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Residential System Sizing Calculation

Summary

Norris Construction

Lake City, FL 32024

Project Title:
Norris Forest Country

COLUMBIA COUNTY BUILDING DEPARTMENT
Received for
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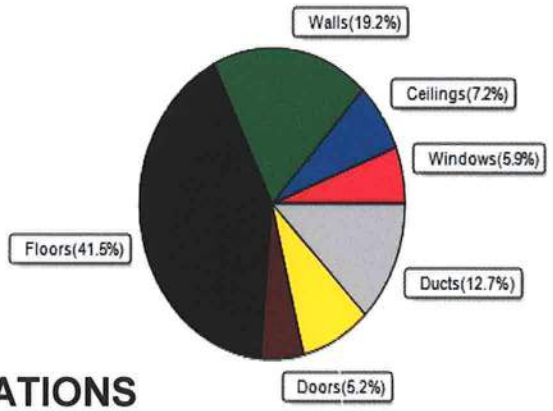
PLANS EXAMINER
12/15/2021

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(54gr.)					
Winter design temperature(MJ8 99%)	33	F	Summer design temperature(MJ8 99%)	92	F
Winter setpoint	70	F	Summer setpoint	75	F
Winter temperature difference	37	F	Summer temperature difference	17	F
Total heating load calculation	**23242**	**Btuh**	**Total cooling load calculation**	**15647**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	180.7	42000	Sensible (SHR = 0.75)	270.3	31500
Heat Pump + Auxiliary(0.0kW)	180.7	42000	Latent	262.9	10500
			Total (Electric Heat Pump)	268.4	42000

WINTER CALCULATIONS

Winter Heating Load (for 1762 sqft)

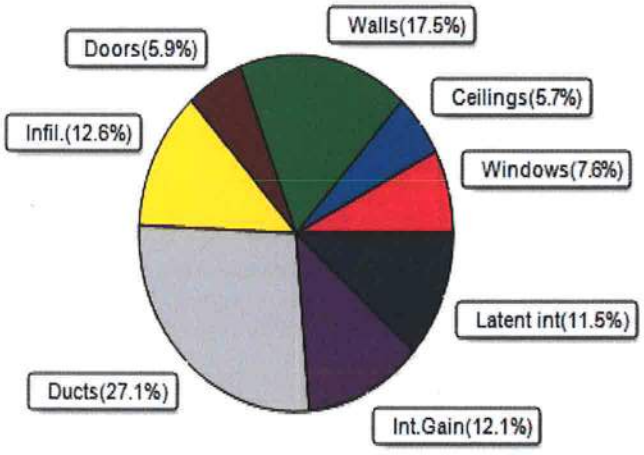
Load component			Load	
Window total	113	sqft	1380	Btuh
Wall total	1418	sqft	4451	Btuh
Door total	71	sqft	1210	Btuh
Ceiling total	1762	sqft	1676	Btuh
Floor total	1762	sqft	9649	Btuh
Infiltration	48	cfm	1932	Btuh
Duct loss			2944	Btuh
Subtotal			**23242**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**23242**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1762 sqft)

Load component			Load	
Window total	113	sqft	1191	Btuh
Wall total	1418	sqft	2738	Btuh
Door total	71	sqft	916	Btuh
Ceiling total	1762	sqft	897	Btuh
Floor total			0	Btuh
Infiltration	36	cfm	666	Btuh
Internal gain			1890	Btuh
Duct gain			3356	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**11653**	**Btuh**
Latent gain(ducts)			887	Btuh
Latent gain(infiltration)			1307	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1800	Btuh
Total latent gain			**3994**	**Btuh**
TOTAL HEAT GAIN			**15647**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY:
DATE: 12/14/21

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Norris Construction

Lake City, FL 32024

Project Title:
Norris Forest Country
Building Type: User

12/15/2021

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 37.0 F (MJ8 99%)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.21	Metal	0.33	N	15.0	12.2	183 Btuh
2	2, NFRC 0.21	Metal	0.33	N	9.0	12.2	110 Btuh
3	2, NFRC 0.21	Metal	0.33	N	20.0	12.2	244 Btuh
4	2, NFRC 0.21	Metal	0.33	E	8.0	12.2	98 Btuh
5	2, NFRC 0.21	Metal	0.33	E	6.0	12.2	73 Btuh
6	2, NFRC 0.21	Metal	0.33	S	40.0	12.2	488 Btuh
7	2, NFRC 0.21	Metal	0.33	W	15.0	12.2	183 Btuh
	Window Total				113.0(sqft)		1380 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.085)	13.0/1.0	463	3.14	1452 Btuh
2	Frame - Wood	- Ext	(0.085)	13.0/1.0	247	3.14	775 Btuh
3	Frame - Wood	- Adj	(0.085)	13.0/1.0	162	3.14	509 Btuh
4	Frame - Wood	- Ext	(0.085)	13.0/1.0	161	3.14	504 Btuh
5	Frame - Wood	- Ext	(0.085)	13.0/1.0	140	3.14	438 Btuh
6	Frame - Wood	- Ext	(0.085)	13.0/1.0	246	3.14	772 Btuh
	Wall Total				1418(sqft)		4451 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.460)	17	17.0	284 Btuh
2	Insulated - Exterior,	n	(0.460)	17	17.0	284 Btuh
3	Insulated - Garage,	n	(0.460)	18	17.0	303 Btuh
4	Insulated - Exterior,	n	(0.460)	20	17.0	340 Btuh
	Door Total			71(sqft)		1210Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Cathedral/L/Shing	(0.026)	38.0/0.0	1762	1.0	1676 Btuh
	Ceiling Total			1762(sqft)		1676Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	221.0 ft(perim.)	43.7	9649 Btuh
	Floor Total			1762 sqft		9649 Btuh

	Envelope Subtotal:	18366 Btuh

Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.18	15858	1.00	47.7	1932 Btuh

Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.145)	2944 Btuh
All Zones	**Sensible Subtotal All Zones**	**23242 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

Norris Construction

Lake City, FL 32024

Project Title:
Norris Forest Country
Building Type: User

12/15/2021

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	23242 Btuh 0 Btuh 23242 Btuh

EQUIPMENT

1. Electric Heat Pump	#	42000 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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System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Norris Construction

Lake City, FL 32024

Project Title:
Norris Forest Country

12/15/2021

Reference City: Gainesville, FL Temperature Difference: 17.0F(MJ8 99%) Humidity difference: 54gr.

Component Loads for Whole House

Window	Type* Panes	SHGC	U	InSh	IS	Ornt	Overhang Len	Hgt	Window Area(sqft) Gross	Shaded	Unshaded	HTM Shaded	Unshaded	Load
1	2 NFRC	0.21, 0.33	B-L	No	N		1.5ft	2.0ft	15.0	0.0	15.0	8	8	115 Btuh
2	2 NFRC	0.21, 0.33	B-L	No	N		1.5ft	2.0ft	9.0	0.0	9.0	8	8	69 Btuh
3	2 NFRC	0.21, 0.33	B-L	No	N		1.5ft	2.0ft	20.0	0.0	20.0	8	8	154 Btuh
4	2 NFRC	0.21, 0.33	B-L	No	E		1.5ft	2.0ft	8.0	0.0	8.0	8	19	151 Btuh
5	2 NFRC	0.21, 0.33	B-L	No	E		1.5ft	2.0ft	6.0	0.0	6.0	8	19	113 Btuh
6	2 NFRC	0.21, 0.33	B-L	No	S		1.5ft	2.0ft	40.0	40.0	0.0	8	9	307 Btuh
7	2 NFRC	0.21, 0.33	B-L	No	W		1.5ft	2.0ft	15.0	0.0	15.0	8	19	282 Btuh
	Window Total								113 (sqft)					1191 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.08	13.0/1.0	462.7	2.0	923 Btuh
2	Frame - Wood - Ext	0.08	13.0/1.0	247.0	2.0	492 Btuh
3	Frame - Wood - Adj	0.08	13.0/1.0	162.2	1.4	234 Btuh
4	Frame - Wood - Ext	0.08	13.0/1.0	160.5	2.0	320 Btuh
5	Frame - Wood - Ext	0.08	13.0/1.0	139.5	2.0	278 Btuh
6	Frame - Wood - Ext	0.08	13.0/1.0	246.0	2.0	491 Btuh
	Wall Total			1418 (sqft)		2738 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	16.7	12.9	215 Btuh
2	Insulated - Exterior	16.7	12.9	215 Btuh
3	Insulated - Garage	17.8	12.9	229 Btuh
4	Insulated - Exterior	20.0	12.9	258 Btuh
	Door Total	71 (sqft)		916 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Cath/Sngl Assem/Light/Shingle	0.026	38.0/0.0	1762.0	0.51	897 Btuh
	Ceiling Total			1762 (sqft)		897 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1762 (ft-perimeter)	0.0	0 Btuh
	Floor Total		1762.0 (sqft)		0 Btuh
			Envelope Subtotal:		5742 Btuh

	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
Infiltration	Natural	0.14	15858	1	35.8	666 Btuh
		Occupants	Btuh/occupant		Appliance	Load
Internal gain		3	X 230	+	1200	1890 Btuh
				Sensible Envelope Load:		8297 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.404)		3356 Btuh
				Sensible Load All Zones		**11653 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Norris Construction
Lake City, FL 32024

Project Title: Norris Forest Country
Climate:FL_GAINESVILLE_REGIONAL_A

12/15/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**8297 Btuh**
	Sensible Duct Load	3356 Btuh
	Total Sensible Zone Loads	**11653 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**11653 Btuh**
	Latent infiltration gain (for 54 gr. humidity difference)	1307 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	887 Btuh
	Latent occupant gain (3.0 people @ 200 Btuh per person)	600 Btuh
	Latent other gain	1200 Btuh
	Latent total gain	**3994 Btuh**
	TOTAL GAIN	**15647 Btuh**

EQUIPMENT

1. Central Unit	#	42000 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)

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