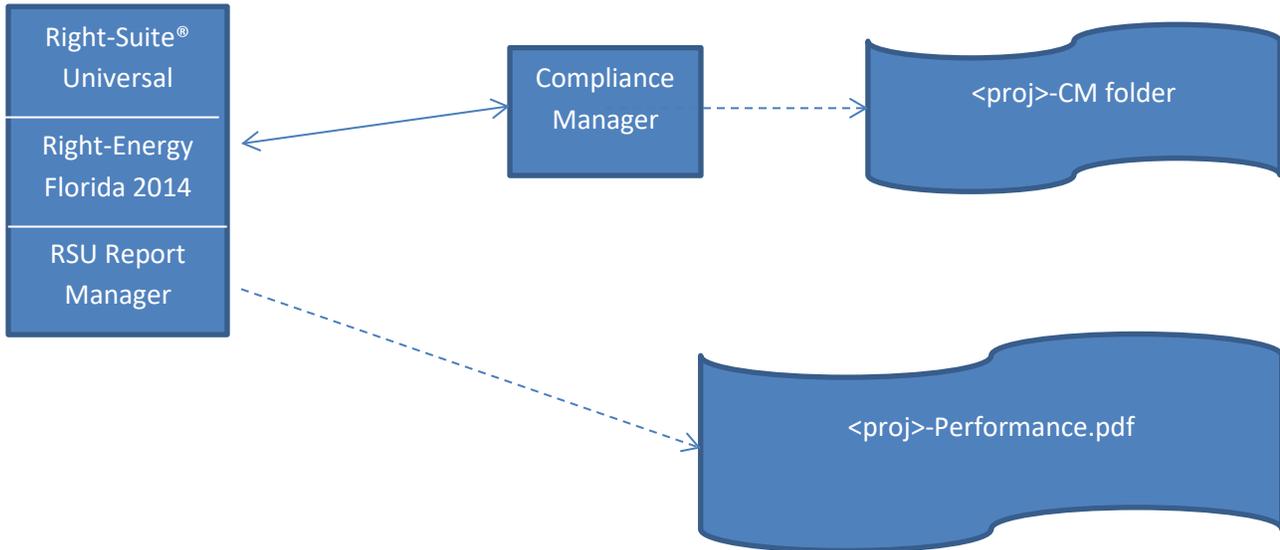
Software Structure

The diagram below conceptually illustrates the information flow used by Right-Energy Florida 2014 to perform compliance analysis using the Performance method.

- When compliance calculations are initiated, Right-Energy Florida 2014 writes project data to a folder having the same name as the RSU project file but with “-CM” added. This folder will be in the same folder

as the project file. For example, if you have an RSU project file at C:\My RSU files\Project1.rup, the project data generated by Right-Energy Florida 2014 will be in a folder named C:\My RSU\files\Project1-CM.

- After the project data files are written, Right-Energy Florida 2014 invokes Compliance Manager. The energy model calculations are performed and results are written to the above folder file. The results are also displayed on the screen. Reports can also be printed showing the details of the compliance.



File Locations

RSU places the PDF of the Florida 2014 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.pdf
```

Florida 2014 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 2014 compliance procedures support energy efficiency and embody many carefully crafted rules about analysis assumptions. From the RSU point of view, there are three classes of data --

- **Equivalent data** are items that RSU and Compliance Manager represent equivalently. Examples include surface areas and HVAC equipment types. Equivalent data is simply transmitted to Compliance Manager as needed.
- **Mappable data** are items that have similar representations in RSU and Compliance Manager, but are not equivalent. For example, in RSU, constructions can have any number of layers and can include user-defined materials. Compliance Manager has a limited number of layers and uses a specified set of materials. In cases like this, RSU must translate information into form required by Compliance Manager.
- **Florida 2014-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 2014 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 2014 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 calculations. There are cases where Compliance Manager 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 Compliance Manager.

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 is 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.

Terminology

Compliance Manager. The compliance manager is the simulation and compliance rule implementation software specified by the Energy Commission. It models the features of the building as specified in the Code to establish the energy budget for the building.

Report Manager. The report manager is part of Right-Suite® Universal and is used to generate the Compliance reports.

Proposed Design. The user-defined proposed building modeled 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. Compliance Manager 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 Site Zip Code in the Project Information Screen.

Detailed information about how the standard design is established can be found in the *Florida Building Code, Fifth Edition (2014), Energy Conservation*.

Mandatory Requirements. Mandatory requirements are found in Sections R401.3, R402.4.1-R402.4.4, R403.1.1, R403.1.3, R403.2.2, R403.2.3, R403.3, R403.3.1, R403.4.1, R403.4.3, R403.4.4, R403.5, R403.6, R403.7, R403.8, R403.9, R404.1, and R405.2 (Performance method only) 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.

1. Broward, Collier, Hendry, Lee, Miami-Dade, Monroe, Palm Beach
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,

Right-Energy® Florida 2014 Supplement

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

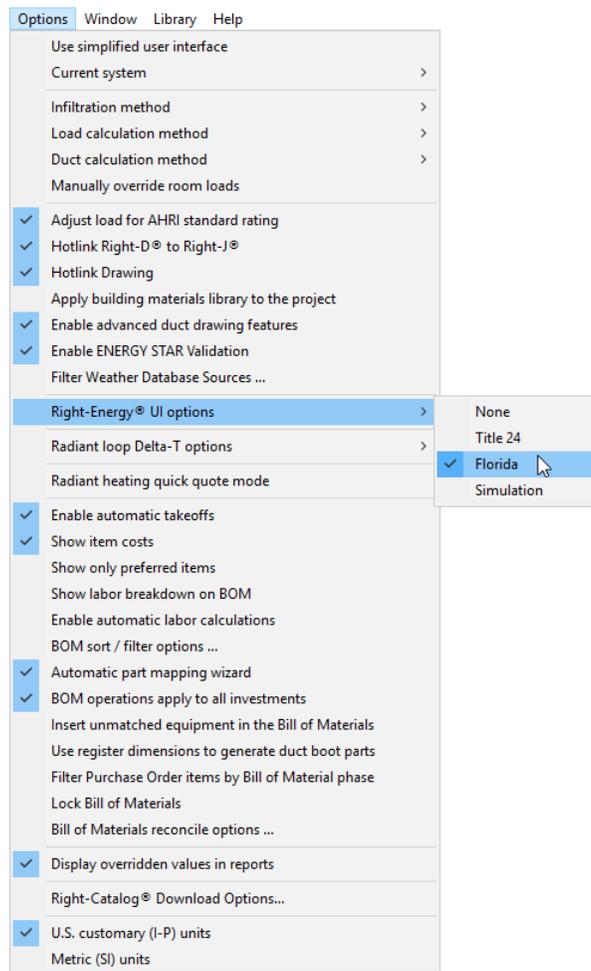
This section is a brief guide on how to perform Florida 2014 compliance analysis in Right-Suite Universal (RSU) using the Right-Energy® Florida 2014 module. The goal is to walk through the process without getting into the details. Two other sections follow that provide information from additional viewpoints –

- 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 2014 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 2014 and disables some project inputs that not used for Florida 2014.



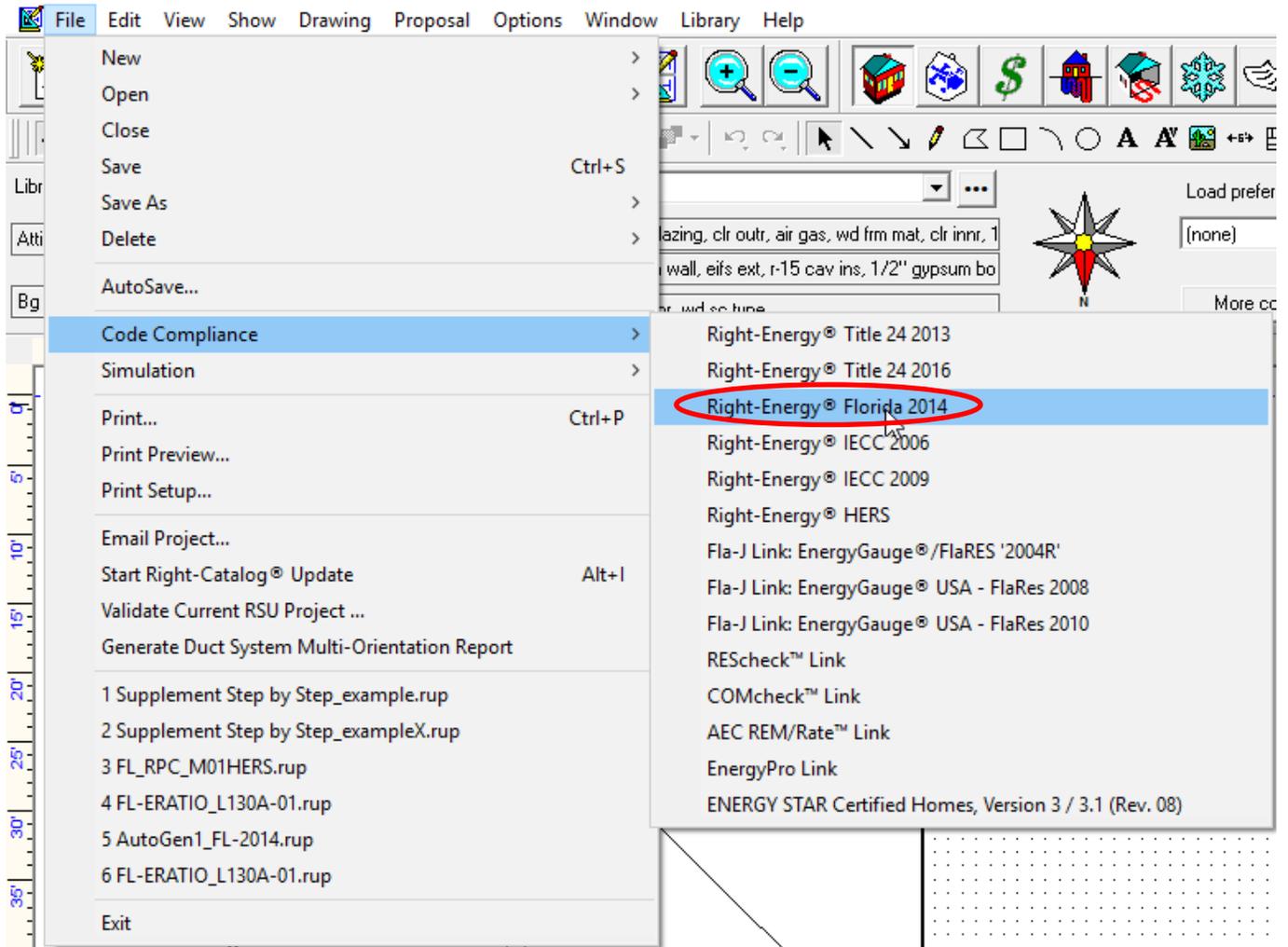
If that option is missing or grey, you may need to update your software or make sure your license has Right-Energy® Florida 2014 enabled. Go to **Help | Licensing** to see your support subscription expiration date (it must be current to update) and licensed features. To add renew your WSS or add Right-Energy® Florida 2014, contact sales at 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 --

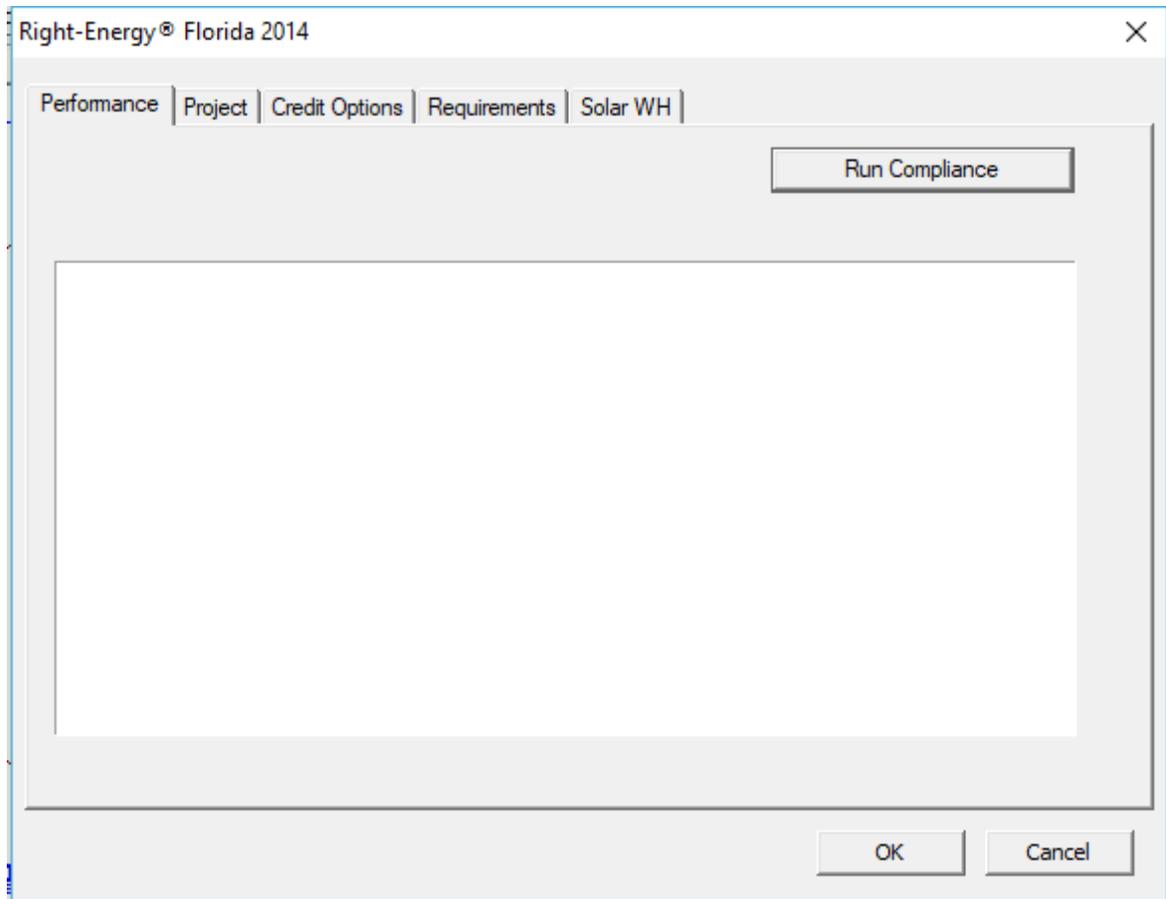
1. Building address (including the zip code), front orientation,
2. Conditioned floor area and average ceiling height,
3. Attic/roof details including roofing material,
4. Ceilings below attic and vaulted ceiling R-values,
5. Wall areas, orientation, and construction details,
6. Door areas and orientation,
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,
10. Mechanical heating and cooling equipment type and efficiency,
11. Distribution system location and construction details,
12. Method for providing mechanical ventilation, and
13. Domestic water heating system details, including type of water heating equipment, fuel type, efficiency, distribution system details.

As discussed under Florida 2014 Data in Right-Suite Universal, much of the required information has equivalent or mappable representation 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 Compliance Manager data is derived directly from the Right-Draw drawing and properties.

There are a number of screens that capture information specific to Florida 2014 analysis. These are accessed via the Code Compliance choice on the File menu --



This choice brings you to the following --

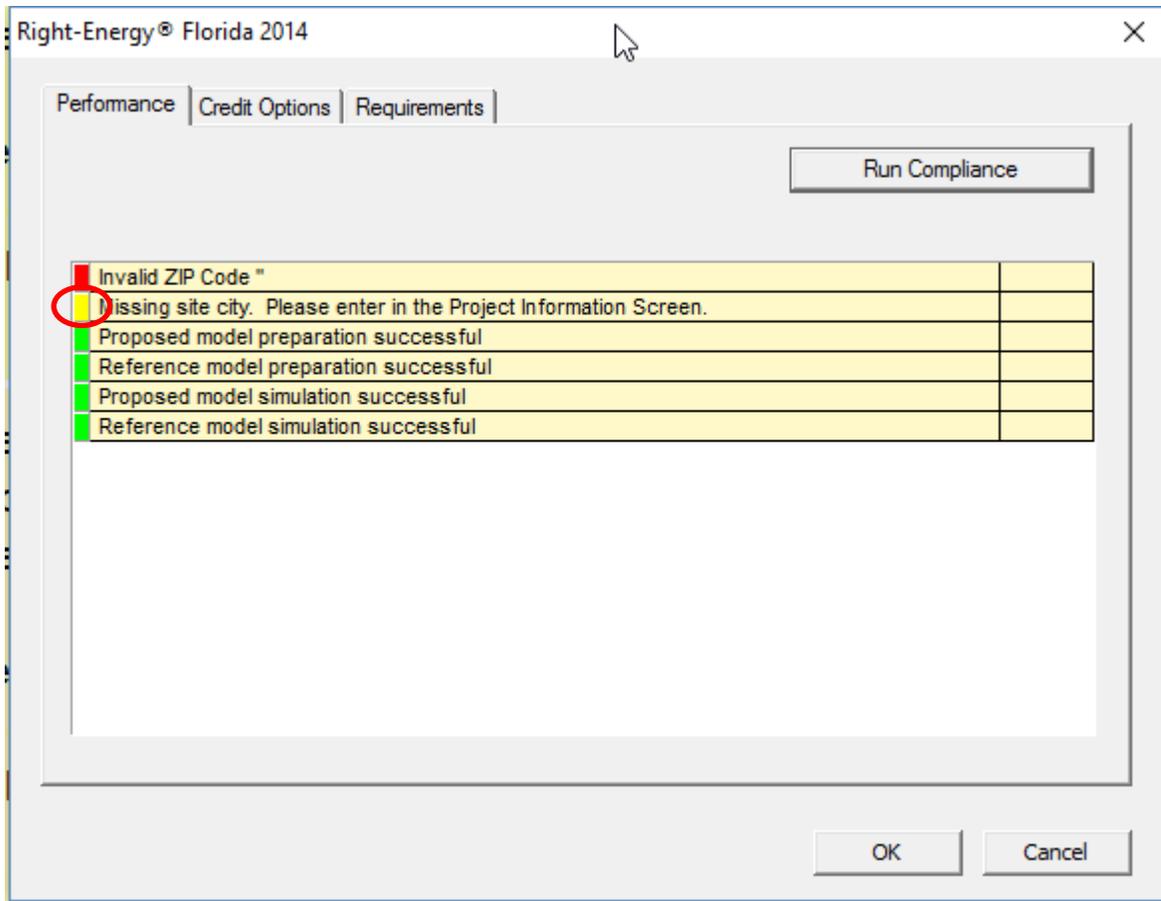


The various tabs allow input of Florida 2014 specific information not found on other RSU screens. See Step-by-Step Example and Detailed Input Description for specifics.

Run

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 2014 Performance screen (shown above).

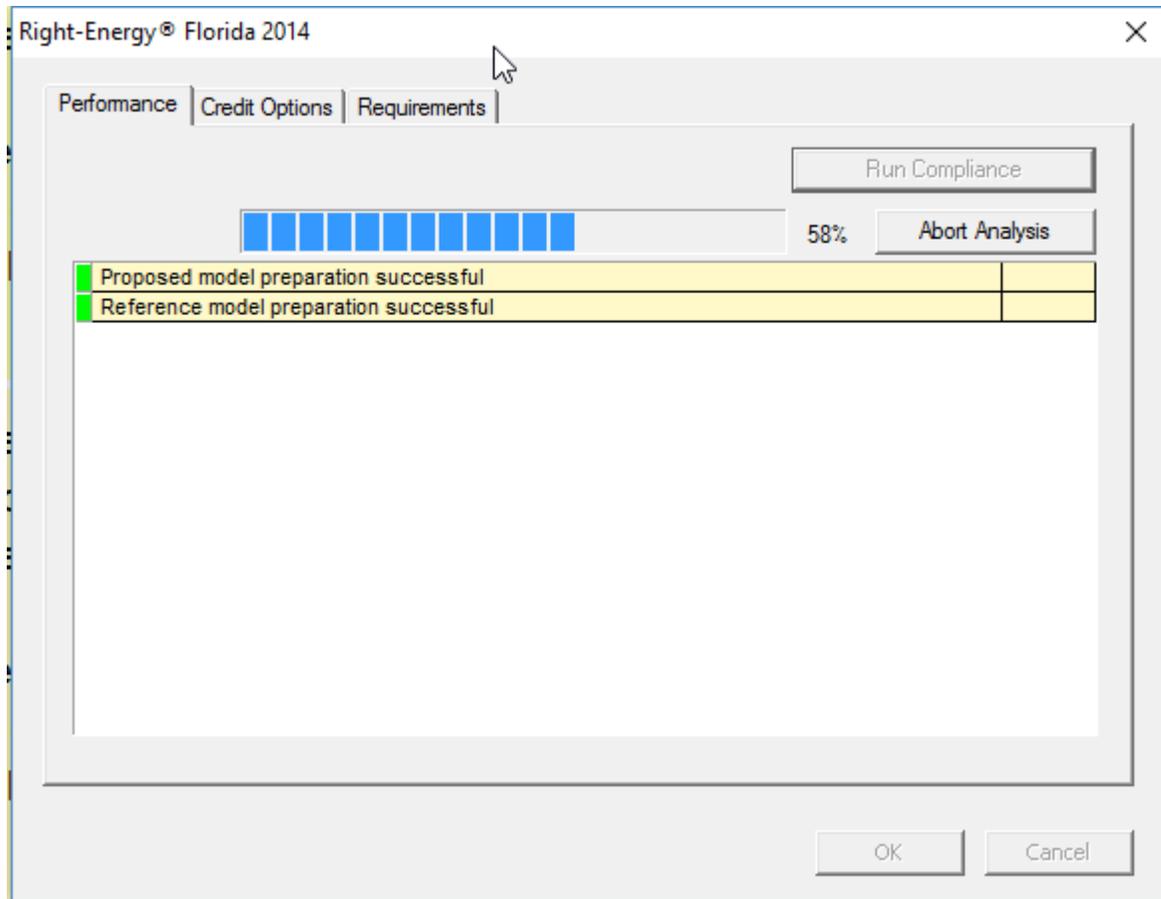
At this point, Right-Energy Florida 2014 gathers information from the RSU project and performs any required mapping to conform to the requirements of Compliance Manager. Right-Energy Florida 2014 then checks the Mandatory requirements (common to both the Performance and Prescriptive methods). Any error or warnings for the Mandatory requirements are shown in a window on the Run 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 Run 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 below).

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.

Right-Energy® Florida 2014

Performance | Project | Credit Options | Requirements | Solar WH | Results

Compliance Summary

	Proposed			Reference		
	Load (MBtu/yr)	Fuel (MBtu/yr)	Electricity (kWh)	Load (MBtu/yr)	Fuel (MBtu/yr)	Electricity (kWh)
Heating energy	0.19	0.00	24.96	2.09	0.00	246.09
Heating fan			2.78			27.19
Cooling energy	45.65		3224.36	46.07		3261.75
Cooling fan			632.36			646.50
DHW	7.55	0.00	829.16	7.55	0.00	3019.11
Total	53.38	0.00	4713.62	55.70	0.00	7200.63

Project name: SimpleHouse2
 Run date: 07/12/2017 14:41:03
 e-Ratio: 0.858

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 B 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.

Compliance Report

PDF compliance report successfully generated.

Would you like to view the report?

Yes No

Investigating errors

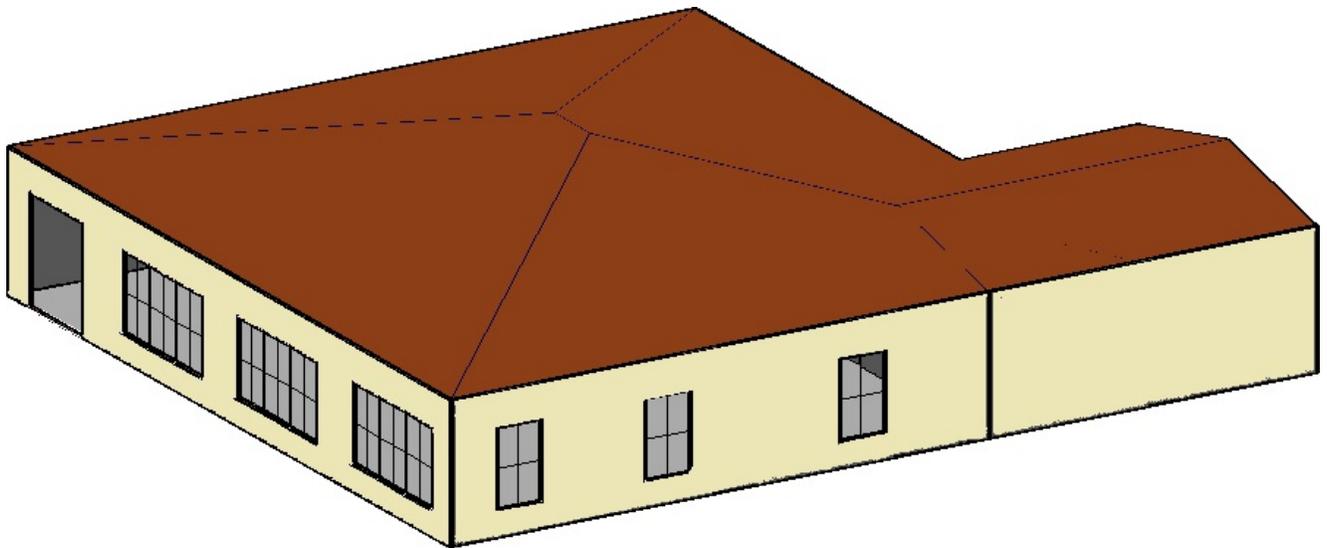
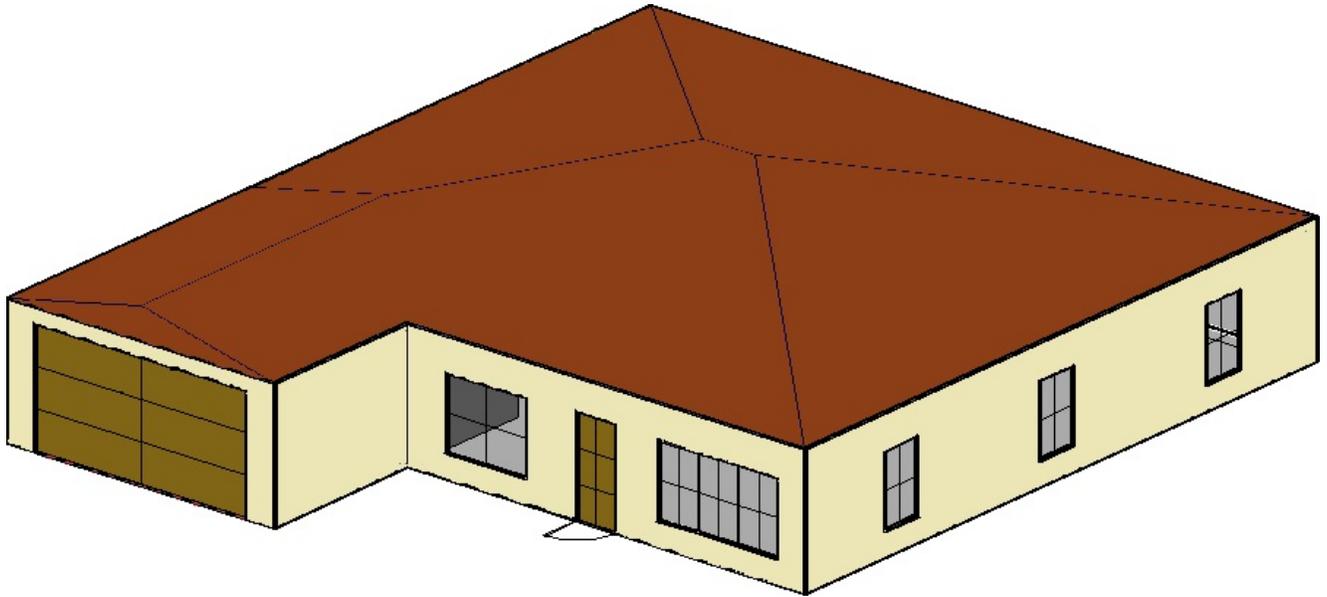
Some errors are self-explanatory and can be immediately corrected via changes to the RSU project. Others may require you to review the Code to determine exactly what needs to be changed.

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 it accurately represents your project. You should make corrections and re-run as needed.

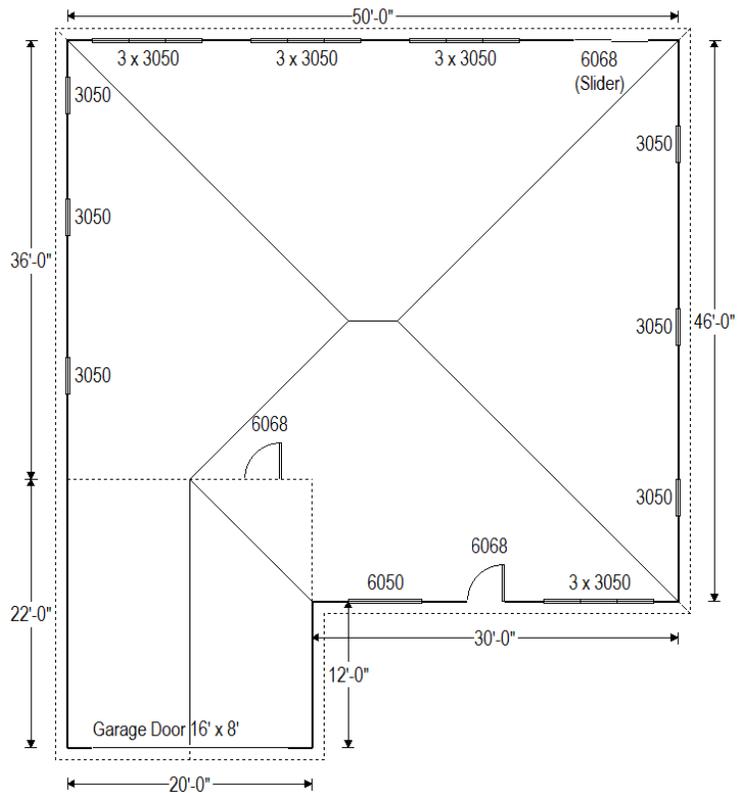
Step-by-Step Example

This example will take you through the steps necessary to prepare a project for Florida 2014 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 ²
Conditioned volume	18,900 ft ³
Gross areas	
Slab	2100 ft ²
Slab perimeter	162 ft
Ceiling	2100 ft ² , vent attic
Front wall (South)	270 ft ²
Front garage wall	180 ft ² , shaded
Left wall (West)	324 ft ²
Left garage wall	90 ft ² , shaded
Back wall (North)	450 ft ²
Right wall (East)	414 ft ²
Front door	20 ft ²
Door from garage	20 ft ²
Garage door	128 ft ²
Overhangs	1 ft



Building Material Description (required additions in custom layer mode in bold)	
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 2014 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 2014, 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 of the contractor that will be building this project. The name will appear on the Right-Energy Florida 2014 reports. All of the other Contractor/Designer information fields are optional for the purposes of successfully using Right-Energy® Florida 2014, 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 2014 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.

The screenshot shows a software interface with a yellow background. On the left, under the heading 'Job', there is a list of fields: Number, Date/Prep.By, Orientation, Plan #, and Jurisdiction. To the right of these labels are input fields. The 'Date/Prep.By' field contains 'Nov 06, 2013'. The 'Orientation' field contains 'Front Door' and has a dropdown arrow. To the right of this is a label 'faces:' followed by a dropdown menu showing 'South'. Below this is a field labeled 'Number of bedrooms' with a value of '3' and a dropdown arrow. A red circle highlights the 'Number of bedrooms' field and its value.

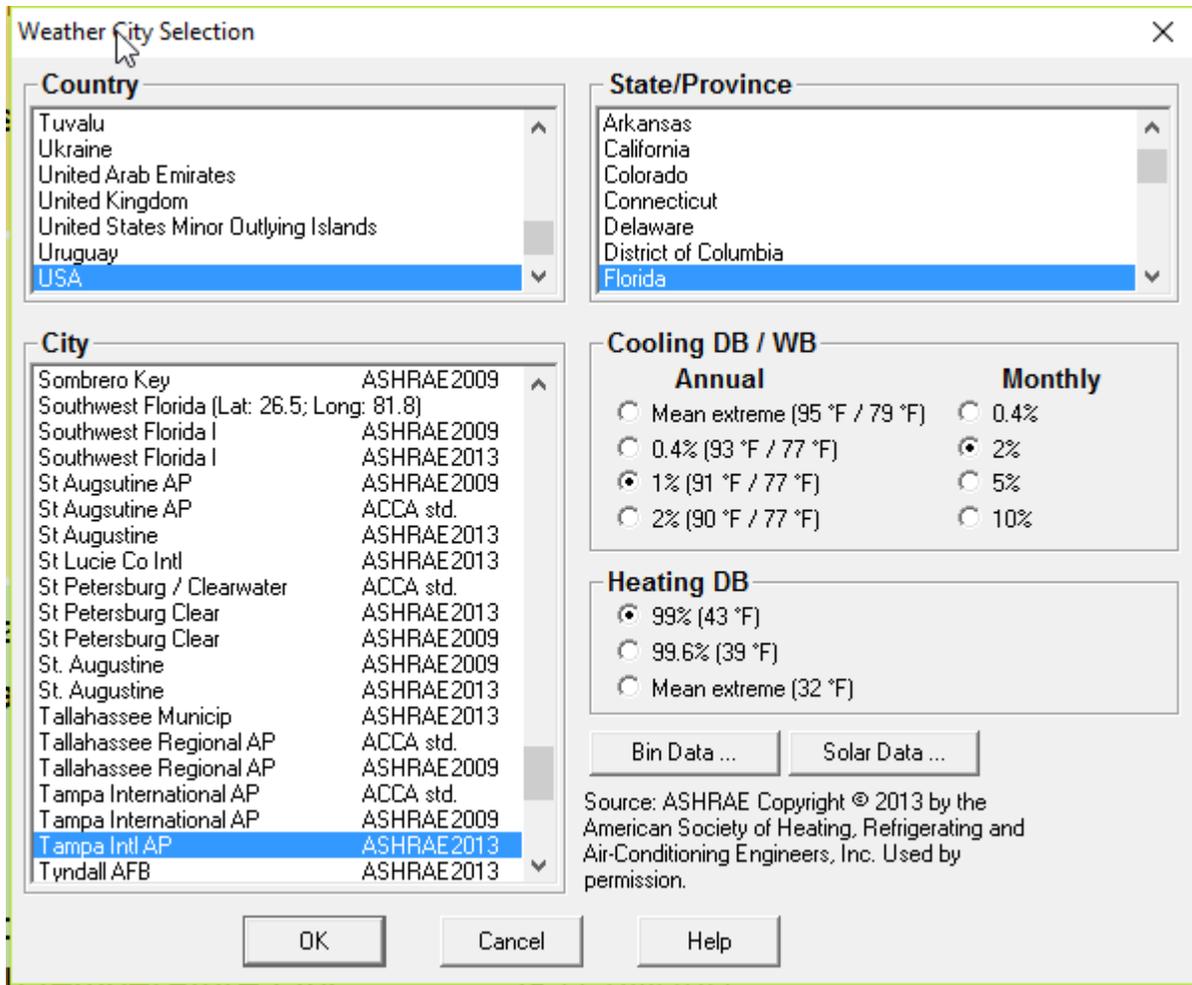
Save

- 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 2014 Compliance, since a Manual J load calculation is required.

- Scroll down to the 'Weather location' in the 'Location' section.
- Click on the  button to the right of the 'Weather location' field.
- Select 'Tampa Intl AP, Florida as shown below and Click the 'OK' button.



- 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/ft²)	Avg DB (°F)	Mains (°F)
Annual (Jul)	91.4	13.9	77.2	53	<input checked="" type="checkbox"/>	1522	72.6	60.0

- Scroll back up to the ‘Hourly weather file’ field (near the Weather Location’ field’. This where you select the hourly weather data (TMY3) that the Performance method uses to perform the energy simulation calculations. You should select the same (or the nearest) city as the Site Address and Weather Location.
- Click on the  button to the right of the field to see a list of available files. The files are named with ‘USA_’ as the first characters, the state abbreviation as the next 2 characters, and then the city. The available cities in Florida are:

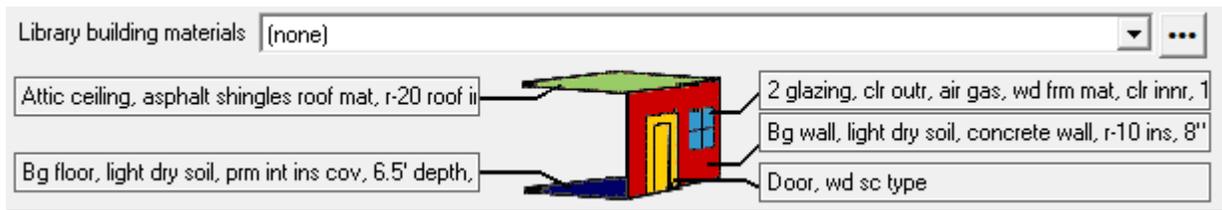
City/Location	File name
Crestview	USA_FL_Crestview-Bob.Sikes.AP.722215_TMY3.et1
Daytona Beach	USA_FL_Daytona.Beach.Intl.AP.722056_TMY3.et1
Fort Lauderdale Executive Airport	USA_FL_Fort.Lauderdale.Executive.AP.722039_TMY3.et1
Fort Lauderdale International Airport	USA_FL_Fort.Lauderdale.Intl.AP.722025_TMY3.et1
Fort Meyers Page Field	USA_FL_Fort.Myers-Page.Field.722106_TMY3.et1
Fort Pierce St. Lucie County Airport	USA_FL_Fort.Pierce-St.Lucie.County.AP.722103_TMY3.et1
Fort Walton Beach Hurlburt Field	USA_FL_Fort.Walton.Beach-Hurlburt.Field.747770_TMY3.et1
Gainesville Regional Airport	USA_FL_Gainesville.Rgnl.AP.722146_TMY3.et1
Homestead Air Force	BaseUSA_FL_Homestead.AFB.722026_TMY3.et1
Jacksonville Craig Field	USA_FL_Jacksonville-Craig.Field.722068_TMY3.et1
Jacksonville International Airport	USA_FL_Jacksonville.Intl.AP.722060_TMY3.et1
Jacksonville NAS	USA_FL_Jacksonville.NAS.722065_TMY3.et1
Key West International Airport	USA_FL_Key.West.Intl.AP.722010_TMY3.et1
Key West NAS	USA_FL_Key.West.NAS.722015_TMY3.et1
Lakeland Linder Regional Airport	USA_FL_Lakeland.Linder.Rgnl.AP.722119_TMY3.et1
MacDill Air Force Base	USA_FL_MacDill.AFB.747880_TMY3.et1
Marathon Airport	USA_FL_Marathon.AP.722016_TMY3.et1
Mayport NS	USA_FL_Mayport.NS.722066_TMY3.et1
Melbourne Regional Airport	USA_FL_Melbourne.Rgnl.AP.722040_TMY3.et1
Miami Kendal-Tamiami Executive Airport	USA_FL_Miami-Kendall-Tamiami.Executive.AP.722029_TMY3.et1
Miami Opa-Locka Airport	USA_FL_Miami-Opa.Locka.AP.722024_TMY3.et1
Miami International	AirportUSA_FL_Miami.Intl.AP.722020_TMY3.et1
Naples Municipal Airport	USA_FL_Naples.Muni.AP.722038_TMY3.et1
NASA Shuttle Landing Facility	USA_FL_NASA.Shuttle.Landing.Facility.747946_TMY3.et1
Ocala Municipal AWOS	USA_FL_Ocala.Muni.AWOS.722055_TMY3.et1
Orlando Sanford Airport	USA_FL_Orlando-Sanford.AP.722057_TMY3.et1
Orlando Executive Airport	USA_FL_Orlando.Executive.AP.722053_TMY3.et1
Orlando International Airport	USA_FL_Orlando.Intl.AP.722050_TMY3.et1
Panama City Bay County Airport	USA_FL_Panama.City-Bay.County.AP.722245_TMY3.et1
Pensacola Forest Sherman NAS	USA_FL_Pensacola-Forest.Sherman.NAS.722225_TMY3.et1
Pensacola Regional Airport	USA_FL_Pensacola.Rgnl.AP.722223_TMY3.et1
Sarasota Bradenton International Airport	USA_FL_Sarasota-Bradenton.Intl.AP.722115_TMY3.et1
Southwest Florida International Airport	USA_FL_Southwest.Florida.Intl.AP.722108_TMY3.et1

City/Location	File name
St. Petersburg Albert Whitted Station	USA_FL_St.Petersburg-Albert.Whitted.Station.722104_TMY3.et1
St Petersburg Clearwater International Airport	USA_FL_St.Petersburg-Clearwater.Intl.AP.722116_TMY3.et1
Tallahassee Regional Airport	USA_FL_Tallahassee.Rgnl.AP.722140_TMY3.et1
Tampa International Airport	USA_FL_Tampa.Intl.AP.722110_TMY3.et1
Tyndall Air Force Base	USA_FL_Tyndall.AFB.747750_TMY3.et1
Valparaiso Elgin Air Force Base	USA_FL_Valparaiso-Elgin.AFB.722210_TMY3.et1
Vero Beach Municipal Airport	USA_FL_Vero.Beach.Muni.AP.722045_TMY3.et1
West Palm Beach International Airport	USA_FL_West.Palm.Beach.Intl.AP.722030_TMY3.et1
Whiting Field NAS	USA_FL_Whiting.Field.NAS.722226_TMY3.et1

- Scroll down to 'USA_FL_Tampa.Intl.AP.722110_TMY3.et1' and click it to select it. Then click the 'Open' button to transfer your selection to RSU.

Right-Draw®

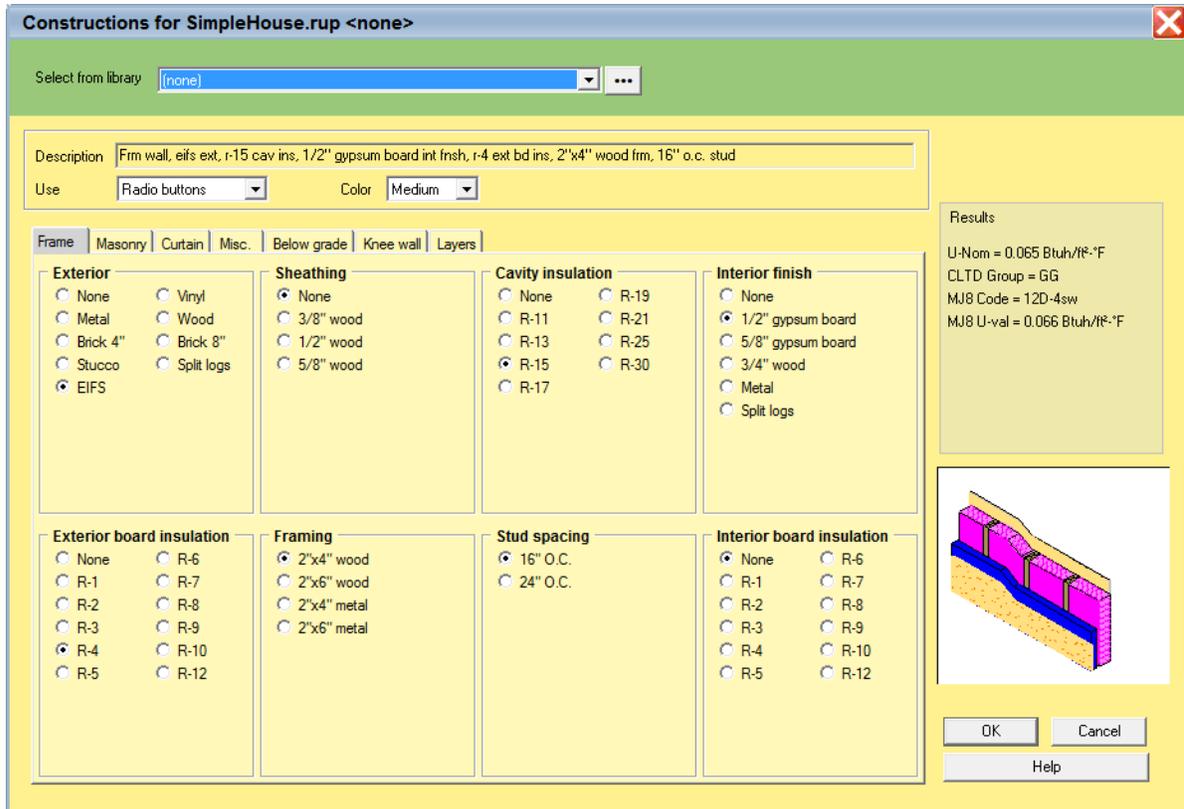
- Select **Show | Right-Draw®** to display the Right-Draw screen.
- We'll define constructions first. Find the Default Construction bar at the top of the drawing screen:



- 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

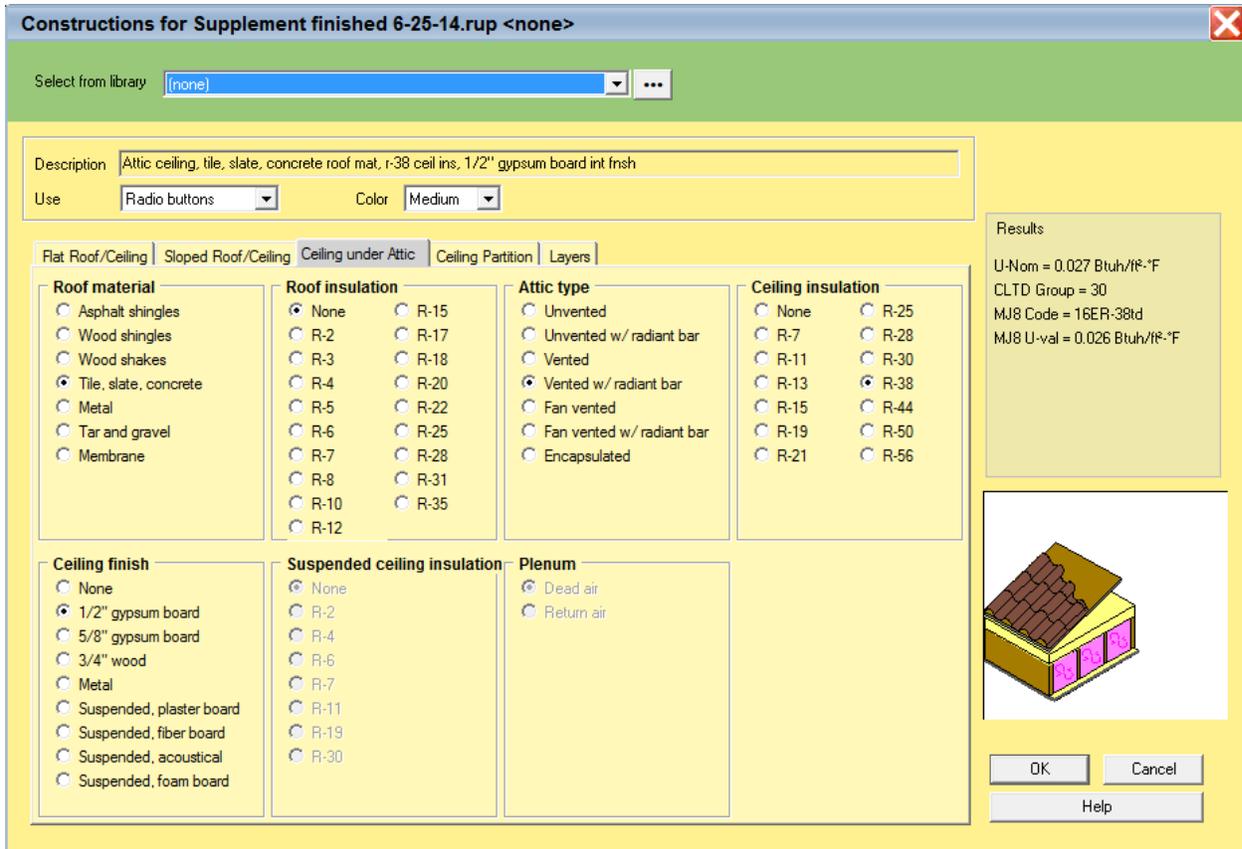
Default Wall

- 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:
 - **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)



- Select 'Medium' from the Color drop-down list.
- Click on the 'Ceiling under Attic' tab
- Select the following radio button options:
 - **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.

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% flr frsh

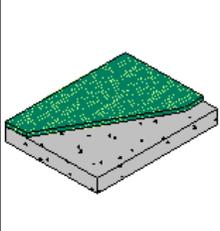
Use: Radio buttons

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

Soil type <input checked="" type="radio"/> Light dry <input type="radio"/> Heavy dry or light damp <input type="radio"/> Heavy damp	Edge insulation <input checked="" type="radio"/> None <input type="radio"/> 1.5' <input type="radio"/> Edge <input type="radio"/> 2' <input type="radio"/> 8" <input type="radio"/> 3' <input type="radio"/> 1' <input type="radio"/> 4' <input type="radio"/> 16"	Slab insulation <input checked="" type="radio"/> None <input type="radio"/> Perimeter interior <input type="radio"/> Full interior <input type="radio"/> Perimeter exterior <input type="radio"/> Full exterior	Edge ducts <input checked="" type="radio"/> None <input type="radio"/> Perimeter ducts
Below grade depth <input checked="" type="radio"/> On grade <input type="radio"/> 5' <input type="radio"/> 1.5' <input type="radio"/> 6' <input type="radio"/> 2' <input type="radio"/> 6.5' <input type="radio"/> 3' <input type="radio"/> 8' <input type="radio"/> 4' <input type="radio"/> 10'	Edge insulation R-value <input checked="" type="radio"/> R-3 <input type="radio"/> R-10 <input type="radio"/> R-5 <input type="radio"/> R-15 <input type="radio"/> R-7 <input type="radio"/> R-20	Slab insulation R-value <input checked="" type="radio"/> R-3 <input type="radio"/> R-18 <input type="radio"/> R-5 <input type="radio"/> R-20 <input type="radio"/> R-8 <input type="radio"/> R-22 <input type="radio"/> R-10 <input type="radio"/> R-25 <input type="radio"/> R-12 <input type="radio"/> R-28 <input type="radio"/> R-15 <input type="radio"/> R-30	Floor finish <input type="radio"/> None <input type="radio"/> Carpet <input checked="" type="radio"/> 80% carpet / 20% bare <input type="radio"/> Tile <input type="radio"/> Hardwood <input type="radio"/> Vinyl
F280 wall insulation <input checked="" type="radio"/> None <input type="radio"/> 2' below grade interior <input type="radio"/> Full interior <input type="radio"/> 2' below grade exterior <input type="radio"/> Full exterior	F280 wall insulation R-value <input checked="" type="radio"/> R-3 <input type="radio"/> R-18 <input type="radio"/> R-5 <input type="radio"/> R-20 <input type="radio"/> R-8 <input type="radio"/> R-22 <input type="radio"/> R-10 <input type="radio"/> R-25 <input type="radio"/> R-12 <input type="radio"/> R-28 <input type="radio"/> R-15 <input type="radio"/> R-30		

Results

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



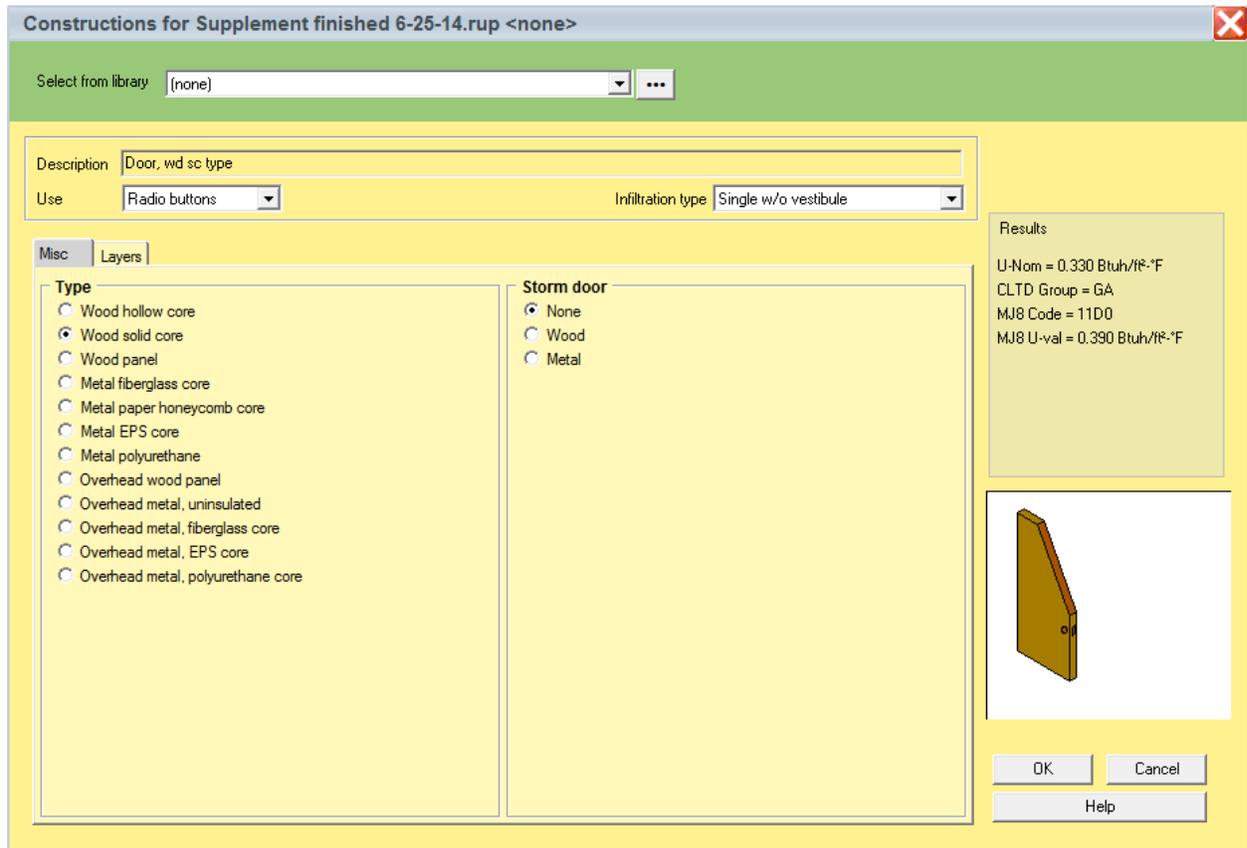
OK Cancel

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

NFRC rated Has storm window

	Without storm window	With storm window	
U-value	0.320	0.320	Btuh/ft ² ·F
SHGC	0.25	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

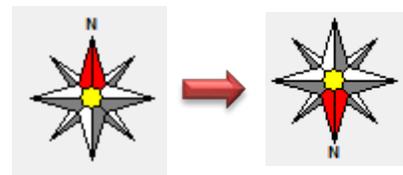
Picture Not Available

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 NFRC 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.

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.

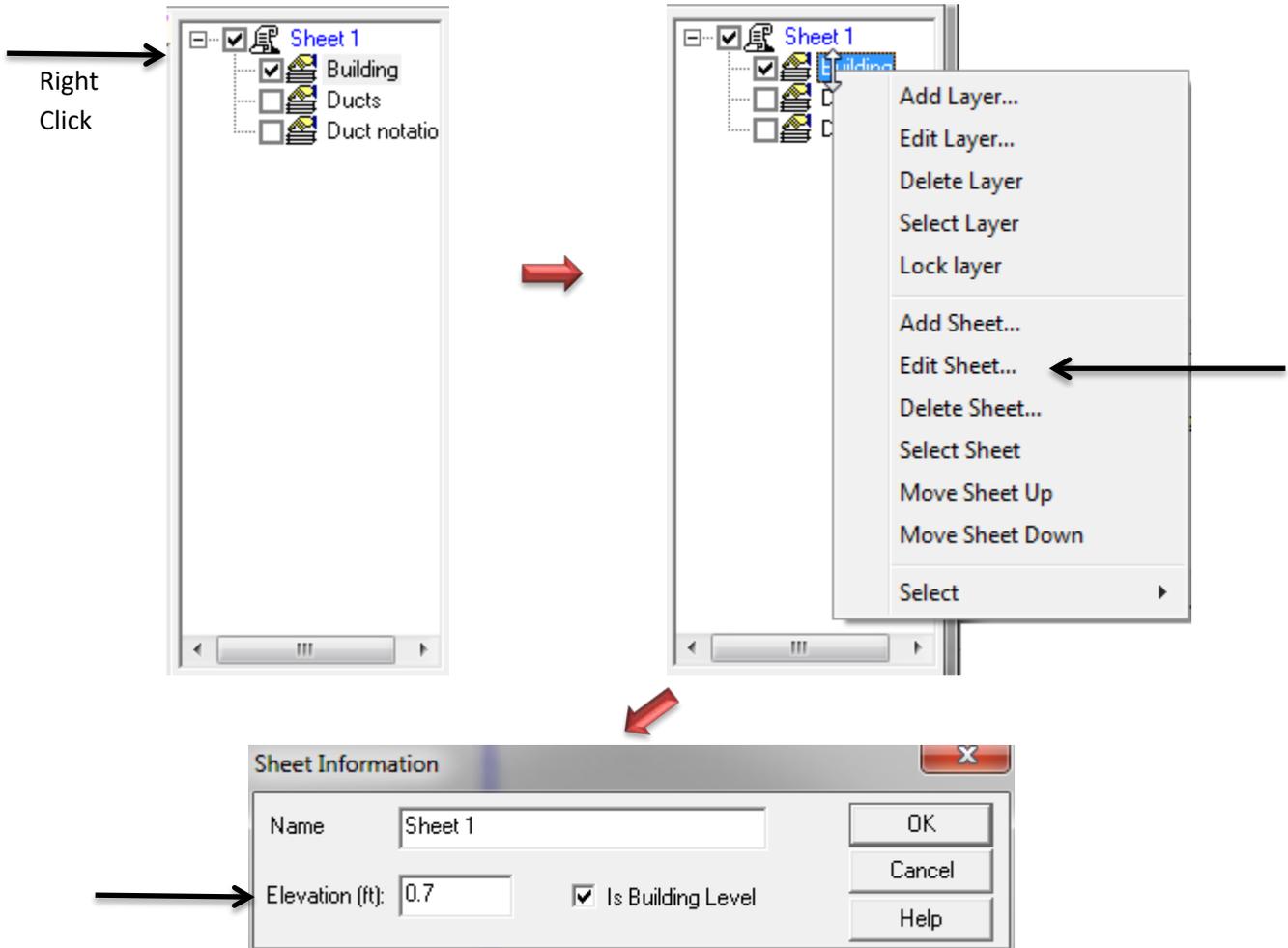


That is, the orientation of the windows would be changed by 180 degrees – North-facing windows would face South, East-facing would face West, etc. Setting the orientation now is just a convenience so that our drawing is easy to draw.

Elevation

Before we start adding rooms, we need to set the bottom of the floor. This is the height above grade of the floor in these rooms. **This is an important factor for Florida 2014 purposes.**

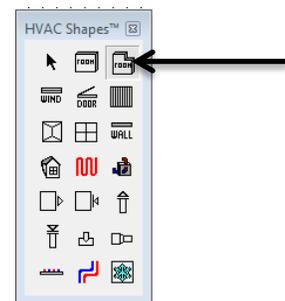
- Click the right mouse button on 'Sheet 1' in the list of Sheets and Layers on the right.
- Select 'Edit Sheet ...' from the menu that appears.



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

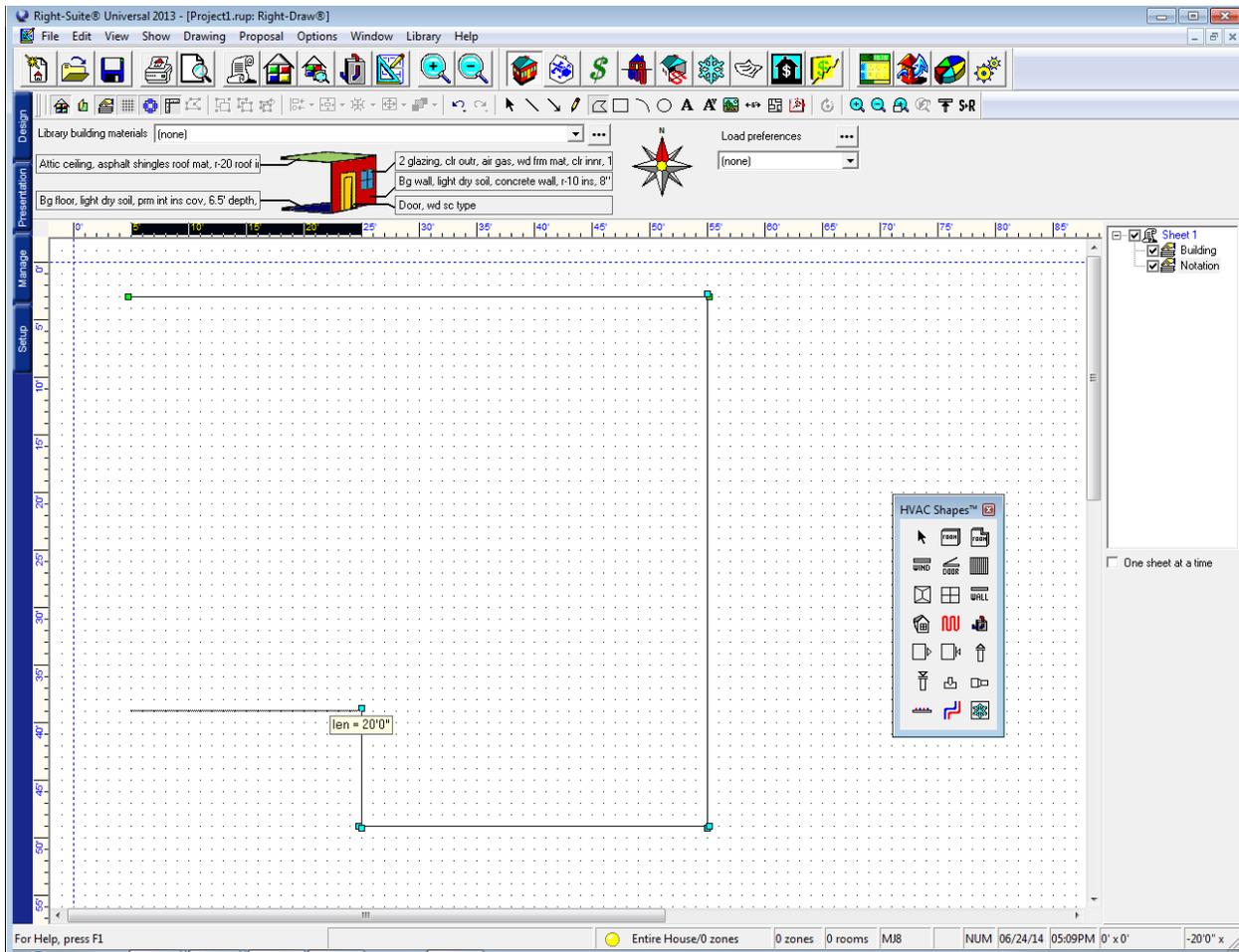
Draw the Living Space

- Click on the Room Wall by Wall tool on the HVAC Shapes™ toolbar
- 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) 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

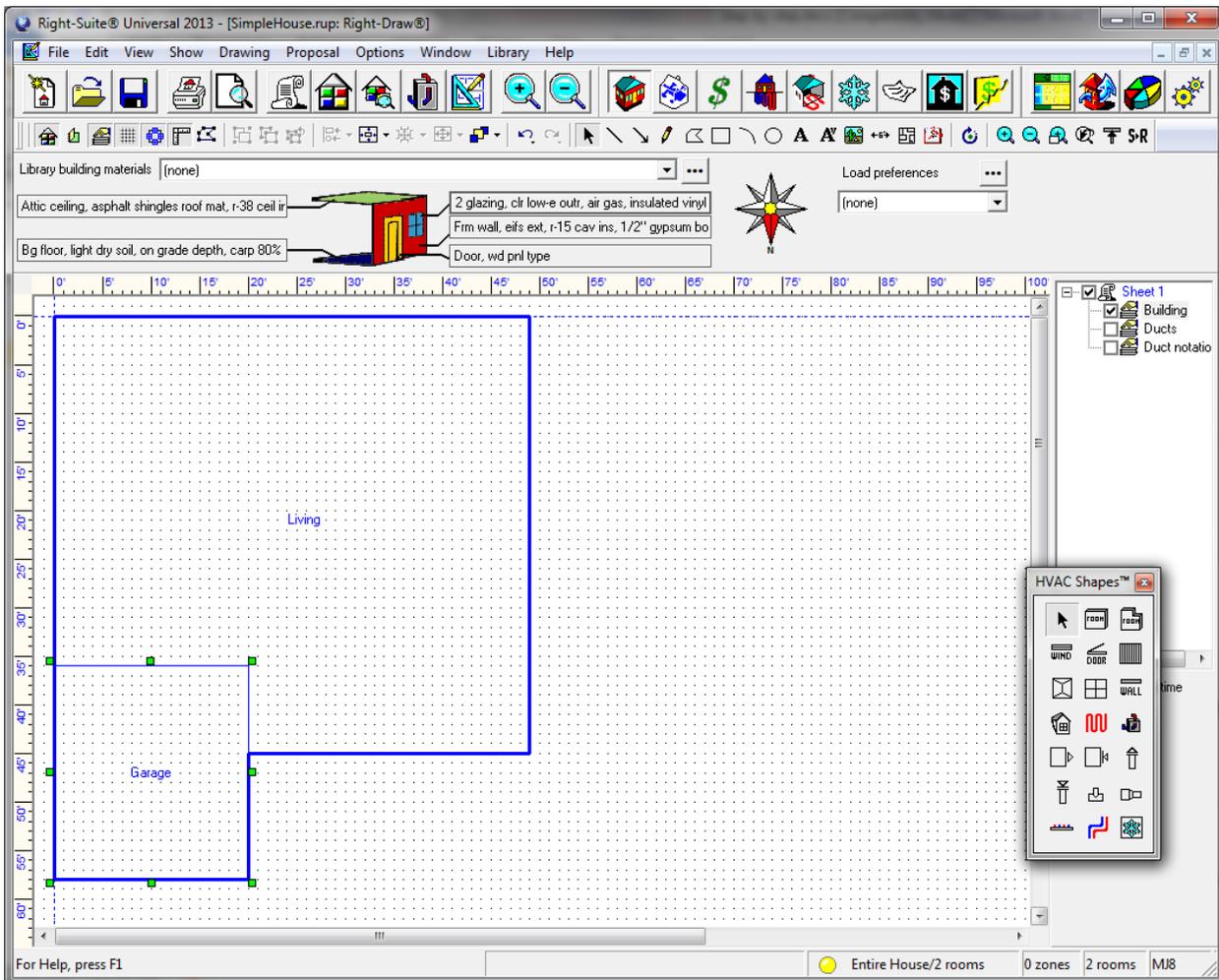
TIP #1: Holding the shift key while you draw linear objects such as walls will lock them into 90 and 45 degree angles.



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.

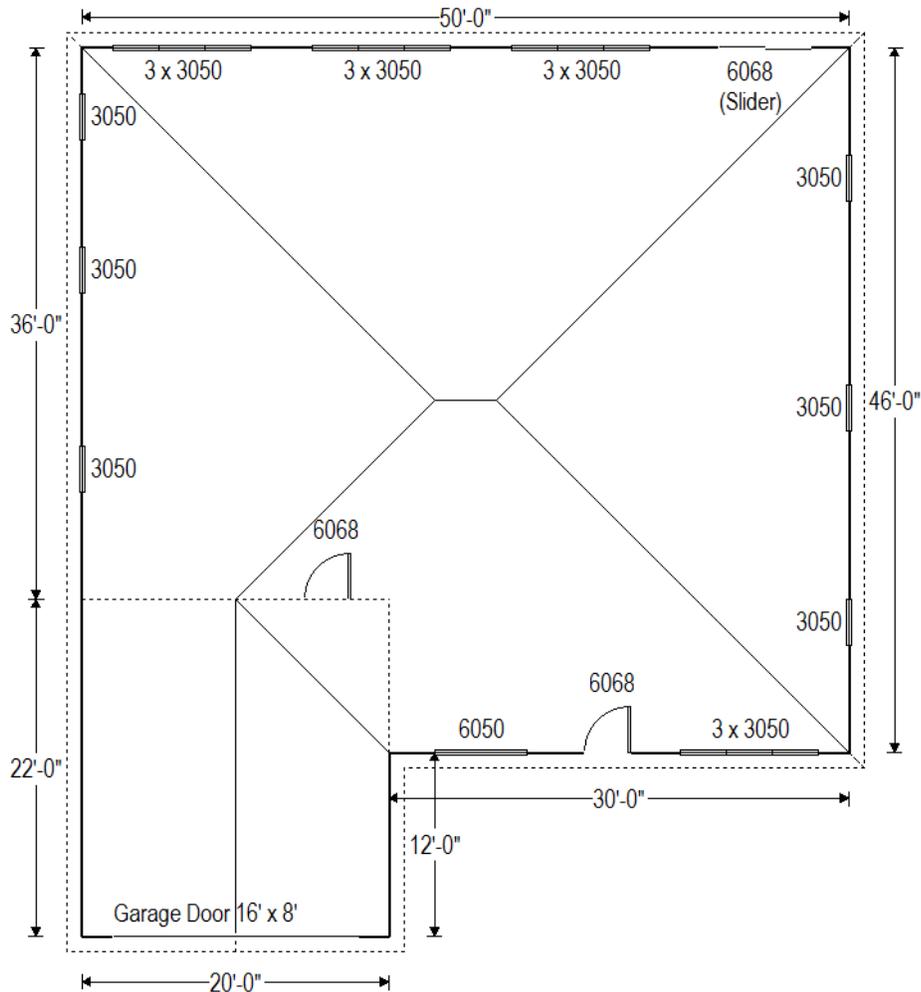


- To rename the rooms, simply left click on the rooms (not the room names) and start typing.

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 2 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:

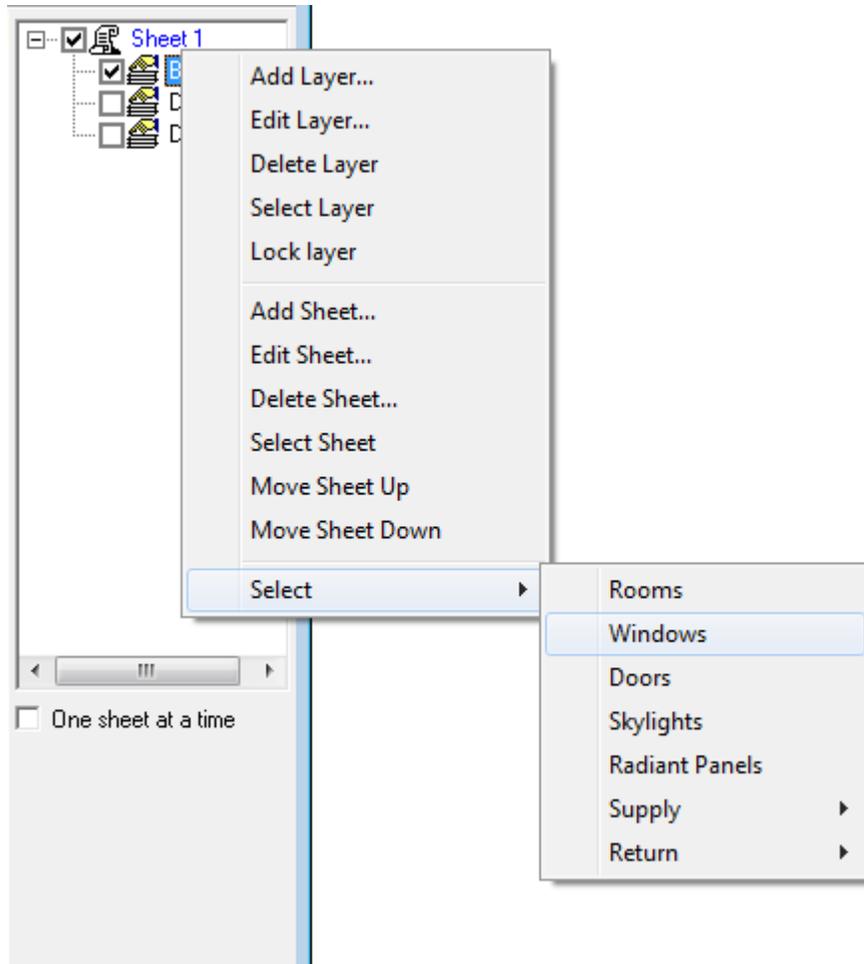


- For doors we'll use a copy trick. Drag and drop a door from the HVAC Shapes to the drawing where it belongs (north/front wall or living/garage partition).
- Right click on the door to view its properties. Change the height to 6'8" (note the calculator that pops up on its own when you type a ' (single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

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.



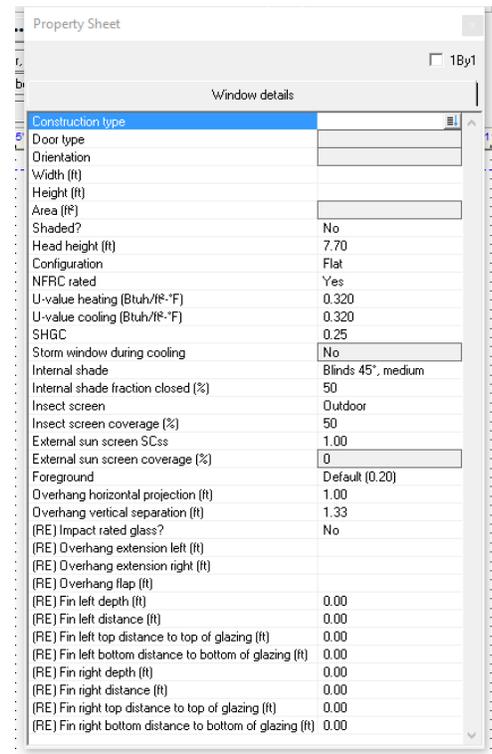
- While 2 of our windows are different sizes the vast majority of our windows are identical, and even those that are different have a lot of things in common with the rest. This will allow us to set all of these common settings in one go.

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.

Properties (Windows Continued)

- 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")**.



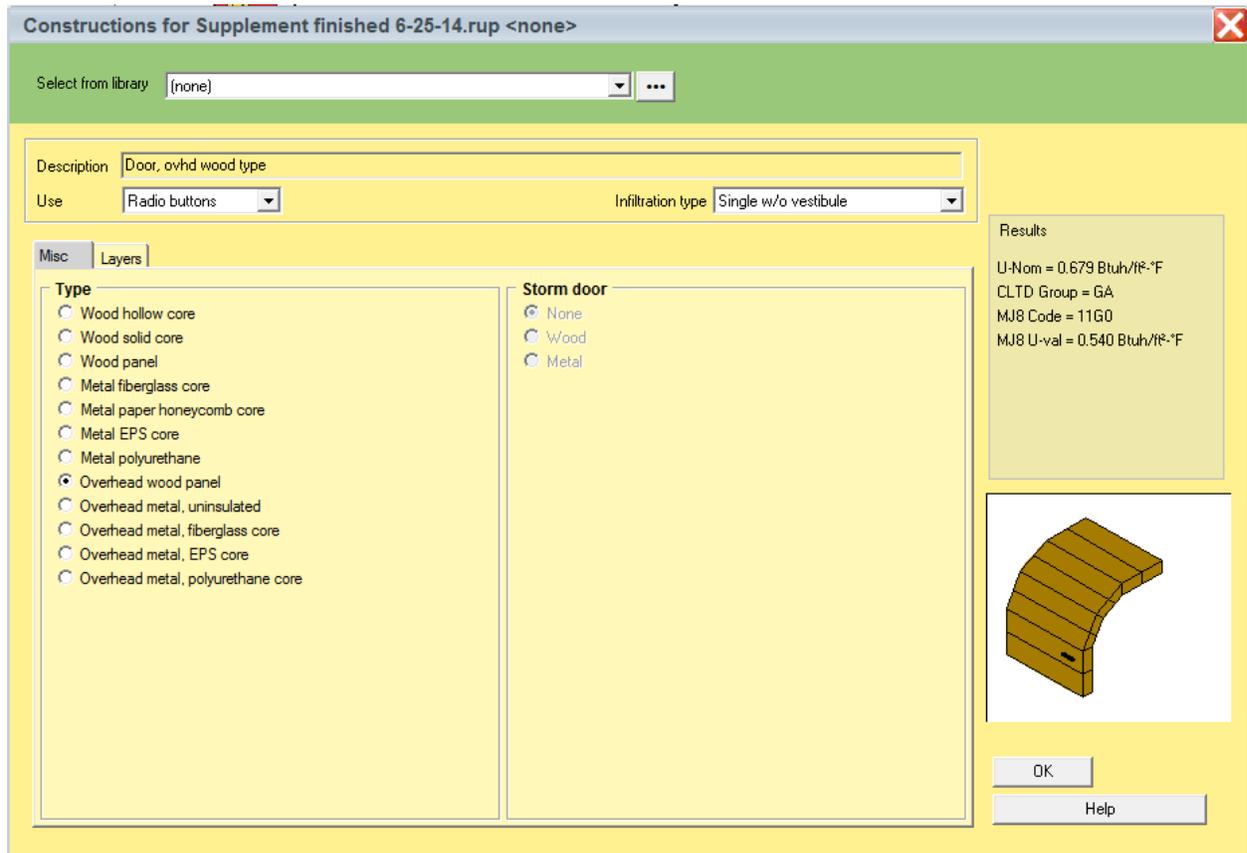
Optional: For both compliance and load purposes having the right size, u-value, SHGC, and shade settings is enough for proper calculations. However, some users prefer to make the slider **look like** a slider. For this:

- 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.

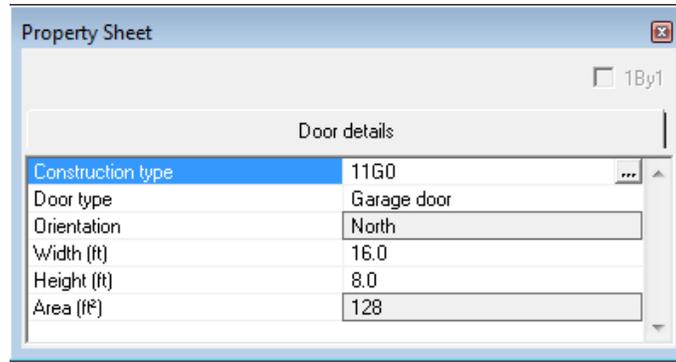
Note 2: The construction type field automatically selects the U-Value and SHGC fields. When using Custom Values you can directly input that information. If you use radio buttons, you can also input that same information directly to the property sheet by designating **NFRC Rated: Yes**. Either way, what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

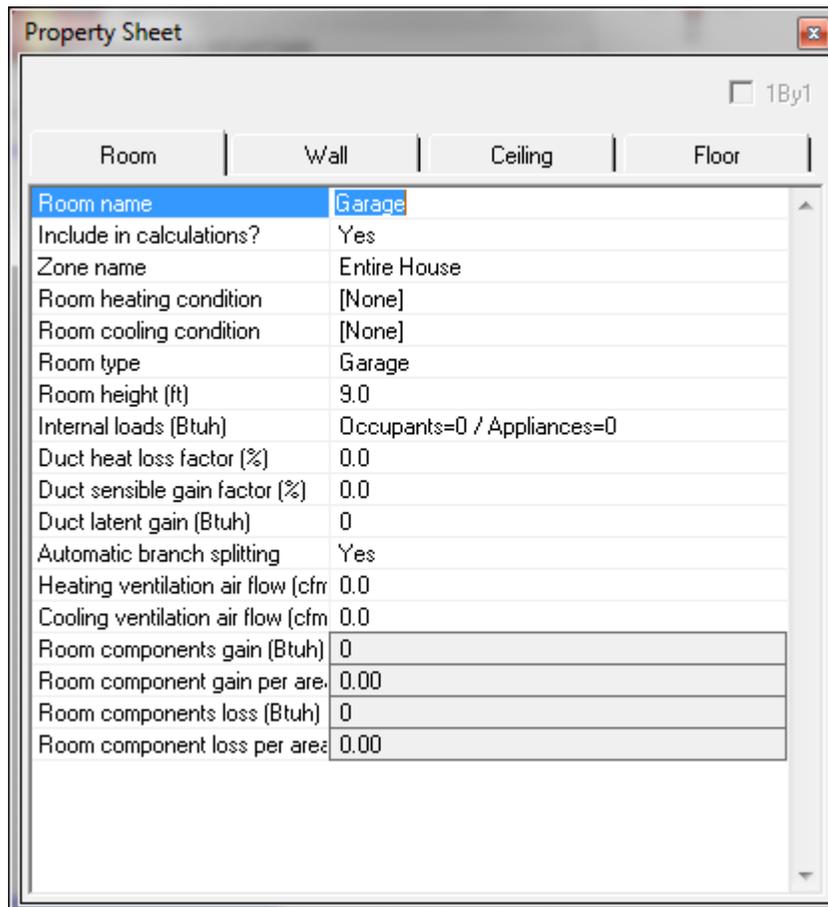


- Click on the 'OK' button to return to the Property Sheet.
- Select 'Garage door' for the Door type.
- In the Property Sheet, set the Width to 16.0' and the Height to 8.0'. Once you do this, you may need to reposition the door on the drawing.



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



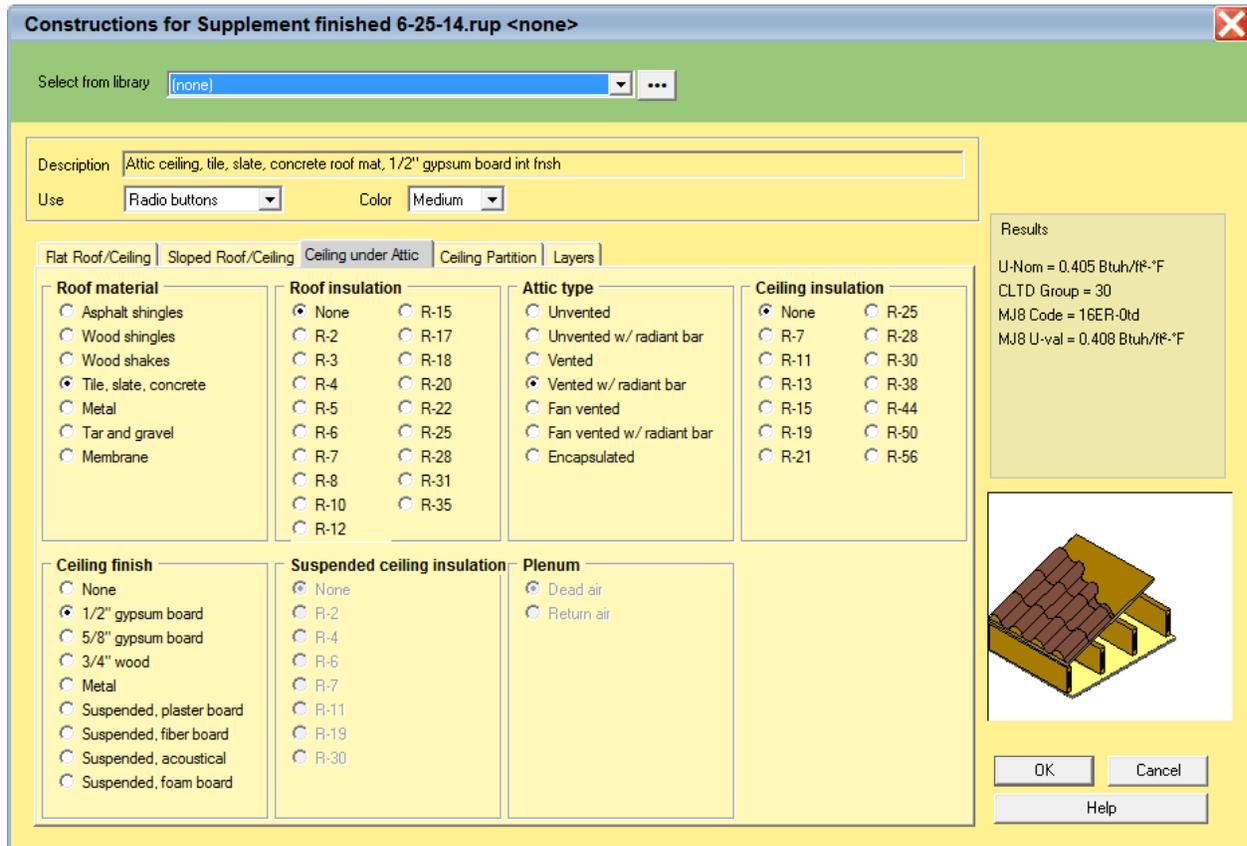
Properties (Garage- Exterior Wall)

- 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: (none)

Description: Attic ceiling, tile, slate, concrete roof mat, 1/2" gypsum board int frsh

Use: Radio buttons Color: Medium

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·°F)	Dens (lb/ft ³)	SpHt (Btu/lb·°F)	R (ft ² ·°F/Btu)	Weight (lb/ft ²)	HC (Btu/ft ² ·°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/ft²·°F
 CLTD Group = GC
 MJ8 Code = Frm wall, r-15 cav
 MJ8 U-val = 0.088 Btu/ft²·°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 2014 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 when you change the heating and cooling conditions, another air handler named (Unconditioned) has been added in the Multizone screen.

Property Sheet

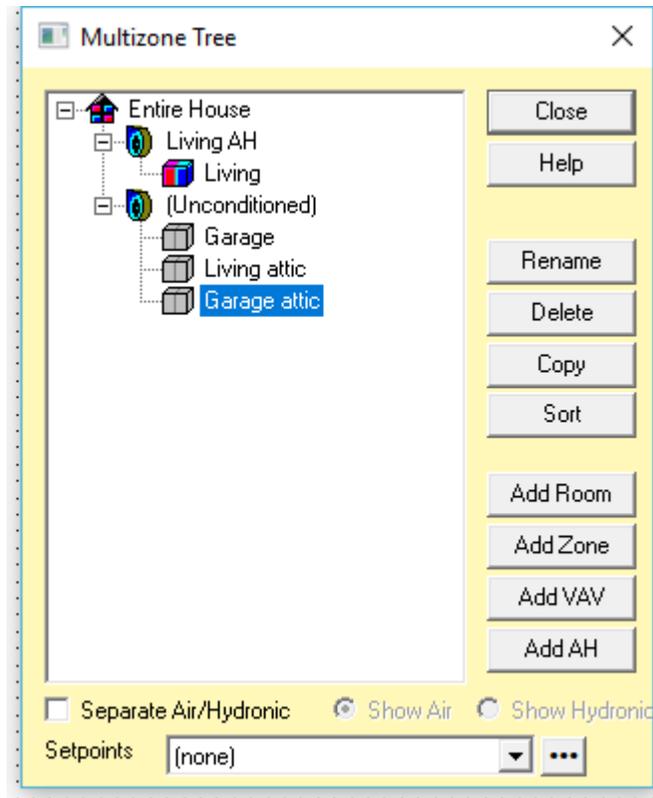
1By1

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/ft²)	0.00		
Room components loss (Btuh)	0		
Room component loss per area (Btuh/ft²)	0.00		

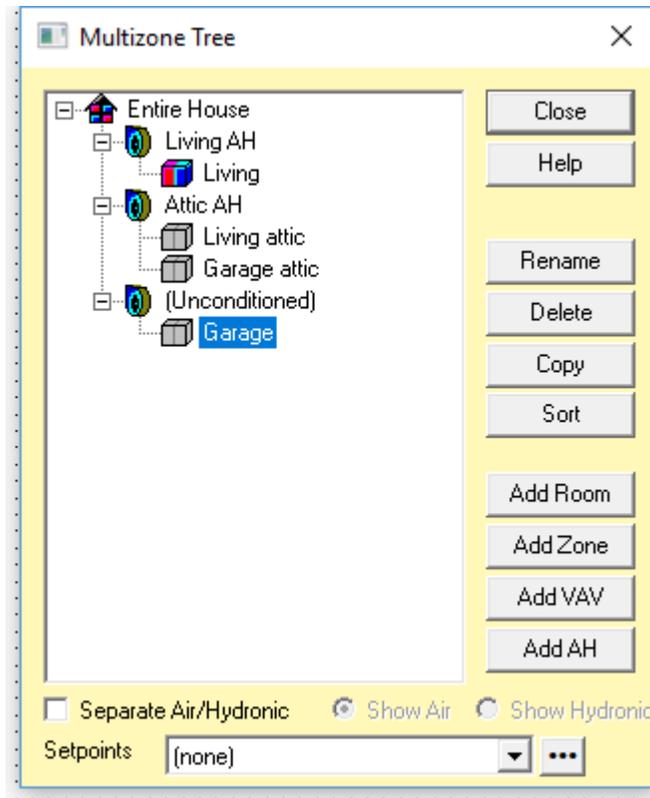
8. Draw another room on top of the Garage room. Name the room 'Garage attic'.
9. In the Property Sheet for the 'Garage attic' room that you just created, change the Room Properties to the same as in step 10 above.

The attic rooms need to be in their own zone. We want the equipment to condition the Living room only. So, we need to have the garage in its own zone as well. 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.



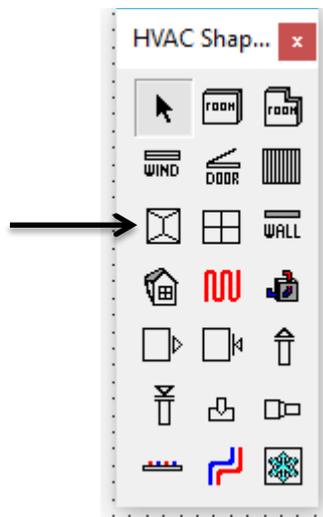
12. Click on the (Unconditioned) air handler and click the 'Rename' button on the right of the screen. Type 'Attic AH' for the new name. Click anywhere else (the Garage room, for example) on the Multizone Tree screen to set the new name. Renaming this air handler will allow it to be separate from the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

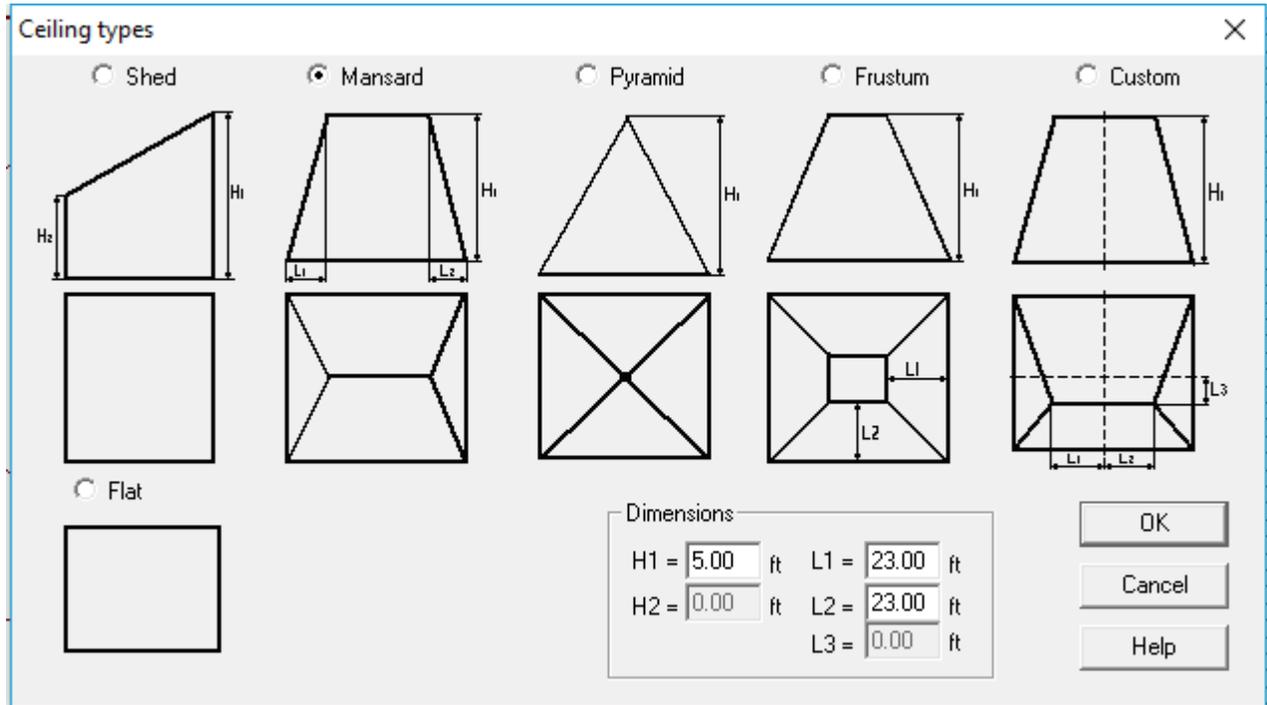
Now we need to add the roof to the attic rooms. Make sure that the Attic sheet is selected on the list of Sheets and Layers on the right.

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

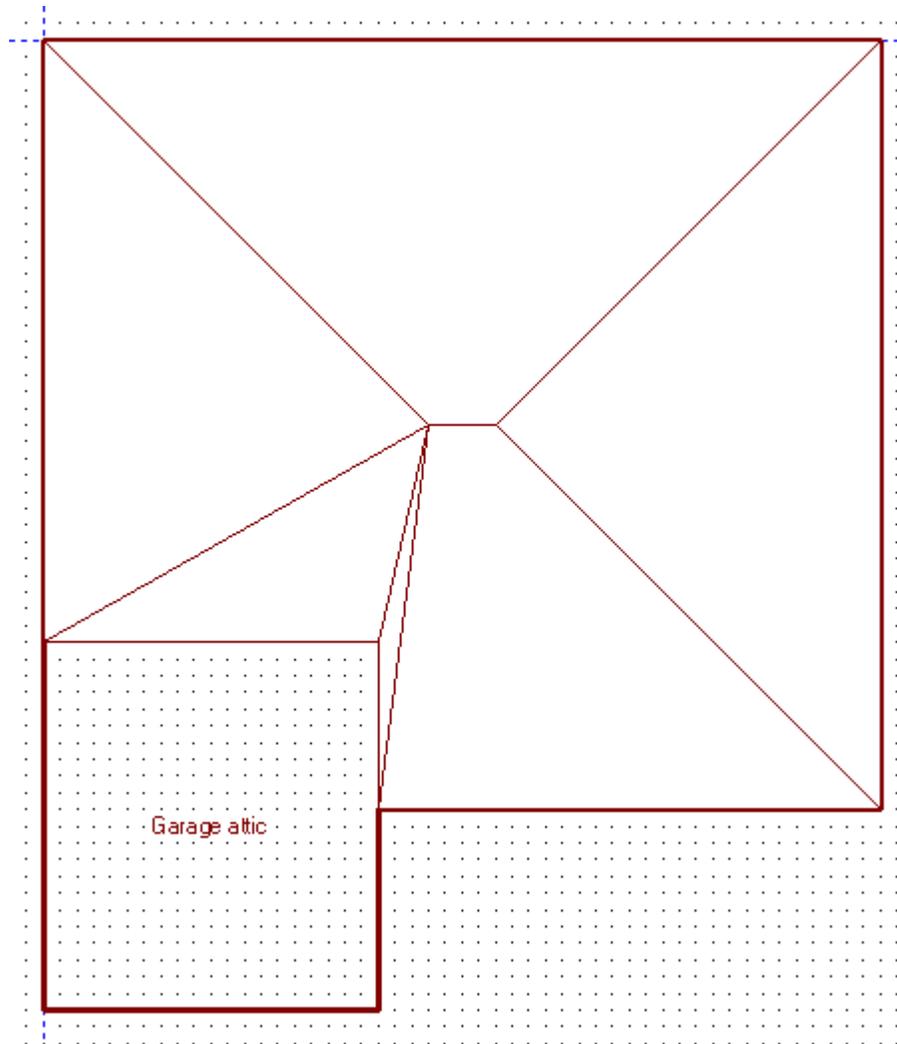


2. Draw a roof over the Living attic room. Just a rectangular one for now. We will re-shape it a little later.

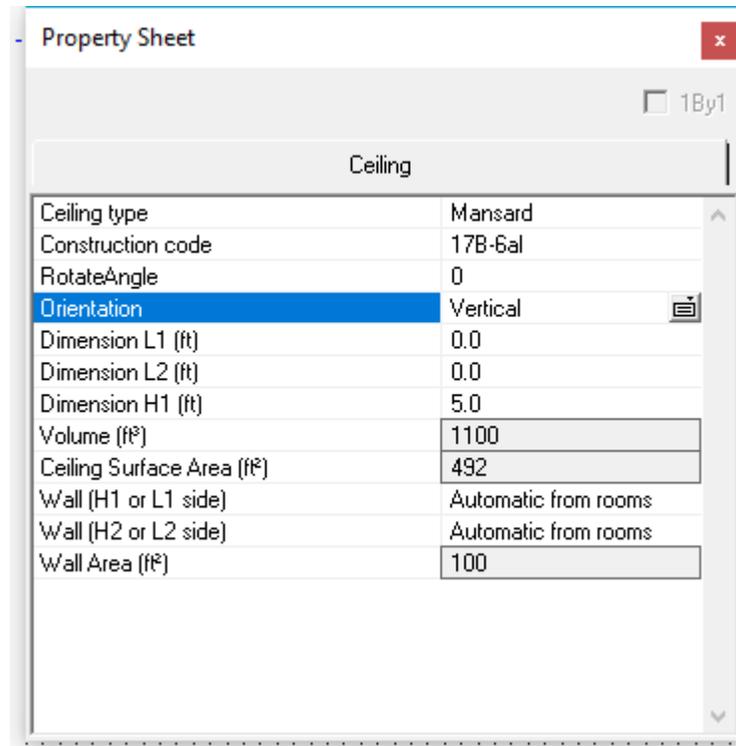
3. A screen will be displayed for you to describe the roof.



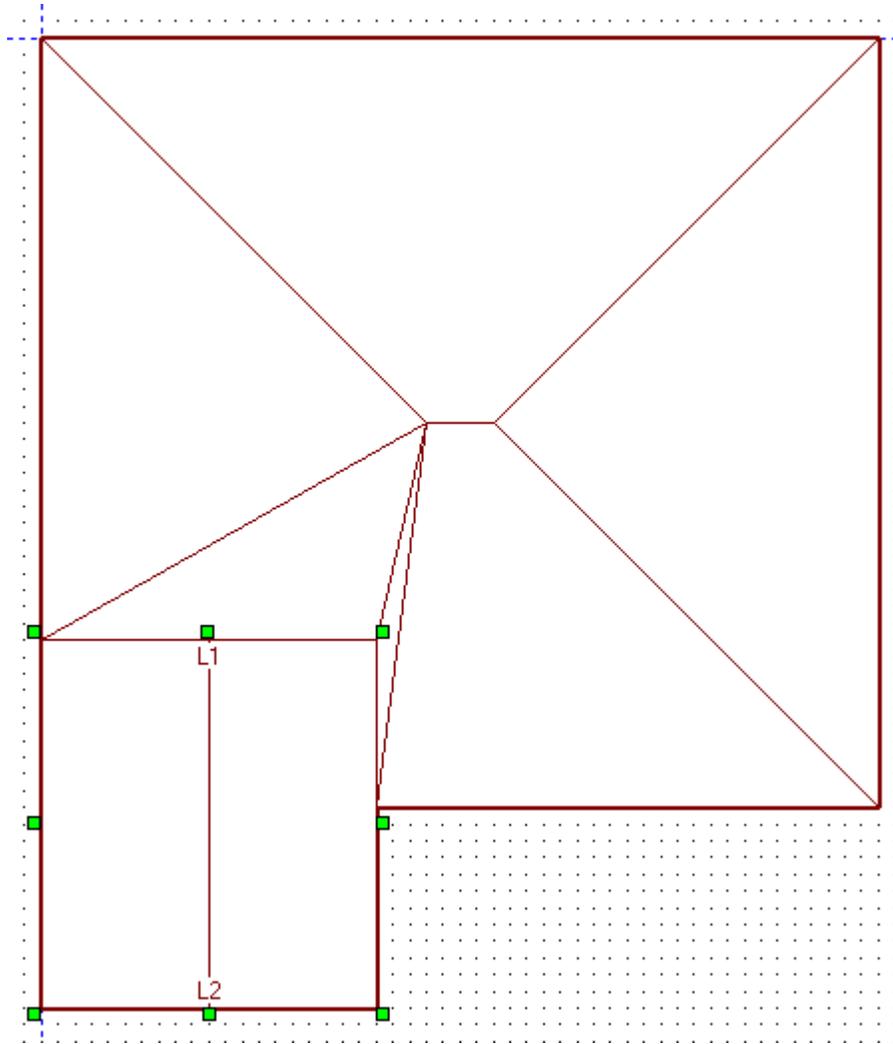
4. Select the 'Mansard' type at the top of the screen. Enter 5 for the H1 dimension. Enter 23 for both the L1 and L2 dimensions.
5. Click the 'OK' button to return to the drawing screen.
6. Click on the 'Edit points' button -  on the Drawing toolbar. Change the shape of the roof to match the Living attic room.



7. 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.
8. 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.



9. The roof ridge is now correct.



Other Load Options

There are other settings important to the load calculations that do not map to Right Right-Energy® Florida 2014, because Florida 2014 requires inputs not in line with the load calculation methods (including infiltration, ventilation, duct loss and gain, and internal gain, among others). These settings should be observed if you are doing a load calculation as well.

If you are concerned with more closely matching numbers in the screen captures with this example here is a list of other load options used in this example (not used by Florida 2014 Compliance):

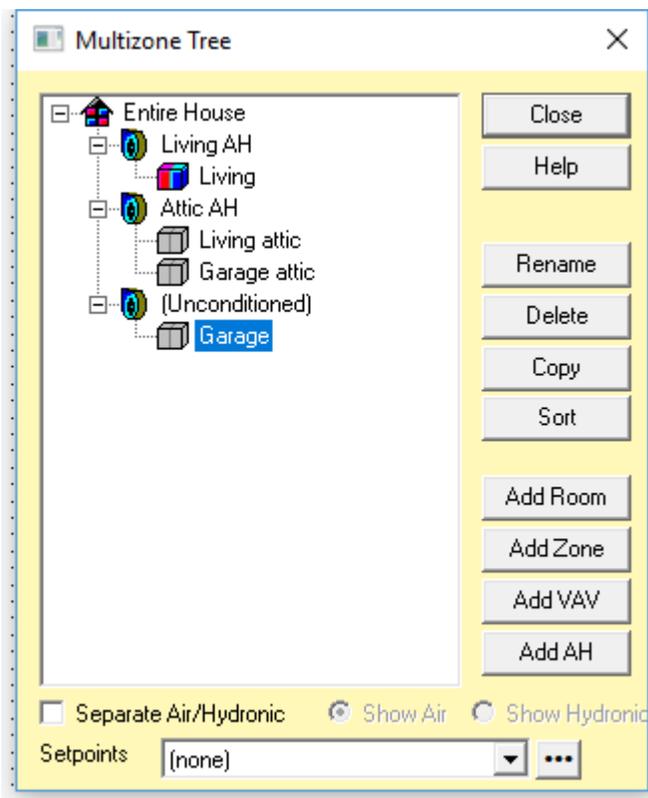
- Internal Gains: 4 occupants and 1200 Btuh
- Duct Load:
 - **Supply: Location:** Vented attic; **Roof Material:** Tile, slate, or concrete; **Roof color:** Dark; **Configuration:** Radial, perimeter outlets; **Sealing:** Extreme; **Insul R:** 8.0; **Heating air temp:** 100°
 - **Return: Location:** Vented attic; **Roof Material:** Tile, slate, or concrete; **Roof color:** Dark; **Configuration:** Radial; **Sealing:** Extreme; **Insul R:** 8.0

- Ventilation: 70 cfm (Exhaust only)
- Infiltration **Heating ACH 0.41; Cooling ACH 0.21** (5 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 (Rest of House). You can name this air handler if you wish.
- Click on the (Rest of House) air handler. This will allow us to select equipment for this air handler.



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

Equipment for Living AH: Base System (Split ASHP)

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

Name: Split ASHP

High velocity duct system

Cooling

- None
- Split AC
- Split air source HP
- Pkg AC
- Pkg air source HP
- Water source HP
- Ground source HP

Supplemental heating Type

- None
- Electric baseboard
- Electric strip
- Furnace
- Boiler

Fuel

- Electricity
- Natural gas
- Oil
- Propane
- Wood
- Backup electricity

Water heating Type Solar

- None
- Conventional
- Instantaneous
- Air source HP
- WS/GS HP dedicated
- WS/GS HP desuperheater

Fuel

- Electricity
- Natural gas
- Oil
- Propane
- Backup electricity

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

- 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; **Water heating type:** unchecked. The last checkbox will not be available when the Florida Right-Energy® UI options is selected.

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

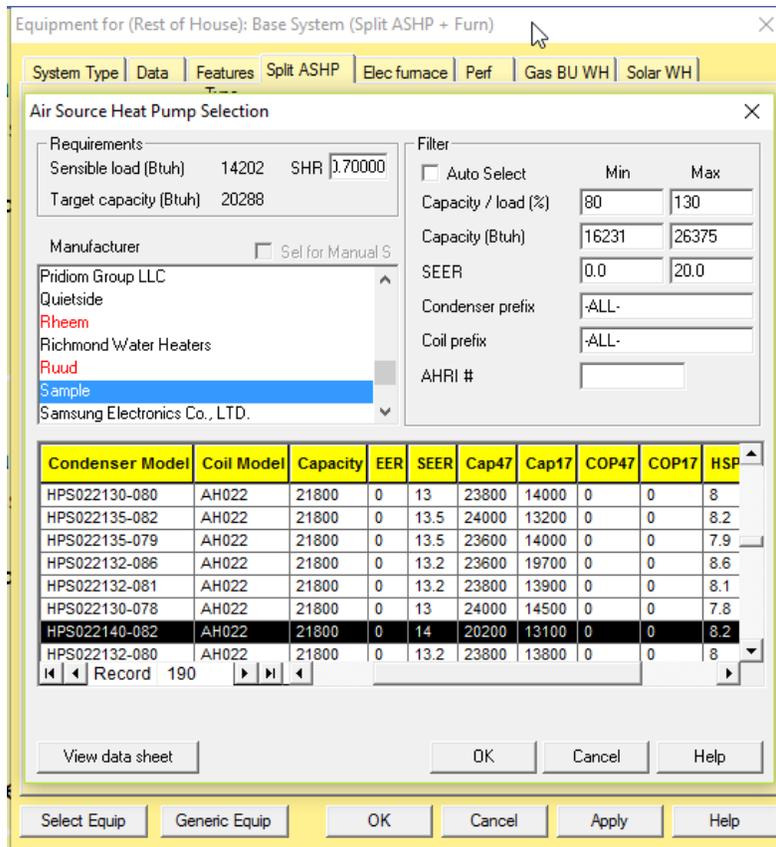
Equipment (Split ASHP Tab)

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). So as not to play favorites with particular brands, we'll be using the Sample equipment manufacturer that is 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 2014 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.

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 2014 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.

Equipment (Elec strip)

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

Equipment for (Rest of House): Base System (Split ASHP)

System Type | Data | Features | Split ASHP | Solar WH | Elec strip | Perf | Elec BU WH | Simulation

Electric Strip Selection

Requirements

Target capacity (Btuh) 49242 Auto Select

Manufacturer

National Comfort Products
 Nordyne
 Nutone
 Payne
 Rheem
 Ruud
 Sample

Trade name

Model SES1234

Input (kW) 14.4

View data sheet OK Cancel Help

Select Equip Generic Equip OK Cancel Apply 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 does, however, have a database of both conventional hot water heaters and solar components. However, when preparing a project for Florida 2014 compliance, you should use the special solar hot water screen rather than the standard RSU Solar WH screen.

Note that the Florida 2014 Code has specific requirements for solar water heating systems. Please review R403.4.4.2.

Backup component

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

1. In the Backup water heater tab (Elec BU WH), enter the occupants, appliances, etc. to determine the daily water use. You can also override the calculated daily use if it is already known.
2. Enter 120 as the thermostat setpoint (for the hot water heater).
3. 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; **1st hour (gal):** 60; **Recovery efficiency (%):** 77.

Note: This data must be entered. If this were an actual design, you would enter the data for the specific hot water heater that will be installed.

The screenshot shows a software window titled "Equipment for (Rest of House): Base System (Split ASHP)". The window has several tabs: "System Type", "Data", "Features", "Split ASHP", "Elec strip", "Elec BU WH", "Solar WH", "Perf", and "Simulation". The "Solar WH" tab is selected. On the left, there is a small house icon. Below it, there is a table for "Occupants":

Age	Number
0-5	0
6-13	2
14-59	2
60-	0

Below the table are checkboxes for "Home during day", "Dishwasher", and "Clothes washer", all of which are checked. There is also a field for "Additional use (gpd)" with a value of 0. To the right of the occupants table is a "Ratings" section with the following fields:

- Tank size (gal): 40
- Input (kWh): 4.5
- Energy factor: 0.960
- 1st hour (gal): 60
- Recovery efficiency (%): 77

Below the ratings section are fields for "Capacity (MBtuh)" and "COP", both empty. There is also a "Load" section with "Setpoint (°F)" set to 120 and "Daily use (gpd)" set to 71. At the bottom of the window are buttons for "Select Equip", "Generic Equip", "OK", "Cancel", "Apply", and "Help".

Note that the above screen has been filled in with example inputs.

4. 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 (Simulation)

The Simulation tab of the Equipment screen has data that is used only for Right-Energy® Florida 2014 simulations.

1. Click on the 'Simulation' tab.

The screenshot shows a software dialog box titled "Equipment for (Rest of House): Base System (Split ASHP)". It has several tabs: "System Type", "Data", "Features", "Split ASHP", "Elec strip", "Elec WH", "Solar WH", "Perf", and "Simulation". The "Simulation" tab is selected. Inside the dialog, there is a section labeled "Simulation only!" with a sub-section "Distribution". Under "Distribution", there is a radio button for "Distribution system efficiency" which is selected. Below this, there are two columns: "Heating" and "Cooling". Each column has a "Distribution type" dropdown menu and a "DSE" text input field. In the "Heating" column, the dropdown is set to "Ducted Air" and the DSE field contains "0.88". In the "Cooling" column, the dropdown is also set to "Ducted Air" and the DSE field contains "0.88". At the bottom of the dialog, there are six buttons: "Select Equip", "Generic Equip", "OK", "Cancel", "Apply", and "Help".

2. 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 you have duct leakage test results, you can enter them here. For this example, we will leave them at the default values. If the values are 0, reselect 'Ducted Air' and the default values will be entered.
3. Click the 'OK' button to exit from the Equipment screen.

Final Entries and Compliance

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

- Select **File | Code Compliance | Right-Energy® Florida 2014** from the menu at the top.

Compliance (Project)

There are some project-wide entries that are used for Florida 2014 code compliance only. These entries can be entered in the Project tab.

1. Click on the Project tab

The screenshot shows a software window titled "Right-Energy® Florida 2014" with a close button (X) in the top right corner. Below the title bar are four tabs: "Performance", "Project", "Credit Options", and "Requirements". The "Project" tab is selected and highlighted with a black arrow. The main area of the window is a form with two columns of fields. The left column contains: Title (empty), Street (1516 Ninth Street), City, State, Zip (Tampa, FL 33601), Owner (Mr. and Mrs. Henry Wagner), Design Location (Tampa Intl AP, FL, US), Lot# (Lot. 410-111), Subdivision (empty), Platbook (empty), Jurisdiction (Hillsborough County), Builder Name (Wrightsoft), and Comment (empty). The right column contains: Year Constructed (empty), Bedrooms (3), Bathrooms (1), Address type (Street address), Family Type (Single Family), New/existing (New (From Plans)), Terrain (Ocean/Lake), Shielding (Suburban), Permit Office (empty), and Permit Number (empty). At the bottom right of the window are "OK" and "Cancel" buttons.

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 2014 reports.

2. Enter all of the information on this screen.

Compliance (Credit Options)

- Click on the 'Credit Options' tab.

Right-Energy® Florida 2014

Performance | Project | **Credit Options** | Requirements

Credit Options

Radiant Barrier or IRRC

None IRCC Radiant Barrier

Roof Deck Emittance

Cool Roof

Solar Absorptance

Thermal Emittance

Unvented Attic

Cross Ventilation

Whole House Fan

Ceiling Fan

Water Heater Recovery

Dedicated Heat Pump

Solar Water Heating

Multiple Heating Systems

Multiple Cooling Systems

Multiple Water Heating Systems

OK Cancel

You can select the optional Florida 2014 Credit Options here. 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 2014" with a close button (X) in the top right corner. The window has five tabs: "Performance", "Project", "Credit Options", "Requirements", and "Solar WH". The "Solar WH" tab is selected. Inside the window, there is a section titled "Solar Water Heating System" containing several input fields:

Field Name	Value
FSEC Certificate Number	
Company Name	
System Model	
Collector Model	
Collector Area (ft ²)	0.0
Storage Volume (gal)	0.0
FEF	3.0

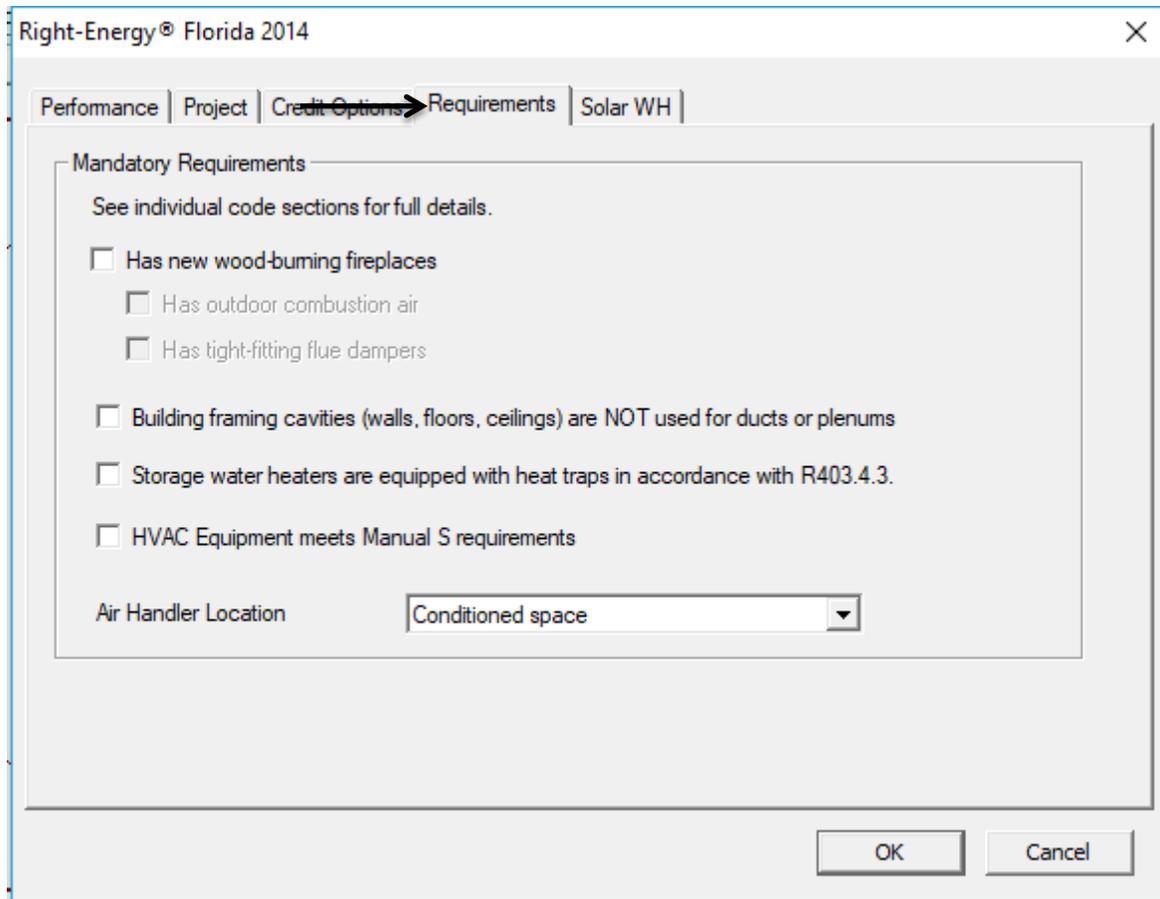
At the bottom right of the window, there are two buttons: "OK" and "Cancel".

All of the information on this screen is required for Florida 2014 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.



This screen shows items that are required by the Florida 2014 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 2014 Code when the checkboxes are checked.

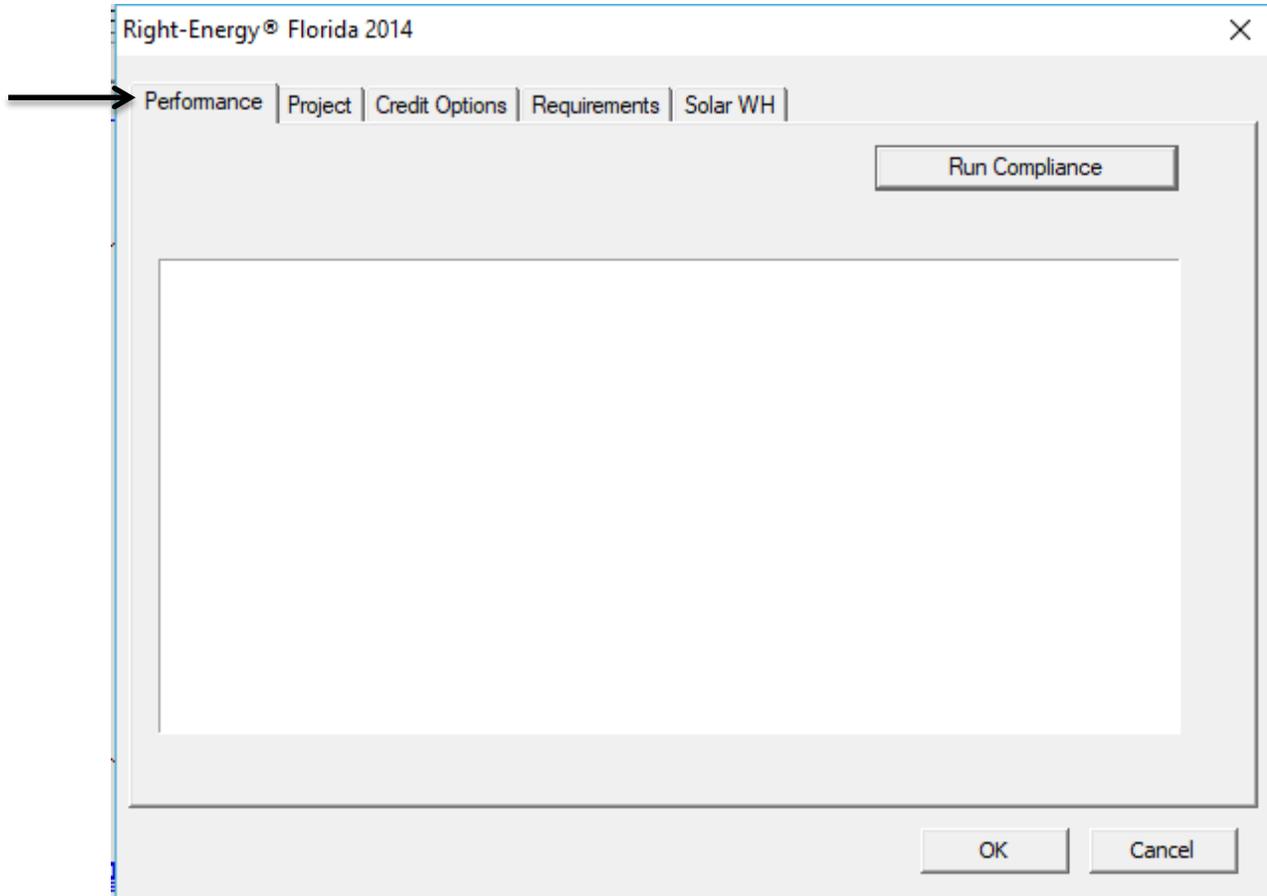
- If your project has fireplaces, you should check the box at the top. The 2 checkboxes below that will become active. The Florida 2014 Code requires that both of those 2 checkboxes be checked. You should confirm that they represent the conditions of your project and check them. If they are not checked, 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 last item is a drop-down list of choices. The choices are:
 - Attic
 - Conditioned space
 - Exterior
- Note that 'Attic' is NOT a valid choice if you will be using any of the Prescriptive methods (R-value, U-factor, UA). In this example, we will be using the Performance method. 'Attic' is a valid choice, however, the Florida 2014 Code requires certain conditions are met. See section R403.2.4 for the details of these conditions.

- Select 'Attic (Valid for Performance method only) from the drop-down list.

Compliance (Run Performance)

We are now ready to perform the Performance compliance calculations.

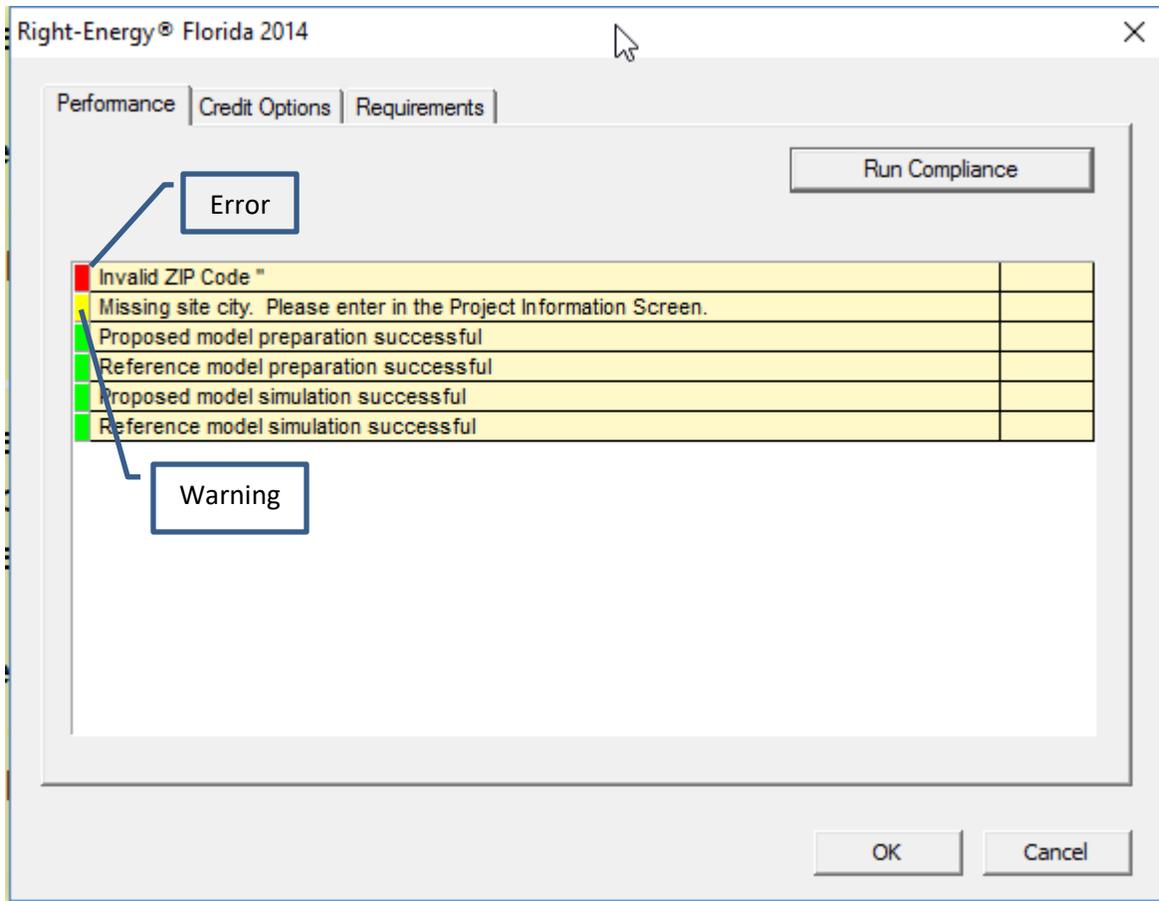
- Select **File | Code Compliance | Right-Energy® Florida 2014** from the menu at the top.
- Click on the 'Performance' tab.



Compliance (Run)

It's time to run the simulation and get our results.

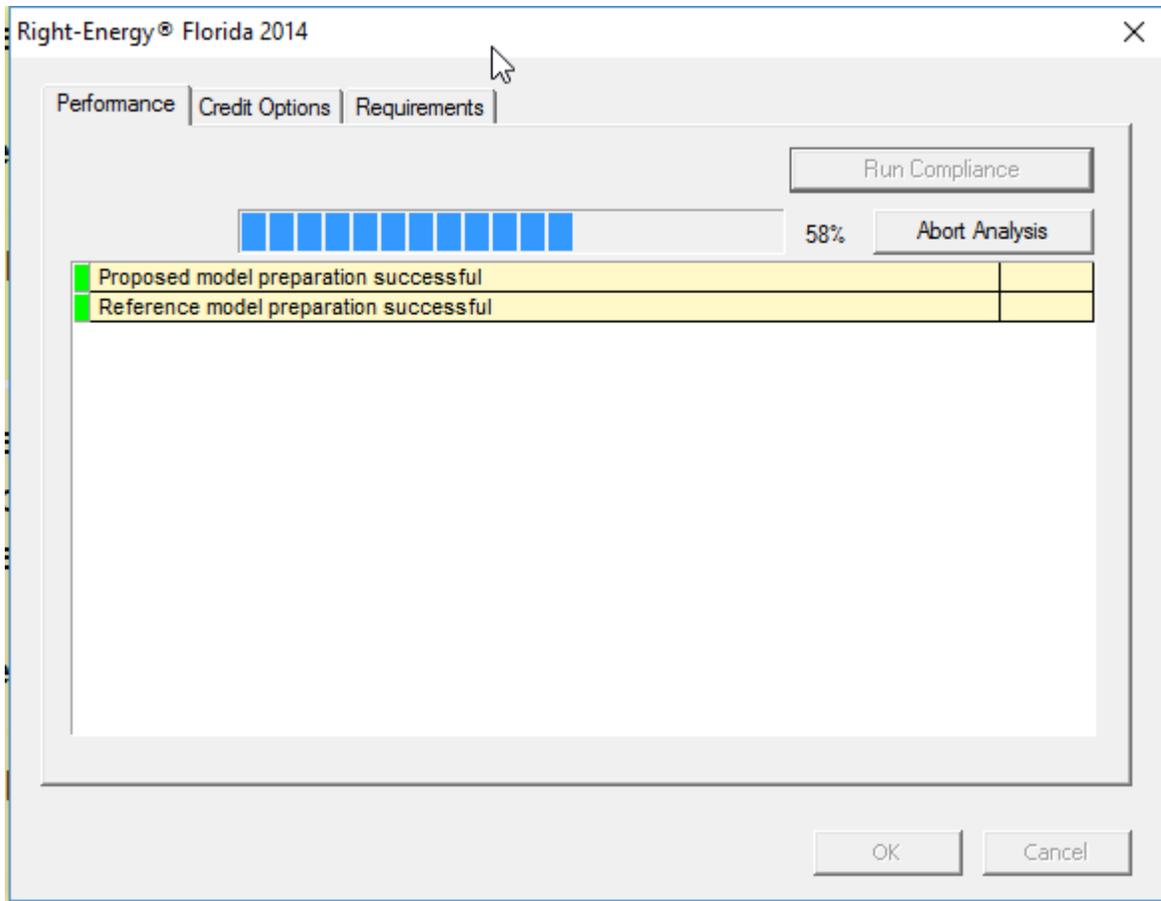
- Click the 'Run Compliance' button.
- If RSU finds any warnings or errors prior to running the simulation, such as a building material that cannot be mapped, you will see them in this window.



- 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 lower right corner of this screen.

Right-Energy® Florida 2014

Performance | Project | Credit Options | Requirements | Solar WH | Results

Compliance Summary

	Proposed			Reference		
	Load (MBtu/yr)	Fuel (MBtu/yr)	Electricity (kWh)	Load (MBtu/yr)	Fuel (MBtu/yr)	Electricity (kWh)
Heating energy	0.19	0.00	24.96	2.09	0.00	246.09
Heating fan			2.78			27.19
Cooling energy	45.65		3224.36	46.07		3261.75
Cooling fan			632.36			646.50
DHW	7.55	0.00	829.16	7.55	0.00	3019.11
Total	53.38	0.00	4713.62	55.70	0.00	7200.63

Project name: SimpleHouse2
 Run date: 07/12/2017 14:41:03
 e-Ratio: 0.858

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 B 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.

Compliance Report

PDF compliance report successfully generated.

Would you like to view the report?

Yes No

Detailed Input Description

This section provides specific details about Right-Suite Universal (RSU) inputs that are used by Right-Energy Florida 2014.

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 zip code in the Site project data. You have to enter the Site zip code either in the Site section or in the Customer section if the 'Same as Customer' checkbox is checked.
- In the 'Site' section, you can check the checkbox at the top to copy the information that is in the 'Customer' section.
- 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 2014. The default value is derived from Right-Draw room type property. You should override the default if it is not correct.
- The Weather location is not needed for Florida 2014 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).

Zone Information Screen

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

Infiltration

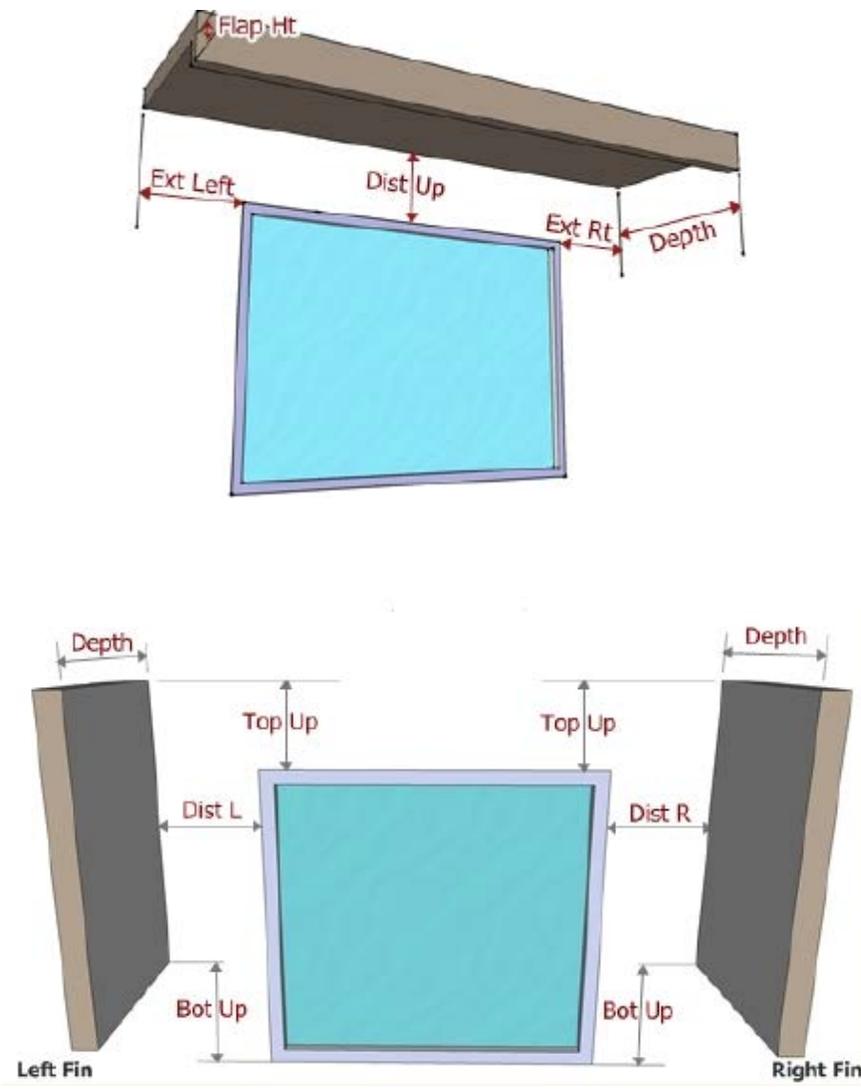
Infiltration data for compliance is entered on the normal RSU Infiltration screen.

Right-Draw®

Drawing procedures are identical to those used for loads calculations. Compliance Manager 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 2014 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 2014 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 Compliance Manager. 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 Compliance Manager 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 2014 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

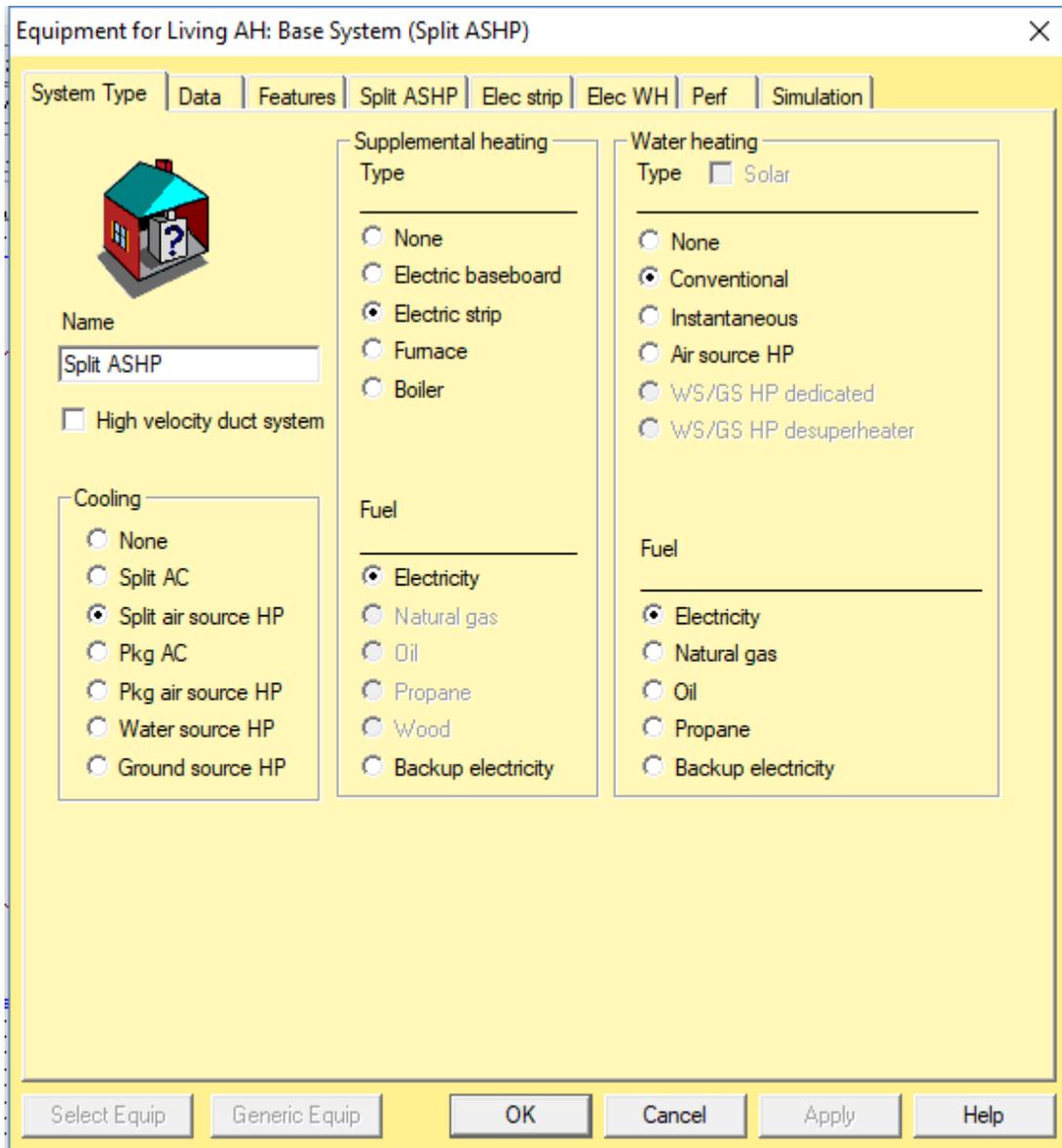
1By1

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 2014 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 (Rest of House): Base System (Split ASHP)

System Type | Data | Features | Split ASHP | Elec strip | Elec BU WH | Solar WH | Perf | Simulation

Type
 Manufacturer: Sample
 Trade name:
 Model: 50400616076
 AHRI ref no.:

Occupants

Age	Number
0-5	0
6-13	2
14-59	2
60-	0

Home during day
 Dishwasher
 Clothes washer
 Additional use (gpd): 0

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			

Load

Setpoint (°F)	120	Daily use (gpd)	71
---------------	-----	-----------------	----

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 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.

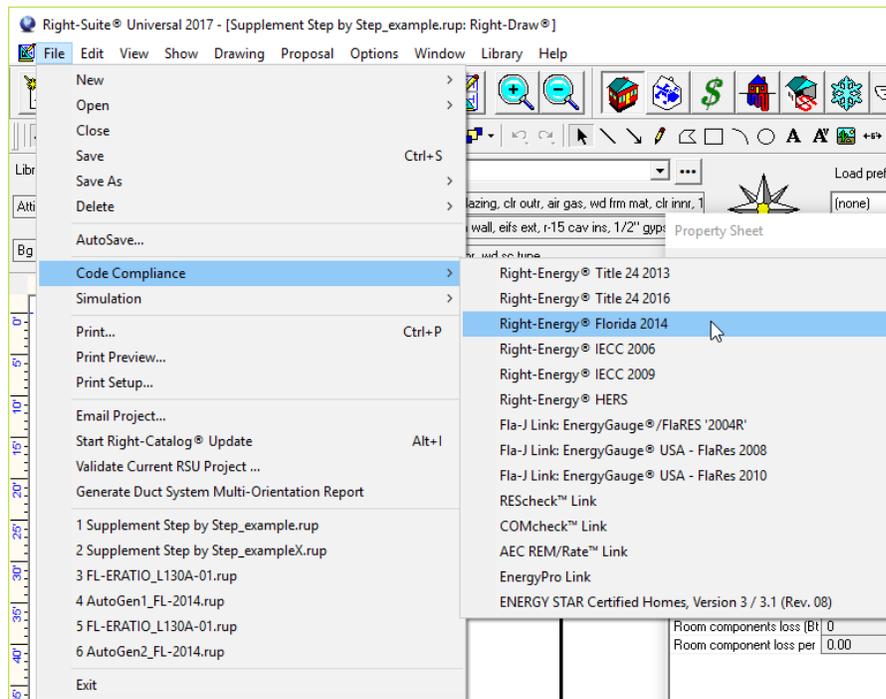
Garages – Garages are usually not conditioned and, therefore, not considered for load calculations. However, compliance requires that they be defined. When you enter an attached garage, be sure to set the following in the Room Property Sheet for the garage:

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'.

Crawl Spaces – Crawl spaces are not explicitly described in RSU. However, they need to be defined for compliance. RSU will generate a crawl space when there is an Exterior Floor with the Exterior Conditions set to one of the crawl space options. When you define a room for unconditioned crawl spaces, be sure to set the room type to ‘Unconditioned crawl space’.

Right-Energy Florida 2014 Screens

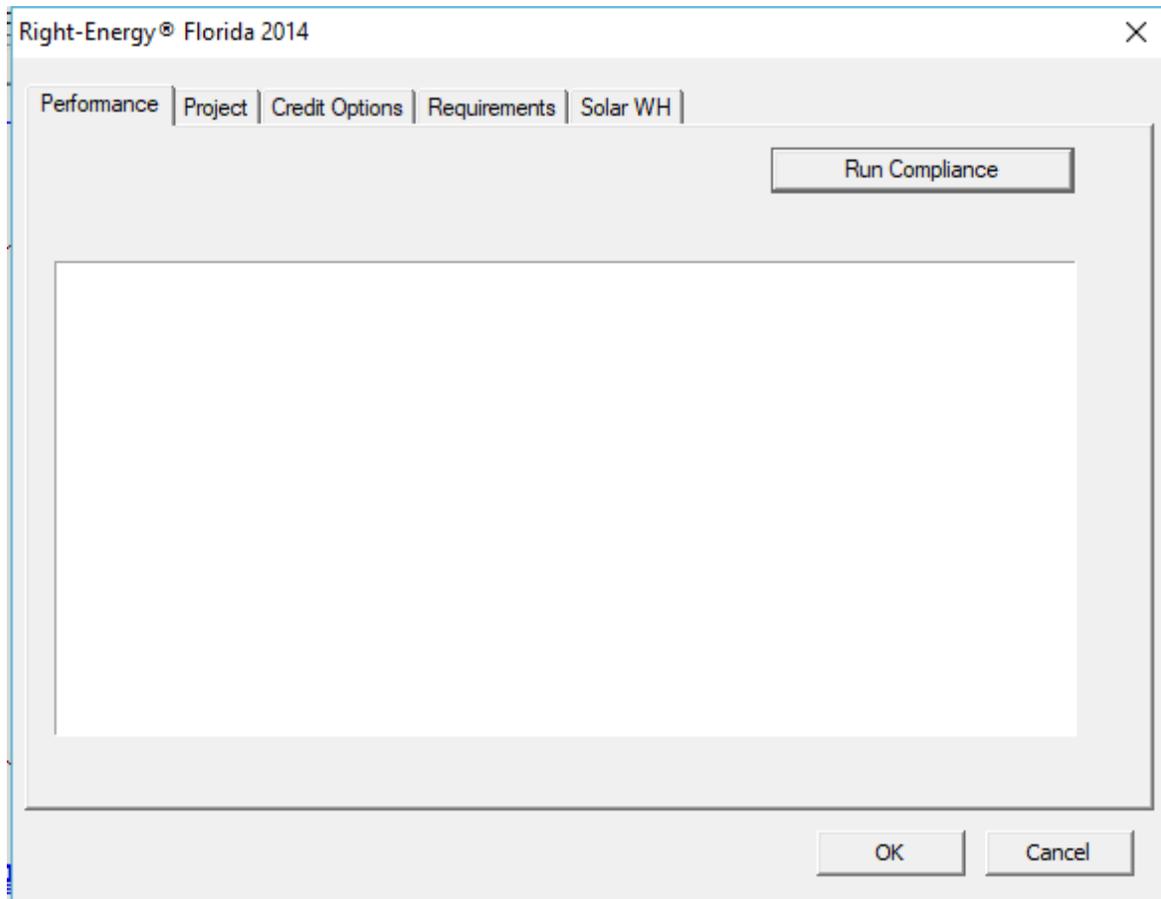
A number of screens capture input that is used *only* for Florida 2014 compliance. In some cases, default information is provided from elsewhere in RSU, but no data entered here has any effect on other RSU calculations.



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.



Appendix A. Energy Commission Approval

Appendix B. Sample Compliance Documentation

RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST

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

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

This Checklist

A Form 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)

Mandatory Requirements (three pages)

Required prior to CO for the Performance method:

A completed Air Barrier and Insulation Inspection Component Criteria checklist (Table 402.4.1.1 of the 2014 Florida Building Code, Energy Conservation with added checkboxes - one page)

A completed Envelope Leakage Test Report (usually one page)

If Form 405 indicates anything other than default duct leakage, then a completed Form 405 Duct Leakage Test Report (usually one page)

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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: Mr. and Mrs. Henry Wagner Design Location: FL, Tampa Intl AP	Builder Name: Wrightsoft Permit Office: Tampa Permit Number: 2222-1 Jurisdiction: Hillsborough County
--	--

<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:30%;">1. New construction or existing</td> <td style="width:30%;">New (From Plans)</td> <td style="width:40%;"></td> </tr> <tr> <td>2. Single family or multiple family</td> <td>Single Family</td> <td></td> </tr> <tr> <td>3. Number of units, if multiple family</td> <td>1</td> <td></td> </tr> <tr> <td>4. Number of bedrooms</td> <td>3</td> <td></td> </tr> <tr> <td>5. Is this a worst case?</td> <td>No</td> <td></td> </tr> <tr> <td>6. Conditioned floor area above grade (ft²)</td> <td>2100</td> <td></td> </tr> <tr> <td>Conditioned floor area below grade (ft²)</td> <td>0</td> <td></td> </tr> <tr> <td>7. Window s (340 ft²)</td> <td>Description</td> <td>Area</td> </tr> <tr> <td>a. U-Factor:</td> <td>Sgl, U=0.032</td> <td>15 ft²</td> </tr> <tr> <td>SHGC:</td> <td>SHGC=0.25</td> <td></td> </tr> <tr> <td>b. U-Factor:</td> <td>Sgl, U=0.032</td> <td>285 ft²</td> </tr> <tr> <td>SHGC:</td> <td>SHGC=0.25</td> <td></td> </tr> <tr> <td>c. U-Factor:</td> <td>DbI, U=0.032</td> <td>41 ft²</td> </tr> <tr> <td>SHGC:</td> <td>SHGC=0.25</td> <td></td> </tr> <tr> <td>d. U-Factor:</td> <td></td> <td>0 ft²</td> </tr> <tr> <td>SHGC:</td> <td>SHGC=0.25</td> <td></td> </tr> <tr> <td>Area Weighted Average Overhang Depth:</td> <td>1 ft</td> <td></td> </tr> <tr> <td>Area Weighted Average SHGC:</td> <td>0.25</td> <td></td> </tr> <tr> <td>8. Floor types (0 ft²)</td> <td>Insulation</td> <td>Area</td> </tr> <tr> <td>a.</td> <td></td> <td>0 ft²</td> </tr> <tr> <td>b.</td> <td>0</td> <td>ft²</td> </tr> <tr> <td>c.</td> <td>0</td> <td>ft²</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		Conditioned floor area below grade (ft²)	0		7. Window s (340 ft²)	Description	Area	a. U-Factor:	Sgl, U=0.032	15 ft²	SHGC:	SHGC=0.25		b. U-Factor:	Sgl, U=0.032	285 ft²	SHGC:	SHGC=0.25		c. U-Factor:	DbI, U=0.032	41 ft²	SHGC:	SHGC=0.25		d. U-Factor:		0 ft²	SHGC:	SHGC=0.25		Area Weighted Average Overhang Depth:	1 ft		Area Weighted Average SHGC:	0.25		8. Floor types (0 ft²)	Insulation	Area	a.		0 ft²	b.	0	ft²	c.	0	ft²	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:30%;">9. Wall types (1347 ft²)</td> <td style="width:30%;">Insulation</td> <td style="width:40%;">Area</td> </tr> <tr> <td>a. Frm wall, eifs ext, r-15 cav i</td> <td>R=19.0</td> <td>1098 ft²</td> </tr> <tr> <td>b. Frm wall, stucco ext, r-15 cav</td> <td>R=15.0</td> <td>249 ft²</td> </tr> <tr> <td>c.</td> <td></td> <td>0 ft²</td> </tr> <tr> <td>d.</td> <td></td> <td>0 ft²</td> </tr> <tr> <td>10. Ceiling types (2100 ft²)</td> <td>Insulation</td> <td>Area</td> </tr> <tr> <td>a. Attic ceiling, asphalt shingle</td> <td>R=30.0</td> <td>2100 ft²</td> </tr> <tr> <td>b.</td> <td></td> <td>0 ft²</td> </tr> <tr> <td>c.</td> <td></td> <td>0 ft²</td> </tr> <tr> <td>11. Ducts</td> <td>R</td> <td>ft²</td> </tr> <tr> <td>a. Sup: Vented attic Ret: Vented attic AH: Uncnd. attic</td> <td>8</td> <td>378</td> </tr> <tr> <td>b.</td> <td></td> <td></td> </tr> <tr> <td>12. Cooling systems</td> <td>MBtuh</td> <td>Efficiency</td> </tr> <tr> <td>a. Central Unit</td> <td>20.2</td> <td>SEER: 14.0</td> </tr> <tr> <td>13. Heating systems</td> <td>MBtuh</td> <td>Efficiency</td> </tr> <tr> <td>a.</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. Solar: Sample SSWS-678 FSEC Cert.#12345</td> <td></td> <td>Cap: 70 gal FEF: 3</td> </tr> <tr> <td>b. Conservation features</td> <td></td> <td></td> </tr> <tr> <td>None</td> <td></td> <td></td> </tr> <tr> <td>15. Credits</td> <td></td> <td>Pstat</td> </tr> </table>	9. Wall types (1347 ft²)	Insulation	Area	a. Frm wall, eifs ext, r-15 cav i	R=19.0	1098 ft²	b. Frm wall, stucco ext, r-15 cav	R=15.0	249 ft²	c.		0 ft²	d.		0 ft²	10. Ceiling types (2100 ft²)	Insulation	Area	a. Attic ceiling, asphalt shingle	R=30.0	2100 ft²	b.		0 ft²	c.		0 ft²	11. Ducts	R	ft²	a. Sup: Vented attic Ret: Vented attic AH: Uncnd. attic	8	378	b.			12. Cooling systems	MBtuh	Efficiency	a. Central Unit	20.2	SEER: 14.0	13. Heating systems	MBtuh	Efficiency	a.	22.4	HSPF: 8.2	14. Hot water systems			a. Solar: Sample SSWS-678 FSEC Cert.#12345		Cap: 70 gal FEF: 3	b. Conservation features			None			15. Credits		Pstat
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Glass/Floor area: 0.162	Total Proposed Modified Loads: 53.38	PASS
	Total Baseline Loads: 55.70	

<p>I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Energy Code.</p> <p>PREPARED BY: _____ DATE: _____</p> <p>I hereby certify that this building, as designed, is in compliance with the Florida Energy Code.</p> <p>OWNER/AGENT: _____ DATE: _____</p>	<p>Review of plans and specifications covered by this calculation indicates compliance with the Florida Energy Code, Energy Conservation. 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>CODE OFFICIAL: _____ DATE: _____</p>
---	---

Building Input Summary Report

PROJECT											
Title:	Right-Energy@ Florida 2014		Bedrooms:	3	Address type:	Street address					
Building type:	FL As Built		Bathrooms:	1	Lot#:	Lot. 410-111					
Owner:	Mr. and Mrs. Henry Wagner		Conditioned area:	2100	Block/Subdivision:	Lexington Crossing					
# of units:	1		Total stories:	1	Platbook:	111-11					
Builder name:	Wrightsoft		Worst case:	No	Street:	1516 Ninth Street					
Permit office:	Tampa		Rotate angle:	0	County:	Hillsborough					
Jurisdiction:	Hillsborough County		Cross ventilation?:	No	City, State, Zip:	Tampa, FL 33601					
Family type:	Single Family		Whole house fan?:	No							
New/existing:	New (From Plans)		Terrain:	Ocean/Lake							
Year Construct:	2017		Shielding?:	Suburban							
Comment:	Pre-construction										
CLIMATE											
Design Location	TMY Site	Design Temp 97.5 %	2.5 %	Int Design Temp Winter	Summer	Heating Degree Days	Design Moisture	Daily Temp Range			
FL, Tampa Intl AP	- unknown -	43	91	70	75	527	119	L			
UTILITY RATES											
Fuel	Unit	Utility Name	Monthly Fixed Cost	\$/Unit							
Electricity	kWh										
Natural Gas	Therm										
Fuel Oil	Gallon										
Propane	Gallon										
SURROUNDINGS											
Ornt	Type	Shade Trees Height	Width	Distance	Exist	Adjacent Buildings Height	Width	Distance			
N									FOR DEMONSTRATION PURPOSES ONLY		
NE											
E											
SE											
S											
SW											
NW											
BLOCKS											
#	Name	Area	Volume								
1	Living AH	2100 ft²	18900 ft³								
SPACES											
#	Name	Area	Volume	Kitchen	Occupants	Bedrooms	Finished	Cooled	Heated		
1	Living	2100 ft²	18900 ft³	No	4	0	Yes	Yes	Yes		
FLOORS											
#	Floor Type	Space	Perimeter	R-Value	Area	Tile	Wood	Carpet			
1	Bg floor, light dry	Living	162 ft	0	2100 ft²	0	0	1.0			
ROOF											
#	Type	Materials	Roof Area	Gable Area	Roof Color	Solar Absor.	SA Tested	Emitt	Emitt Tested	Deck Insul.	Pitch (deg)
1	Flat	RoofAsph	0	0	Dark	0.90	No	0.9	No	31	0
ATTIC											
#	Type	Ventilation	Vent Ratio (1 in)	Area	RBS	IRCC					
1	No attic	Unvented	300	0 ft²	N	N					

CEILING						
#	Ceiling Type	Space	R-Value	Area	Framing Fraction	Truss Type
1	Attic ceiling, asphalt s	Living	31	2100 ft²	0.10	--

WALLS														
Wall orientation below is as entered. Actual orientation is modified by rotate angle shown in "Project" section above.														
#	Ornt	Adjacent To	Wall Type	Space	Cavity R-Value	Width Ft	In	Height Ft	In	Area	Sheathing R-Value	Framing Fraction	Solar Absor.	Below Grade%
1	n	Exterior	Frm wall, stucco ext,	Living	0	20	0	9	0	180 ft²	0	0.25	0.80	0

DOORS										
#	Ornt	Door Type	Space	Storms	U-Value	Width Ft	In	Height Ft	In	Area
1	n	Door, ovhd wood type	Living	None	0.540	16	0	8	0	128 ft²

WINDOWS												
#	Ornt	Wall ID	Frame	Panes	NFRC	U-Factor	SHGC	Storms	Area	Overhang Depth	Separation	Interior Shade Screening
1	n	1	None	Single (Clear)	Yes	0.032	0.25	No	15 ft²	1 ft 0 ft	1 ft 4 ft	Blinds 45° outdoor

INFILTRATION								
#	Scope	Method	SLA	CFM 50	ELA	EqLA	ACH	ACH 50
1	Wholehouse	Blower Door	0.0868	2300	126.6	237.7	5.00	7.30

MASS					
Mass Type	Area	Thickness	Furniture Fraction	ACH 50	Space
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HEATING SYSTEM						
#	System Type	Subtype	Efficiency	Capacity	Block	Ducts
1	Natural Gas Furnace	None	HSPF: 8.2	22.4 MBtuh	1	sys#1

COOLING SYSTEM								
#	System Type	Subtype	Efficiency	Capacity	Air Flow	SHR	Block	Ducts
1	Central Unit	Split	EER: 10.6	20.2 MBtuh	673 cfm	0.70	1	sys#1

HOT WATER SYSTEM						
#	System Type	EF	Cap	Use	SetPnt	Conservation
1	Electric conventional (40 gal, 0.96 EF)	0.96	40 gal	61 gal	120 °F	None

SOLAR HOT WATER SYSTEM						
FSEC Cert #	Company Name	System Model #	Collector Model #	Collector Area	Storage Volume	FEF
	N/A		N/A			0

DUCTS												
#	Location	--- Supply --- R-Value	Area (ft²)	--- Return --- Location	Area (ft²)	Leakage Type	Air Handler	CFM 25 Out	Percent Leakage	QN	RLF	HVAC # Heat Cool
1	Vented attic	6	289	Vented attic	89	Default leakage	Uncnd. attic	0 cfm	19.77	0	0.2	1 1

TEMPERATURES

Programable Thermostat: Y

Ceiling Fans:

Cooling	<input checked="" type="checkbox"/>	Jan	<input checked="" type="checkbox"/>	Feb	<input checked="" type="checkbox"/>	Mar	<input checked="" type="checkbox"/>	Apr	<input checked="" type="checkbox"/>	May	<input checked="" type="checkbox"/>	Jun	<input checked="" type="checkbox"/>	Jul	<input checked="" type="checkbox"/>	Aug	<input checked="" type="checkbox"/>	Sep	<input checked="" type="checkbox"/>	Oct	<input checked="" type="checkbox"/>	Nov	<input checked="" type="checkbox"/>	Dec
Heating	<input checked="" type="checkbox"/>	Jan	<input checked="" type="checkbox"/>	Feb	<input checked="" type="checkbox"/>	Mar	<input checked="" type="checkbox"/>	Apr	<input checked="" type="checkbox"/>	May	<input checked="" type="checkbox"/>	Jun	<input checked="" type="checkbox"/>	Jul	<input checked="" type="checkbox"/>	Aug	<input checked="" type="checkbox"/>	Sep	<input checked="" type="checkbox"/>	Oct	<input checked="" type="checkbox"/>	Nov	<input checked="" type="checkbox"/>	Dec
Venting	<input checked="" type="checkbox"/>	Jan	<input checked="" type="checkbox"/>	Feb	<input checked="" type="checkbox"/>	Mar	<input checked="" type="checkbox"/>	Apr	<input checked="" type="checkbox"/>	May	<input checked="" type="checkbox"/>	Jun	<input checked="" type="checkbox"/>	Jul	<input checked="" type="checkbox"/>	Aug	<input checked="" type="checkbox"/>	Sep	<input checked="" type="checkbox"/>	Oct	<input checked="" type="checkbox"/>	Nov	<input checked="" type="checkbox"/>	Dec

Thermostat Schedule:	Florida Building Code, 5th Edition	Hours											
Schedule Type	(2014)	1	2	3	4	5	6	7	8	9	10	11	12

Cooling (WD)	AM	75	75	75	75	75	75	75	75	75	75	75	75
	PM	75	75	75	75	75	75	75	75	75	75	75	75
Cooling (WEH)	AM	75	75	75	75	75	75	75	75	75	75	75	75
	PM	75	75	75	75	75	75	75	75	75	75	75	75
Heating (WD)	AM	72	72	72	72	72	72	72	72	72	72	72	72
	PM	72	72	72	72	72	72	72	72	72	72	72	72
Heating (WEH)	AM	72	72	72	72	72	72	72	72	72	72	72	72
	PM	72	72	72	72	72	72	72	72	72	72	72	72

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ENERGY PERFORMANCE LEVEL (EPL) DISPLAY CARD

ESTIMATED ENERGY PERFORMANCE INDEX* = 81
The lower the Energy Performance Index, the more efficient the home.

1516 Ninth Street, Tampa, FL 33601

<p>1. New construction or existing 2. Single family or multiple family 3. Number of units, if multiple family 4. Number of bedrooms 5. Is this a worst case? 6. Conditioned floor area (ft²)</p>	<p>New (From Plans) Single Family 1 3 No 2100</p>	<p>9. Wall Types a. Frm wall, eifs ext, r-15 cav i b. Frm wall, stucco ext, r-15 cav c. d. 10. Ceiling Types a. Attic ceiling, asphalt shingle b. c. 11. Ducts a. Sup: Vented attic Ret: Vented attic AH: Uncnd. attc b. 12. Cooling systems a. Central Unit 13. Heating systems a. Natural Gas Furnace</p>	<p>Insulation R=19.0 R=15.0 Insulation R=30.0 R R MBtuh 20.2 MBtuh 22.4</p>	<p>Area 1098 ft² 249 ft² 0 ft² 0 ft² 2100 ft² 0 ft² 0 ft² ft² 378 Efficiency SEER: 14.0 Efficiency HSPF: 8.2</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 Sgl, U=0.032 SHGC=0.25 Dbl, U=0.032 SHGC=0.25 SHGC=0.25 1 ft 0.25</p>	<p>Area 15 ft² 285 ft² 41 ft² 0 ft² 1 ft 0.25</p>	<p>14. Hot water systems a. Solar: Sample SSWS-678 FSEC Cert.#12345 b. Conservation features None 15. Credits</p>	<p>Cap: 70 gal FEF: 3 Pstat</p>

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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: _____

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

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

Residential Whole Building Performance and Prescriptive Methods

ADDRESS: 1516 Ninth Street
Tampa, FL 33601PERMIT #:
2222-1**MANDATORY REQUIREMENTS** - See individual code sections for full details.

- 401.3 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 C.
- R402.4 Air leakage (Mandatory).** The building thermal envelope shall be constructed to limit air leakage in accordance with the requirements of Sections R402.4.1 through R402.4.4.
- 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 5 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope.
- During testing:
1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weather-stripping 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.
- R402.4.2 Fireplaces.** New wood-burning fireplaces shall have tight-fitting flue dampers and outdoor combustion air.
- R402.4.3 Fenestration air leakage.** Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m²), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m²), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer. Exception: Site-built windows, skylights and doors.
- R402.4.4 Recessed lighting.** Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as having an air leakage rate not more than 2.0 cfm (0.944 L/s) when tested in accordance with ASTM E 283 at a 1.57 psf (75 Pa) pressure differential. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.
- R403.1.1 Thermostat provision (Mandatory).** At least one thermostat shall be provided for each separate heating and cooling system.
- R403.1.3 Heat pump supplementary heat (Mandatory).** Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.
- R403.2.2 Sealing (Mandatory).** All ducts, air handlers, and filter boxes and building cavities that form the primary air containment passageways for air distribution systems shall be considered ducts and plenum chambers, shall be constructed and sealed in accordance with Section C403.2.7.2 of the Commercial Provisions of this code and shall be shown to meet duct tightness criteria by post-construction or rough-in testing below.

Duct tightness shall be verified by testing to Section 803 of the RESNET Standards by either an energy rater certified in accordance with Section 553.99, Florida Statutes, or as authorized by Florida Statutes, to be "substantially leak free" by either of the following:

1. Post-construction test: Total leakage shall be less than or equal to 4 cfm (113 L/min) per 100 square feet (9.29 m²) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to 4 cfm (113 L/min) per 100 square feet (9.29 m²) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure. All registers shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 3 cfm (85 L/min) per 100 square feet (9.29 m²) of conditioned floor area. Exceptions:
 1. The total leakage test is not required for ducts and air handlers located entirely within the building envelope.
 2. Duct testing is not mandatory for buildings complying by Section 405 of this code.

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

- R403.9.1.2 Heat pump pool heaters.** Heat pump pool heaters shall have a minimum COP of 4.0 when tested in accordance with AHRI 1160, Table 2, Standard Rating Conditions-Low Air Temperature. A test report from an independent laboratory is required to verify procedure compliance. Geothermal swimming pool 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.**

- R405.2.1 Performance ONLY.**

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

AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

Project Name:	Right-Energy® Florida 2014 Example	Builder Name	Wrightsoft
Street:	1516 Ninth Street	Permit Office:	Tampa
City, State, Zip:	Tampa, FL 33601	Permit Number:	2222-1
Owner:	Mr. and Mrs. Henry Wagner	Jurisdiction:	Hillsborough County
Design Location:	FL, Tampa Intl AP		

COMPONENT	CRITERIA	CHECK
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. Exterior thermal envelope contains a continuous barrier. Breaks or joints in the air barrier shall be sealed. Air-permeable insulation is not used as a sealing material.	
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	
Walls	Corners and headers shall be insulated and the junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top or exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.	
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing shall be sealed.	
Rim joists	Rim joists are insulated and include an air barrier.	
Floors (including above-garage and cantilevered floors)	Insulation shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier shall be installed at any exposed edge of insulation.	
Crawl space walls	Where provided in lieu of floor insulation, insulation shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	
Shafts, penetrations	Duct shafts, utility penetrations, and flue shaft openings to exterior or unconditioned space shall be sealed.	
Narrow cavities	Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity spaces.	
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be air tight, IC rated, and sealed to the drywall.	
Plumbing and wiring	Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.	
Shower/tub on exterior wall	Exterior walls adjacent to showers and tubs shall be insulated and the air barrier installed separating them from the showers and tubs.	
Electrical/phone box on 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 envelope shall be sealed to the subfloor or drywall.	
Fireplace	An air barrier shall be installed on fireplace walls. Fireplaces shall have gasketed doors.	

FOR DEMONSTRATION PURPOSES

FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION

Envelope Leakage Test Report Prescriptive and Performance Methods

Project name: Right-Energy® Florida 2014 Example Street: 1516 Ninth Street City, State, Zip: Tampa, FL 33601 Owner: Mr. and Mrs. Henry Wagner Design Location: FL, Tampa Intl AP	Builder name: Wrightsoft Permit office: Tampa Permit number: 2222-1 Jurisdiction: Hillsborough County
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Envelope Leakage Test Results

Regression Data:

C: _____ n: _____ R: _____

Multi Point Test Data:

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

Leakage Characteristics

CFM(50): _____

ELA: _____

EqLA: _____

ACH: _____

ACH(50): _____

SLA: _____

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 5 air changes per hour in Climates Zones 1 and 2, 3 air changes per hour in Climates Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weather-stripping 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 openings 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 the Florida Energy Code requirements in accordance with Section 402.4.1.2.

Signature: _____

Printed Name: _____

Florida Rater Certification #: _____

DATE: _____

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



BUILDING OFFICIAL: _____

DATE: _____

FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION

Air Distribution System Test Report Prescriptive and Performance Methods

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

Air Distribution System Leakage Test Results

CFM25 Air Distribution System Leakage Test Values		
Line	System	Total Duct Leakage
1	System 1	_____ cfm25(Total)
2	System 2	_____ cfm25(Total)
3	System 3	_____ cfm25(Total)
4	System 4	_____ cfm25(Total)
5	Total House Duct System Leakage	Sum lines 1-4 _____ Divide by _____ (Total Conditioned Floor Area) = _____ (Qn,Total) To qualify as "substantially leak free" Qn Total must be less than or equal to 0.04 if air handler unit is installed. If air handler unit is not installed Qn Total must be less than or equal to 0.03.

FOR DEMONSTRATION PURPOSES ONLY

I hereby certify that the above duct testing performance results demonstrate compliance with the Florida Energy Code requirements in accordance with Section 403.2.2.

Signature: _____
 Printed Name: _____
 Florida Rater Certification #: _____
 DATE: _____

Duct tightness shall be verified by testing to Section 803 of the RESNET Standards by either an energy rater certified in accordance with Section 553.99, Florida Statutes, or as authorized by Florida Statutes, to be "substantially leak free."



BUILDING OFFICIAL: _____
DATE: _____