Residential System Sizing Calculation

Summary

Project Title:
Grand Cypress ALF

Lake City, FL

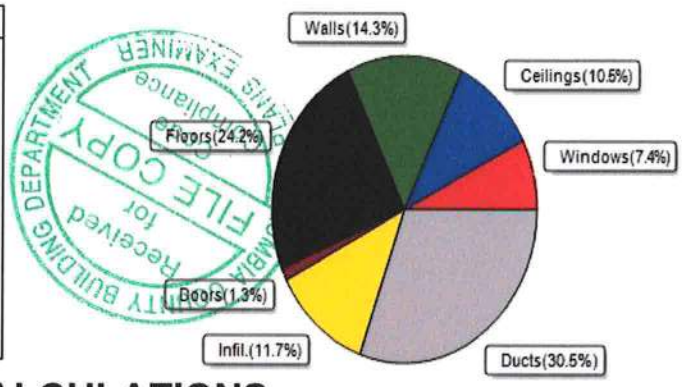
9/28/2020

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	**179645**	**Btuh**	**Total cooling load calculation**	**194626**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	100.0	179645	Sensible (SHR = 0.70)	94.8	134561
Heat Pump + Auxiliary(0.0kW)	100.0	179645	Latent	109.3	57669
			Total (Electric Heat Pump)	98.8	192230

WINTER CALCULATIONS

Winter Heating Load (for 17708 sqft)

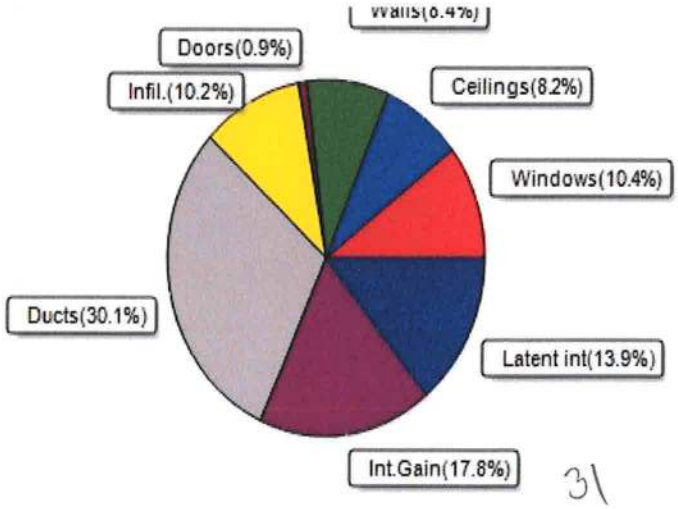
Load component			Load	
Window total	927	sqft	13344	Btuh
Wall total	7243	sqft	25714	Btuh
Door total	128	sqft	2355	Btuh
Ceiling total	18593	sqft	18876	Btuh
Floor total	17708	sqft	43522	Btuh
Infiltration	479	cfm	20986	Btuh
Duct loss			54848	Btuh
Subtotal			**179645**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**179645**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 17708 sqft)

Load component			Load	
Window total	927	sqft	20230	Btuh
Wall total	7243	sqft	16392	Btuh
Door total	128	sqft	1766	Btuh
Ceiling total	18593	sqft	16045	Btuh
Floor total			0	Btuh
Infiltration	359	cfm	7476	Btuh
Internal gain			34650	Btuh
Duct gain			45326	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**141887**	**Btuh**
Latent gain(ducts)			13334	Btuh
Latent gain(infiltration)			12406	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			27000	Btuh
Total latent gain			**52740**	**Btuh**
TOTAL HEAT GAIN			**194626**	**Btuh**



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8th Edition

EnergyGauge® System Sizing
PREPARED BY: _____
DATE: 9/28/2020

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Project Title:
Grand Cypress ALF
Building Type: User

Lake City, FL

9/28/2020

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	Metal	0.36	S	13.3	14.4	192 Btuh
2	2, NFRC 0.25	Vinyl	0.36	E	30.0	14.4	432 Btuh
3	2, NFRC 0.25	Vinyl	0.36	S	150.0	14.4	2160 Btuh
4	2, NFRC 0.25	Vinyl	0.36	W	30.0	14.4	432 Btuh
5	2, NFRC 0.25	Vinyl	0.36	S	13.3	14.4	192 Btuh
6	2, NFRC 0.25	Vinyl	0.36	E	105.0	14.4	1512 Btuh
7	2, NFRC 0.25	Metal	0.36	N	6.7	14.4	96 Btuh
8	2, NFRC 0.25	Vinyl	0.36	W	30.0	14.4	432 Btuh
9	2, NFRC 0.25	Vinyl	0.36	N	60.0	14.4	864 Btuh
10	2, NFRC 0.25	Vinyl	0.36	E	90.0	14.4	1296 Btuh
11	2, NFRC 0.25	Vinyl	0.36	N	90.0	14.4	1296 Btuh
12	2, NFRC 0.25	Metal	0.36	N	20.0	14.4	288 Btuh
13	2, NFRC 0.25	Vinyl	0.36	W	80.0	14.4	1152 Btuh
14	2, NFRC 0.25	Vinyl	0.36	N	60.0	14.4	864 Btuh
15	2, NFRC 0.25	Vinyl	0.36	E	30.0	14.4	432 Btuh
16	2, NFRC 0.25	Metal	0.36	N	13.3	14.4	192 Btuh
17	2, NFRC 0.25	Vinyl	0.36	W	105.0	14.4	1512 Btuh
	Window Total				926.7(sqft)		13344 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	322	3.55	1144 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	307	3.55	1089 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	1088	3.55	3861 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	307	3.55	1089 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	322	3.55	1144 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	1063	3.55	3773 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	329	3.55	1167 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	294	3.55	1044 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	449	3.55	1592 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	234	3.55	831 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	158	3.55	560 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	244	3.55	866 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	449	3.55	1592 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	294	3.55	1044 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	322	3.55	1144 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	1063	3.55	3773 Btuh
	Wall Total				7243(sqft)		25714 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.460)	20	18.4	368 Btuh
2	Insulated - Exterior,	n	(0.460)	48	18.4	883 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)	20	18.4	368 Btuh
	Door Total			128(sqft)		2355Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Grand Cypress ALF
Building Type: User

Lake City, FL

9/28/2020

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Metal	(0.025)	38.0/0.0	18593	1.0	18876 Btuh
	Ceiling Total			18593(sqft)		18876Btuh
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	922.1 ft(perim.)	47.2	43522 Btuh
	Floor Total			17708 sqft		43522 Btuh
				Envelope Subtotal:		103811 Btuh
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.18	159372	1.00	479.2	20986 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.439)	54848 Btuh
All Zones			**Sensible Subtotal All Zones**			**179645 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	179645 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	179645 Btuh

EQUIPMENT

1. Electric Heat Pump	#	179645 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)

Version 8

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Grand Cypress ALF

Lake City, FL

9/28/2020

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

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	0.25, 0.36		No	No	S	9.5ft.	1.0ft.	13.3	13.3	0.0	12	14	161	Btuh
2	2 NFRC	0.25, 0.36		No	No	E	1.5ft.	1.0ft.	30.0	1.5	28.5	12	31	901	Btuh
3	2 NFRC	0.25, 0.36		No	No	S	1.5ft.	1.0ft.	150.0	150.0	0.0	12	14	1815	Btuh
4	2 NFRC	0.25, 0.36		No	No	W	1.5ft.	1.0ft.	30.0	1.5	28.5	12	31	901	Btuh
5	2 NFRC	0.25, 0.36		No	No	S	9.5ft.	1.0ft.	13.3	13.3	0.0	12	14	161	Btuh
6	2 NFRC	0.25, 0.36		No	No	E	1.5ft.	1.0ft.	105.0	5.1	99.9	12	31	3152	Btuh
7	2 NFRC	0.25, 0.36		No	No	N	9.5ft.	1.0ft.	6.7	0.0	6.7	12	12	81	Btuh
8	2 NFRC	0.25, 0.36		No	No	W	1.5ft.	1.0ft.	30.0	1.5	28.5	12	31	901	Btuh
9	2 NFRC	0.25, 0.36		No	No	N	1.5ft.	1.0ft.	60.0	0.0	60.0	12	12	726	Btuh
10	2 NFRC	0.25, 0.36		No	No	E	1.5ft.	1.0ft.	90.0	4.4	85.6	12	31	2702	Btuh
11	2 NFRC	0.25, 0.36		No	No	N	1.5ft.	1.0ft.	90.0	0.0	90.0	12	12	1089	Btuh
12	2 NFRC	0.25, 0.36		No	No	N	1.5ft.	1.0ft.	20.0	0.0	20.0	12	12	242	Btuh
13	2 NFRC	0.25, 0.36		No	No	W	1.5ft.	1.0ft.	80.0	2.9	77.1	12	31	2420	Btuh
14	2 NFRC	0.25, 0.36		No	No	N	1.5ft.	1.0ft.	60.0	0.0	60.0	12	12	726	Btuh
15	2 NFRC	0.25, 0.36		No	No	E	1.5ft.	1.0ft.	30.0	1.5	28.5	12	31	901	Btuh
16	2 NFRC	0.25, 0.36		No	No	N	9.5ft.	1.0ft.	13.3	0.0	13.3	12	12	161	Btuh
17	2 NFRC	0.25, 0.36		No	No	W	1.5ft.	1.0ft.	105.0	5.1	99.9	12	31	3152	Btuh
	Excursion													40	Btuh
	Window Total								927 (sqft)					20230	Btuh

Walls	Type	U-Value	R-Value	Area(sqft)	HTM	Load	
			Cav/Sheath				
1	Frame - Wood - Ext	0.09	13.0/0.0	322.2	2.3	729	Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	306.8	2.3	694	Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	1087.5	2.3	2461	Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	306.8	2.3	694	Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	322.2	2.3	729	Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	1062.8	2.3	2405	Btuh
7	Frame - Wood - Ext	0.09	13.0/0.0	328.8	2.3	744	Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	294.0	2.3	665	Btuh
9	Frame - Wood - Ext	0.09	13.0/0.0	448.5	2.3	1015	Btuh
10	Frame - Wood - Ext	0.09	13.0/0.0	234.0	2.3	530	Btuh
11	Frame - Wood - Ext	0.09	13.0/0.0	157.8	2.3	357	Btuh
12	Frame - Wood - Ext	0.09	13.0/0.0	244.0	2.3	552	Btuh
13	Frame - Wood - Ext	0.09	13.0/0.0	448.5	2.3	1015	Btuh
14	Frame - Wood - Ext	0.09	13.0/0.0	294.0	2.3	665	Btuh
15	Frame - Wood - Ext	0.09	13.0/0.0	322.2	2.3	729	Btuh
16	Frame - Wood - Ext	0.09	13.0/0.0	1062.8	2.3	2405	Btuh
	Wall Total			7243 (sqft)		16392	Btuh

Doors	Type	Area (sqft)	HTM	Load	
1	Insulated - Exterior	20.0	13.8	276	Btuh
2	Insulated - Exterior	48.0	13.8	662	Btuh
3	Insulated - Exterior	20.0	13.8	276	Btuh
4	Insulated - Exterior	20.0	13.8	276	Btuh
5	Insulated - Exterior	20.0	13.8	276	Btuh
	Door Total	128 (sqft)		1766	Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load	
1	Vented Attic/Light/Metal/RB	0.025	38.0/0.0	18593.0	0.86	16045	Btuh
	Ceiling Total			18593 (sqft)		16045	Btuh

Floors	Type	R-Value	Size	HTM	Load	
1	Slab On Grade	0.0	17708 (ft-perimeter)	0.0	0	Btuh
	Floor Total		17708.0 (sqft)		0	Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Grand Cypress ALF

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

9/28/2020

				Envelope Subtotal:		54434 Btuh
Infiltration	Type Natural	Average ACH 0.14	Volume(cuft) 159372	Wall Ratio 1	CFM= 359.4	Load 7476 Btuh
Internal gain		Occupants 135	Btuh/occupant X 230	+ +	Appliance 3600	Load 34650 Btuh
				Sensible Envelope Load:		96560 Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.469)		45326 Btuh
				Sensible Load All Zones		**141887 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Grand Cypress ALF
Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

9/28/2020

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**96560 Btuh**
	Sensible Duct Load	45326 Btuh
	Total Sensible Zone Loads	**141887 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**141887 Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	12406 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	13334 Btuh
	Latent occupant gain (135.0 people @ 200 Btuh per person)	27000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**52740 Btuh**
	TOTAL GAIN	**194626 Btuh**

EQUIPMENT

1. Central Unit	#	192230 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