

ROBINSON RESIDENCE HVAC LOAD ANALYSIS

for

WILL ROBINSON



Prepared By:

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08/20/12

Miscellaneous Project Data

Project File Name: ROBINSON RESIDENCE

System Input Data

—System 1—	Outdoor Dry Bulb	Outdoor Wet Bulb	Indoor Rel.Hum.	Indoor Dry Bulb	Grains Difference
Winter:	31	N/A	N/A	72	N/A
Summer:	93	78	50%	75	57

External Overhangs

No.	Projection	Offset	No.	Projection	Offset
1	3	1	6	0	0
2	5	0	7	0	0
3	4	0.5	8	0	0
4	0	0	9	0	0
5	0	0	10	0	0

Duct Sizing Inputs

	Runouts	Main Trunk
Duct Material:	Flexible Duct	Fiberglass Duct Board
Roughness Factor:	0.010000	0.003000
Pressure Drop:	0.1000 In.wg/100 Ft.	0.1000 In.wg/100 Ft.
Minimum Velocity:	450.0 Ft./Minute	650.0 Ft./Minute
Maximum Velocity:	750.0 Ft./Minute	900.0 Ft./Minute
Minimum Height:	0 Inches	0 Inches
Maximum Height:	0 Inches	0 Inches

Outside Air Data

	Winter	Summer
Infiltration:	0.900 AC/Hr	0.400 AC/Hr
Volume of Conditioned Space:	X 14845 Cu.Ft.	X 14845 Cu.Ft.
	13,361 Cu.Ft./Hr	5,938 Cu.Ft./Hr
	X 0.0167	X 0.0167
Total Building Infiltration:	222.675 CFM	98.96667 CFM
Total Building Ventilation:	0 CFM	0 CFM
—System 1—		
Infiltration & Ventilation Sensible Gain Multiplier:	19.80 = (1.10 X 18.00 Summer Temp. Difference)	
Infiltration & Ventilation Latent Gain Multiplier:	38.46 = (0.68 X 56.56 Grains Difference)	
Infiltration & Ventilation Sensible Loss Multiplier:	45.10 = (1.10 X 41.00 Winter Temp. Difference)	

Total Building Summary Loads

Component Description	Area Quan	Sen. Loss	Lat. Gain	Sen. Gain	Total Gain
3C Window Double Pane Clear Glass Metal Frame	139	4,134	0	9,159	9,159
8O Glass Door Double Clear Glass Metal Frame	42	1,248	0	2,990	2,990
11A Door Metal Fiberglass Core	42	1,016	0	536	536
12G Wall R-13 + 3/4" ExtPoly Board(R-3.8)	1,307	3,485	0	1,836	1,836
16G Ceiling R-30 Insulation	1,715	2,319	0	2,377	2,377
22A Slab on Grade No Edge Insulation	183	6,077	0	0	0
Subtotals for structure:	3,428	18,279	0	16,898	16,898
Active People:	4	0	920	1,200	2,120
Inactive People:	0	0	0	0	0
Appliances:	0	0	1,200	1,200	2,400
Lighting:	0	0		4,433	
Ductwork:	0	1,814	0	2,801	2,801
Infiltration: Winter CFM: 222.7, Summer CFM: 99.0	223	10,044	3,806	1,960	5,766
Ventilation: Winter CFM: 0.0, Summer CFM: 0.0	0	0	0	0	0
Sensible Gain Total:				28,492	
Temperature Swing Multiplier:				X1.00	
Building Load Totals:		30,137	5,926	28,492	34,418

Check Figures

Total Building Supply CFM:	1295	CFM per square foot:	0.755
Square feet of room area:	1,715	Square feet per ton:	556.177

Building Loads

Total heating required with outside air:	30,137 Btuh	30.137 MBH
Total sensible gain:	28,492 Btuh	83 %
Total latent gain:	5,926 Btuh	17 %
Total cooling required with outside air:	34,418 Btuh	2.868 Tons (based on sensible + latent)
		3.084 Tons (based on 77% sensible capacity)

Notes

Calculations are based on 7th edition of ACCA Manual J.
 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.

System #1 Summary Loads

Component Description	Area Quan	Sen. Loss	Lat. Gain	Sen. Gain	Total Gain
3C Window Double Pane Clear Glass Metal Frame	139	4,134	0	9,159	9,159
8O Glass Door Double Clear Glass Metal Frame	42	1,248	0	2,990	2,990
11A Door Metal Fiberglass Core	42	1,016	0	536	536
12G Wall R-13 + 3/4" ExtPoly Board(R-3.8)	1,307	3,485	0	1,836	1,836
16G Ceiling R-30 Insulation	1,715	2,319	0	2,377	2,377
22A Slab on Grade No Edge Insulation	183	6,077	0	0	0
Subtotals for structure:	3,428	18,279	0	16,898	16,898
Active People:	4	0	920	1,200	2,120
Inactive People:	0	0	0	0	0
Appliances:	0	0	1,200	1,200	2,400
Lighting:	0	0		4,433	
Ductwork:	0	1,814	0	2,801	2,801
Infiltration: Winter CFM: 222.7, Summer CFM: 99.0	223	10,044	3,806	1,960	5,766
Ventilation: Winter CFM: 0.0, Summer CFM: 0.0	0	0	0	0	0
Sensible Gain Total:				28,492	
Temperature Swing Multiplier:				X1.00	
System Load Totals:		30,137	5,926	28,492	34,418

Check Figures

Supply CFM:	1,295	CFM per square foot:	0.755
Square feet of room area:	1,715	Square feet per ton:	556.177

System Loads

Total heating required with outside air:	30,137 Btuh	30.137 MBH
Total sensible gain:	28,492 Btuh	83 %
Total latent gain:	5,926 Btuh	17 %
Total cooling required with outside air:	34,418 Btuh	2.868 Tons (based on sensible + latent)
		3.084 Tons (based on 77% sensible capacity)

Notes

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 Be sure to select a unit that meets both sensible and latent loads.

Room Load Summary Reports

System #1 Room Load Summary

No	Room Name	Area SF	Htg Sens Btuh	Htg Nom CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Clg Nom CFM	Zone Adj Fact	Clg Adj CFM	Air Sys CFM
---Zone 1---												
1	Utility Room	126	2,449	32	1-4	629	1,207	358	55	1.00	55	55
2	1/2 Bath	38	1,053	14	1-3	664	717	68	33	1.00	33	33
3	Master Closet	76	672	9	1-3	564	609	0	28	1.00	28	28
4	Master Closet #2	54	111	1	1-3	424	458	0	21	1.00	21	21
5	Master Bath	151	3,012	39	2-4	517	1,987	307	90	1.00	90	90
6	Master Bedroom	224	3,392	44	1-8	497	3,813	742	173	1.00	173	173
7	Great Room	378	7,184	93	2-8	527	6,470	1,357	294	1.25	368	294
8	Kitchen	209	5,246	68	3-6	566	6,987	2,301	318	1.05	333	318
9	Hall	40	91	1	1-3	404	436	0	20	1.00	20	20
10	Bath #2	49	591	8	1-3	614	663	51	30	1.00	30	30
11	Bedroom#2	156	3,187	41	2-5	463	2,780	486	126	1.00	126	126
12	Bedroom#3	214	3,149	41	1-7	503	2,365	256	108	1.25	134	108
System 1 Totals		1715	30,137	391			28,492	5,926	1,295		1,411	1,295
Main Trunk Size: 16x14 in.												

System #1 Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	2.868	83%/17%	28,492	5,926	34,418
Recommended:	3.084	77%/23%	28,492	8,511	37,003