CP-AB-Floyd
HVAC Load Calculations

for

Amira Builders
14901 N Main St
Alachua, FL 32615

Prepared By:

Ken Fonorow
Florida H.E.R.O., Inc.
15220 NW 5th Ave
Newberry, Fl 32669
(352) 472-5661
Tuesday, February 2, 2021

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-AB-Floyd
Designed By:	Ken Fonorow
Project Date:	2/2/2021
Project Comment:	Custom Home
Client Name:	Amira Builders
Client Address:	14901 N Main St
Client City:	Alachua, FL 32615
Client Phone:	386 462-9071
Client E-Mail Address:	amirabuilders@aol.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 West
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:	1,000	CFM Per Square ft.:	0.438
Square ft. of Room Area:	2,285	Square ft. Per Ton:	970
Volume (ft³):	23,339		

Building Loads

Total Heating Required Including Ventilation Air:	33,789	Btuh	33.789	MBH
Total Sensible Gain:	22,084	Btuh	78	%
Total Latent Gain:	6,194	Btuh	22	%
Total Cooling Required Including Ventilation Air:	28,278	Btuh	2.36	Tons (Based On Sensible + Latent)

Notes

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.
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:	0.220	AC/hr	0.110	AC/hr
	86	CFM	43	CFM
Infiltration Actual:	0.229	AC/hr	0.089	AC/hr
Above Grade Volume:	X 23,339	Cu.ft.	X 23,339	Cu.ft.
	5,349	Cu.ft./hr	2,084	Cu.ft./hr
	X 0.0167		X 0.0167	
Total Building Infiltration:	89	CFM	35	CFM
Total Building Ventilation:	25	CFM	50	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: 0.220 AC/hr (86 CFM), Construction: Semi-Tight
Summer Infiltration Specified: 0.110 AC/hr (43 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	16B	0.06	6	614	No
1	Return	Main	Attic	16B	0.06	6	227	No

Tabular Manual D Ductsize Grid

Ducts	Room	Feeds Zones	Flow	Diam	Wid	Hei	Vel
CP-AB-Floy							
CP-AB-Floyd							
System 2							
Supply							
Return							
System 4							
Supply							
Return							
System 6							
Supply							
Return							
System 8							
Supply							
Return							
System 10							
Supply							
Return							
System 12							
Supply							
Return							
System 14							
Supply							
Return							

Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
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	81	1,075	0	1,129	1,129
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.23, U-value 0.34, SHGC 0.23	38.2	507	0	524	524
FrDr 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	114.5	1,517	0	1,108	1,108
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	42	556	0	738	738
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.23, medium color blinds at 45° with 100% coverage, U-value 0.34, SHGC 0.23	30	398	0	608	608
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.32, U-value 0.34, SHGC 0.23	12	160	0	126	126
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	42	556	0	712	712
11P: Door-Metal - Polyurethane Core, U-value 0.29	17.8	201	0	145	145
12E-0sw: Wall-Frame, R-19 insulation in 2 x 6 stud cavity, no board insulation, siding finish, wood studs, U-value 0.068	2218.4	5,885	0	2,929	2,929
16B-30: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Vented Attic, No Radiant Barrier, Dark Asphalt Shingles or Dark Metal, Tar and Gravel or Membrane, R-30 insulation, U-value 0.032	2284.9	2,852	0	3,803	3,803
16B-19: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Vented Attic, No Radiant Barrier, Dark Asphalt Shingles or Dark Metal, Tar and Gravel or Membrane, R-19 insulation, U-value 0.049	96	183	0	246	246
22A-pl: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, light dry soil, U-value 0.989	267	10,299	0	0	0
Subtotals for structure:		24,189	0	12,068	12,068
People:	6		1,200	1,380	2,580
Equipment:			1,350	2,650	4,000
Lighting:	0			0	0
Ductwork:		4,730	681	3,533	4,215
Infiltration: Winter CFM: 89, Summer CFM: 35		3,803	1,215	647	1,862
Ventilation: Winter CFM: 25, Summer CFM: 50		1,067	1,748	930	2,678
Exhaust: Winter CFM: 50, Summer CFM: 25					
AED Excursion:		0	0	876	876
Total Building Load Totals:		33,789	6,194	22,084	28,278

Check Figures

Total Building Supply CFM:	1,000	CFM Per Square ft.:	0.438
Square ft. of Room Area:	2,285	Square ft. Per Ton:	970
Volume (ft³):	23,339		

Building Loads

Total Heating Required Including Ventilation Air: 33,789 Btuh 33.789 MBH

Total Building Summary Loads (cont'd)

Building Loads

Total Sensible Gain:	22,084	Btuh	78	%
Total Latent Gain:	6,194	Btuh	22	%
Total Cooling Required Including Ventilation Air:	28,278	Btuh	2.36	Tons (Based On Sensible + Latent)

Notes

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.
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.

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 Suite	252	3,430	63	2-6	358	3,080	535	141	141
2	Master Bath	180	2,784	51	1-6	338	1,452	668	66	66
3	MBR WIC	143	2,374	43	1-4	376	718	103	33	33
4	Laundry	99	139	3	1-4	251	478	350	22	22
5	PWDR	36	816	15	1-4	113	216	88	10	10
6	Garage Entry	90	1,517	28	0-0	0	669	51	31	31
	Zone 1 subtotal	800	11,059	202			6,613	1,795	302	302
---Zone 2---										
7	Kitchen	204	2,452	45	1-7	481	2,815	648	129	129
8	Pantry	76	858	16	1-4	306	584	34	27	27
9	Dining	156	2,120	39	1-6	523	2,246	84	103	103
10	Foyer	96	1,961	36	1-7	575	3,361	67	154	154
11	Great Room	345	3,177	58	2-6	504	4,332	483	198	198
12	Bedroom 2	182	3,331	61	1-7	559	3,266	133	149	149
13	Bath	195	1,651	30	1-4	438	837	311	38	38
14	Bedroom 3	192	4,332	79	1-6	432	1,856	187	85	85
15	BR 3 WIC	40	504	9	1-4	88	167	23	8	8
	Zone 2 subtotal	1,485	20,387	373			19,464	1,970	890	890
	Ventilation		1,067				930	1,748		
	Duct Latent							497		
	Return Duct		1,277				954	184		
	System 1 total	2,285	33,789	575			22,084	6,194	923	1,000

System 1 Main Trunk Size:	14x14	in.
Velocity:	735	ft./min
Loss per 100 ft.:	0.347	in.wg

Note: Since the system is multizone, the Peak Fenestration Gain Procedure was used to determine glass sensible gains at the room and zone levels, so the sums of the zone sensible gains and airflows for cooling shown above are not intended to equal the totals at the system level. Room and zone sensible gains and cooling CFM values are for the hour in which the glass sensible gain for the zone is at its peak. Sensible gains at the system level are based on the "Average Load Procedure + Excursion" method.

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	2.36	78% / 22%	22,084	6,194	28,278
Actual:	2.38	77% / 23%	22,022	6,578	28,600

Equipment Data

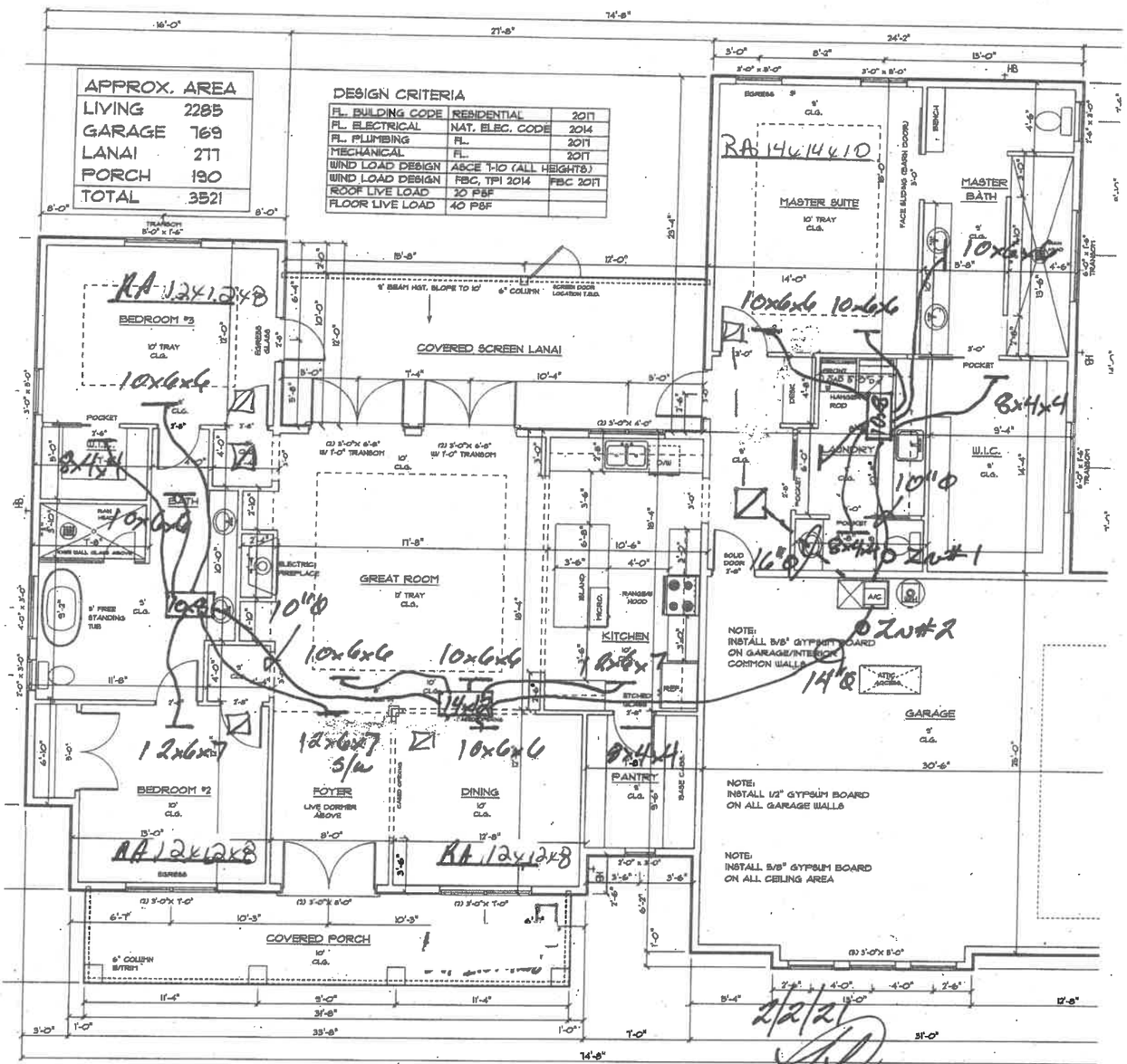
	Heating System	Cooling System
Type:	Air Source Heat Pump	Air Source Heat Pump
Model:	CH14NB030*0**A*	CH14NB030*0**A*
Indoor Model:		FB4CNP030L
Brand:	14 SEER HP	14 SEER HP
Description:	Air Source Heat Pump	Air Source Heat Pump
Efficiency:	8.2 HSPF	14 SEER
Sound:	0	0
Capacity:	28,600 Btuh	28,600 Btuh
Sensible Capacity:	n/a	22,022 Btuh
Latent Capacity:	n/a	6,578 Btuh
AHRI Reference No.:	n/a	9162305

System 1 Room Load Summary (cont'd)

Equipment Data

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: 22,084 Btuh, Lat. gain: 6,194 Btuh, Sen. loss: 33,789 Btuh, Entering clg. coil DB: 76.7F, Entering clg. coil WB: 63.6F, Entering htg. coil DB: 69.9F, Clg. coil TD: 20F, Htg. coil TD: 50F, Req. clg. airflow: 923 CFM, Req. htg. airflow: 575 CFM

CP-AB-Floyd



MAIN FLOOR PLAN