FORM R405-2020

FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION

Florida Department of Business and Professional Regulation - Residential Performance Method

Project Name:	Mr & Mrs S Rowan Barndominium	Builder Name:	
Street:	Woodborough Subdivision	Permit Office:	Columbia
City, State, Zip:	Lake City , FL ,	Permit Number:	
Owner:		Jurisdiction:	
Design Location:	FL, Gainesville	County:	Columbia (Florida Climate Zone 2)

1. New construction or existing	New (From Plans)
2. Single family or multiple family	Detached
3. Number of units, if multiple family	1
4. Number of Bedrooms	1
5. Is this a worst case?	No
6. Conditioned floor area above grade (ft²)	1360
Conditioned floor area below grade (ft²)	0

7. Windows(54.0 sqft.)

	Description	Area
a. U-Factor:	Dbl, U=0.40	54.00 ft²
SHGC:	SHGC=0.25	
b. U-Factor:	N/A	ft²
SHGC:		
c. U-Factor:	N/A	ft²
SHGC:		
Area Weighted Average Overhang Depth:		1.333 ft.
Area Weighted Average SHGC:		0.250

8. Skylights

		Area
c. U-Factor:(AVG)	N/A	ft²
SHGC(AVG):	N/A	

9. Floor Types (1360.0 sqft.)

	Insulation	Area
a. Floor Over Other Space	R=19.0	1008.00 ft²
b. Slab-On-Grade Edge Insulation	R=19.0	352.00 ft²
c. N/A	R=	ft²

10. Wall Types(1657.3 sqft.)

	Insulation	Area
a. Frame - Wood, Exterior	R=13.0	1657.30 ft²
b. N/A	R=	ft²
c. N/A	R=	ft²
d. N/A	R=	ft²

11. Ceiling Types (1008.0 sqft.)

	Insulation	Area
a. Roof Deck (Unvented)	R=38.0	1008.00 ft²
b. N/A	R=	ft²
c. N/A	R=	ft²

12. Ducts — R ft²

13. Cooling systems

	kBtu/hr	Efficiency
a. PTAC and Room Unit	13.8	EER:17.00

14. Heating systems

	kBtu/hr	Efficiency
a. Window/Wall Heat Pump	20.7	HSPF:7.70

15. Hot water systems

a. Electric — Cap: 40 gallons, EF: 0.920

b. Conservation features
None

16. Credits — CF, Pstat

Glass/Floor Area: 0.040

Total Proposed Modified Loads: 30.42

Total Baseline Loads: 38.16

PASS

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

PREPARED BY: _____

DATE: _____

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

OWNER/AGENT: _____

DATE: _____

Review of the plans and specifications covered by this calculation indicates compliance with the Florida Energy Code. Before construction is completed this building will be inspected for compliance with Section 553.908 Florida Statutes.

BUILDING OFFICIAL: _____

DATE: _____

- Compliance requires certification by the air handler unit manufacturer that the air handler enclosure qualifies as certified factory-sealed in accordance with R403.3.2.1.

- Compliance requires an Air Barrier and Insulation Inspection Checklist in accordance with R402.4.1.1 and this project requires an envelope leakage test report with envelope leakage no greater than 6.20 ACH50 (R402.4.1.2).

- Proposed Qn of NAN exceeds the performance method default limit of 0.08 and therefore does not require duct testing. R405 .2.3

FORM R405-2020

INPUT SUMMARY CHECKLIST REPORT

PROJECT

Title:	Mr & Mrs S Rowan Barndomi	Bedrooms:	1	Address Type:	Street Address
Building Type:	User	Conditioned Area:	1360	Lot #	
Owner Name:		Total Stories:	2	Block/Subdivision:	
# of Units:	1	Worst Case:	No	PlatBook:	
Builder Name:		Rotate Angle:	0	Street:	Woodborough Subdivisi
Permit Office:	Columbia	Cross Ventilation:		County:	Columbia
Jurisdiction:		Whole House Fan:		City, State, Zip:	Lake City ,
Family Type:	Detached				FL ,
New/Existing:	New (From Plans)				
Comment:					

CLIMATE

√	Design Location	TMY Site	Design Temp 97.5 %	Design Temp 2.5 %	Int Design Temp Winter	Int Design Temp Summer	Heating Degree Days	Design Moisture	Daily Temp Range
_____	FL, Gainesville	FL_GAINESVILLE_REGI	32	92	70	75	1305.5	51	Medium

BLOCKS

Number	Name	Area	Volume
1	Block1	1360	10880

SPACES

Number	Name	Area	Volume	Kitchen	Occupants	Bedrooms	Infil ID	Finished	Cooled	Heated
1	1st Floor	352	2816	No	2	0	1	Yes	Yes	Yes
2	2nd Floor	1008	8064	Yes	0	1	1	Yes	Yes	Yes

FLOORS

√	#	Floor Type	Space	Perimeter	Perimeter R-Value	Area	Joist R-Value	Tile	Wood	Carpet
_____	1	Slab-On-Grade Edge Insulatio	1st Floor	78 ft	19	352 ft²	----	0	0	1
_____	2	Floor Over Other Space	2nd Floor	----	----	1008 ft²	19	0	0	1

ROOF

√	#	Type	Materials	Roof Area	Gable Area	Roof Color	Rad Barr	Solar Absor.	SA Tested	Emitt	Emitt Tested	Deck Insul.	Pitch (deg)
_____	1	Gable or shed	Metal	1092 ft²	210 ft²	Light	N	0.6	No	0.9	No	38	22.62

ATTIC

√	#	Type	Ventilation	Vent Ratio (1 in)	Area	RBS	IRCC
_____	1	Full attic	Unvented	0	1008 ft²	N	N

FORM R405-2020

INPUT SUMMARY CHECKLIST REPORT

CEILING

√	#	Ceiling Type	Space	R-Value	Ins Type	Area	Framing Frac	Truss Type
_____	1	Under Attic (Unvented)	2nd Floor	0	Batt	1008 ft²	0.11	Wood

WALLS

√	#	Ornt	Adjacent To	Wall Type	Space	Cavity R-Value	Width Ft	Width In	Height Ft	Height In	Area	Sheathing R-Value	Framing Fraction	Solar Absor.	Below Grade%
____	1	N	Exterior	Frame - Wood	1st Floor	13	24		8		192.0 ft²		0.23	0.75	0
____	2	E	Exterior	Frame - Wood	1st Floor	13	14	8	8		117.3 ft²		0.23	0.75	0
____	3	S	Exterior	Frame - Wood	1st Floor	13	24		8		192.0 ft²		0.23	0.75	0
____	4	W	Exterior	Frame - Wood	1st Floor	13	14	8	8		117.3 ft²		0.23	0.75	0
____	5	N	Exterior	Frame - Wood	2nd Floor	13	24		8		192.0 ft²		0.23	0.75	0
____	6	E	Exterior	Frame - Wood	2nd Floor	13	40	11	8		327.3 ft²		0.23	0.75	0
____	7	N	Exterior	Frame - Wood	2nd Floor	13	24		8		192.0 ft²		0.23	0.75	0
____	8	N	Exterior	Frame - Wood	2nd Floor	13	40	11	8		327.3 ft²		0.23	0.75	0

DOORS

√	#	Ornt	Door Type	Space	Storms	U-Value	Width Ft	Width In	Height Ft	Height In	Area
_____	1	S	Insulated	1st Floor	None	.4	3		6	8	20 ft²
_____	2	S	Insulated	1st Floor	None	.46	3		6	8	20 ft²
_____	3	N	Insulated	2nd Floor	None	.46	3		6	8	20 ft²
_____	4	E	Insulated	2nd Floor	None	.46	3		6	8	20 ft²
_____	5	N	Insulated	2nd Floor	None	.46	6		6	8	40 ft²

WINDOWS

Orientation shown is the entered, Proposed orientation.

√	#	Ornt	Wall ID	Frame	Panes	NFRC	U-Factor	SHGC	Imp	Area	Overhang Depth	Overhang Separation	Int Shade	Screening
_____	1	N	1	Vinyl	Low-E Double	Yes	0.4	0.25	N	9.0 ft²	1 ft 4 in	1 ft 0 in	Drapes/blinds	None
_____	2	W	4	Vinyl	Low-E Double	Yes	0.4	0.25	N	12.0 ft²	1 ft 4 in	2 ft 0 in	Drapes/blinds	None
_____	3	E	6	Vinyl	Low-E Double	Yes	0.4	0.25	N	9.0 ft²	1 ft 4 in	2 ft 0 in	Drapes/blinds	None
_____	4	N	8	Vinyl	Low-E Double	Yes	0.4	0.25	N	24.0 ft²	1 ft 4 in	2 ft 0 in	Drapes/blinds	None

INFILTRATION

#	Scope	Method	SLA	CFM 50	ELA	EqLA	ACH	ACH 50
1	Wholehouse	Proposed ACH(50)	.000315	1124.3	61.68	115.8	.1603	6.2

HEATING SYSTEM

√	#	System Type	Subtype	Speed	Efficiency	Capacity	Block	Ducts
_____	1	Window/Wall Heat Pump/	None	Singl	HSPF:7.7	20.67 kBtu/hr	1	Ductless

FORM R405-2020

INPUT SUMMARY CHECKLIST REPORT

COOLING SYSTEM

√	#	System Type	Subtype	Subtype	Efficiency	Capacity	Air Flow	SHR	Block	Ducts
_____	1	PTAC and Room Unit/	RoomUnit with Louvered	Single Side	EER: 17	13.8 kBtu/hr	360 cfm	0.7	1	Ductless

HOT WATER SYSTEM

√	#	System Type	SubType	Location	EF	Cap	Use	SetPnt	Conservation
_____	1	Electric	None	Exterior	0.92	40 gal	40 gal	120 deg	None

SOLAR HOT WATER SYSTEM

√	FSEC Cert #	Company Name	System Model #	Collector Model #	Collector Area	Storage Volume	FEF
_____	None	None			ft²		

TEMPERATURES

Programable Thermostat: Y

Ceiling Fans:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cooling	[ ]	[ ]	[ ]	[ ]	[ ]	[X]	[X]	[X]	[X]	[ ]	[ ]	[ ]
Heating	[X]	[X]	[X]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[X]	[X]
Venting	[ ]	[ ]	[X]	[X]	[ ]	[ ]	[ ]	[ ]	[ ]	[X]	[X]	[ ]

Thermostat Schedule: HERS 2006 Reference

Schedule Type		Hours 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

MECHANICAL VENTILATION

Type	Supply CFM	Exhaust CFM	Fan Watts	HRV	Heating System	Run Time	Cooling System
Fans/ERV	100	100	400	0	1 - Window/Wall Heat Pum	10%	1 - PTAC and Room Unit

MASS

Mass Type	Area	Thickness	Furniture Fraction	Space
Default(8 lbs/sq.ft.	0 ft²	0 ft	0.3	1st Floor
Default(8 lbs/sq.ft.	0 ft²	0 ft	0.3	2nd Floor

ENERGY PERFORMANCE LEVEL (EPL) DISPLAY CARD

ESTIMATED ENERGY PERFORMANCE INDEX* = 80

The lower the EnergyPerformance Index, the more efficient the home.

Woodborough Subdivision, Lake City, FL,

1. New construction or existing	New (From Plans)
2. Single family or multiple family	Detached
3. Number of units, if multiple family	1
4. Number of Bedrooms	1
5. Is this a worst case?	No
6. Conditioned floor area (ft²)	1360

7. Windows**	Description	Area
a. U-Factor:	Dbl, U=0.40	54.00 ft²
SHGC:	SHGC=0.25	
b. U-Factor:	N/A	ft²
SHGC:		
c. U-Factor:	N/A	ft²
SHGC:		
d. U-Factor:	N/A	ft²
SHGC:		
Area Weighted Average Overhang Depth:		1.333 ft.
Area Weighted Average SHGC:		0.250

8. Skylights	Description	Area
a. U-Factor(AVG):	N/A	ft²
SHGC(AVG):	N/A	

9. Floor Types	Insulation	Area
a. Floor Over Other Space	R=19.0	1008.00 ft²
b. Slab-On-Grade Edge Insulation	R=19.0	352.00 ft²
c. N/A	R=	ft²

10. Wall Type and Insulation	Insulation	Area
a. Frame - Wood, Exterior	R=13.0	1657.30 ft²
b. N/A	R=	ft²
c. N/A	R=	ft²
d. N/A	R=	ft²

11. Ceiling Type and insulation level	Insulation	Area
a. Roof Deck (Unvented)	R=38.0	1008.00 ft²
b. N/A	R=	ft²
c. N/A	R=	ft²

12. Ducts, location & insulation level	R	ft²

13. Cooling systems	kBtu/hr	Efficiency
a. PTAC and Room Unit	13.8	EER:17.00

14. Heating systems	kBtu/hr	Efficiency
a. Window/Wall Heat Pump	20.7	HSPF:7.70

15. Hot water systems	
a. Electric	Cap: 40 gallons EF: 0.92
b. Conservation features None	
Credits (Performance method)	CF, Pstat

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

Builder Signature: _____ Date: _____

Address of New Home: _____ City/FL Zip: _____

*Note: This is not a Building Energy Rating. If your Index is below 70, your home may qualify for energy efficient mortgage (EEM) incentives if you obtain a Florida Energy Rating. For information about the Florida Building Code, Energy Conservation, contact the Florida Building Commission's support staff.

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

RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST

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

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

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

Required prior to CO:

- ☐ *Air Barrier and Insulation Inspection Component Criteria checklist (Table R402.4.1.1 - one page)*
- ☐ *A completed 2020 Envelope Leakage Test Report (usually one page); exception in R402.4 allows dwelling units of R-2 Occupancies and multiple attached single family dwellings to comply with Section C402.5*
- ☐ *If Form R405 duct leakage type indicates anything other than "default leakage", then a completed 2020 Duct Leakage Test Report - Performance Method (usually one page)*

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

Jurisdiction:	Permit #:

Job Information

Builder: Community: Lot: NA

Address: Woodborough Subdivision

City: Lake 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 R405-2020 (Performance) or R406-2020 (ERI), section labeled as infiltration, sub-section ACH50.

ACH(50) specified on Form R405-2020-Energy Calc (Performance) or R406-2020 (ERI): 6.200

_____ x 60 ÷ 10880 = _____
CFM(50) Building Volume 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 Statues.*or individuals licensed as set forth in Section 489.105(3)(f), (g), or (i) or an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the*code official.* Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope.*

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

Testing Company

Company Name: _____ Phone: _____

I hereby verify that the above Air Leakage results are in accordance with the 2020 7th Edition Florida Building Code Energy Conservation requirements according to the compliance method selected above.

Signature of Tester: _____ Date of Test: _____

Printed Name of Tester: _____

License/Certification #: _____ Issuing Authority: _____

2020 - AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

TABLE 402.4.1.1
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA [a]

				CHECK
Project Name:	Mr & Mrs S Rowan Barndominium	Builder Name:		
Street:	Woodborough Subdivision	Permit Office:	Columbia	
City, State, Zip:	Lake City , FL ,	Permit Number:		
Owner:		Jurisdiction:		
Design Location:	FL, Gainesville			

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

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

Florida Code Summary Report

Woodborough Subdivision
Lake City, FL,
Registration #:

Title: Mr & Mrs S Rowan Barndominium
FLProp2020

TMY City: FL_GAINESVILLE_R
Elec Util: MCLEOD2
Gas Util: Florida Average
Run Date:

Energy Uses	Reference Home	Proposed Home	e-Ratio
Heating	3.28 MBtu	3.75 MBtu	1.14
Cooling	10.65 MBtu	7.39 MBtu	0.69
Hot Water	4.62 MBtu	4.22 MBtu	0.91
Total	18.55 MBtu	15.35 MBtu	0.83

Building Loads	Reference Home	Proposed Home	e-Ratio
Heating	7.28 MBtu	8.21 MBtu*	1.13
Cooling	26.77 MBtu	18.44 MBtu*	0.69
Hot Water	4.11 MBtu	3.76 MBtu*	0.91
Total	38.16 MBtu	30.42 MBtu	0.80

* normalized modified loads

Glass/Floor Area: 0.040	Total Proposed Modified Loads: 30.42	**PASS**
	Total Reference Loads: 38.16	

Florida Building Code, Energy Conservation, 7th Edition (2020)
Mandatory Requirements for Residential Performance, Prescriptive and ERI Methods

ADDRESS:	Woodborough Subdivision Lake City , 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.

SECTION R402 BUILDING THERMAL ENVELOPE

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

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

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

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

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

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

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

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

☐ **R402.4.3 Fenestration air leakage.** Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/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. Duct leakage testing is required for Section R405 compliance where credit is taken for leakage, and a duct air leakage Qn to the outside of less than 0.080 (where Qn = duct leakage to the outside in cfm per 100 square feet of conditioned floor area tested at 25 Pascals) is indicated in the compliance report for the proposed design.*

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

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

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

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

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

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

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

MANDATORY REQUIREMENTS - (Continued)

R403.5.5 Heat traps (Mandatory). Storage water heaters not equipped with integral heat traps and having vertical pipe risers shall have heat traps installed on both the inlets and outlets. External heat traps shall consist of either a commercially available heat trap or a downward and upward bend of at least 3 ½ inches (89 mm) in the hot water distribution line and cold water line located as close as possible to the storage tank.

R403.5.6 Water heater efficiencies (Mandatory).

R403.5.6.1.1 Automatic controls. Service water-heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use. The minimum temperature setting range shall be from 100°F to 140°F (38°C to 60°C).

R403.5.6.1.2 Shut down. A separate switch or a clearly marked circuit breaker shall be provided to permit the power supplied to electric service systems to be turned off. A separate valve shall be provided to permit the energy supplied to the main burner(s) of combustion types of service water-heating systems to be turned off.

R403.5.6.2 Water-heating equipment. Water-heating equipment installed in residential units shall meet the minimum efficiencies of Table C404.2 in Chapter 4 of the Florida Building Code, Energy Conservation, Commercial Provisions, for the type of equipment installed. Equipment used to provide heating functions as part of a combination system shall satisfy all stated requirements for the appropriate water-heating category. Solar water heaters shall meet the criteria of Section R403.5.6.2.1.

R403.5.6.2.1 Solar water-heating systems. Solar systems for domestic hot water production are rated by the annual solar energy factor of the system. The solar energy factor of a system shall be determined from the Florida Solar Energy Center Directory of Certified Solar Systems. Solar collectors shall be tested in accordance with ISO Standard 9806, Test Methods for Solar Collectors, and SRCC Standard TM-1, Solar Domestic Hot Water System and Component Test Protocol. Collectors in installed solar water-heating systems should meet the following criteria:

1. Be installed with a tilt angle between 10 degrees and 40 degrees of the horizontal; and
2. Be installed at an orientation within 45 degrees of true south.

R403.6 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of the Florida Building Code, Residential, or Florida Building Code, Mechanical, as applicable, or with other approved means of ventilation including: Natural, Infiltration or Mechanical means. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

R403.6.1 Whole-house mechanical ventilation system fan efficacy. When installed to function as a whole-house mechanical ventilation system, fans shall meet the efficacy requirements of Table R403.6.1.

Exception: Where an air handler that is integral to tested and listed HVAC equipment is used to provide whole-house mechanical ventilation, the air handler shall be powered by an electronically commutated motor.

R403.6.2 Ventilation air. Residential buildings designed to be operated at a positive indoor pressure or for mechanical ventilation shall meet the following criteria:

1. The design air change per hour minimums for residential buildings in ASHRAE 62.2, Ventilation for Acceptable Indoor Air Quality, shall be the maximum rates allowed for residential applications.
2. No ventilation or air-conditioning system make-up air shall be provided to conditioned space from attics, crawlspaces, attached enclosed garages or outdoor spaces adjacent to swimming pools or spas.
3. If ventilation air is drawn from enclosed space(s), then the walls of the space(s) from which air is drawn shall be insulated to a minimum of R-11 and the ceiling shall be insulated to a minimum of R-19, space permitting, or R-10 otherwise.

R403.7 Heating and cooling equipment.

R403.7.1 Equipment sizing (Mandatory). Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on the equipment loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies, based on building loads for the directional orientation of the building. The manufacturer and model number of the outdoor and indoor units (if split system) shall be submitted along with the sensible and total cooling capacities at the design conditions described in Section R302.1. This Code does not allow designer safety factors, provisions for future expansion or other factors that affect equipment sizing. System sizing calculations shall not include loads created by local intermittent mechanical ventilation such as standard kitchen and bathroom exhaust systems. New or replacement heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is installed.

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

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

For SI: 1 cfm = 28.3 L/min. a. When tested in accordance with HVI Standard 916

MANDATORY REQUIREMENTS - (Continued)

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

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

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

Exceptions:

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

R403.7.1.2 Heating equipment capacity.

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

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

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

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

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

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

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

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

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

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

Exceptions:

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

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

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

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

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

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

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

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

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

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

SECTION R404

ELECTRICAL POWER AND LIGHTING SYSTEMS

☐ **R404.1 Lighting equipment (Mandatory).** Not less than 90 percent of the lamps in permanently installed luminaires shall have an efficacy of at least 45 lumens-per-watt or shall utilize lamps with an efficacy of not less than 65 lumens-per-watt.

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

Building Input Summary Report

PROJECT

Title:	Mr & Mrs S Rowan Barndominium			Address type:	S
Building Type:	User	Bedrooms:	1	Lot #:	
Owner:		Conditioned Area:	1360	Block/SubDivision:	
		Total Stories:	2	PlatBook:	
Builder Name:		Worst Case:	No	Street:	Woodborough Subdivision
Permit Office:	Columbia	Rotate Angle:	0	County:	Columbia
Jurisdiction:		Cross Ventilation:		City, State, Zip:	Lake City,
Family Type:	Detached	Whole House Fan:			FL,
New/Existing:	New (From Plans)	Terrain:	Suburban		
Year Construct:	2022	Shielding:	Suburban		
Comment:					

CLIMATE

√	Design Location	Tmy Site	Design Temp 97.5%	Design Temp 2.5%	Int Design Temp Winter	Int Design Temp Summer	Heating Degree Days	Design Moisture	Daily temp Range
___	FL, Gainesville	FL_GAINESVILLE_REGIONA	32	92	70	75	1305.5	51	Medium

UTILITY

√	Fuel	Unit	Utility Name	Monthly Fixed Cost	$/Unit
___	Electricity	kWh	MCLEOD2	0.00	0.11
___	Natural Gas	Therm	Florida Average	0.00	1.80
___	Fuel Oil	Gallon	Florida Default	0.00	3.40
___	Propane	Gallon	Florida Default	0.00	4.50

SURROUNDINGS

Ornt	Type	Shade Trees Height	Shade Trees Width	Shade Trees Distance	Shade Trees Exist	Adjacent Buildings Height	Adjacent Buildings Width	Adjacent Buildings Distance
N	None	0 ft	0 ft	0 ft		0 ft	0 ft	0 ft
NE	None	0 ft	0 ft	0 ft		0 ft	0 ft	0 ft
E	None	0 ft	0 ft	0 ft		0 ft	0 ft	0 ft
SE	None	0 ft	0 ft	0 ft		0 ft	0 ft	0 ft
S	None	0 ft	0 ft	0 ft		0 ft	0 ft	0 ft
SW	None	0 ft	0 ft	0 ft		0 ft	0 ft	0 ft
W	None	0 ft	0 ft	0 ft		0 ft	0 ft	0 ft
NW	None	0 ft	0 ft	0 ft		0 ft	0 ft	0 ft

BLOCKS

√	Number	Name	Area	Volume
___	1	Block1	1360	10880

SPACES

√	Number	Name	Area	Volume	Kitchen	Occupants	Bedrooms	Finished	Cooled	Heated
___	1	1st Floor	352	2816	No	2	0	Yes	Yes	Yes
___	2	2nd Floor	1008	8064	Yes	0	1	Yes	Yes	Yes

Building Input Summary Report

FLOORS (Total Exposed Area = 352 sq.ft.)

√	#	Floor Type	Space	Exposed Perim	Perimeter R-Value	Area	U-Factor	Joist R-Value	Tile	Wood	Carpet
___	1	Slab-On-Grade Edge Ins	1st Floor	78	19	352 ft	0.045	---	0.00	0.00	1.00
___	2	Floor Over Other Space	2nd Floor	---	---	1008 ft	0.046		0.00	0.00	1.00

ROOF

√	#	Type	Materials	Roof Area	Gable Area	Roof Color	Rad Barr	Solar Absor.	SA Tested	Emitt	Emitt Tested	Deck Insul.	Pitch (deg)
___	1	Gable or shed	Metal	1092 ft²	210 ft²	Light	N	0.6	No	0.9	No	38	22.62

ATTIC

√	#	Type	Ventilation	Vent Ratio (1 in)	Area	RBS	IRCC
___	1	Full attic	Unvented	0	1008 ft²	N	N

CEILING (Total Exposed Area = 1008 sq.ft.)

√	#	Ceiling Type	Space	R-Value	Ins. Type	Area	U-Factor	Framing Frac.	Truss Type
___	1	Under Attic(Unvented)	2nd Floor	0.0	Batt	1008.0ft²	0.024	0.11	Wood

WALLS (Total Exposed Area = 1657 sq.ft.)

√	#	Ornt	Adjacent To	Wall Type	Space	Cavity R-Value	Width Ft	Width In	Height Ft	Height In	Area sq.ft.	U-Factor	Sheath R-Value	Frm. Frac.	Solar Absor.	Below Grade
___	1	N	Exterior	Frame - Wood	1st Floor	13.0	24.0	0	8.0	0	192.0	0.084		0.23	0.75	0 %
___	2	E	Exterior	Frame - Wood	1st Floor	13.0	14.0	8	8.0	0	117.3	0.084		0.23	0.75	0 %
___	3	S	Exterior	Frame - Wood	1st Floor	13.0	24.0	0	8.0	0	192.0	0.084		0.23	0.75	0 %
___	4	W	Exterior	Frame - Wood	1st Floor	13.0	14.0	8	8.0	0	117.3	0.084		0.23	0.75	0 %
___	5	N	Exterior	Frame - Wood	2nd Floor	13.0	24.0	0	8.0	0	192.0	0.084		0.23	0.75	0 %
___	6	E	Exterior	Frame - Wood	2nd Floor	13.0	40.0	11	8.0	0	327.3	0.084		0.23	0.75	0 %
___	7	N	Exterior	Frame - Wood	2nd Floor	13.0	24.0	0	8.0	0	192.0	0.084		0.23	0.75	0 %
___	8	N	Exterior	Frame - Wood	2nd Floor	13.0	40.0	11	8.0	0	327.3	0.084		0.23	0.75	0 %

DOORS (Total Exposed Area = 120 sq.ft.)

√	#	Ornt	Adjacent To	Door Type	Space	Storms	U-Value	Width Ft	Width In	Height Ft	Height In	Area
___	1	S	Exterior	Insulated	1st Floor	None	0.40	3.00	0	6.00	8	20.0ft²
___	2	S	Exterior	Insulated	1st Floor	None	0.46	3.00	0	6.00	8	20.0ft²
___	3	N	Exterior	Insulated	2nd Floor	None	0.46	3.00	0	6.00	8	20.0ft²
___	4	E	Exterior	Insulated	2nd Floor	None	0.46	3.00	0	6.00	8	20.0ft²
___	5	N	Exterior	Insulated	2nd Floor	None	0.46	6.00	0	6.00	8	40.0ft²

WINDOWS (Total Exposed Area = 54 sq.ft.)

√	#	Ornt	Wall ID	Frame	Panes	NFRC	U-Factor	SHGC	Imp	Storm	Area	-----Overhang----- Depth	Separation	Interior Shade	Screening
___	1	N	1	Vinyl	Low-E Double	Yes	0.40	0.25	N	N	9.0ft²	1.0 ft 4 in	1.0 ft 0 in	Drapes/blinds	None
___	2	W	4	Vinyl	Low-E Double	Yes	0.40	0.25	N	N	12.0ft²	1.0 ft 4 in	2.0 ft 0 in	Drapes/blinds	None
___	3	E	6	Vinyl	Low-E Double	Yes	0.40	0.25	N	N	9.0ft²	1.0 ft 4 in	2.0 ft 0 in	Drapes/blinds	None

Building Input Summary Report

WINDOWS(Continued)

___	4	N	8	Vinyl	Low-E Double	Yes	0.40	0.25	N	N	24.0ft²	1.0 ft 4 in	2.0 ft 0 in	Drapes/blinds	None

INFILTRATION

√	#	Scope	Method	SLA	CFM50	ELA	EqLA	ACH	ACH50	Space(s)
___	1	Wholehouse	Proposed ACH(50)	0.00031	1124	61.68	115.80	0.1603	6.2	All

MASS

√	#	Mass Type	Area	Thickness	Furniture Fraction	Space
___	1	Default(8 lbs/sq.ft.)	0 ft²	0 ft	0.30	1st Floor
___	2	Default(8 lbs/sq.ft.)	0 ft²	0 ft	0.30	2nd Floor

HEATING SYSTEM

√	#	System Type	Subtype/Speed	AHRI #	Efficiency	Capacity kBtu/hr	----Geothermal HeatPump---- Entry	Power	Volt	Current	Ducts	Block
___	1	Window/Wall HP	None/Single		HSPF: 7.70	20.7		0.00	0.00	0.00	sys#0	1

COOLING SYSTEM

√	#	System Type	Subtype/Speed	AHRI #	Efficiency	Capacity kBtu/hr	Air Flow cfm	SHR	Duct	Block
___	1	PTAC and Room Unit	RoomUnit with Louvered Sid		EER:17	13.8	360	0.70	Ductless	1

AHU SYSTEM

√	#	Test Mode	Cooling/Heating (Proposed)	Grade	DESIGN CFM Cool	DESIGN CFM Heat	Proposed
___	1		1 - PTAC and Room Unit/1 - Window/Wall Heat Pump	III (AirFlow) III (WattDraw) III (Refrig)			0 CFM 0

HOT WATER SYSTEM

√	#	System Type	Subtype	Location	EF(UEF)	Cap	Use	SetPnt	Fixture Flow	Pipe Ins.	Pipe length
___	1	Electric	None	Exterior	0.92 (0.92)	40.00 gal	40 gal	120 deg	Standard	=>R-3	30

	#	Recirculation System	Recirc Control Type	Loop length	Branch length	Pump power	DWHR	Facilities Connected	Equal Flow	DWHR Eff	Other Credits
___	1	No		NA	NA	NA	No	NA	NA	NA	None

DUCTS

√	Duct #	---------Supply--------- Location	R-Value	Area	---------Return--------- Location	R-Value	Area	Leakage Type	Air Handler	CFM 25 TOT	CFM 25 OUT	QN	RLF	HVAC # Heat	Cool

Building Input Summary Report

MECHANICAL VENTILATION

√ Type	Supply CFM	Exhaust CFM	HRV	Fan	Run Time	Heating System	Cooling System
___ Fans/ERV	100.0	100.0	0.0	400.0 W	10 %	1 - Window/Wall Heat Pump	1 - PTAC and Room Unit

TEMPERATURES

Programable Thermostat: Y Ceiling Fans: Y

Cooling	[ ] Jan	[ ] Feb	[ ] Mar	[ ] Apr	[ ] May	[X] Jun	[X] Jul	[X] Aug	[X] Sep	[ ] Oct	[ ] Nov	[ ] Dec
Heating	[X] Jan	[X] Feb	[X] Mar	[ ] Apr	[ ] May	[ ] Jun	[ ] Jul	[ ] Aug	[ ] Sep	[ ] Oct	[X] Nov	[X] Dec
Venting	[ ] Jan	[ ] Feb	[X] Mar	[X] Apr	[ ] May	[ ] Jun	[ ] Jul	[ ] Aug	[ ] Sep	[X] Oct	[X] Nov	[ ] Dec

√ Thermostat Schedule: HERS 2006 Reference Schedule Type		Hours 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

REFRIGERATORS

√ ID	Type	Screen	Location	Quantity	Vol	Frz. Vol	Make	Model	Schedule	kWhPerYr
___ 1	Default Refrigerator	Default New	Main	1	26	5			HERS2011	

CLOTHES WASHERS

√ ID	Type	Screen	Location	Capacity	Make	Model	Schedule	LoadsPerYr
___ 1	Cl washer	Default New	Main	2.874			HERS2011	312

CLOTHES DRYERS

√ ID	Type	Screen	Location	Quantity	Fuel Type	Make	Model	Schedule	kWhPerYr
___ 1	Dryer	Default Existing	Main	4.5	Electricity			HERS2011	266

DISHWASHERS

√ ID	Type	Screen	Location	Capacity	Vintage	Make	Model	Schedule	kWhPerYr
___ 1	Dishwasher	Default New	Main	12	2013 or Newer			HERS2011	372

RANGE OVENS

√ ID	Type	Screen	Location	Type	Fuel Type	Make	Model	Cooktop	Oven
___ 1	RangeOven	Default New	Main	Combo	Elec			Electric flat	Not Convec

Building Input Summary Report

HARD WIRED LIGHTING

√ID	Type	Screen	Location	Total#	Quantity#	Comp Fl	All Other Fl	Bulb Type	Schedule	Watts per bulb
__ 2	Hard-Wired	By Count - Qualifying	Exterior	4	3				HERS2011	

MISC ELECTRICAL LOADS

√ID	Type	Screen	Location	Item	Quantity	Catagory	Operating	Schedule	Off Standby
___ 1	Misc Elec Load	Simple Default	Main		1		1	HERS2011	1

APPLIANCES & LIGHTING SCHEDULES

Appliance Schedule: HERS2014

Schedule Type			Hours 1	2	3	4	5	6	7	8	9	10	11	12
Occupancy peak:	400 Btu	AM	0.930	0.930	0.930	0.930	0.930	0.930	0.930	0.980	0.460	0.270	0.270	0.270
% Released:	100 %	PM	0.270	0.270	0.270	0.270	0.330	0.610	1.000	1.000	0.930	0.930	0.930	0.930
refrig peak:	89 W	AM	0.824	0.804	0.784	0.764	0.744	0.734	0.744	0.754	0.764	0.794	0.814	0.854
% Released:	100 %	PM	0.854	0.864	0.884	0.904	0.925	0.945	0.925	0.915	0.904	0.894	0.874	0.854
cWash peak:	6 W	AM	0.200	0.100	0.050	0.050	0.050	0.075	0.200	0.375	0.500	0.800	0.950	1.000
% Released:	30 %	PM	0.875	0.850	0.800	0.625	0.625	0.600	0.575	0.550	0.625	0.700	0.650	0.375
E-cDry peak:	68 W	AM	0.200	0.100	0.050	0.050	0.050	0.075	0.200	0.375	0.500	0.800	0.950	1.000
% Released:	15 %	PM	0.875	0.850	0.800	0.625	0.625	0.600	0.575	0.550	0.625	0.700	0.650	0.375
dWash peak:	18 W	AM	0.139	0.050	0.028	0.024	0.029	0.090	0.169	0.303	0.541	0.594	0.502	0.443
% Released:	60 %	PM	0.376	0.396	0.334	0.323	0.344	0.448	0.791	1.000	0.800	0.597	0.383	0.281
E-rOven peak:	136 W	AM	0.057	0.057	0.057	0.057	0.057	0.114	0.171	0.286	0.343	0.343	0.343	0.400
% Released:	80 %	PM	0.457	0.343	0.286	0.400	0.571	1.000	0.857	0.429	0.286	0.229	0.171	0.114
TVs peak:	176 W	AM	0.100	0.050	0.050	0.050	0.100	0.200	0.400	0.450	0.400	0.200	0.100	0.100
% Released:	100 %	PM	0.050	0.050	0.150	0.450	0.850	1.000	0.950	0.800	0.500	0.250	0.150	0.100
cFan peak:	0 W	AM	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.250	0.250	0.250	0.250	0.250
% Released:	100 %	PM	0.250	0.250	0.250	0.250	0.250	0.250	0.550	0.600	0.600	0.600	0.600	0.600
lgts-in peak:	0 W	AM	0.160	0.150	0.160	0.180	0.230	0.450	0.420	0.260	0.190	0.160	0.120	0.110
% Released:	100 %	PM	0.160	0.170	0.250	0.270	0.340	0.550	0.600	0.880	1.000	0.880	0.510	0.280
lgts-out peak:	45 W	AM	1.000	1.000	1.000	1.000	1.000	0.750	0.750	0.000	0.000	0.000	0.000	0.000
% Released:	0 %	PM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.750	0.750	0.750	1.000
lgts-gar peak:	0 W	AM	0.000	0.000	0.000	0.000	0.000	0.500	0.750	1.000	0.750	0.500	0.000	0.000
% Released:	0 %	PM	0.000	0.000	0.500	0.500	0.750	1.000	0.750	0.500	0.000	0.000	0.000	0.000
MEL peak:	0 W	AM	0.500	0.500	0.500	0.750	0.750	0.850	1.000	1.000	1.000	1.000	0.900	0.900
% Released:	90 %	PM	0.900	0.900	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.850	0.750	0.750

Residential System Sizing Calculation

Summary

Project Title:

Woodborough Subdivision
Lake City, FL

Mr & Mrs S Rowan Barndominium

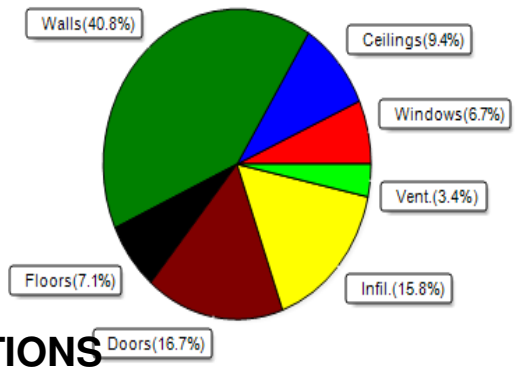
2/16/2022

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	**12899**	**Btuh**	**Total cooling load calculation**	**11350**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Window/Wall Heat Pump)	160.3	20672	Sensible (SHR = 0.70)	102.8	9660
Heat Pump + Auxiliary(0.0kW)	160.3	20672	Latent	212.4	4140
			Total (Window/Wall Heat Pump)	121.6	13800

WINTER CALCULATIONS

Winter Heating Load (for 1360 sqft)

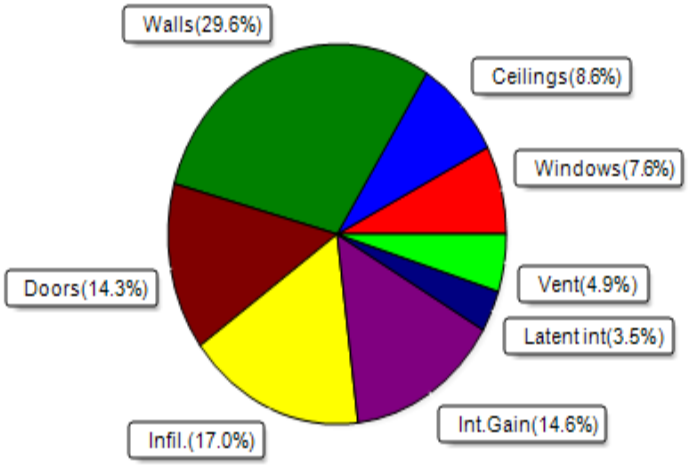
Load component			Load	
Window total	54	sqft	864	Btuh
Wall total	1483	sqft	5266	Btuh
Door total	120	sqft	2160	Btuh
Ceiling total	1008	sqft	1215	Btuh
Floor total	See detail report		919	Btuh
Infiltration	47	cfm	2037	Btuh
Duct loss			0	Btuh
Subtotal			**12461**	**Btuh**
Ventilation	10	cfm	438	Btuh
TOTAL HEAT LOSS			**12899**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1360 sqft)

Load component			Load	
Window total	54	sqft	859	Btuh
Wall total	1483	sqft	3357	Btuh
Door total	120	sqft	1620	Btuh
Ceiling total	1008	sqft	972	Btuh
Floor total			0	Btuh
Infiltration	35	cfm	726	Btuh
Internal gain			1660	Btuh
Duct gain			0	Btuh
Sens. Ventilation	10	cfm	208	Btuh
Blower Load			0	Btuh
Total sensible gain			**9401**	**Btuh**
Latent gain(ducts)			0	Btuh
Latent gain(infiltration)			1204	Btuh
Latent gain(ventilation)			345	Btuh
Latent gain(internal/occupants/other)			400	Btuh
Total latent gain			**1949**	**Btuh**
TOTAL HEAT GAIN			**11350**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY: _____
DATE: _____

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:

Woodborough Subdivision — Mr & Mrs S Rowan Barndominium
Lake City, FL

2/16/2022

Reference City: Gainesville, FL — Temperature Difference: 19.0F(TMY3 99%) — Humidity difference: 51gr.

Component Loads for Whole House

	Type*					Overhang		Window Area(sqft)			HTM		Load
Window	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded	
1	2 NFRC	0.25, 0.40		B-L	No	N	1.3ft	1.0ft	9.0	0.0	9.0	10	10	91 Btuh
2	2 NFRC	0.25, 0.40		B-L	No	W	1.3ft	2.0ft	12.0	0.0	12.0	10	23	280 Btuh
3	2 NFRC	0.25, 0.40		B-L	No	E	1.3ft	2.0ft	9.0	0.0	9.0	10	23	210 Btuh
4	2 NFRC	0.25, 0.40		B-L	No	N	1.3ft	2.0ft	24.0	0.0	24.0	10	10	242 Btuh
	Excursion													36 Btuh
	Window Total								54 (sqft)					859 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.0	183.0	2.3	414 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	117.3	2.3	266 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	152.0	2.3	344 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	105.3	2.3	238 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	172.0	2.3	389 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	298.3	2.3	675 Btuh
7	Frame - Wood - Ext	0.09	13.0/0.0	152.0	2.3	344 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	303.3	2.3	687 Btuh
	Wall Total			1483 (sqft)		3357 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	20.0	12.0	240 Btuh
2	Insulated - Exterior	20.0	13.8	276 Btuh
3	Insulated - Exterior	20.0	13.8	276 Btuh
4	Insulated - Exterior	20.0	13.8	276 Btuh
5	Insulated - Exterior	40.0	13.8	552 Btuh
	Door Total	120 (sqft)		1620 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Unvented Attic/Light/Metal	0.241	0.0/38.0	1008.0	0.96	972 Btuh
	Ceiling Total			1008 (sqft)		972 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	19.0	352 (ft-perimeter)	0.0	0 Btuh
2	Interior	19.0	1008 (sqft)	0.0	0 Btuh
	Floor Total		1360.0 (sqft)		0 Btuh
			Envelope Subtotal:		6808 Btuh

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural(Adjusted for ventilation)	0.19	10880	1	34.9	726 Btuh

Internal gain	Occupants		Btuh/occupant		Appliance	Load
	2	X	230	+	1200	1660 Btuh
				Sensible Envelope Load:		9193 Btuh
Duct load	NA, Supply(R0.0-None), Return(R0.0-None)			(DGM of 0.000)		0 Btuh
				Sensible Load All Zones		**9193 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A

Woodborough Subdivision
Lake City, FL

Mr & Mrs S Rowan Barndominium

2/16/2022

WHOLE HOUSE TOTALS

	Sensible Envelope Load All Zones	**9193**	**Btuh**
	Sensible Duct Load	0	Btuh
	Total Sensible Zone Loads	**9193**	**Btuh**
	Sensible ventilation	208	Btuh
	Blower	0	Btuh
Whole House	**Total sensible gain**	**9401**	**Btuh**
Totals for Cooling	Latent infiltration gain (for 51 gr. humidity difference)	1204	Btuh
	Latent ventilation gain	345	Btuh
	Latent duct gain	0	Btuh
	Latent occupant gain (2.0 people @ 200 Btuh per person)	400	Btuh
	Latent other gain	0	Btuh
	Latent total gain	**1949**	**Btuh**
	TOTAL GAIN	**11350**	**Btuh**

EQUIPMENT

1. PTAC and Room Unit	#	13800 Btuh

*Key: Window types (Panes - 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

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Project Title:

Woodborough Subdivision — Mr & Mrs S Rowan Barndominium

Lake City, FL — Building Type: User

2/16/2022

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.25	Vinyl	0.40	N	9.0	16.0	144 Btuh
2	2, NFRC 0.25	Vinyl	0.40	W	12.0	16.0	192 Btuh
3	2, NFRC 0.25	Vinyl	0.40	E	9.0	16.0	144 Btuh
4	2, NFRC 0.25	Vinyl	0.40	N	24.0	16.0	384 Btuh
	Window Total				54.0(sqft)		864 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	183	3.55	650 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	117	3.55	417 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	152	3.55	540 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	105	3.55	374 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	172	3.55	611 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	298	3.55	1059 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	152	3.55	540 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	303	3.55	1077 Btuh
	Wall Total				1483(sqft)		5266 Btuh
Doors	Type	Storm	Ueff.		Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		20	16.0	320 Btuh
2	Insulated - Exterior,	n	(0.460)		20	18.4	368 Btuh
3	Insulated - Exterior,	n	(0.460)		20	18.4	368 Btuh
4	Insulated - Exterior,	n	(0.460)		20	18.4	368 Btuh
5	Insulated - Exterior,	n	(0.460)		40	18.4	736 Btuh
	Door Total				120(sqft)		2160Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area X	HTM=	Load
1	Unvent Attic/L/Metal		(0.241)	0.0/38.0	1008	1.2	1215 Btuh
	Ceiling Total				1008(sqft)		1215Btuh
Floors	Type		Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade		(0.295)	19.0	78.0 ft(perim.)	11.8	919 Btuh
2	Interior		(0.295)	19.0	1008.0 sqft	0.0	0 Btuh
	Floor Total				1360 sqft		919 Btuh
					Envelope Subtotal:		10424 Btuh

Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural(Adjusted for ventilation)		0.26	10880	1.00	46.5	2037 Btuh
Duct load	NA, R0.0, Supply(), Return()					(DLM of 0.000)	0 Btuh
All Zones				**Sensible Subtotal All Zones**			**12461 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Woodborough Subdivision — Mr & Mrs S Rowan Barndominium
Lake City, FL — Building Type: User

2/16/2022

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	12461 Btuh
	Ventilation Sensible Heat Loss	438 Btuh
	Total Heat Loss	12899 Btuh

EQUIPMENT

1. Window/Wall Heat Pump	#	20672 Btuh

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)

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Version 8