

MERRYPLACE HOMES - TYPE II-ALT HVAC Load Calculations

for

MERRYPLACE HOMES
425 HOGANS ST
WEST PALM BEACH, FL 33407



SHGC WARNING:

The window performance values consist of the **u-factor** for the frame, and Solar Heat Gain Coefficient (**SHGC**) for the glass. These values have a huge impact on the building thermal envelop and may have a significant impact on the following:

- the size of the HVAC system(s), \$\$\$
- the duct work layout and design, \$\$
- delays with permitting, \$\$\$\$
- inspector comments or failed inspections \$\$

It is **important** to us that your project stay on schedule and if there are any changes to the design base it may impact any of the bullet points above. [KO Energy Design](mailto:info@koenergydesign.com) must be contacted immediately at info@koenergydesign.com or (561) 327-7272 to help support any changes to your project information.

Prepared By:

Karen Oliver
KO Energy Design

561 327-7272
Tuesday, September 22, 2020

**CITY OF WEST PALM BEACH
DEVELOPMENT SERVICES DEPARTMENT**



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.

17120258
04/26/21

OFFICIAL PERMIT RECORD



Project Report

General Project Information

Project Title: MERRYPLACE HOMES - TYPE II-ALT
Designed By: Karen Oliver
Project Date: Monday, September 21, 2020
Client Name: MERRYPLACE HOMES
Client Address: 425 HOGANS ST
Client City: WEST PALM BEACH, FL 33407
Company Name: KO Energy Design
Company Representative: Karen Oliver
Company Phone: 561 327-7272
Company E-Mail Address: info@koenergydesign.com
Company Website: www.koenergydesign.com
Permit Number(s): JURISDICTION: 604700
FACING: S
BUILT: NC
GARAGE: 302

Design Data

Reference City: West Palm Beach AP, Florida
Building Orientation: Front door faces South
Daily Temperature Range: Medium
Latitude: 26 Degrees
Elevation: 15 ft.
Altitude Factor: 0.999

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	47	44.1	n/a	n/a	70	n/a
Summer:	91	78	56%	50%	75	59

Check Figures

Total Building Supply CFM:	1,200	CFM Per Square ft.:	0.812
Square ft. of Room Area:	1,478	Square ft. Per Ton:	544
Volume (ft³):	13,795		

Building Loads

Total Heating Required Including Ventilation Air:	29,409 Btuh	29.409 MBH
Total Sensible Gain:	25,855 Btuh	79 %
Total Latent Gain:	6,742 Btuh	21 %
Total Cooling Required Including Ventilation Air:	32,597 Btuh	2.72 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.

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Load Preview Report

Scope	Net Ton	ft. ² /Ton	Area	Sen Gain	Lat Gain	Net Gain	Sen Loss	Sys Htg CFM	Sys Clg CFM	Sys Act CFM	Duct Size
Building	2.72	544	1,478	25,855	6,742	32,597	29,409	1,200	1,200	1,200	
System 1	2.72	544	1,478	25,855	6,742	32,597	29,409	1,200	1,200	1,200	14
Supply Duct Latent					620	620					
Return Duct				1,177	572	1,749	271				
Zone 1 - Clq.: 72%, Htg.: 71%			1,133	17,686	3,950	21,636	20,759	855	860	860	12
1-Foyer			62	2,846	400	3,246	4,007	165	138	138	1--7
2-Living Room			227	3,013	1,150	4,163	2,687	111	147	147	1--7
3-Kitchen			171	2,546	275	2,821	475	20	124	124	1--6
7-Dining Room			156	3,217	375	3,592	3,741	154	156	156	1--7
8-Bedroom 1			204	2,572	725	3,297	4,127	170	125	125	1--6
9-Bath 1			108	804	225	1,029	1,250	51	39	39	1--4
10-Bedroom 2			180	2,448	675	3,123	3,872	159	119	119	1--6
11-Bedroom 2 Wic			25	241	125	366	599	25	12	12	1--4
Zone 2 - Clq.: 28%, Htg.: 29%			345	6,992	1,600	8,592	8,379	345	340	340	9
4-Master Bath			99	1,135	500	1,635	2,426	100	55	55	1--5
5-Master Wic			36	306	0	306	33	1	15	15	1--4
6-Master Bedroom			210	5,551	1,100	6,651	5,921	244	270	270	1--8

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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-Foyer	Built-In	0	0	0.0003	0.1		517.8		165	138	138	1--7	
2-Living Room	Built-In	0	0	0.0003	0.1		548.3		111	147	147	1--7	
3-Kitchen	Built-In	0	0	0.0003	0.1		630.4		20	124	124	1--6	
7-Dining Room	Built-In	0	0	0.0003	0.1		585.3		154	156	156	1--7	
8-Bedroom 1	Built-In	0	0	0.0003	0.1		636.9		170	125	125	1--6	
9-Bath 1	Built-In	0	0	0.0003	0.1		448.3		51	39	39	1--4	
10-Bedroom 2	Built-In	0	0	0.0003	0.1		606.2		159	119	119	1--6	
11-Bedroom 2 Wic	Built-In	0	0	0.0003	0.1		134.3		25	12	12	1--4	
Zone 2													
4-Master Bath	Built-In	0	0	0.0003	0.1		404.8		100	55	55	1--5	
5-Master Wic	Built-In	0	0	0.0003	0.1		170.5		1	15	15	1--4	
6-Master Bedroom	Built-In	0	0	0.0003	0.1		773.3		244	270	270	1--8	
Other Ducts in System 1													
Supply Main Trunk	Built-In	0	0	0.0003	0.1		1122.6		1,200	1,200	1,200	14	

Summary

System 1

Heating Flow: 1200

Cooling Flow: 1200

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Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
LawsonBldr: Glazing-Lawson, Impact, Alum, Clear, U-value 1.11, SHGC 0.39	250	6,381	0	7,760	7,760
11P: Door-Metal - Polyurethane Core, U-value 0.29	18.9	137	0	88	88
r4.1cbs: Wall-Block, Custom, CBS R-4.1 foil, U-value 0.143	1075.3	3,536	0	2,505	2,505
12B-0sw: Part-Frame, R-11 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs, U-value 0.097	354.4	861	0	549	549
16B-30-ad: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), vented attic, no radiant barrier, R-30 insulation, dark asphalt, U-value 0.032	1523	1,120	0	2,487	2,487
22A-ph-t: Floor-Slab on grade, No edge insulation, no insulation below floor, tile covering, passive, heavy moist soil, U-value 1.358	182	5,685	0	0	0
Subtotals for structure:		17,720	0	13,389	13,389
People:	4		800	920	1,720
Equipment:			200	4,600	4,800
Lighting:	0			0	0
Ductwork:		6,224	1,192	4,964	6,156
Infiltration: Winter CFM: 216, Summer CFM: 113		5,465	4,550	1,982	6,532
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Total Building Load Totals:		29,409	6,742	25,855	32,597

Check Figures

Total Building Supply CFM:	1,200	CFM Per Square ft.:	0.812
Square ft. of Room Area:	1,478	Square ft. Per Ton:	544
Volume (ft³):	13,795		

Building Loads

Total Heating Required Including Ventilation Air:	29,409 Btuh	29.409 MBH
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System 1 Room Load Summary

Room 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	Foyer	62	4,007	52	1-7	518	2,846	400	129	138
2	Living Room	227	2,687	35	1-7	548	3,013	1,150	137	147
3	Kitchen	171	475	6	1-6	630	2,546	275	116	124
7	Dining Room	156	3,741	49	1-7	585	3,217	375	146	156
8	Bedroom 1	204	4,127	54	1-6	637	2,572	725	117	125
9	Bath 1	108	1,250	16	1-4	448	804	225	37	39
10	Bedroom 2	180	3,872	50	1-6	606	2,448	675	111	119
11	Bedroom 2 Wic	25	599	8	1-4	134	241	125	11	12
Zone 1 subtotal		1,133	20,759	270			17,686	3,950	804	860
---Zone 2---										
4	Master Bath	99	2,426	32	1-5	405	1,135	500	52	55
5	Master Wic	36	33	0	1-4	170	306	0	14	15
6	Master Bedroom	210	5,921	77	1-8	773	5,551	1,100	252	270
Zone 2 subtotal		345	8,379	109			6,992	1,600	318	340
Duct Latent Return Duct			271				1,177	572		
System 1 total		1,478	29,409	379			25,855	6,742	1,122	1,200

System 1 Main Trunk Size: 14 in.
 Velocity: 1,123 ft./min
 Loss per 100 ft.: 0.127 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:	2.72	79% / 21%	25,855	6,742	32,597
Actual:	2.92	75% / 25%	26,250	8,750	35,000

Equipment Data

	Heating System	Cooling System
Type:	Electric Resistance	Standard Air Conditioner
Model:	ASPT47C14A*	GSX160361F*
Indoor Model:		ASPT47C14A*
Brand:		GOODMAN, JANITROL, AMANA DISTINCTIONS, EVERREST, ONE HOUR AIR CONDITIONING AND HEATING, ENERGI AIR, FRANKLIN
Description:	8KW HEAT STRIP	
Efficiency:	0%	16 SEER
Sound:	0	0
Capacity:	27,000 Btuh	35,000 Btuh
Sensible Capacity:	n/a	26,250 Btuh
Latent Capacity:	n/a	8,750 Btuh
AHRI Reference No.:	n/a	201384313

This system's equipment was selected in accordance with ACCA Manual S.
 Manual S equipment sizing data: SODB: 91F, SOWB: 88F, WODB: 47F, SIDB: 75F, SIRH: 50%, WIDB: 70F, Sen. gain: 25,855 Btuh, Lat. gain: 6,742 Btuh, Sen. loss: 29,409 Btuh, Entering clg. coil DB: 75.9F, Entering clg. coil WB: 62.8F, Entering htg. coil DB: 69.8F, Clg. coil TD: 20F, HTG. coil TD: 70F, Req. clg. airflow: 1122 CFM, Req. htg. airflow: 379 CFM

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Field Verification Requirement

Project Information

Designed by: Karen Oliver
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Client name: MERRYPLACE HOMES
Client address: 425 HOGANS ST
Client city: WEST PALM BEACH, FL 33407
Company name: KO Energy Design
Company phone: 561 327-7272

Field Verification Requirement

All inputs/defaults/building characteristics used for the ACCA Manual J Version 8 calculations must be verified by the HVAC contractor in the field and/or must be verified by the builder/owner verifying that what is being built is consistent with the builder's/owners project components in this report. Test and balance reports if performed are to reflect Manual J system actual CFM for each individual unit. K.O. Energy Design must be notified in writing of any said changes.

Equipment Selection

Equipment selected below was carefully chosen to meet or exceed the FL Energy Efficiency Code. Alternate equivalent equipment selection shall also meet the attached Energy Code Requirements. Any change in SEER or size of equipment will require approval and plan revision. K.O. Energy Design must be notified in writing of any said changes.

Manual D Duct Sizing

Duct sizing has been carefully engineered at the stated s.p. Any deviance in duct sizing could impact the performance and efficiency of selected equipment. Any change or alteration in duct sizing will require approval and possible plan revision. K.O. Energy Design must be notified in writing of any said changes. Duct sealing Air Distribution System Test to be performed and made available for Rough Duct Inspection, if required.

Item	System 1
Air Handler Name	System #1
Cooling Description	
Cooling Model Type	Standard Air Conditioner
Cooling Model Number	GSX160361F*+ASPT47C14A*
Cooling Capacity	35000
Cooling Efficiency	16 SEER
AHRI Reference No.	201384313
Heating Description	8KW HEAT STRIP
Heating Model Type	Electric Resistance
Heating Model Number	ASPT47C14A*
Heating Capacity	27000
Heating Efficiency	0%

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