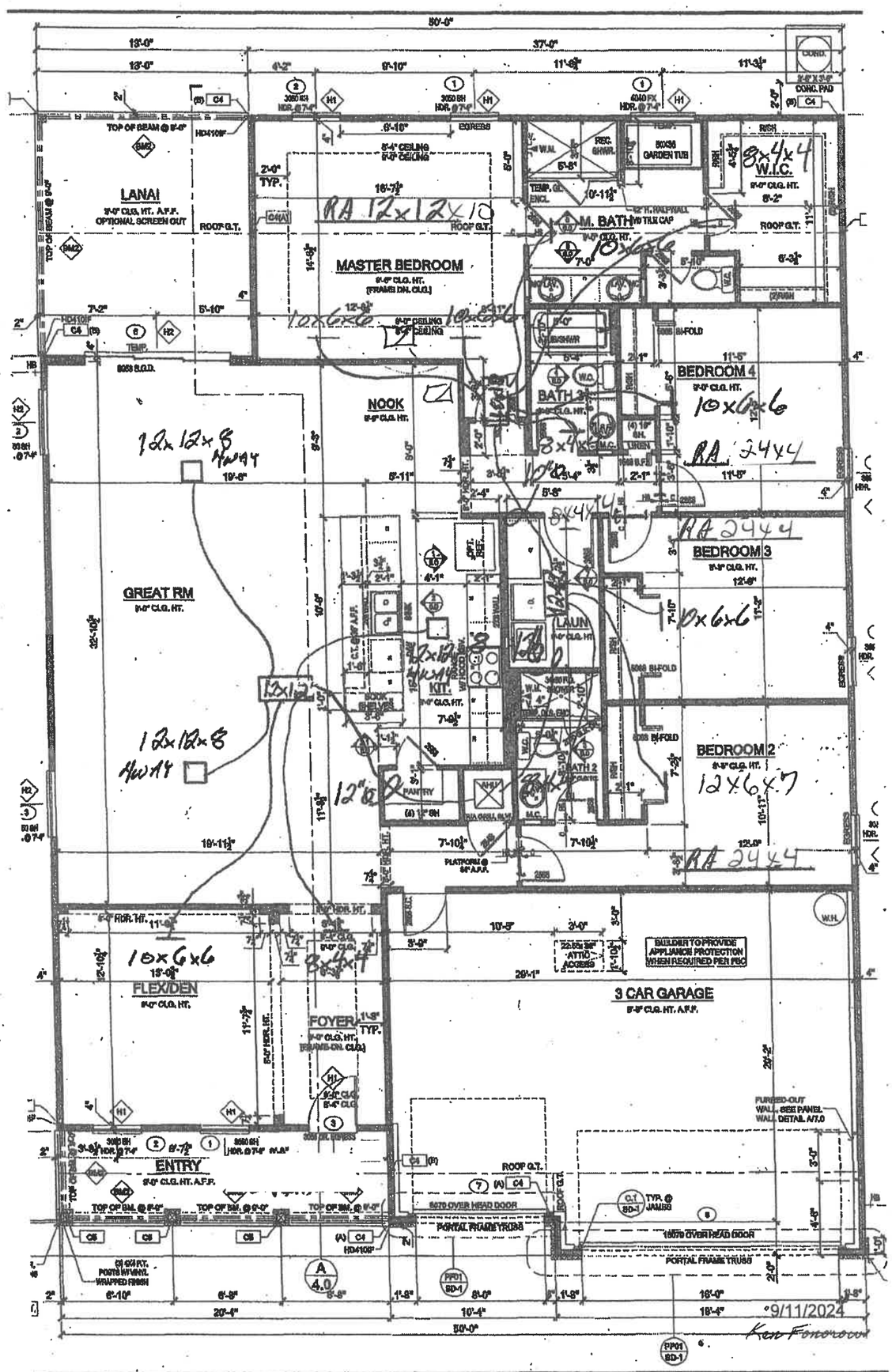
CP-MRD-FC-3


LANAI
MASTER BEDROOM
NOOK
GREAT RM
KIT.
FLEX/DEN
FOYER
ENTRY
M. BATH
BEDROOM 4
BEDROOM 3
BEDROOM 2
3 CAR GARAGE
RA 12x12x10
10x6x6
12x12x8
12x6x7
RA 24x4
8x4x4
W.I.C.
9/11/2024
Ken Fonoroow

CP-MRD-FC-3
HVAC Load Calculations

for

Maronda Homes

Prepared By:

Ken Fonorow
Florida H.E.R.O., Inc.
15220 NW 5th Ave
Newberry, Fl 32669
(352) 472-5661
Wednesday, September 11, 2024

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-3
Designed By:	Ken Fonorow
Project Date:	9/11/2024
Project Comment:	Harmony 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
Company E-Mail Address:	ken@floridahero.com
Company Website:	www.floridahero.com

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:	1,200	CFM Per Square ft.:	0.487
Square ft. of Room Area:	2,466	Square ft. Per Ton:	956
Volume (ft³):	22,196		

Building Loads

Total Heating Required Including Ventilation Air:	33,574	Btuh	33.574	MBH
Total Sensible Gain:	23,441	Btuh	76	%
Total Latent Gain:	7,519	Btuh	24	%
Total Cooling Required Including Ventilation Air:	30,960	Btuh	2.58	Tons (Based On Sensible + Latent)

Notes

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Calculations are performed per ACCA Manual J 8th Edition, Version 2.50, 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
	81	CFM	41	CFM
Infiltration Actual:	0.227	AC/hr	0.096	AC/hr
Above Grade Volume:	X 22,196	Cu.ft.	X 22,196	Cu.ft.
	5,028	Cu.ft./hr	2,126	Cu.ft./hr
	X 0.0167		X 0.0167	
Total Building Infiltration:	84	CFM	35	CFM
Total Building Ventilation:	35	CFM	55	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 (81 CFM), Construction: Semi-Tight
Summer Infiltration Specified: 0.110 AC/hr (41 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	0.09	6	537	No
1	Return	Main	Cond. Space	-	0.15	6	24	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		392		160	154	154	2--6	
2-Deluxe M Bath	Built-In	450	750	0.15	0.1		398.3		58	78	78	1--6	
3-Master WIC	Built-In	450	750	0.15	0.1		480.2		87	42	42	1--4	
4-Bath 3	Built-In	450	750	0.15	0.1		61.7		3	5	5	1--4	
5-Laundry	Built-In	450	750	0.15	0.1		81.5		4	7	7	1--4	
6-Bedroom 4	Built-In	450	750	0.15	0.1		402.5		71	79	79	1--6	
7-Bedroom 3	Built-In	450	750	0.15	0.1		416.6		66	82	82	1--6	
8-Bedroom 2	Built-In	450	750	0.15	0.1		452.8		154	121	121	1--7	
9-Bath 2	Built-In	450	750	0.15	0.1		60.1		3	5	5	1--4	
10-Kitchen/Nook/Great Ro	Built-In	450	750	0.15	0.1		478.1		362	501	501	3--8	
11-Flex/Den	Built-In	450	750	0.15	0.1		390.6		140	77	77	1--6	
12-Foyer	Built-In	450	750	0.15	0.1		561.6		93	49	49	1--4	
Other Ducts in System 1													
Supply Main Trunk	Built-In	650	900	0.15	0.1		675		1,200	1,200	1,200	16x16	

Summary

System 1

Heating Flow: 1200

Cooling Flow: 1200

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	85	1,127	0	1,477	1,477
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.23, U-value 0.34, SHGC 0.23	12	159	0	127	127
VYN 34 23: Glazing-Dbl Pn Vyn Fr U .34 SHGC .23, ground reflectance = 0.23, outdoor insect screen with 50% coverage, U-value 0.34, SHGC 0.23	45	597	0	1,218	1,218
10C-f: Glazing-French door, double pane low-e glass (e = 0.40), insulated fiberglass frame, ground reflectance = 0.32, medium color blinds at 45° with 25% coverage, U-value 0.45, SHGC 0.43	72	1,263	0	942	942
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	30	398	0	228	228
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	1723.4	6,117	0	3,686	3,686
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	2466	3,079	0	4,104	4,104
22A-pl: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, light dry soil, U-value 0.989	225	8,677	0	0	0
Subtotals for structure:		21,844	0	12,089	12,089
People:	7		1,400	1,610	3,010
Equipment:			1,850	3,025	4,875
Lighting:	0			0	0
Ductwork:		6,660	1,107	5,034	6,141
Infiltration: Winter CFM: 84, Summer CFM: 35		3,576	1,239	660	1,899
Ventilation: Winter CFM: 35, Summer CFM: 55		1,493	1,923	1,023	2,946
Exhaust: Winter CFM: 55, Summer CFM: 35					
Total Building Load Totals:		33,574	7,519	23,441	30,960

Check Figures

Total Building Supply CFM:	1,200	CFM Per Square ft.:	0.487
Square ft. of Room Area:	2,466	Square ft. Per Ton:	956
Volume (ft³):	22,196		

Building Loads

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Total Cooling Required Including Ventilation Air:	30,960	Btuh	2.58	Tons (Based On Sensible + Latent)

Notes

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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 Bedroom	272	4,272	78	2-6	392	2,876	576	131	154
2	Deluxe M Bath	125	1,546	28	1-6	398	1,461	911	67	78
3	Master WIC	98	2,337	43	1-4	480	783	111	36	42
4	Bath 3	47	73	1	1-4	62	101	250	5	5
5	Laundry	62	97	2	1-4	81	133	250	6	7
6	Bedroom 4	200	1,889	35	1-6	403	1,477	70	67	79
7	Bedroom 3	184	1,755	32	1-6	417	1,528	64	70	82
8	Bedroom 2	184	4,122	75	1-7	453	2,261	175	103	121
9	Bath 2	46	72	1	1-4	60	98	250	4	5
10	Kitchen/Nook/Great Room	959	9,682	177	3-8	478	9,353	1,568	427	501
11	Flex/Den	196	3,736	68	1-6	391	1,433	156	65	77
12	Foyer	95	2,499	46	1-4	562	916	108	42	49
	Ventilation		1,493				1,023	1,923		
	Duct Latent							1,107		
	System 1 total	2,466	33,574	586			23,441	7,519	1,025	1,200

System 1 Main Trunk Size:	16x16	in.
Velocity:	675	ft./min
Loss per 100 ft.:	0.237	in.wg

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	2.58	76% / 24%	23,441	7,519	30,960
Actual:	2.90	77% / 23%	26,796	8,004	34,800

Equipment Data

	Heating System	Cooling System
Type:	Air Source Heat Pump	Air Source Heat Pump
Model:	4TWR6036H1	4TWR6036H1
Indoor Model:		TEM6A0C36
Brand:	TRANE	TRANE
Description:	Air Source Heat Pump	Air Source Heat Pump
Efficiency:	9 HSPF	16 SEER
Sound:	0	0
Capacity:	33,000 Btuh	34,800 Btuh
Sensible Capacity:	n/a	26,796 Btuh
Latent Capacity:	n/a	8,004 Btuh
AHRI Reference No.:	n/a	7562981

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: 23,441 Btuh, Lat. gain: 7,519 Btuh, Sen. loss: 33,574 Btuh, Entering clg. coil DB: 75.8F, Entering clg. coil WB: 63.3F, Entering htg. coil DB: 70.9F, Clg. coil TD: 20F, Htg. coil TD: 50F, Req. clg. airflow: 1025 CFM, Req. htg. airflow: 586 CFM