CP-MRD-FC-4
HVAC Load Calculations

for

Maronda Homes

Prepared By:

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15220 NW 5th Ave
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Rhvac is an ACCA approved Manual J, D and S computer program.
Calculations are performed per ACCA Manual J 8th Edition, Version 2.50, and ACCA Manual D.

Project Report

General Project Information

Project Title:	CP-MRD-FC-4
Designed By:	Ken Fonorow
Project Date:	1/22/2025
Project Comment:	Memphis Model
Client Name:	Maronda Homes
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
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Design Data

Reference City:		Gainesville, Florida
Building Orientation:		Front door faces South
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.:	0.624
Square ft. of Room Area:	1,602	Square ft. Per Ton:	725
Volume (ft³):	14,418		

Building Loads

Total Heating Required Including Ventilation Air:	28,368	Btuh	28.368	MBH
Total Sensible Gain:	18,307	Btuh	69	%
Total Latent Gain:	8,213	Btuh	31	%
Total Cooling Required Including Ventilation Air:	26,521	Btuh	2.21	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.	7	in.

Outside Air Data

	Winter		Summer	
Infiltration Specified:	0.140	AC/hr	0.070	AC/hr
	34	CFM	17	CFM
Infiltration Actual:	0.140	AC/hr	0.070	AC/hr
Above Grade Volume:	X 14,418	Cu.ft.	X 14,418	Cu.ft.
	2,019	Cu.ft./hr	1,009	Cu.ft./hr
	X 0.0167		X 0.0167	
Total Building Infiltration:	34	CFM	17	CFM
Total Building Ventilation:	125	CFM	125	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: 0.140 AC/hr (34 CFM), Construction: Tight
Summer Infiltration Specified: 0.070 AC/hr (17 CFM), Construction: 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	432	No
1	Return	Main	Cond. Space	-	0.06	6	160	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		429		153	168	168	2--6	
2-Master Bath	Built-In	450	750	0.15	0.1		653.1		90	57	57	1--4	
3-Master WIC	Built-In	450	750	0.15	0.1		185.5		29	16	16	1--4	
4-Bedroom 3	Built-In	450	750	0.15	0.1		584.3		118	115	115	1--6	
5-Kitchen	Built-In	450	750	0.15	0.1		641		51	171	171	1--7	
6-Foyer	Built-In	450	750	0.15	0.1		626.9		102	55	55	1--4	
7-Bedroom 2	Built-In	450	750	0.15	0.1		445.2		172	87	87	1--6	
8-Bath 2	Built-In	450	750	0.15	0.1		154.6		24	13	13	1--4	
9-Laundry	Built-In	450	750	0.15	0.1		477		34	42	42	1--4	
10-Great Room/Nook	Built-In	450	750	0.15	0.1		467		227	275	275	3--6	
Other Ducts in System 1													
Supply Main Trunk	Built-In	650	900	0.15	0.1		734.7		1,000	1,000	1,000	14x14	

Summary

System 1

Heating Flow: 1000

Cooling Flow: 1000

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	80	1,061	0	1,289	1,289
SGD U 34 SHGC 23: Glazing-SGD DbPnVyFr 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	40	530	0	304	304
11P: Door-Metal - Polyurethane Core, U-value 0.29	37.8	427	0	307	307
12C-0sw: Wall-Frame, R-13 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs, U-value 0.091	1583.3	5,620	0	3,386	3,386
16B-38: 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-38 insulation, U-value 0.026	1702	1,725	0	2,301	2,301
22A-pl: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, light dry soil, U-value 0.989	195	7,522	0	0	0
Subtotals for structure:		16,885	0	7,587	7,587
People:	6		1,200	1,380	2,580
Equipment:			1,450	2,950	4,400
Lighting:	0			0	0
Ductwork:		4,715	606	3,754	4,360
Infiltration: Winter CFM: 34, Summer CFM: 17		1,435	587	312	899
Ventilation: Winter CFM: 125, Summer CFM: 125		5,333	4,370	2,325	6,694
Exhaust: Winter CFM: 125, Summer CFM: 125					
Total Building Load Totals:		28,368	8,213	18,307	26,521

Check Figures

Total Building Supply CFM:	1,000	CFM Per Square ft.:	0.624
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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	238	3,524	64	2-6	429	2,692	644	123	168
2	Master Bath	96	2,081	38	1-4	653	911	411	42	57
3	Master WIC	54	658	12	1-4	186	259	18	12	16
4	Bedroom 3	143	2,717	50	1-6	584	1,834	73	84	115
5	Kitchen	176	1,186	22	1-7	641	2,738	570	125	171
6	Foyer	91	2,344	43	1-4	627	874	62	40	55
7	Bedroom 2	154	3,967	73	1-6	445	1,397	109	64	87
8	Bath 2	45	548	10	1-4	155	216	265	10	13
9	Laundry	91	777	14	1-4	477	665	370	30	42
10	Great Room/Nook	514	5,233	96	3-6	467	4,397	715	201	275
	Ventilation		5,333				2,325	4,370		
	Duct Latent							606		
	System 1 total	1,602	28,368	421			18,307	8,213	730	1,000

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

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	2.21	69% / 31%	18,307	8,213	26,521
Actual:	2.43	76% / 24%	22,200	7,000	29,200

Equipment Data

	Heating System	Cooling System
Type:	Air Source Heat Pump	Air Source Heat Pump
Model:	4TWR5030H1+TDR	4TTR5030H1
Indoor Model:		TEM6A0B30H21+TDR
Brand:	TRANE	TRANE
Description:	Air Source Heat Pump	Air Source Heat Pump
Efficiency:	8.1 HSPF2	15.2 SEER2
Sound:	0	0
Capacity:	27,400 Btuh	29,200 Btuh
Sensible Capacity:	n/a	22,200 Btuh
Latent Capacity:	n/a	7,000 Btuh
AHRI Reference No.:	n/a	210798234

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: 18,307 Btuh, Lat. gain: 8,213 Btuh, Sen. loss: 28,368 Btuh, Entering clg. coil DB: 77.2F, Entering clg. coil WB: 64.6F, Entering htg. coil DB: 67.1F, Clg. coil TD: 20F, Htg. coil TD: 50F, Req. clg. airflow: 730 CFM, Req. htg. airflow: 421 CFM