



Building Analysis
Entire House
JACOBSON RESIDENCE

Job:
Date: Oct 22, 2020
By: ENERGYCALCS.NET, INC.

Energycalcs.net, Inc. 267 DeLeon Rd, DeBary, FL 32713 Phone: 386-775-0908 Email: maggie@energycalcs.net Web: www.energycalcs.net

Project Information

For: Jacobson Residence
217 SW BOULDER GLEN, FORT WHITE, FL 32038

Design Conditions

Location:
Gainesville Regional AP, FL, US
Elevation: 164 ft
Latitude: 30°N

Outdoor:
Dry bulb (°F) 33
Daily range (°F) 20 (M)
Wet bulb (°F) 76
Wind speed (mph) 15.0

Heating
Cooling

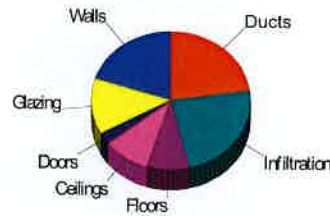
Indoor:
Indoor temperature (°F) 70
Design TD (°F) 37
Relative humidity (%) 50
Moisture difference (gr/lb) 32.8

Heating
Cooling

Infiltration:
Method Blower door
Shielding / stories 3 (partial) / 1
Pressure / AVF 50 Pa / 1664 cfm

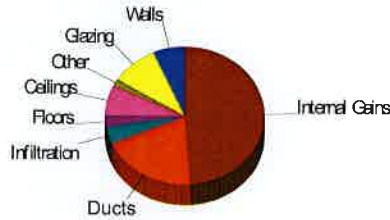
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	3.4	4477	20.0
Glazing	14.1	2904	13.0
Doors	14.4	606	2.7
Ceilings	1.2	2145	9.6
Floors	1.1	1913	8.5
Infiltration	3.3	5248	23.5
Ducts		5084	22.7
Piping		0	0
Humidification		0	0
Ventilation		0	0
Adjustments		0	0
Total		22377	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	1.6	2148	6.5
Glazing	15.3	3162	9.6
Doors	11.1	467	1.4
Ceilings	1.3	2435	7.4
Floors	0.5	879	2.7
Infiltration	0.8	1337	4.1
Ducts		6410	19.5
Ventilation		0	0
Internal gains		16080	48.8
Blower		0	0
Adjustments		0	0
Total		32917	100.0



Latent Cooling Load = 4643 Btuh
Overall U-value = 0.064 Btuh/ft²·°F

Data entries checked.



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Component Constructions
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Design Conditions

Location:			Indoor:		Heating	Cooling
Gainesville Regional AP, FL, US			Indoor temperature (°F)		70	75
Elevation: 164 ft			Design TD (°F)		37	17
Latitude: 30°N			Relative humidity (%)		50	50
			Moisture difference (gr/lb)		32.8	45.4
Outdoor:	Heating	Cooling	Infiltration:			
Dry bulb (°F)	33	92	Method		Blower door	
Daily range (°F)	-	20 (M)	Shielding / stories		3 (partial) / 1	
Wet bulb (°F)	-	76	Pressure / AVF		50 Pa / 1664 cfm	
Wind speed (mph)	15.0	7.5				

Construction descriptions

	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Clg Btuh	HTM Btuh/ft²	Gain Btuh
Walls								
12C-0sw: Frn wall, stucco ext, r-13 cav ins, 1/2" gypsum board int	n	494	0.091	13.0	3.37	1665	1.62	799
fns h, 2"x4" w ood frm, 16" o.c. stud	e	160	0.091	13.0	3.37	540	1.62	259
	s	507	0.091	13.0	3.37	1707	1.62	819
	w	168	0.091	13.0	3.37	566	1.62	271
	all	1330	0.091	13.0	3.37	4477	1.62	2148

Partitions (none)

Windows

4A3-2ov: 2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap	11	0.290	0	10.7	116	8.36	90	
1/8" thk; NFRC rated (SHGC=0.21); 50% outdoor insect screen; 1.33 ft overhang (3.8 ft window ht, 0.75 ft sep.); 6.67 ft head ht	e	11	0.290	0	10.7	116	21.2	229
	all	22	0.290	0	10.7	231	14.8	319
4A3-2ov: 2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap	24	0.470	0	17.4	417	14.9	357	
1/8" thk; 50% outdoor insect screen; 1.33 ft overhang (4 ft window ht, s	48	0.470	0	17.4	835	14.9	713	
0.75 ft sep.); 6.67 ft head ht	w	24	0.470	0	17.4	417	40.1	963
	all	96	0.470	0	17.4	1669	21.2	2033
4A3-2ovd: 2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.27); 50% outdoor insect screen; 1.33 ft overhang (6.8 ft window ht, 0.75 ft sep.); 6.67 ft head ht	n	41	0.300	0	11.1	453	9.64	393
4A3-2ov: 2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap	48	0.310	0	11.5	551	8.67	416	
1/8" thk; NFRC rated (SHGC=0.21); 50% outdoor insect screen; 1.33 ft overhang (4 ft window ht, 0.75 ft sep.); 6.67 ft head ht								

Doors

11D0: Door, w d s c type	n	21	0.390	0	14.4	303	11.1	233
	s	21	0.390	0	14.4	303	11.1	233
	all	42	0.390	0	14.4	606	11.1	467



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Ceilings								
16C-30mt: Attic ceiling, mtl roof mat, r-30 ceil ins, 1/2" gypsum board int fnsh	1812	0.032	30.0	1.18	2145	1.34	2435	
Floors								
19A-30cstp: Flr floor, frm flr, 8" thkns, r-30 cav ins, tight crwl ovr	1812	0.034	30.0	1.06	1913	0.49	879	



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Notes:

Design Information

Weather: Gainesville Regional AP, FL, US

Winter Design Conditions

Outside db	33 °F
Inside db	70 °F
Design TD	37 °F

Summer Design Conditions

Outside db	92 °F
Inside db	75 °F
Design TD	17 °F
Daily range	M
Relative humidity	50 %
Moisture difference	45 gr/lb

Heating Summary

Structure	17293 Btuh
Ducts	5084 Btuh
Central vent (0 cfm) (none)	0 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	22377 Btuh

Infiltration

Method	Blower door
Shielding / stories	3 (partial) / 1
Pressure / AVF	50 Pa / 1664 cfm

	Heating	Cooling
Area (ft ²)	1812	1812
Volume (ft ³)	14265	14265
Air changes/hour	0.55	0.30
Equip. AVF (cfm)	130	72

Heating Equipment Summary

Make	GENERIC 3.5 TON
Trade	
Model	15 SEER
AHRI ref	
Efficiency	8.5 HSPF
Heating input	
Heating output	40000 Btuh @ 47°F
Temperature rise	26 °F
Actual air flow	1400 cfm
Air flow factor	0.063 cfm/Btuh
Static pressure	0.50 in H2O
Space thermostat	
Capacity balance point = 0 °F	

Sensible Cooling Equipment Load Sizing

Structure	26508 Btuh
Ducts	6410 Btuh
Central vent (0 cfm) (none)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	y
Rate/s wing multiplier	1.00
Equipment sensible load	32917 Btuh

Latent Cooling Equipment Load Sizing

Structure	3410 Btuh
Ducts	1234 Btuh
Central vent (0 cfm) (none)	0 Btuh
Equipment latent load	4643 Btuh

Equipment Total Load (Sen+Lat)	37561 Btuh
Req. total capacity at 0.80 SHR	3.4 ton

Cooling Equipment Summary

Make	GENERIC 3.5 TON
Trade	
Cond	15 SEER
Coil	
AHRI ref	
Efficiency	15 SEER
Sensible cooling	32000 Btuh
Latent cooling	8000 Btuh
Total cooling	40000 Btuh
Actual air flow	1400 cfm
Air flow factor	0.043 cfm/Btuh
Static pressure	0.50 in H2O
Load sensible heat ratio	0.88

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.



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Duct System Summary

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	Heating	Cooling
External static pressure	0.50 in H ₂ O	0.50 in H ₂ O
Pressure losses	0 in H ₂ O	0 in H ₂ O
Available static pressure	0.50 in H ₂ O	0.50 in H ₂ O
Supply / return available pressure	0.250 / 0.250 in H ₂ O	0.250 / 0.250 in H ₂ O
Lowest friction rate	0.398 in/100ft	0.398 in/100ft
Actual air flow	1400 cfm	1400 cfm
Total effective length (TEL)	126 ft	

Supply Branch Detail Table

Name	Design (Btuh)	Htg (cfm)	Clg (cfm)	Design FR	Diam (in)	H x W (in)	Duct Matl	Actual Ln (ft)	Ftg.Eqv Ln (ft)	Trunk
BATH	h 854	53	25	0.398	5.0	0x0	MFx	35.6	90.0	st1
BED	h 3360	210	145	0.442	8.0	0x0	MFx	23.1	90.0	st1
EXISTING	c 25270	895	1075	0	0	0x0	MFx	0	0	
LIVING	h 1562	98	70	0.442	6.0	0x0	MFx	23.1	90.0	st1
LIVING-A	h 1562	98	70	0.449	6.0	0x0	MFx	21.4	90.0	st1
WIC	h 738	46	16	0.424	4.0	0x0	MFx	27.8	90.0	st1

Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st1	Peak AVF	505	325	0.398	643	12.0	0 x 0	VnIFx	

Return Branch Detail Table

Name	Grille Size (in)	Htg (cfm)	Clg (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb2	0x0	1400	1400	0	0	0	0	0x 0		MFx	

Bold/italic values have been manually overridden



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Manual S Compliance Report

Entire House

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Cooling Equipment

Design Conditions

Outdoor design DB:	92.0°F	Sensible gain:	32917 Btuh	Entering coil DB:	76.2°F
Outdoor design WB:	76.0°F	Latent gain:	4643 Btuh	Entering coil WB:	63.1°F
Indoor design DB:	75.0°F	Total gain:	37561 Btuh		
Indoor RH:	50%	Estimated airflow:	1400 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP		
Manufacturer:	GENERIC 3.5 TON	Model:	15 SEER
Actual airflow:	1400 cfm		
Sensible capacity:	35200 Btuh	107% of load	
Latent capacity:	4800 Btuh	103% of load	
Total capacity:	40000 Btuh	106% of load	SHR: 88%

Heating Equipment

Design Conditions

Outdoor design DB:	33.0°F	Heat loss:	22377 Btuh	Entering coil DB:	69.4°F
Indoor design DB:	70.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP		
Manufacturer:	GENERIC 3.5 TON	Model:	15 SEER
Actual airflow:	1400 cfm		
Output capacity:	40000 Btuh	179% of load	
Supplemental heat required:	0 Btuh		
Capacity balance:	0 °F		
Economic balance:	0 °F		

Meets all requirements of ACCA Manual S.

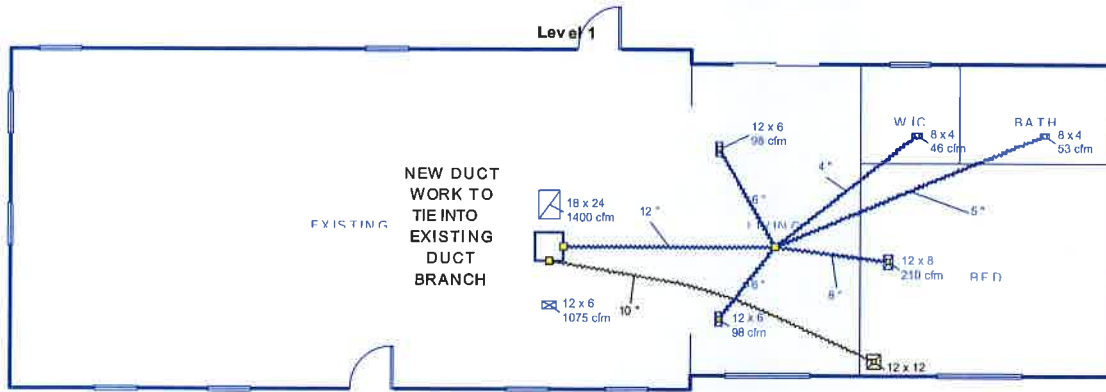


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