

RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST

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

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

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

Required prior to CO for the Performance Method:

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

INPUT SUMMARY CHECKLIST REPORT

PROJECT

Title:	200615 Willians	Bedrooms:	3	Address Type:	Street Address
Building Type:	User	Conditioned Area:	1710	Lot #	
Owner Name:	William Residence	Total Stories:	1	Block/Subdivision:	
# of Units:	1	Worst Case:	Yes	PlatBook:	
Builder Name:		Rotate Angle:	270	Street:	
Permit Office:		Cross Ventilation:		County:	columbia
Jurisdiction:		Whole House Fan:		City, State, Zip:	, FL ,
Family Type:	Single-family				
New/Existing:	New (From Plans)				
Comment:					

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, Gainesville	FL_GAINESVILLE_REGI	32	92	70	75	1305.5	51	Medium

BLOCKS

Number	Name	Area	Volume
1	Block1	1710	15732

SPACES

Number	Name	Area	Volume	Kitchen	Occupants	Bedrooms	Infil ID	Finished	Cooled	Heated
1	Main	1710	15732	Yes	6	3	1	Yes	Yes	Yes

FLOORS

✓	#	Floor Type	Space	Perimeter	R-Value	Area		Tile	Wood	Carpet
_____	1	Slab-On-Grade Edge Insulatio	Main	185 ft	0	1710 ft²	----	0.3	0.3	0.4

ROOF

✓	#	Type	Materials	Roof Area	Gable Area	Roof Color	Rad Barr	Solar Absor.	SA Tested	Emitt Tested	Emitt Tested	Deck Insul.	Pitch (deg)
_____	1	Hip	Composition shingles	1981 ft²	0 ft²	Medium	N	0.85	No	0.9	No	0	30.3

ATTIC

✓	#	Type	Ventilation	Vent Ratio (1 in)	Area	RBS	IRCC
_____	1	Full attic	Vented	300	1710 ft²	N	N

CEILING

✓	#	Ceiling Type	Space	R-Value	Ins Type	Area	Framing Frac	Truss Type
_____	1	Under Attic (Vented)	Main	38	Blown	1710 ft²	0	Wood

INPUT SUMMARY CHECKLIST REPORT

WALLS

✓	#	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=>W	Exterior	Frame - Wood	Main	13	14	4	9		129.0 ft²		0.23	0.75	0
___	2	E=>N	Exterior	Frame - Wood	Main	13	8	0	9		72.0 ft²		0.23	0.75	0
___	3	N=>W	Exterior	Frame - Wood	Main	13	35	4	9		318.0 ft²		0.23	0.75	0
___	4	E=>N	Exterior	Face Brick - Wood	Main	13	31	8	9		285.0 ft²		0.23	0.75	0
___	5	S=>E	Exterior	Face Brick - Wood	Main	13	14		9		126.0 ft²		0.23	0.75	0
___	6	W=>S	Exterior	Face Brick - Wood	Main	13	2		9		18.0 ft²		0.23	0.75	0
___	7	N=>W	Exterior	Face Brick - Wood	Main	13	7	0	9		63.0 ft²		0.23	0.75	0
___	8	E=>N	Exterior	Face Brick - Wood	Main	13	2		9		18.0 ft²		0.23	0.75	0
___	9	S=>E	Exterior	Face Brick - Wood	Main	13	16	4	9		147.0 ft²		0.23	0.75	0
___	10	E=>N	Exterior	Face Brick - Wood	Main	13	3		9		27.0 ft²		0.23	0.75	0
___	11	S=>E	Exterior	Face Brick - Wood	Main	13	12	4	9		111.0 ft²		0.23	0.75	0
___	12	W=>S	Exterior	Face Brick - Wood	Main	13	42	6	9		382.5 ft²		0.23	0.75	0

DOORS

✓	#	Ornt	Door Type	Space	Storms	U-Value	Width Ft	In	Height Ft	In	Area
___	1	N=>W	Insulated	Main	None	.4	3		8		24 ft²
___	2	N=>W	Insulated	Main	None	.4	1		8		8 ft²
___	3	N=>W	Insulated	Main	None	.4	4		8		32 ft²
___	4	N=>W	Insulated	Main	None	.4	1		8		8 ft²
___	5	N=>W	Insulated	Main	None	.4	1		8		8 ft²

WINDOWS

Orientation shown is the entered orientation (=>) changed to Worst Case.

✓	#	Ornt	Wall ID	Frame	Panes	NFRC	U-Factor	SHGC	Imp	Area	Overhang Depth	Separation	Int Shade	Screening
___	1	N=>W	3	Metal	Low-E Double	Yes	0.32	0.22	N	16.0 ft²	9 ft 6 in	0 ft 0 in	None	None
___	2	N=>W	3	Metal	Low-E Double	Yes	0.32	0.22	N	64.0 ft²	9 ft 6 in	0 ft 0 in	None	None
___	3	N=>W	3	Metal	Low-E Double	Yes	0.32	0.22	N	36.0 ft²	9 ft 6 in	0 ft 0 in	None	None
___	4	N=>W	3	Metal	Low-E Double	Yes	0.32	0.22	N	16.0 ft²	9 ft 6 in	0 ft 0 in	None	None
___	5	E=>N	4	Metal	Low-E Double	Yes	0.32	0.22	N	24.0 ft²	1 ft 6 in	0 ft 6 in	None	None
___	6	E=>N	4	Metal	Low-E Double	Yes	0.32	0.22	N	8.0 ft²	1 ft 6 in	0 ft 6 in	None	None
___	7	S=>E	5	Metal	Low-E Double	Yes	0.32	0.22	N	8.0 ft²	1 ft 6 in	0 ft 6 in	None	None
___	8	S=>E	5	Metal	Low-E Double	Yes	0.32	0.22	N	15.0 ft²	1 ft 6 in	0 ft 6 in	None	None
___	9	N=>W	7	Metal	Low-E Double	Yes	0.32	0.22	N	16.0 ft²	10 ft 6 in	1 ft 0 in	None	None
___	10	N=>W	7	Metal	Low-E Double	Yes	0.32	0.22	N	16.0 ft²	10 ft 6 in	1 ft 6 in	None	None
___	11	S=>E	9	Metal	Low-E Double	Yes	0.32	0.22	N	24.0 ft²	1 ft 6 in	0 ft 6 in	None	None
___	12	S=>E	9	Metal	Low-E Double	Yes	0.32	0.22	N	18.0 ft²	1 ft 6 in	0 ft 6 in	None	None
___	13	S=>E	11	Metal	Low-E Double	Yes	0.32	0.22	N	18.0 ft²	1 ft 6 in	0 ft 6 in	None	None
___	14	W=>S	12	Metal	Low-E Double	Yes	0.32	0.22	N	36.0 ft²	1 ft 6 in	0 ft 6 in	None	None
___	15	W=>S	12	Metal	Low-E Double	Yes	0.32	0.22	N	4.5 ft²	1 ft 6 in	0 ft 6 in	None	None
___	16	W=>S	12	Metal	Low-E Double	Yes	0.32	0.22	N	12.0 ft²	1 ft 6 in	0 ft 6 in	None	None

INPUT SUMMARY CHECKLIST REPORT

INFILTRATION												
#	Scope	Method	SLA	CFM 50	ELA	EqLA	ACH	ACH 50				
1	Wholehouse	Proposed ACH(50)	.000409	1835.4	100.76	189.5	.1628	7				

HEATING SYSTEM									
✓	#	System Type	Subtype	Speed	Efficiency	Capacity	Block		Ducts
✓	1	Electric Heat Pump/	None	Singl	HSPF:8.6	31 kBtu/hr	1		sys#1

COOLING SYSTEM										
✓	#	System Type	Subtype	Subtype	Efficiency	Capacity	Air Flow	SHR	Block	Ducts
✓	1	Central Unit/	None	Singl	SEER: 15	31 kBtu/hr	930 cfm	0.75	1	sys#1

HOT WATER SYSTEM									
✓	#	System Type	SubType	Location	EF	Cap	Use	SetPnt	Conservation
✓	1	Electric	None	Main	0.95	40 gal	60 gal	120 deg	None

SOLAR HOT WATER SYSTEM							
✓	FSEC Cert #	Company Name	System Model #	Collector Model #	Collector Area	Storage Volume	FEF
✓	None	None				ft²	

DUCTS														
✓	#	---- Supply ----			---- Return ----		Leakage Type	Air Handler	CFM 25 TOT	CFM25 OUT	QN	RLF	HVAC #	
		Location	R-Value	Area	Location	Area							Heat	Cool
✓	1	Attic	6	342 ft²	Attic	85.5 ft²	Default Leakage	Main	(Default)	(Default)			1	1

TEMPERATURES																								
Programable Thermostat: Y							Ceiling Fans:																	
Cooling	☐	Jan	☐	Feb	☐	Mar	☐	Apr	☐	May	☒	Jun	☒	Jul	☒	Aug	☒	Sep	☐	Oct	☐	Nov	☐	Dec
Heating	☒	Jan	☒	Feb	☒	Mar	☒	Apr	☐	May	☐	Jun	☐	Jul	☐	Aug	☐	Sep	☐	Oct	☒	Nov	☒	Dec
Venting	☐	Jan	☐	Feb	☒	Mar	☒	Apr	☒	May	☐	Jun	☐	Jul	☐	Aug	☐	Sep	☐	Oct	☒	Nov	☒	Dec

INPUT SUMMARY CHECKLIST REPORT

Thermostat Schedule: HERS 2006 Reference		Hours											
Schedule Type		1	2	3	4	5	6	7	8	9	10	11	12
Cooling (WD)	AM	78	78	78	78	78	78	78	78	80	80	80	80
	PM	80	80	78	78	78	78	78	78	78	78	78	78
Cooling (WEH)	AM	78	78	78	78	78	78	78	78	78	78	78	78
	PM	78	78	78	78	78	78	78	78	78	78	78	78
Heating (WD)	AM	66	66	66	66	66	68	68	68	68	68	68	68
	PM	68	68	68	68	68	68	68	68	68	68	66	66
Heating (WEH)	AM	66	66	66	66	66	68	68	68	68	68	68	68
	PM	68	68	68	68	68	68	68	68	68	68	66	66
MASS													
Mass Type			Area		Thickness		Furniture Fraction			Space			
Default(8 lbs/sq.ft.			0 ft²		0 ft		0.3			Main			

ENERGY PERFORMANCE LEVEL (EPL) DISPLAY CARD**ESTIMATED ENERGY PERFORMANCE INDEX* = 100****The lower the Energy Performance Index, the more efficient the home.**

1. New home or, addition	1. <u>New (From Plans)</u>	12. Ducts, location & insulation level	
2. Single-family or multiple-family	2. <u>Single-family</u>	a) Supply ducts	R <u>6.0</u>
3. No. of units (if multiple-family)	3. <u>1</u>	b) Return ducts	R <u>6.0</u>
4. Number of bedrooms	4. <u>3</u>	c) AHU location	Main
5. Is this a worst case? (yes/no)	5. <u>Yes</u>	13. Cooling system:	Capacity <u>31.0</u>
6. Conditioned floor area (sq. ft.)	6. <u>1710</u>	a) Split system	SEER <u> </u>
7. Windows, type and area		b) Single package	SEER <u> </u>
a) U-factor:(weighted average)	7a. <u>0.320</u>	c) Ground/water source	SEER/COP <u> </u>
b) Solar Heat Gain Coefficient (SHGC)	7b. <u>0.220</u>	d) Room unit/PTAC	EER <u> </u>
c) Area	7c. <u>331.5</u>	e) Other	<u> </u> 15.0
8. Skylights		14. Heating system:	Capacity <u>31.0</u>
a) U-factor:(weighted average)	8a. <u>NA</u>	a) Split system heat pump	HSPF <u> </u>
b) Solar Heat Gain Coefficient (SHGC)	8b. <u>NA</u>	b) Single package heat pump	HSPF <u> </u>
9. Floor type, insulation level:		c) Electric resistance	COP <u> </u>
a) Slab-on-grade (R-value)	9a. <u>0.0</u>	d) Gas furnace, natural gas	AFUE <u> </u>
b) Wood, raised (R-value)	9b. <u> </u>	e) Gas furnace, LPG	AFUE <u> </u>
c) Concrete, raised (R-value)	9c. <u> </u>	f) Other	<u> </u> 8.60
10. Wall type and insulation:		15. Water heating system	
A. Exterior:		a) Electric resistance	EF <u>0.95</u>
1. Wood frame (Insulation R-value)	10A1. <u>13.0</u>	b) Gas fired, natural gas	EF <u> </u>
2. Masonry (Insulation R-value)	10A2. <u> </u>	c) Gas fired, LPG	EF <u> </u>
B. Adjacent:		d) Solar system with tank	EF <u> </u>
1. Wood frame (Insulation R-value)	10B1. <u> </u>	e) Dedicated heat pump with tank	EF <u> </u>
2. Masonry (Insulation R-value)	10B2. <u> </u>	f) Heat recovery unit	HeatRec% <u> </u>
11. Ceiling type and insulation level		g) Other	<u> </u>
a) Under attic	11a. <u>38.0</u>	16. HVAC credits claimed (Performance Method)	
b) Single assembly	11b. <u> </u>	a) Ceiling fans	<u> </u>
c) Knee walls/skylight walls	11c. <u> </u>	b) Cross ventilation	<u> </u> No
d) Radiant barrier installed	11d. <u>No</u>	c) Whole house fan	<u> </u> No
		d) Multizone cooling credit	<u> </u>
		e) Multizone heating credit	<u> </u>
		f) Programmable thermostat	<u> </u> Yes

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

I certify that this home has complied with the Florida Building Code, Energy Conservation, 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: _____, FL

Florida Building Code, Energy Conservation, 6th Edition (2017)

Mandatory Requirements for Residential Performance, Prescriptive and ERI Methods

ADDRESS:

, FL ,

Permit Number:

MANDATORY REQUIREMENTS See individual code sections for full details.

SECTION R401 GENERAL



R401.3 Energy Performance Level (EPL) display card (Mandatory). The building official shall require that an energy performance level (EPL) display card be completed and certified by the builder to be accurate and correct before final approval of the building for occupancy. Florida law (Section 553.9085, Florida Statutes) requires the EPL display card to be included as an addendum to each sales contract for both presold and nonpresold residential buildings. The EPL display card contains information indicating the energy performance level and efficiencies of components installed in a dwelling unit. The building official shall verify that the EPL display card completed and signed by the builder accurately reflects the plans and specifications submitted to demonstrate code compliance for the building. A copy of the EPL display card can be found in Appendix RD.



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

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



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



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



R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding seven air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ANSI/RESNET/ICC 380 and reported at a pressure of 0.2 inch w.g. (50 pascals). Testing shall be conducted by either individuals as defined in Section 553.993(5) or (7), Florida Statutes, or individuals licensed as set forth in Section 489.105(3)(f), (g) or (i) or an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope.

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

During testing:

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



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



R402.4.3 Fenestration air leakage. Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/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.

MANDATORY REQUIREMENTS - (Continued)

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

Exceptions:

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

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

SECTION R403 SYSTEMS

R403.1 Controls.

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

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

- ☐ **R403.3.2 Sealing (Mandatory)** All ducts, air handlers, filter boxes and building cavities that form the primary air containment passageways for air distribution systems shall be considered ducts or plenum chambers, shall be constructed and sealed in accordance with Section C403.2.9.2 of the Commercial Provisions of this code and shall be shown to meet duct tightness criteria below.

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

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

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

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

Exceptions:

1. A duct air leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope.
2. Duct testing is not mandatory for buildings complying by Section 405 of this code.

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

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

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

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

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

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

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

MANDATORY REQUIREMENTS - (Continued)

- ☐ **R403.5.5 Heat traps (Mandatory).** Storage water heaters not equipped with integral heat traps and having vertical pipe risers shall have heat traps installed on both the inlets and outlets. External heat traps shall consist of either a commercially available heat trap or a downward and upward bend of at least 3 ½ inches (89 mm) in the hot water distribution line and cold water line located as close as possible to the storage tank.
- R403.5.6 Water heater efficiencies (Mandatory).**
- ☐ **R403.5.6.1.1 Automatic controls.** Service water-heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use. The minimum temperature setting range shall be from 100°F to 140°F (38°C to 60°C).
- ☐ **R403.5.6.1.2 Shut down.** A separate switch or a clearly marked circuit breaker shall be provided to permit the power supplied to electric service systems to be turned off. A separate valve shall be provided to permit the energy supplied to the main burner(s) of combustion types of service water-heating systems to be turned off.
- ☐ **R403.5.6.2 Water-heating equipment.** Water-heating equipment installed in residential units shall meet the minimum efficiencies of Table C404.2 in Chapter 4 of the Florida Building Code, Energy Conservation, Commercial Provisions, for the type of equipment installed. Equipment used to provide heating functions as part of a combination system shall satisfy all stated requirements for the appropriate water-heating category. Solar water heaters shall meet the criteria of Section R403.5.6.2.1.
- ☐ **R403.5.6.2.1 Solar water-heating systems.** Solar systems for domestic hot water production are rated by the annual solar energy factor of the system. The solar energy factor of a system shall be determined from the Florida Solar Energy Center Directory of Certified Solar Systems. Solar collectors shall be tested in accordance with ISO Standard 9806, Test Methods for Solar Collectors, and SRCC Standard TM-1, Solar Domestic Hot Water System and Component Test Protocol. Collectors in installed solar water-heating systems should meet the following criteria:
1. Be installed with a tilt angle between 10 degrees and 40 degrees of the horizontal; and
 2. Be installed at an orientation within 45 degrees of true south.
- ☐ **R403.6 Mechanical ventilation (Mandatory).** The building shall be provided with ventilation that meets the requirements of the Florida Building Code, Residential, or Florida Building Code, Mechanical, as applicable, or with other approved means of ventilation including: Natural, Infiltration or Mechanical means. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.
- ☐ **R403.6.1 Whole-house mechanical ventilation system fan efficacy.** When installed to function as a whole-house mechanical ventilation system, fans shall meet the efficacy requirements of Table R403.6.1.
- Exception:** Where whole-house mechanical ventilation fans are integral to tested and listed HVAC equipment, they shall be powered by an electronically commutated motor.
- ☐ **R403.6.2 Ventilation air.** Residential buildings designed to be operated at a positive indoor pressure or for mechanical ventilation shall meet the following criteria:
1. The design air change per hour minimums for residential buildings in ASHRAE 62.2, Ventilation for Acceptable Indoor Air Quality, shall be the maximum rates allowed for residential applications.
 2. No ventilation or air-conditioning system make-up air shall be provided to conditioned space from attics, crawlspaces, attached enclosed garages or outdoor spaces adjacent to swimming pools or spas.
 3. If ventilation air is drawn from enclosed space(s), then the walls of the space(s) from which air is drawn shall be insulated to a minimum of R-11 and the ceiling shall be insulated to a minimum of R-19, space permitting, or R-10 otherwise.
- R403.7 Heating and cooling equipment (Mandatory).**
- ☐ **R403.7.1 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 that affect equipment sizing. System sizing calculations shall not include loads created by local intermittent mechanical ventilation such as standard kitchen and bathroom exhaust systems. New or replacement heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is installed.

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

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

For SI: 1 cfm = 28.3 L/min.

a. When tested in accordance with HVI Standard 916

MANDATORY REQUIREMENTS - (Continued)

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

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

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

Exceptions:

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

R403.7.1.2 Heating equipment capacity.

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

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

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

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

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

- ☐ **R403.8 Systems serving multiple dwelling units (Mandatory).** Systems serving multiple dwelling units shall comply with Sections C403 and C404 of the IECC—Commercial Provisions in lieu of Section R403.

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

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

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

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

Exceptions:

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

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

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

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

- ☐ **R403.10.5 Heat pump pool heaters.** Heat pump pool heaters shall have a minimum COP of 4.0 when tested in accordance with AHRI 1160, Table 2, Standard Rating Conditions-Low Air Temperature. A test report from an independent laboratory is required to verify procedure compliance. Geothermal swimming pool heat pumps are not required to meet this standard.
- ☐ **R403.11 Portable spas (Mandatory)** The energy consumption of electric-powered portable spas shall be controlled by the requirements of APSP-14.

SECTION R404

ELECTRICAL POWER AND LIGHTING SYSTEMS

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

2017 - AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

TABLE 402.4.1.1
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

Project Name: 200615 Willians Street: City, State, Zip: , FL , Owner: William Residence Design Location: FL, Gainesville Builder Name: Permit Office: Permit Number: Jurisdiction:			CHECK
COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA	
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.	
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.	
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.	
Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing shall be sealed.		
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.	
Floors (including above-garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.	
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace	
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.		
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity spaces.	
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.		
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.	
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.	
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.	
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.		
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the sub-floor or drywall.		
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.		

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

Envelope Leakage Test Report (Blower Door Test)

Residential Prescriptive, Performance or ERI Method Compliance 2017 Florida Building Code, Energy Conservation, 6th Edition

Jurisdiction:

Permit #:

Job Information

Builder:

Community:

Lot: NA

Address:

City:

State: FL

Zip:

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



PRESCRIPTIVE METHOD-The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 7 air changes per hour at a pressure of 0.2 inch w.g. (50 Pascals) in Climate Zones 1 and 2.



PERFORMANCE or ERI METHOD-The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding the selected ACH(50) value, as shown on Form R405-2017 (Performance) or R406-2017 (ERI), section labeled as infiltration, sub-section ACH50.
ACH(50) specified on Form R405-2017-Energy Calc (Performance) or R406-2017 (ERI): 7.000

$$\frac{\text{CFM}(50)}{\text{Building Volume}} \times 60 \div 4.18914\text{E}34 = \text{ACH}(50)$$



PASS



When ACH(50) is less than 3, Mechanical Ventilation installation must be verified by building department.

Method for calculating building volume:



Retrieved from architectural plans



Code software calculated



Field measured and calculated

R402.4.1.2 Testing. Testing shall be conducted in accordance with ANSI/RESNET/ICC 380 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Testing shall be conducted by either individuals as defined in Section 553.993(5) or (7), *Florida Statutes*, or individuals licensed as set forth in Section 489.105(3)(f), (g), or (i) or an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

During testing:

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

Testing Company

Company Name: _____ Phone: _____

I hereby verify that the above Air Leakage results are in accordance with the 2017 6th Edition Florida Building Code Energy Conservation requirements according to the compliance method selected above.

Signature of Tester: _____ Date of Test: _____

Printed Name of Tester: _____

License/Certification #: _____ Issuing Authority: _____

Residential System Sizing Calculation

Summary

William Residence

Project Title:
200615 Willians

, FL

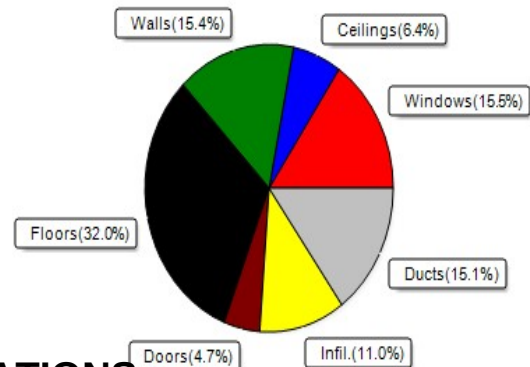
2020-06-17

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M)			
Humidity data: Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(51gr.)			
Winter design temperature(TMY3 99%)	30 F	Summer design temperature(TMY3 99%)	94 F
Winter setpoint	70 F	Summer setpoint	75 F
Winter temperature difference	40 F	Summer temperature difference	19 F
Total heating load calculation	27310 Btuh	Total cooling load calculation	25229 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	113.5 31000	Sensible (SHR = 0.75)	109.3 23250
Heat Pump + Auxiliary(0.0kW)	113.5 31000	Latent	195.8 7750
		Total (Electric Heat Pump)	122.9 31000

WINTER CALCULATIONS

Winter Heating Load (for 1710 sqft)

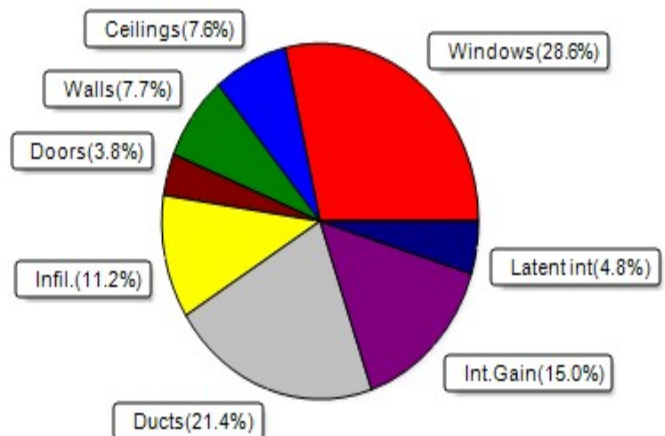
Load component		Load	
Window total	332 sqft	4243	Btuh
Wall total	1285 sqft	4213	Btuh
Door total	80 sqft	1280	Btuh
Ceiling total	1710 sqft	1736	Btuh
Floor total	1710 sqft	8732	Btuh
Infiltration	68 cfm	2991	Btuh
Duct loss		4116	Btuh
Subtotal		27310	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		27310	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1710 sqft)

Load component		Load	
Window total	332 sqft	7203	Btuh
Wall total	1285 sqft	1951	Btuh
Door total	80 sqft	960	Btuh
Ceiling total	1710 sqft	1910	Btuh
Floor total		0	Btuh
Infiltration	51 cfm	1066	Btuh
Internal gain		3780	Btuh
Duct gain		4401	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		21270	Btuh
Latent gain(ducts)		991	Btuh
Latent gain(infiltration)		1768	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		3959	Btuh
TOTAL HEAT GAIN		25229	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2020-06-17

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

William Residence
, FL

Project Title:
200615 Willians
Building Type: User

2020-06-17

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)
This calculation is for Worst Case. The house has been rotated 315 degrees.

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.22	Metal	0.32	NW	16.0		12.8	205 Btuh
2	2, NFRC 0.22	Metal	0.32	NW	64.0		12.8	819 Btuh
3	2, NFRC 0.22	Metal	0.32	NW	36.0		12.8	461 Btuh
4	2, NFRC 0.22	Metal	0.32	NW	16.0		12.8	205 Btuh
5	2, NFRC 0.22	Metal	0.32	NE	24.0		12.8	307 Btuh
6	2, NFRC 0.22	Metal	0.32	NE	8.0		12.8	102 Btuh
7	2, NFRC 0.22	Metal	0.32	SE	8.0		12.8	102 Btuh
8	2, NFRC 0.22	Metal	0.32	SE	15.0		12.8	192 Btuh
9	2, NFRC 0.22	Metal	0.32	NW	16.0		12.8	205 Btuh
10	2, NFRC 0.22	Metal	0.32	NW	16.0		12.8	205 Btuh
11	2, NFRC 0.22	Metal	0.32	SE	24.0		12.8	307 Btuh
12	2, NFRC 0.22	Metal	0.32	SE	18.0		12.8	230 Btuh
13	2, NFRC 0.22	Metal	0.32	SE	18.0		12.8	230 Btuh
14	2, NFRC 0.22	Metal	0.32	SW	36.0		12.8	461 Btuh
15	2, NFRC 0.22	Metal	0.32	SW	4.5		12.8	58 Btuh
16	2, NFRC 0.22	Metal	0.32	SW	12.0		12.8	154 Btuh
Window Total					331.5(sqft)			4243 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	105		3.55	373 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	72		3.55	256 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	138		3.55	490 Btuh
4	Face Br - Wood	- Ext	(0.080)	13.0/0.0	253		3.19	807 Btuh
5	Face Br - Wood	- Ext	(0.080)	13.0/0.0	103		3.19	329 Btuh
6	Face Br - Wood	- Ext	(0.080)	13.0/0.0	18		3.19	57 Btuh
7	Face Br - Wood	- Ext	(0.080)	13.0/0.0	23		3.19	73 Btuh
8	Face Br - Wood	- Ext	(0.080)	13.0/0.0	18		3.19	57 Btuh
9	Face Br - Wood	- Ext	(0.080)	13.0/0.0	105		3.19	335 Btuh
10	Face Br - Wood	- Ext	(0.080)	13.0/0.0	27		3.19	86 Btuh
11	Face Br - Wood	- Ext	(0.080)	13.0/0.0	93		3.19	297 Btuh
12	Face Br - Wood	- Ext	(0.080)	13.0/0.0	330		3.19	1053 Btuh
Wall Total					1285(sqft)			4213 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh
2	Insulated - Exterior, n		(0.400)		8		16.0	128 Btuh
3	Insulated - Exterior, n		(0.400)		32		16.0	512 Btuh
4	Insulated - Exterior, n		(0.400)		8		16.0	128 Btuh
5	Insulated - Exterior, n		(0.400)		8		16.0	128 Btuh
Door Total					80(sqft)			1280Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.025)	38.0/0.0	1710		1.0	1736 Btuh
Ceiling Total					1710(sqft)			1736Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

William Residence

Project Title:
200615 Willians
Building Type: User

, FL

2020-06-17

Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 185.0 ft(perim.) 1710 sqft	HTM= 47.2	Load 8732 Btuh 8732 Btuh
	Envelope Subtotal:					20204 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.26	Volume(cuft) 15732	Wall Ratio 1.00	CFM= 68.3	2991 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.177)					4116 Btuh
All Zones	Sensible Subtotal All Zones					27310 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	27310 Btuh 0 Btuh 27310 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	31000 Btuh
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Key: Window types - NFRC (Requires U-Factor and Shading coefficient(SHGC) of glass as numerical values)
or - Glass as 'Clear' or 'Tint' (Uses U-Factor and SHGC defaults)

U - (Window U-Factor)

HTM - (ManualJ Heat Transfer Multiplier)



Version 8

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

William Residence

Project Title:
200615 Willians

, FL

2020-06-17

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%)

Humidity difference: 51gr.

This calculation is for Worst Case. The house has been rotated 315 degrees.

Component Loads for Whole House

Window	Type*						Overhang		Window Area(sqft)			HTM		Load		
	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded			
1	2 NFRC	0.22, 0.32	No	No	NW		9.5ft.	0.0ft.	16.0	0.0	16.0	11	21	334	Btuh	
2	2 NFRC	0.22, 0.32	No	No	NW		9.5ft.	0.0ft.	64.0	0.0	64.0	11	21	1335	Btuh	
3	2 NFRC	0.22, 0.32	No	No	NW		9.5ft.	0.0ft.	36.0	0.0	36.0	11	21	751	Btuh	
4	2 NFRC	0.22, 0.32	No	No	NW		9.5ft.	0.0ft.	16.0	0.0	16.0	11	21	334	Btuh	
5	2 NFRC	0.22, 0.32	No	No	NE		1.5ft.	0.5ft.	24.0	0.0	24.0	11	21	501	Btuh	
6	2 NFRC	0.22, 0.32	No	No	NE		1.5ft.	0.5ft.	8.0	0.0	8.0	11	21	167	Btuh	
7	2 NFRC	0.22, 0.32	No	No	SE		1.5ft.	0.5ft.	8.0	7.9	0.1	11	22	87	Btuh	
8	2 NFRC	0.22, 0.32	No	No	SE		1.5ft.	0.5ft.	15.0	4.9	10.1	11	22	273	Btuh	
9	2 NFRC	0.22, 0.32	No	No	NW		10.5f	1.0ft.	16.0	0.0	16.0	11	21	334	Btuh	
10	2 NFRC	0.22, 0.32	No	No	NW		10.5f	1.5ft.	16.0	0.0	16.0	11	21	334	Btuh	
11	2 NFRC	0.22, 0.32	No	No	SE		1.5ft.	0.5ft.	24.0	7.9	16.1	11	22	437	Btuh	
12	2 NFRC	0.22, 0.32	No	No	SE		1.5ft.	0.5ft.	18.0	5.9	12.1	11	22	327	Btuh	
13	2 NFRC	0.22, 0.32	No	No	SE		1.5ft.	0.5ft.	18.0	5.9	12.1	11	22	327	Btuh	
14	2 NFRC	0.22, 0.32	No	No	SW		1.5ft.	0.5ft.	36.0	11.8	24.2	11	22	655	Btuh	
15	2 NFRC	0.22, 0.32	No	No	SW		1.5ft.	0.5ft.	4.5	4.5	0.0	11	22	48	Btuh	
16	2 NFRC	0.22, 0.32	No	No	SW		1.5ft.	0.5ft.	12.0	5.9	6.1	11	22	196	Btuh	
Excursion														763	Btuh	
Window Total									332 (sqft)						7203	Btuh
Walls	Type						U-Value	R-Value	Area(sqft)			HTM		Load		
								Cav/Sheath								
1	Frame - Wood - Ext						0.09	13.0/0.0	105.0			2.3		238 Btuh		
2	Frame - Wood - Ext						0.09	13.0/0.0	72.0			2.3		163 Btuh		
3	Frame - Wood - Ext						0.09	13.0/0.0	138.0			2.3		312 Btuh		
4	Face Brick - Wood - Ext						0.08	13.0/0.0	253.0			1.3		323 Btuh		
5	Face Brick - Wood - Ext						0.08	13.0/0.0	103.0			1.3		131 Btuh		
6	Face Brick - Wood - Ext						0.08	13.0/0.0	18.0			1.3		23 Btuh		
7	Face Brick - Wood - Ext						0.08	13.0/0.0	23.0			1.3		29 Btuh		
8	Face Brick - Wood - Ext						0.08	13.0/0.0	18.0			1.3		23 Btuh		
9	Face Brick - Wood - Ext						0.08	13.0/0.0	105.0			1.3		134 Btuh		
10	Face Brick - Wood - Ext						0.08	13.0/0.0	27.0			1.3		34 Btuh		
11	Face Brick - Wood - Ext						0.08	13.0/0.0	93.0			1.3		119 Btuh		
12	Face Brick - Wood - Ext						0.08	13.0/0.0	330.0			1.3		421 Btuh		
Wall Total									1285 (sqft)					1951 Btuh		
Doors	Type						Area (sqft)			HTM		Load				
1	Insulated - Exterior						24.0			12.0		288 Btuh				
2	Insulated - Exterior						8.0			12.0		96 Btuh				
3	Insulated - Exterior						32.0			12.0		384 Btuh				
4	Insulated - Exterior						8.0			12.0		96 Btuh				
5	Insulated - Exterior						8.0			12.0		96 Btuh				
Door Total							80 (sqft)					960 Btuh				
Ceilings	Type/Color/Surface						U-Value	R-Value	Area(sqft)			HTM		Load		
1	Vented Attic/Light/Shingle						0.025	38.0/0.0	1710.0			1.12		1910 Btuh		
Ceiling Total									1710 (sqft)					1910 Btuh		
Floors	Type						R-Value			Size			HTM		Load	
1	Slab On Grade						0.0			1710 (ft-perimeter)			0.0		0 Btuh	
Floor Total										1710.0 (sqft)					0 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

William Residence

Project Title:
200615 Willians

Climate:FL_GAINESVILLE_REGIONAL_A

, FL

2020-06-17

	Envelope Subtotal:					12024 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.20	15732	1	51.2	1066 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		6	X 230	+	2400	3780 Btuh
	Sensible Envelope Load:					16869 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.261)					4401 Btuh
	Sensible Load All Zones					21270 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

William Residence
, FL

Project Title:
200615 Willians

Climate:FL_GAINESVILLE_REGIONAL_A

2020-06-17

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	16869 Btuh
	Sensible Duct Load	4401 Btuh
	Total Sensible Zone Loads	21270 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	21270 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1768 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	991 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3959 Btuh
	TOTAL GAIN	25229 Btuh

EQUIPMENT

1. Central Unit	#	31000 Btuh
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*Key: Window types (Panels - Number and type of panes of glass)
 (SHGC - Shading coefficient of glass as SHGC numerical value)
 (U - Window U-Factor)
 (InSh - Interior shading device: none(No), Blinds(B), Draperies(D) or Roller Shades(R))
 - For Blinds: Assume medium color, half closed
 For Draperies: Assume medium weave, half closed
 For Roller shades: Assume translucent, half closed
 (IS - Insect screen: none(N), Full(F) or Half(½))
 (Ornt - compass orientation)



Version 8