CP-CC-FWS-6 RV
HVAC Load Calculations

for

Chemerys Construction
2025 NW County Road 236
High Springs, FL 32643

Prepared By:

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Friday, December 4, 2020

Rhvac is an ACCA approved Manual J, D and S computer program.
Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.

Project Report

General Project Information

Project Title:	CP-CC-FWS-6 RV
Designed By:	Ken Fonorow
Project Date:	12/2/2020
Project Comment:	Custom home
Client Name:	Chemerys Construction
Client Address:	2025 NW County Road 236
Client City:	High Springs, FL 32643
Client Phone:	352 222-6964
Client E-Mail Address:	cjchemerys@hotmail.com
Company Name:	Florida H.E.R.O., Inc.
Company Representative:	Ken Fonorow
Company Address:	15220 NW 5th Ave
Company City:	Newberry, Fl 32669
Company Phone:	(352) 472-5661
Company E-Mail Address:	ken@floridahero.com
Company Website:	www.floridahero.com

Design Data

Reference City:		Gainesville, Florida
Building Orientation:		Front door faces East
Daily Temperature Range:		Medium
Latitude:	29	Degrees
Elevation:	152	ft.
Altitude Factor:	0.995	

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	33	30.8	n/a	n/a	72	n/a
Summer:	92	77	51%	50%	75	52

Check Figures

Total Building Supply CFM:	800	CFM Per Square ft.:	0.556
Square ft. of Room Area:	1,440	Square ft. Per Ton:	838
Volume (ft³):	12,962		

Building Loads

Total Heating Required Including Ventilation Air:	24,412	Btuh	24.412	MBH
Total Sensible Gain:	16,656	Btuh	81	%
Total Latent Gain:	3,959	Btuh	19	%
Total Cooling Required Including Ventilation Air:	20,614	Btuh	1.72	Tons (Based On Sensible + Latent)

Notes

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All computed results are estimates as building use and weather may vary.
Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.

Miscellaneous Report

System 1 Whole House Input Data	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	33	30.8	80%	n/a	72	n/a
Summer:	92	77	51%	50%	75	51.69

Duct Sizing Inputs

	Main Trunk		Runouts	
Calculate:	Yes		Yes	
Use Schedule:	Yes		Yes	
Roughness Factor:	0.15000		0.15000	
Pressure Drop:	0.1000	in.wg./100 ft.	0.1000	in.wg./100 ft.
Minimum Velocity:	650	ft./min	450	ft./min
Maximum Velocity:	900	ft./min	750	ft./min
Minimum Height:	0	in.	0	in.
Maximum Height:	0	in.	0	in.

Outside Air Data

	Winter		Summer	
Infiltration Specified:	0.310	AC/hr	0.160	AC/hr
	67	CFM	35	CFM
Infiltration Actual:	0.373	AC/hr	0.000	AC/hr
Above Grade Volume:	X 12,962	Cu.ft.	X 12,962	Cu.ft.
	4,841	Cu.ft./hr	0	Cu.ft./hr
	X 0.0167		X 0.0167	
Total Building Infiltration:	81	CFM	0	CFM
Total Building Ventilation:	0	CFM	45	CFM

---System 1---

Infiltration & Ventilation Sensible Gain Multiplier: 18.60 = (1.10 X 0.995 X 17.00 Summer Temp. Difference)
Infiltration & Ventilation Latent Gain Multiplier: 34.96 = (0.68 X 0.995 X 51.69 Grains Difference)
Infiltration & Ventilation Sensible Loss Multiplier: 42.66 = (1.10 X 0.995 X 39.00 Winter Temp. Difference)
Winter Infiltration Specified: 0.310 AC/hr (67 CFM), Construction: Semi-Tight
Summer Infiltration Specified: 0.160 AC/hr (35 CFM), Construction: Semi-Tight

Duct Load Factor Scenarios for System 1

No.	Type	Description	Location	Attic Ceiling	Duct Leakage	Duct Insulation	Surface Area	From [T]MDD
1	Supply	Main	Attic	16A	0.06	6	369	No
1	Return	Main	Attic	16A	0.06	6	137	No

Duct Size Preview

Room or Duct Name	Source	Minimum Velocity	Maximum Velocity	Rough. Factor	Design L/100	SP Loss	Duct Velocity	Duct Length	Htg Flow	Clg Flow	Act. Flow	Duct Size	Reg Size
System 1													
Supply Runouts													
Zone 1													
1-Master Bedroom	Built-In	450	750	0.15	0.1		422		123	166	166	2--6	
2-Master WIC	Built-In	450	750	0.15	0.1		134.4		19	12	12	1--4	
3-Master Bath	Built-In	450	750	0.15	0.1		445.5		54	39	39	1--4	
4-Living/Dining Room	Built-In	450	750	0.15	0.1		409.3		264	241	241	3--6	
5-Kitchen/Nook	Built-In	450	750	0.15	0.1		670.6		124	179	179	1--7	
6-Bedroom 2	Built-In	450	750	0.15	0.1		335.3		63	66	66	1--6	
7-Bath 1	Built-In	450	750	0.15	0.1		228.1		17	20	20	1--4	
8-Bedroom 3	Built-In	450	750	0.15	0.1		395.3		135	78	78	1--6	
Other Ducts in System 1													
Supply Main Trunk	Built-In	650	900	0.15	0.1		800		800	800	800	12x12	

Summary

System 1

Heating Flow:	800
Cooling Flow:	800

Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
FG 34 23: Glazing-Fr Dr Dbl Pn Vyn U .34 SHGC .23, ground reflectance = 0.32, medium color blinds at 45° with 50% coverage, U-value 0.34, SHGC 0.23	48	636	0	416	416
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.23, outdoor insect screen with 50% coverage, medium color blinds at 45° with 50% coverage, U-value 0.34, SHGC 0.23	60	796	0	1,232	1,232
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.32, outdoor insect screen with 50% coverage, medium color blinds at 45° with 50% coverage, U-value 0.34, SHGC 0.23	30	398	0	222	222
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.32, outdoor insect screen with 50% coverage, medium color blinds at 45° with 25% coverage, U-value 0.34, SHGC 0.23	27	358	0	482	482
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.23, outdoor insect screen with 50% coverage, medium color blinds at 45° with 25% coverage, U-value 0.34, SHGC 0.23	30	398	0	425	425
11P: Door-Metal - Polyurethane Core, U-value 0.29	24	271	0	195	195
12E-0sw: Wall-Frame, R-19 insulation in 2 x 6 stud cavity, no board insulation, siding finish, wood studs, U-value 0.068	1710.1	4,535	0	2,255	2,255
R20 UV: Roof/Ceiling-Roof Joists Between Roof Deck and Ceiling or Foam Encapsulated Roof Joists, Custom, Open cell foam R 20, U-value 0.047	1440.1	2,639	0	3,519	3,519
22A-pl: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, light dry soil, U-value 0.989	214	8,254	0	0	0
Subtotals for structure:		18,285	0	8,746	8,746
People:	5		1,000	1,150	2,150
Equipment:			950	2,925	3,875
Lighting:	0			0	0
Ductwork:		2,685	435	2,998	3,434
Infiltration: Winter CFM: 81, Summer CFM: 0		3,442	0	0	0
Ventilation: Winter CFM: 0, Summer CFM: 45		0	1,573	837	2,410
Exhaust: Winter CFM: 45, Summer CFM: 0					
Total Building Load Totals:		24,412	3,959	16,656	20,614

Check Figures

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System 1 Room Load Summary

No	Room Name	Area SF	Htg Sens Btuh	Min Htg CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Min Clg CFM	Act Sys CFM
---Zone 1---										
1	Master Bedroom	189	3,654	67	2-6	422	3,109	400	142	166
2	Master WIC	50	553	10	1-4	134	220	0	10	12
3	Master Bath	70	1,594	29	1-4	445	729	350	33	39
4	Living/Dining Room	570	7,823	143	3-6	409	4,523	400	207	241
5	Kitchen/Nook	192	3,672	67	1-7	671	3,362	550	154	179
6	Bedroom 2	162	1,866	34	1-6	335	1,235	0	56	66
7	Bath 1	45	517	9	1-4	228	373	250	17	20
8	Bedroom 3	162	4,007	73	1-6	395	1,456	0	67	78
	Ventilation		0				837	1,573		
	Duct Latent							318		
	Return Duct		727				812	118		
	System 1 total	1,440	24,412	433			16,656	3,959	686	800

System 1 Main Trunk Size:	12x12	in.
Velocity:	800	ft./min
Loss per 100 ft.:	0.527	in.wg

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	1.72	81% / 19%	16,656	3,959	20,614
Actual:	1.85	77% / 23%	17,094	5,106	22,200

Equipment Data

	Heating System	Cooling System
Type:	Air Source Heat Pump	Air Source Heat Pump
Model:	CH14NB024*0**A*	CH14NB024*0**A*
Indoor Model:		FB4CNP030L
Brand:	14 SEER HP	14 SEER HP
Description:	Air Source Heat Pump	Air Source Heat Pump
Efficiency:	8.2 HSPF	14 SEER
Sound:	0	0
Capacity:	22,200 Btuh	22,200 Btuh
Sensible Capacity:	n/a	17,094 Btuh
Latent Capacity:	n/a	5,106 Btuh
AHRI Reference No.:	n/a	9162148

This system's equipment was selected in accordance with ACCA Manual S.
Manual S equipment sizing data: SODB: 92F, SOWB: 77F, WODB: 33F, SIDB: 75F, SIRH: 50%, WIDB: 72F, Sen. gain: 16,656 Btuh, Lat. gain: 3,959 Btuh, Sen. loss: 24,412 Btuh, Entering clg. coil DB: 76.9F, Entering clg. coil WB: 63.8F, Entering htg. coil DB: 71.2F, Clg. coil TD: 20F, Htg. coil TD: 50F, Req. clg. airflow: 686 CFM, Req. htg. airflow: 433 CFM