499 Jay Windom Martin Residence Hvac Design
HVAC Load Calculations

for

499 Jay Windom Martin Residence
6406 Westover Dr. Granbury, TX.

Elite Software

RHVAC Residential HVAC Loads

Prepared By:

499 Jay Windom Martin Residence
6406 Westover Dr. Granbury, TX.

Monday, October 13, 2025

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 Filename:	C:\Users\User\AppData\Local\Elite Software\Rhvac 10\499 Jay Windom RESIDENCE basement.r10
Project Title:	499 Jay Windom Martin Residence Hvac Design
Designed By:	Engr Rahaman
Project Date:	Friday, October 22, 2025
Client Address:	499 Jay Windom Martin Residence
Client City:	6406 Westover Dr. Granbury, TX.
Company Address:	499 Jay Windom Martin Residence
Company City:	6406 Westover Dr. Granbury, TX.
Permit Number(s):	HV2025001

Design Data

Reference City:		Fort Worth Carswell AFB, Texas
Building Orientation:		Front door faces North
Daily Temperature Range:		Medium
Latitude:	32	Degrees
Elevation:	650	ft.
Altitude Factor:	0.977	

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	40	20.42	0%	30%	72	46.90
Summer:	100	74	30%	50%	75	21

Check Figures

Total Building Supply CFM:	1,131	CFM Per Square ft.:	0.625
Square ft. of Room Area:	1,810	Square ft. Per Ton:	520
Volume (ft³) (Above Grade):	16,290		
Volume (ft³) (Total):	16,290		

Building Loads

Total Heating Required Including Ventilation Air:	27,111	Btuh	27.111	MBH
Total Sensible Gain:	28,644	Btuh	69	%
Total Latent Gain:	13,089	Btuh	31	%
Total Cooling Required Including Ventilation Air:	41,733	Btuh	3.48	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.

Load Preview Report

Scope	Has AED	Net Ton	ft.²/Ton	Area	Sen Gain	Lat Gain	Net Gain	Sen Loss	Min Htg CFM	Min Clg CFM	Sys Htg CFM	Sys Clg CFM	Sys Act CFM	
Building		3.48	520	1,810	28,644	13,089	41,733	27,111	286	1,131	286	1,131	1,131	
System 1 Main Floor	Yes	3.48	520	1,810	28,644	13,089	41,733	27,111	286	1,131	286	1,131	1,131	12x17
Ventilation					4,351	5,729	10,081	5,570			405	405	405	
Humidification								12,614						
Zone 1				1,810	24,293	7,360	31,653	8,927	286	1,131	286	1,131	1,131	12x17
1-Basement Mechanical				140	847	0	847	645	21	39	21	39	39	1--5
2-Basement Theater				300	10,966	6,900	17,866	1,382	44	510	44	510	510	1--12
3-Basement Storage				130	1,316	0	1,316	608	20	61	20	61	61	1--5
4-Basement Bedroom				190	3,628	460	4,088	1,836	59	169	59	169	169	1--8
5-Basement Bathroom				100	1,224	0	1,224	547	18	57	18	57	57	1--5
6-Basement Flex Room				200	1,612	0	1,612	869	28	75	28	75	75	1--6
7-Basement Pumproom				490	2,835	0	2,835	1,948	62	132	62	132	132	1--7
8-Basement Lower Courtyaed				260	1,865	0	1,865	1,092	35	87	35	87	87	1--6

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-Basement Mechanical	Built-In	0	750	0.01	0.1		288.9		21	39	39	1--5	
2-Basement Theater	Built-In	0	750	0.01	0.1		649.8		44	510	510	1--12	
3-Basement Storage	Built-In	0	750	0.01	0.1		449.2		20	61	61	1--5	
4-Basement Bedroom	Built-In	0	750	0.01	0.1		483.7		59	169	169	1--8	
5-Basement Bathroom	Built-In	0	750	0.01	0.1		417.8		18	57	57	1--5	
6-Basement Flex Room	Built-In	0	750	0.01	0.1		382.1		28	75	75	1--6	
7-Basement Pumproom	Built-In	0	750	0.01	0.1		493.7		62	132	132	1--7	
8-Basement Lower Courtya	Built-In	0	750	0.01	0.1		442		35	87	87	1--6	
Other Ducts in System 1													
Supply Main Trunk	Built-In	0	900	0.003	0.1		798		286	1,131	1,131	12x17	

Summary

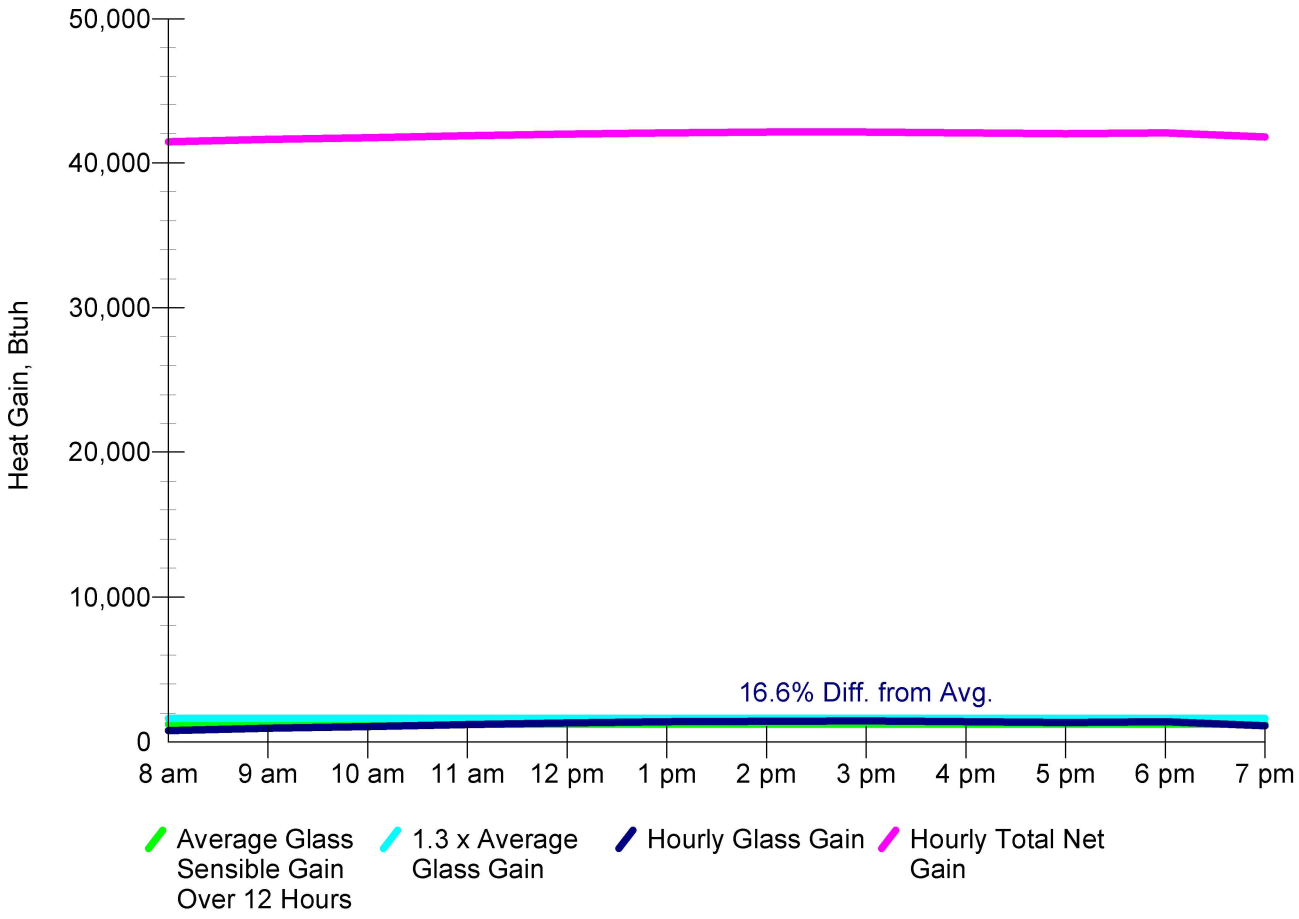
System 1

Heating Flow: 286

Cooling Flow: 1131

System 1 - Main Floor - Adequate Exposure Diversity Test

Test For Adequate Exposure Diversity



AED Calculation Summary

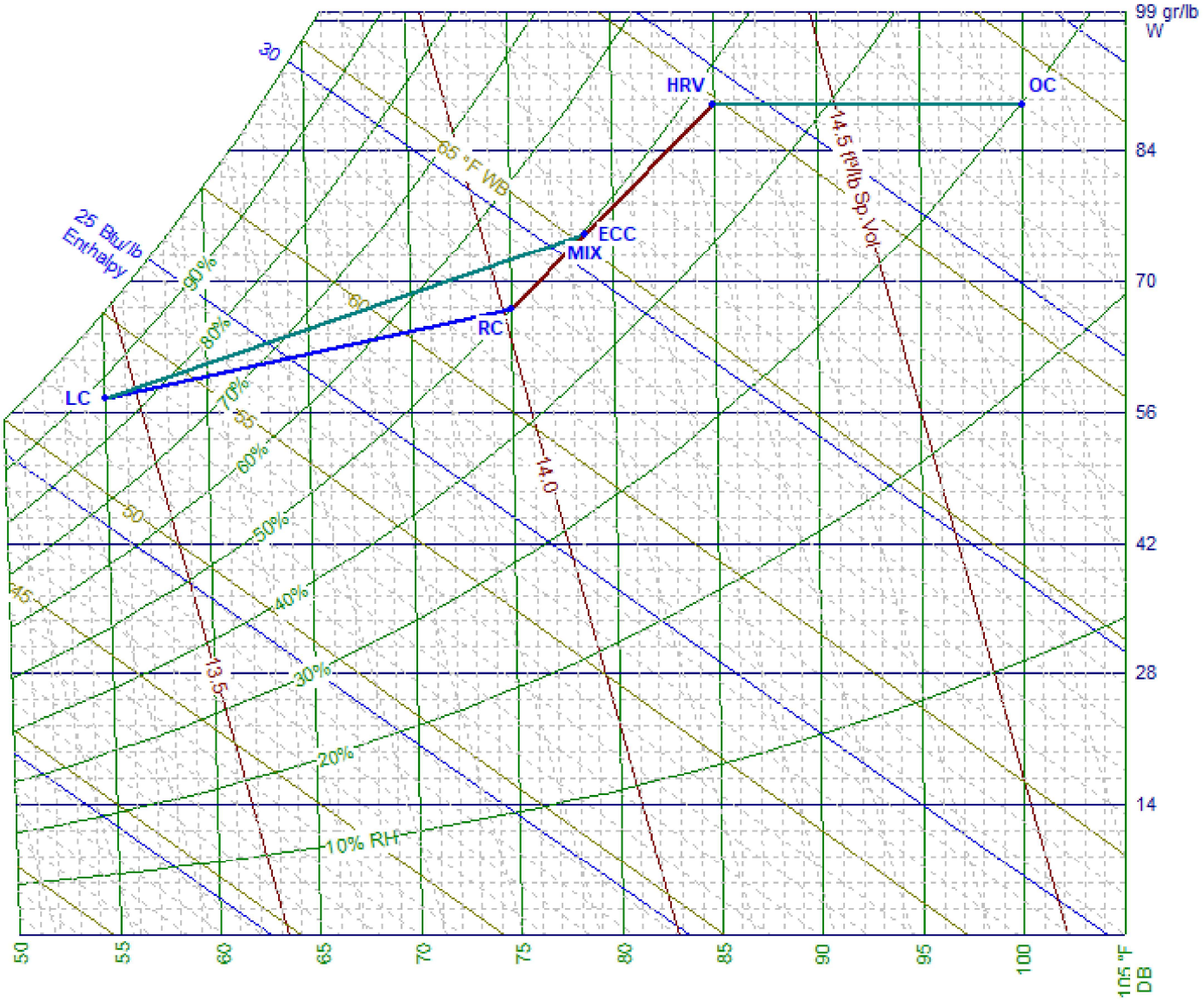
--- SYSTEM HAS ADEQUATE EXPOSURE DIVERSITY. ---

System is on N, E, S, W rosette.
Peak load exceeds 12-hour average load by 16.6%.
AED Excursion (amount by which peak exceeds 1.3 x average): 0 Btuh

Definition: A system has adequate exposure diversity if the peak-hour glass load for the entire conditioned space does not exceed the average glass load for the entire conditioned space by more than 30 percent.

System 1 - Main Floor - Psychrometric Chart

Name	Description	DB	WB	Name	Description	DB	WB
RC	Room Condition	75	62.4	OC	Outdoor Condition	100	74
LC	Leaving Coil Condition	55	52.7	ECC	Entering Coil Condition	78.7	65.3
SD	Supply Duct Gain	n/a	n/a	DTF	Draw-thru Fan S.Gain	n/a	n/a
RD	Return Duct Gain	n/a	n/a	MIX	Mixed Air Point	78.7	65.3
RML	Return Misc Latent	n/a	n/a	ML	Supply Misc Latent	n/a	n/a
RMS	Return Misc Sensible	n/a	n/a	MS	Supply Misc Sensible	n/a	n/a
HRV	Heat Recovery Ventilator	85	69.8				



Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
1G-cm-s: Glazing-Double pane with storm, clear, metal frame no break, U-value 0.55, SHGC 0.62	41	721	0	1,087	1,087
11F: Door-Wood - Solid Core With Metal Storm, U-value 0.28	90	806	0	908	908
Frame wall-R-23: Wall-Frame, Custom, R-23 insulation, U-value 0.043	2110	2,929	0	2,014	2,014
16A-38: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Unvented Attic, No Radiant Barrier, Any Roofing Material, Any Roof Color, R-38 insulation, U-value 0.026	1810	1,505	0	3,764	3,764
19A1-11op: Floor-Over enclosed crawl space, No insulation on exposed walls, sealed or vented space, spray foam insulation, passive, R-11 open cell 1/2 lb. spray foam, 3 inches in 2 x 10 joist cavity, U-value 0.072	1810	2,966	0	2,316	2,316
Subtotals for structure:		8,927	0	10,089	10,089
People:	32		7,360	9,600	16,960
Equipment:			0	0	0
Lighting:	1350			4,604	4,604
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Ventilation: Winter CFM: 405, Summer CFM: 405		5,570	5,729	4,351	10,081
Humidification (Winter) 34.39 gal/day :		12,614	0	0	0
Total Building Load Totals:		27,111	13,089	28,644	41,733

Check Figures

Total Building Supply CFM:	1,131	CFM Per Square ft.:	0.625
Square ft. of Room Area:	1,810	Square ft. Per Ton:	520
Volume (ft³) (Above Grade):	16,290		
Volume (ft³) (Total):	16,290		

Building Loads

Total Heating Required Including Ventilation Air:	27,111	Btuh	27.111	MBH
Total Sensible Gain:	28,644	Btuh	69	%
Total Latent Gain:	13,089	Btuh	31	%
Total Cooling Required Including Ventilation Air:	41,733	Btuh	3.48	Tons (Based On Sensible + Latent)

Notes

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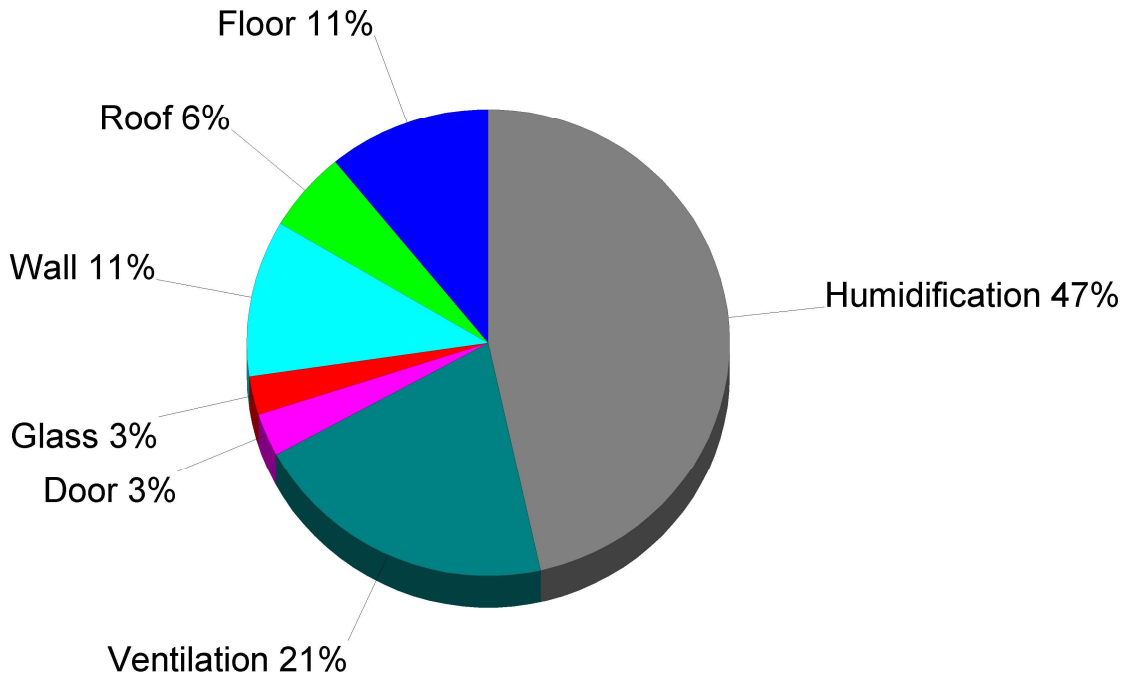
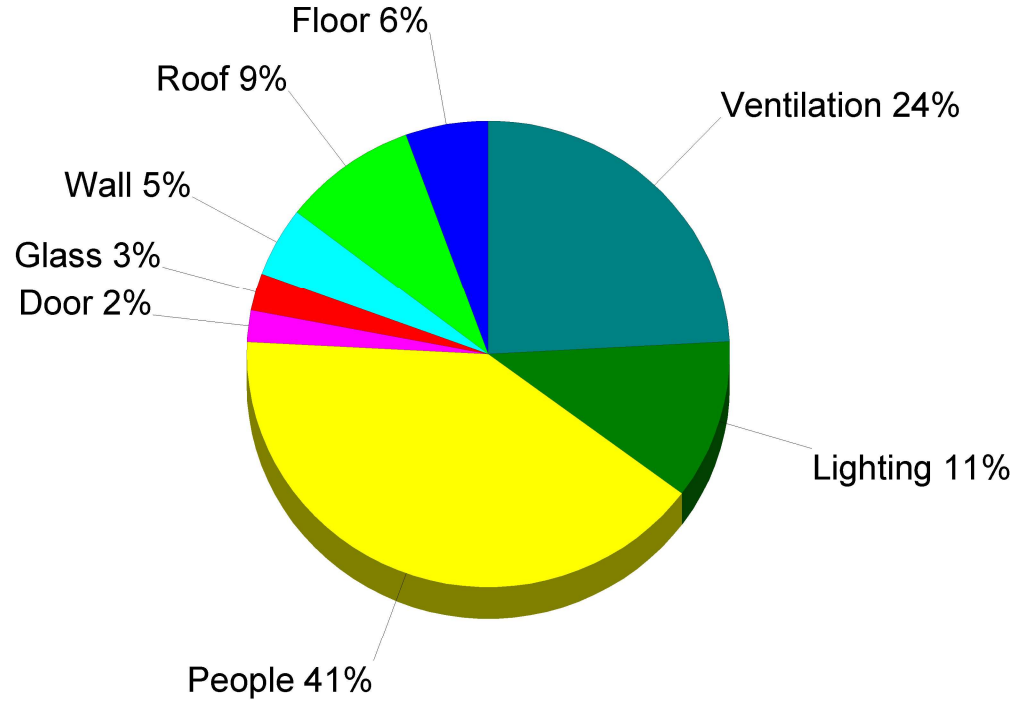
Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.

Building Pie Chart

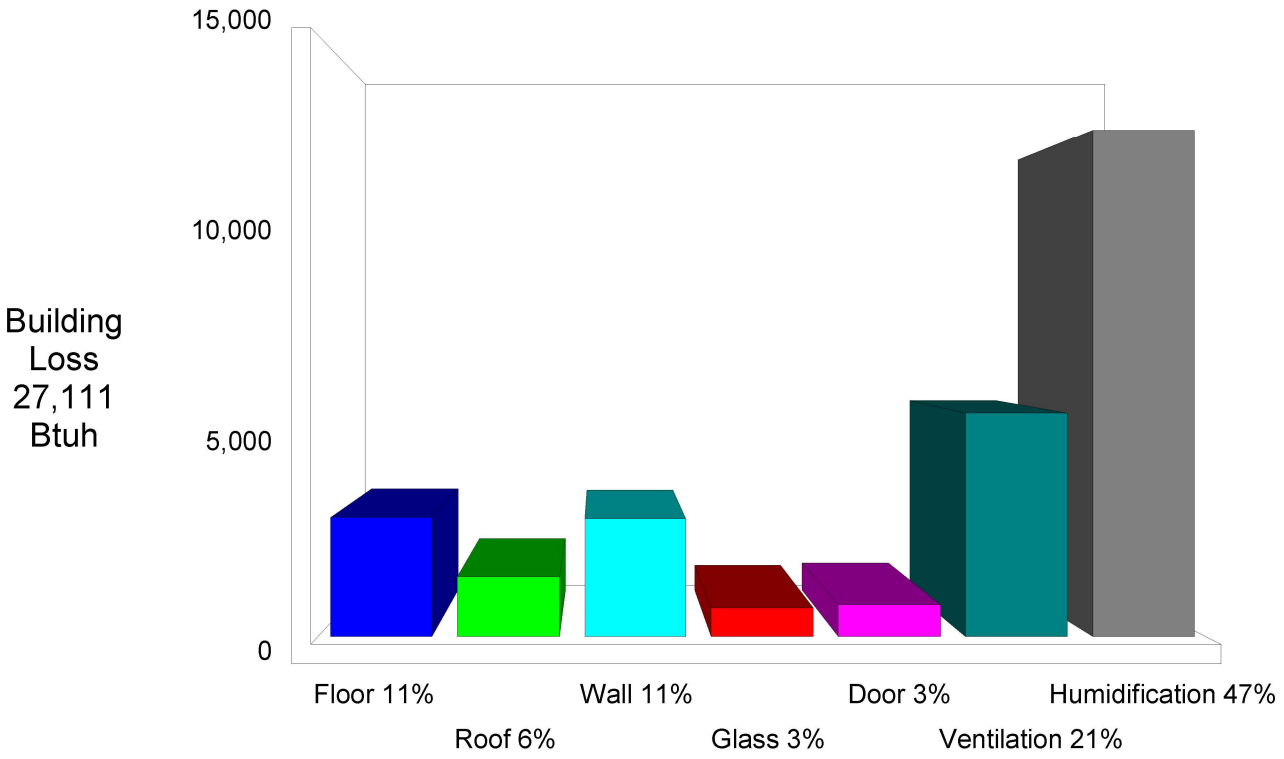
Building Loss 27,111 Btuh

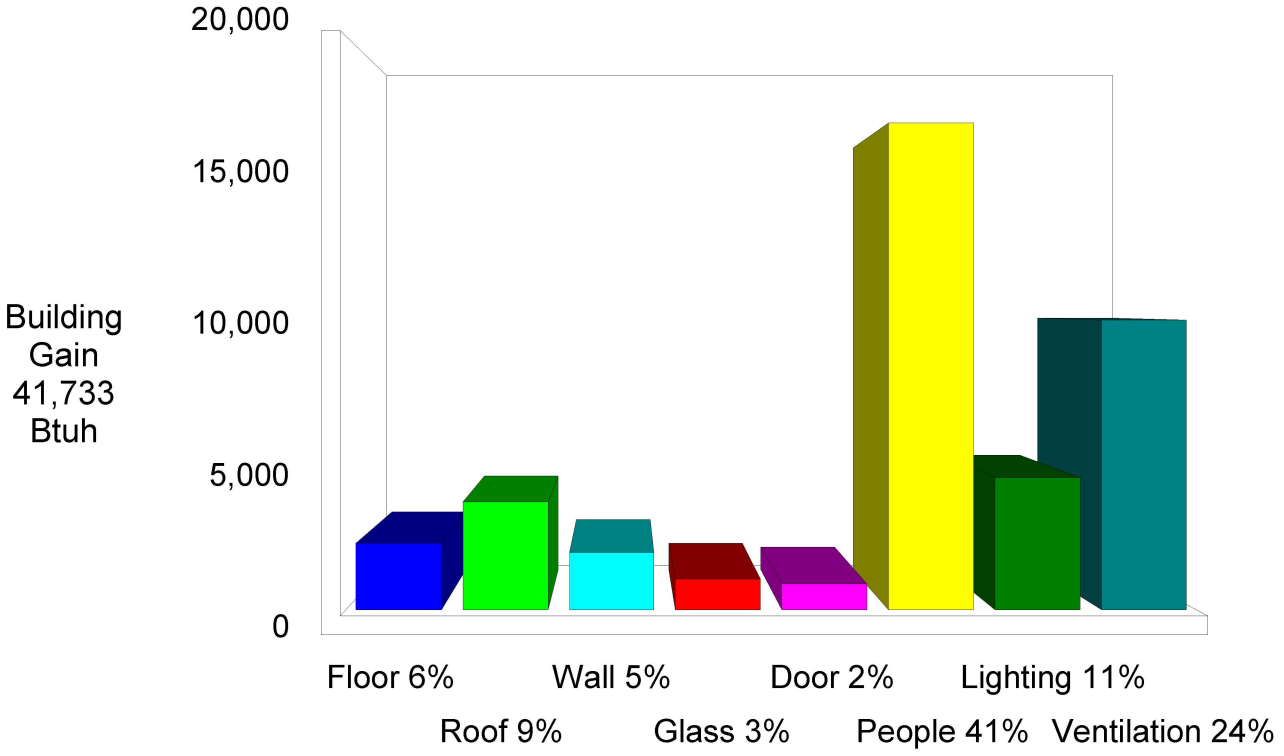


Building Gain 41,733 Btuh



Building Bar Graph





System 1 Main Floor Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
1G-cm-s: Glazing-Double pane with storm, clear, metal frame no break, U-value 0.55, SHGC 0.62	41	721	0	1,087	1,087
11F: Door-Wood - Solid Core With Metal Storm, U-value 0.28	90	806	0	908	908
Frame wall-R-23: Wall-Frame, Custom, R-23 insulation, U-value 0.043	2110	2,929	0	2,014	2,014
16A-38: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Unvented Attic, No Radiant Barrier, Any Roofing Material, Any Roof Color, R-38 insulation, U-value 0.026	1810	1,505	0	3,764	3,764
19A1-11op: Floor-Over enclosed crawl space, No insulation on exposed walls, sealed or vented space, spray foam insulation, passive, R-11 open cell 1/2 lb. spray foam, 3 inches in 2 x 10 joist cavity, U-value 0.072	1810	2,966	0	2,316	2,316
Subtotals for structure:		8,927	0	10,089	10,089
People:	32		7,360	9,600	16,960
Equipment:			0	0	0
Lighting:	1350			4,604	4,604
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Ventilation: Winter CFM: 405, Summer CFM: 405		5,570	5,729	4,351	10,081
Humidification (Winter) 34.39 gal/day :		12,614	0	0	0
System 1 Main Floor Load Totals:		27,111	13,089	28,644	41,733

Check Figures

Supply CFM:	1,131	CFM Per Square ft.:	0.625
Square ft. of Room Area:	1,810	Square ft. Per Ton:	520
Volume (ft³) (Above Grade):	16,290		
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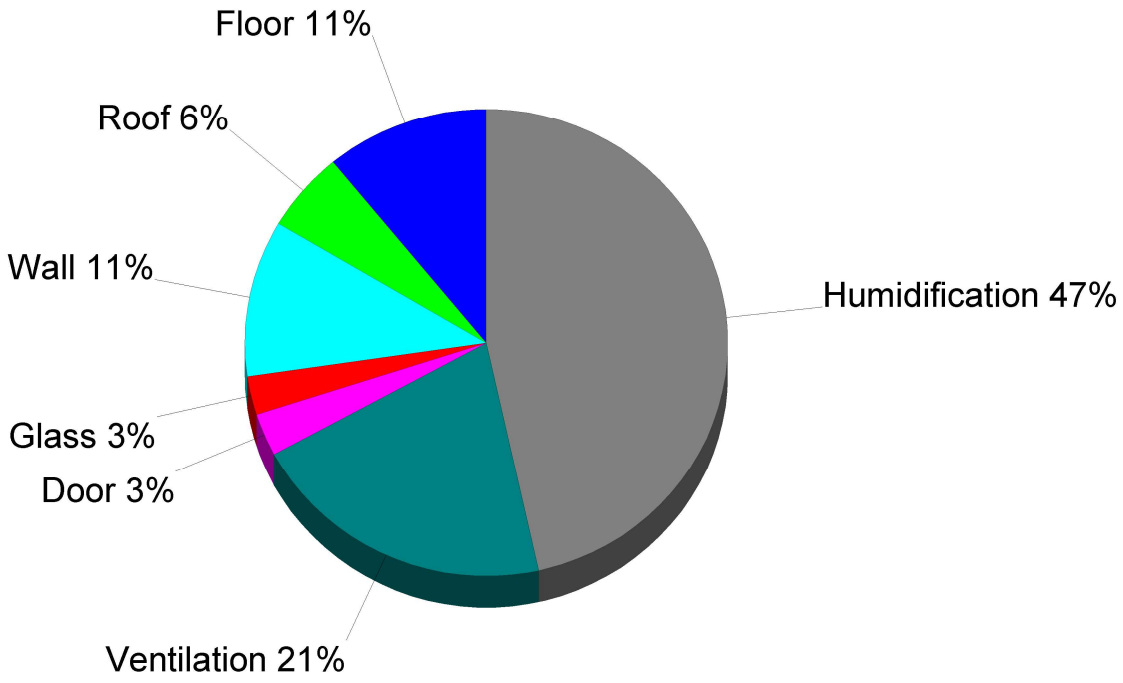
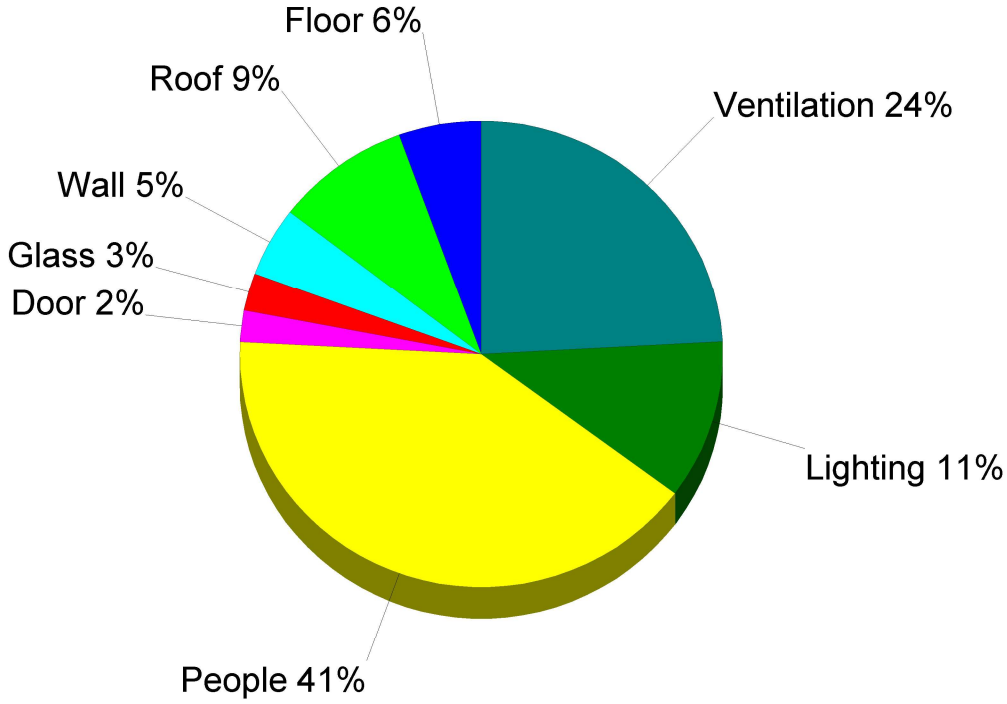
System 1 Main Floor Pie Chart

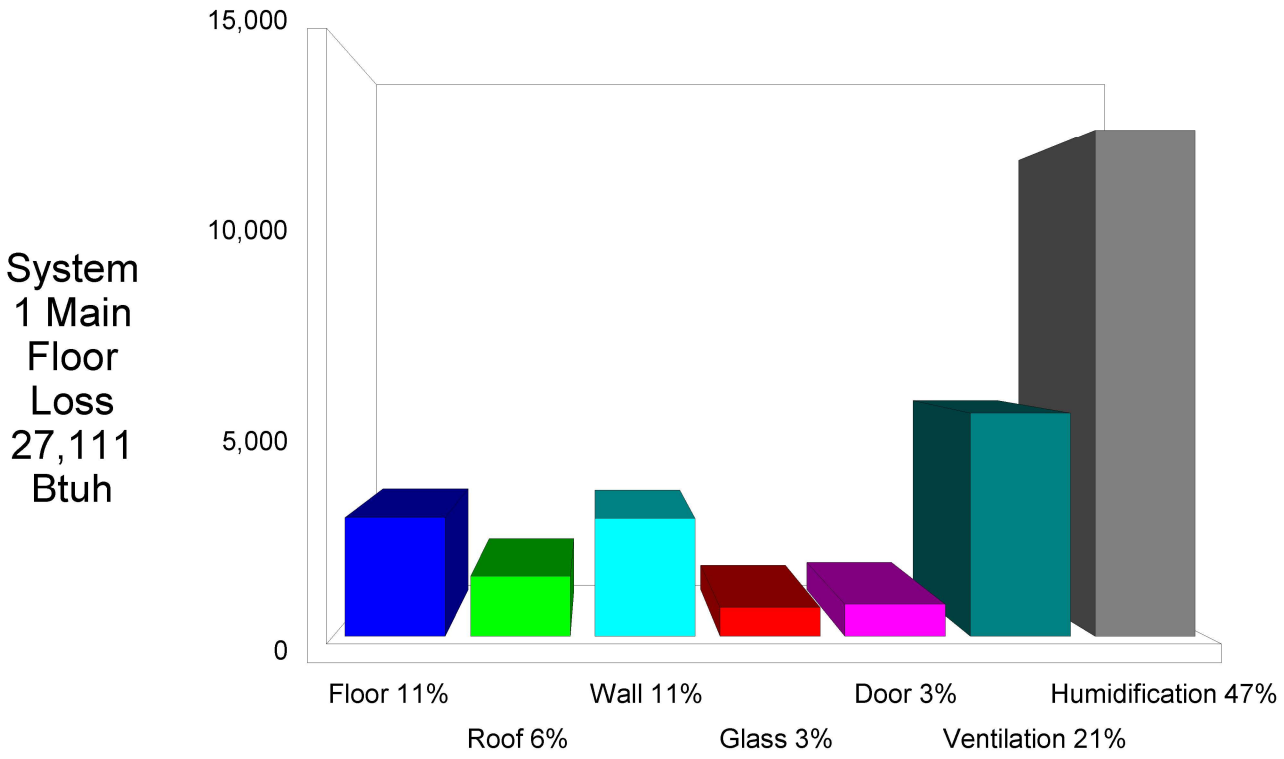
System 1 Main Floor Loss 27,111 Btuh

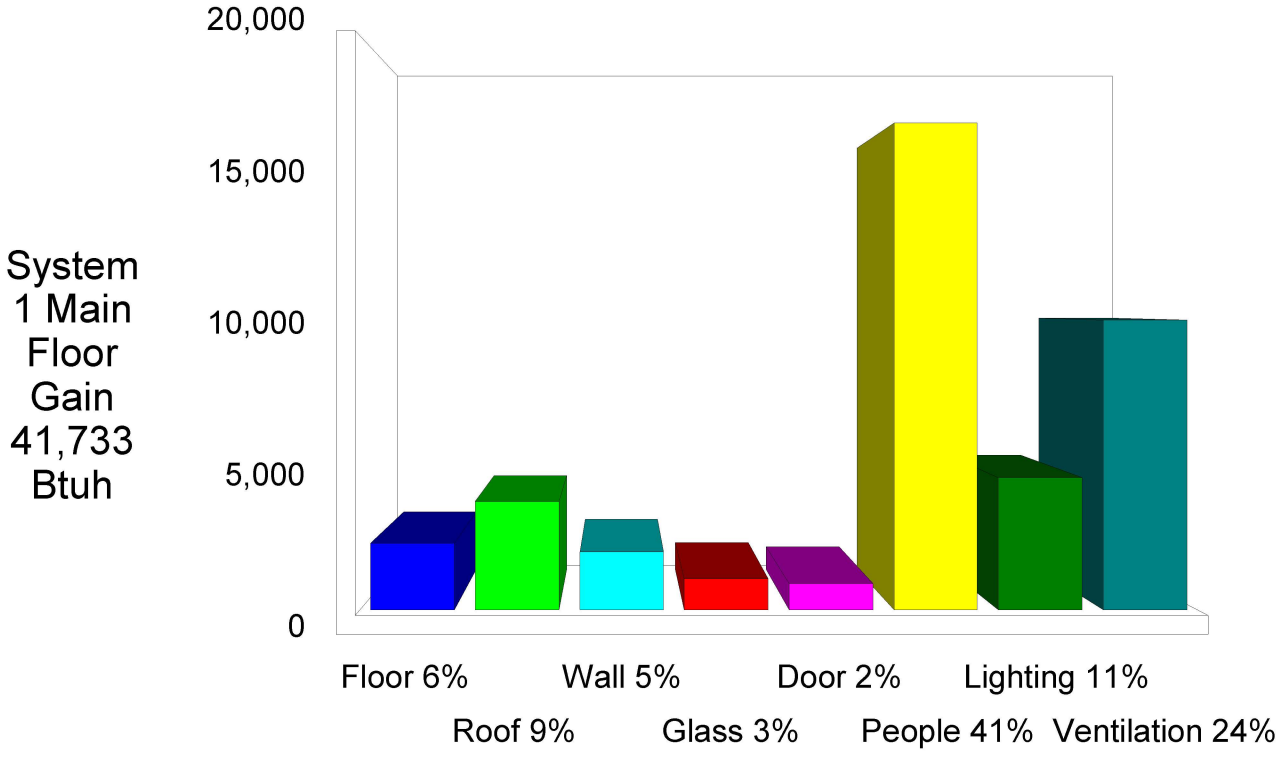


System 1 Main Floor Gain 41,733 Btuh



System 1 Main Floor Bar Graph





Equipment Data - System 1 - Main Floor

Cooling

System Type:	Standard Air Conditioner
Outdoor Model:	Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F
Outdoor Manufacturer:	GOODMAN
Description:	0
Capacity:	42,000
Efficiency:	16 SEER

Heating

System Type:	Electric Resistance
Model:	Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F.
Manufacturer:	GOODMAN
Description:	0
Capacity:	42,000
Efficiency:	0%

This system's equipment was selected in accordance with ACCA Manual S.
Manual S equipment sizing data: SODB: 100F, SOWB: 74F, WODB: 40F, SIDB: 75F, SIRH: 50%, WIDB: 72F, Sen. gain: 28,644 Btuh, Lat. gain: 13,089 Btuh, Sen. loss: 27,111 Btuh, Entering clg. coil DB: 84F, Entering clg. coil WB: 66.9F, Entering htg. coil DB: 53.9F, Clg. coil TD: 20F, Htg. coil TD: 70F, Req. clg. airflow: 1131 CFM, Req. htg. airflow: 286 CFM

Manual S Performance Data - System 1 - Main Floor

Loads and Design Conditions

Cooling:

Outdoor Dry Bulb:	100	Sensible Gain:	28.644
Outdoor Wet Bulb:	74	Latent Gain:	13.089
Indoor Dry Bulb:	75	Total Gain:	41.733
Indoor RH:	50	Load SHR:	0.69
Supply Airflow:	1,131	Entering Dry Bulb:	84
		Entering Wet Bulb:	66.9

Heating:

Outdoor Dry Bulb:	40	Sensible Loss:	27.111
Indoor Dry Bulb:	72	Entering Dry Bulb:	53.9
Indoor RH:	30	Supply Airflow:	286

Equipment Performance Data at System Design Conditions

This system's equipment was selected in accordance with ACCA Manual S.

Cooling:
Model Type: Standard Air Conditioner, Model: Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F. ERV MODEL: HRV5-150-TPD(27C78)
Nominal Capacity: 42.000, Manufacturer: GOODMAN

Entered Interpolation Data:

EWB °F	Air Flow CFM	ODB °F	Total Capacity MBtuh	Power Input kW	EDB 84 °F	
					S/T	Sensible Capacity MBtuh
66.90942	1131	100	42	0	1	42

Interpolation Results:

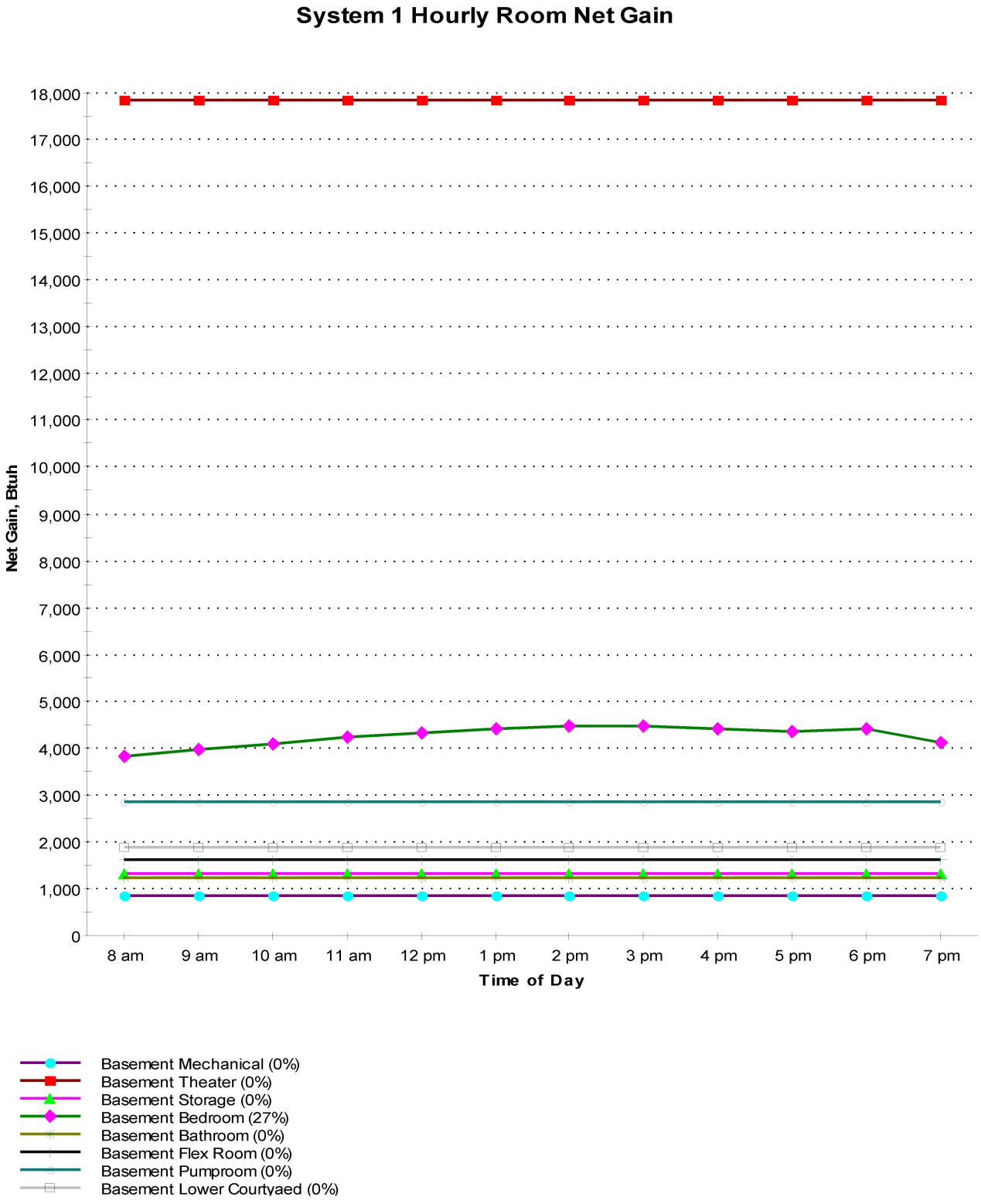
		Load	Percent of Load
Sensible Capacity:	42.000	28.644	147%
Latent Capacity:	0.000	13.089	0%
Total Capacity:	42.000	41.733	101%

Heating:
Model Type: Electric Resistance, Model: Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F. , Nominal Capacity: 42.000, Manufacturer: GOODMAN

Results:

		Load	Percent of Load
Heating Capacity:	42.000	27.111	155%

System 1 - Hourly Room Net Gain



Note: Glass gain as a percent of net gain is shown in parenthesis. Although floor, roof, wall and door gains also vary throughout the day, for this graph and in Manual J glass gains are the only ones that fluctuate.

System 1, Zone 1 Summary Loads (Average Load Procedure for Rooms)

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
1G-cm-s: Glazing-Double pane with storm, clear, metal frame no break, U-value 0.55, SHGC 0.62	41	721	0	1,087	1,087
11F: Door-Wood - Solid Core With Metal Storm, U-value 0.28	90	806	0	908	908
Frame wall-R-23: Wall-Frame, Custom, R-23 insulation, U-value 0.043	2110	2,929	0	2,014	2,014
16A-38: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Unvented Attic, No Radiant Barrier, Any Roofing Material, Any Roof Color, R-38 insulation, U-value 0.026	1810	1,505	0	3,764	3,764
19A1-11op: Floor-Over enclosed crawl space, No insulation on exposed walls, sealed or vented space, spray foam insulation, passive, R-11 open cell 1/2 lb. spray foam, 3 inches in 2 x 10 joist cavity, U-value 0.072	1810	2,966	0	2,316	2,316
Subtotals for structure:		8,927	0	10,089	10,089
People:	32		7,360	9,600	16,960
Equipment:			0	0	0
Lighting:	1350			4,604	4,604
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 0, Summer CFM: 0		0	0	0	0
System 1, Zone 1 Load Totals:		8,927	7,360	24,293	31,653

Check Figures

Supply CFM:	1,131	CFM Per Square ft.:	0.625
Square ft. of Room Area:	1,810	Square ft. Per Ton:	686
Volume (ft³) (Above Grade):	16,290		
Volume (ft³) (Total):	16,290		

Zone Loads

Total Heating Required:	8,927	Btuh	8.927	MBH
Total Sensible Gain:	24,293	Btuh	77	%
Total Latent Gain:	7,360	Btuh	23	%
Total Cooling Required:	31,653	Btuh	2.64	Tons (Based On Sensible + Latent)

Notes

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Detailed Room Loads - Room 1 - Basement Mechanical (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.		Occurrences:	1	
Room Length:	10.0	ft.	System Number:	1	
Room Width:	14.0	ft.	Zone Number:	1	
Area:	140.0	sq.ft.	Supply Air:	39	CFM
Ceiling Height:	9.0	ft.	Supply Air Changes:	1.9	AC/hr
Volume:	1,260	cu.ft.	Req. Vent. Clg:	75	CFM
Number of Registers:	1		Actual Winter Vent.:	29	CFM
Runout Air:	39	CFM	Percent of Supply.:	74	%
Runout Duct Size:	5	in.	Actual Summer Vent.:	14	CFM
Runout Air Velocity:	289	ft./min.	Percent of Supply:	36	%
Runout Air Velocity:	289	ft./min.	Actual Winter Infil.:	0	CFM
Actual Loss:	0.069	in.wg./100 ft.	Actual Summer Infil.:	0	CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Frame wall-R-23 14 X 9	126	0.043	1.4	175	1.0	0	120
E -Wall-Frame wall-R-23 10 X 9	90	0.043	1.4	125	1.0	0	86
UP-Ceil-16A-38 10 X 14	140	0.026	0.8	116	2.1	0	291
Floor-19A1-11op 14 X 10	140	0.072	1.6	229	1.3	0	179
Subtotals for Structure:				645		0	676
Infil.: Win.: 0.0, Sum.: 0.0	216		0.000	0	0.000	0	0
Lighting:	50						171
Room Totals:				645		0	847

Detailed Room Loads - Room 2 - Basement Theater (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.		Occurrences:	1	
Room Length:	10.0	ft.	System Number:	1	
Room Width:	30.0	ft.	Zone Number:	1	
Area:	300.0	sq.ft.	Supply Air:	510	CFM
Ceiling Height:	9.0	ft.	Supply Air Changes:	11.3	AC/hr
Volume:	2,700	cu.ft.	Req. Vent. Clg:	330	CFM
Number of Registers:	1		Actual Winter Vent.:	63	CFM
Runout Air:	510	CFM	Percent of Supply.:	12	%
Runout Duct Size:	12	in.	Actual Summer Vent.:	183	CFM
Runout Air Velocity:	650	ft./min.	Percent of Supply:	36	%
Runout Air Velocity:	650	ft./min.	Actual Winter Infil.:	0	CFM
Actual Loss:	0.102	in.wg./100 ft.	Actual Summer Infil.:	0	CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Frame wall-R-23 14 X 9	81	0.043	1.4	112	1.0	0	77
E -Wall-Frame wall-R-23 10 X 9	90	0.043	1.4	125	1.0	0	86
N -Door-11F 3 X 8	24	0.280	9.0	215	10.1	0	242
N -Door-11F 3 X 7	21	0.280	9.0	188	10.1	0	212
UP-Ceil-16A-38 10 X 30	300	0.026	0.8	250	2.1	0	624
Floor-19A1-11op 30 X 10	300	0.072	1.6	492	1.3	0	384
Subtotals for Structure:				1,382		0	1,625
Infil.: Win.: 0.0, Sum.: 0.0	216		0.000	0	0.000	0	0
People: 230 lat/per, 300 sen/per:	30					6,900	9,000
Lighting:	100						341
Room Totals:				1,382		6,900	10,966

Detailed Room Loads - Room 3 - Basement Storage (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.		Occurrences:	1	
Room Length:	10.0	ft.	System Number:	1	
Room Width:	13.0	ft.	Zone Number:	1	
Area:	130.0	sq.ft.	Supply Air:	61	CFM
Ceiling Height:	9.0	ft.	Supply Air Changes:	3.1	AC/hr
Volume:	1,170	cu.ft.	Req. Vent. Clg:	0	CFM
Number of Registers:	1		Actual Winter Vent.:	28	CFM
Runout Air:	61	CFM	Percent of Supply.:	45	%
Runout Duct Size:	5	in.	Actual Summer Vent.:	22	CFM
Runout Air Velocity:	449	ft./min.	Percent of Supply:	36	%
Runout Air Velocity:	449	ft./min.	Actual Winter Infil.:	0	CFM
Actual Loss:	0.164	in.wg./100 ft.	Actual Summer Infil.:	0	CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Frame wall-R-23 13 X 9	117	0.043	1.4	162	1.0	0	112
E -Wall-Frame wall-R-23 10 X 9	90	0.043	1.4	125	1.0	0	86
UP-Ceil-16A-38 10 X 13	130	0.026	0.8	108	2.1	0	270
Floor-19A1-11op 13 X 10	130	0.072	1.6	213	1.3	0	166
Subtotals for Structure:				608		0	634
Infil.: Win.: 0.0, Sum.: 0.0	207		0.000	0	0.000	0	0
Lighting:	200						682
Room Totals:				608		0	1,316

Detailed Room Loads - Room 4 - Basement Bedroom (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.		Occurrences:	1	
Room Length:	10.0	ft.	System Number:	1	
Room Width:	19.0	ft.	Zone Number:	1	
Area:	190.0	sq.ft.	Supply Air:	169	CFM
Ceiling Height:	9.0	ft.	Supply Air Changes:	5.9	AC/hr
Volume:	1,710	cu.ft.	Req. Vent. Clg:	0	CFM
Number of Registers:	1		Actual Winter Vent.:	83	CFM
Runout Air:	169	CFM	Percent of Supply.:	49	%
Runout Duct Size:	8	in.	Actual Summer Vent.:	60	CFM
Runout Air Velocity:	484	ft./min.	Percent of Supply:	36	%
Runout Air Velocity:	484	ft./min.	Actual Winter Infil.:	0	CFM
Actual Loss:	0.099	in.wg./100 ft.	Actual Summer Infil.:	0	CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Frame wall-R-23 19 X 9	85	0.043	1.4	118	1.0	0	81
E -Wall-Frame wall-R-23 10 X 9	90	0.043	1.4	125	1.0	0	86
N -Door-11F 3 X 8	24	0.280	9.0	215	10.1	0	242
N -Door-11F 3 X 7	21	0.280	9.0	188	10.1	0	212
N -Gls-1G-cm-s shgc-0.62 100%S	41	0.550	17.6	721	26.5	0	1,087
UP-Ceil-16A-38 10 X 19	190	0.026	0.8	158	2.1	0	395
Floor-19A1-11op 19 X 10	190	0.072	1.6	311	1.3	0	243
Subtotals for Structure:				1,836		0	2,346
Infil.: Win.: 0.0, Sum.: 0.0	261		0.000	0	0.000	0	0
People: 230 lat/per, 300 sen/per:	2					460	600
Lighting:	200						682
Room Totals:				1,836		460	3,628

Detailed Room Loads - Room 5 - Basement Bathroom (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.		Occurrences:	1	
Room Length:	10.0	ft.	System Number:	1	
Room Width:	10.0	ft.	Zone Number:	1	
Area:	100.0	sq.ft.	Supply Air:	57	CFM
Ceiling Height:	9.0	ft.	Supply Air Changes:	3.8	AC/hr
Volume:	900	cu.ft.	Req. Vent. Clg:	0	CFM
Number of Registers:	1		Actual Winter Vent.:	25	CFM
Runout Air:	57	CFM	Percent of Supply.:	44	%
Runout Duct Size:	5	in.	Actual Summer Vent.:	20	CFM
Runout Air Velocity:	418	ft./min.	Percent of Supply:	36	%
Runout Air Velocity:	418	ft./min.	Actual Winter Infil.:	0	CFM
Actual Loss:	0.142	in.wg./100 ft.	Actual Summer Infil.:	0	CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Frame wall-R-23 14 X 9	126	0.043	1.4	175	1.0	0	120
E -Wall-Frame wall-R-23 10 X 9	90	0.043	1.4	125	1.0	0	86
UP-Ceil-16A-38 10 X 10	100	0.026	0.8	83	2.1	0	208
Floor-19A1-11op 10 X 10	100	0.072	1.6	164	1.3	0	128
Subtotals for Structure:				547		0	542
Infil.: Win.: 0.0, Sum.: 0.0	216		0.000	0	0.000	0	0
Lighting:	200						682
Room Totals:				547		0	1,224

Detailed Room Loads - Room 6 - Basement Flex Room (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.		Occurrences:	1	
Room Length:	10.0	ft.	System Number:	1	
Room Width:	20.0	ft.	Zone Number:	1	
Area:	200.0	sq.ft.	Supply Air:	75	CFM
Ceiling Height:	9.0	ft.	Supply Air Changes:	2.5	AC/hr
Volume:	1,800	cu.ft.	Req. Vent. Clg:	0	CFM
Number of Registers:	1		Actual Winter Vent.:	39	CFM
Runout Air:	75	CFM	Percent of Supply.:	53	%
Runout Duct Size:	6	in.	Actual Summer Vent.:	27	CFM
Runout Air Velocity:	382	ft./min.	Percent of Supply:	36	%
Runout Air Velocity:	382	ft./min.	Actual Winter Infil.:	0	CFM
Actual Loss:	0.092	in.wg./100 ft.	Actual Summer Infil.:	0	CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Frame wall-R-23 20 X 9	180	0.043	1.4	250	1.0	0	172
E -Wall-Frame wall-R-23 10 X 9	90	0.043	1.4	125	1.0	0	86
UP-Ceil-16A-38 10 X 20	200	0.026	0.8	166	2.1	0	416
Floor-19A1-11op 20 X 10	200	0.072	1.6	328	1.3	0	256
Subtotals for Structure:				869		0	930
Infil.: Win.: 0.0, Sum.: 0.0	270		0.000	0	0.000	0	0
Lighting:	200						682
Room Totals:				869		0	1,612

Detailed Room Loads - Room 7 - Basement Pumproom (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.		Occurrences:	1	
Room Length:	10.0	ft.	System Number:	1	
Room Width:	49.0	ft.	Zone Number:	1	
Area:	490.0	sq.ft.	Supply Air:	132	CFM
Ceiling Height:	9.0	ft.	Supply Air Changes:	1.8	AC/hr
Volume:	4,410	cu.ft.	Req. Vent. Clg:	0	CFM
Number of Registers:	1		Actual Winter Vent.:	88	CFM
Runout Air:	132	CFM	Percent of Supply.:	67	%
Runout Duct Size:	7	in.	Actual Summer Vent.:	47	CFM
Runout Air Velocity:	494	ft./min.	Percent of Supply:	36	%
Runout Air Velocity:	494	ft./min.	Actual Winter Infil.:	0	CFM
Actual Loss:	0.124	in.wg./100 ft.	Actual Summer Infil.:	0	CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Frame wall-R-23 49 X 9	441	0.043	1.4	612	1.0	0	421
E -Wall-Frame wall-R-23 10 X 9	90	0.043	1.4	125	1.0	0	86
UP-Ceil-16A-38 10 X 49	490	0.026	0.8	408	2.1	0	1,019
Floor-19A1-11op 49 X 10	490	0.072	1.6	803	1.3	0	627
Subtotals for Structure:				1,948		0	2,153
Infil.: Win.: 0.0, Sum.: 0.0	531		0.000	0	0.000	0	0
Lighting:	200						682
Room Totals:				1,948		0	2,835

Detailed Room Loads - Room 8 - Basement Lower Courtyaed (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.		Occurrences:	1	
Room Length:	10.0	ft.	System Number:	1	
Room Width:	26.0	ft.	Zone Number:	1	
Area:	260.0	sq.ft.	Supply Air:	87	CFM
Ceiling Height:	9.0	ft.	Supply Air Changes:	2.2	AC/hr
Volume:	2,340	cu.ft.	Req. Vent. Clg:	0	CFM
Number of Registers:	1		Actual Winter Vent.:	50	CFM
Runout Air:	87	CFM	Percent of Supply.:	57	%
Runout Duct Size:	6	in.	Actual Summer Vent.:	31	CFM
Runout Air Velocity:	442	ft./min.	Percent of Supply:	36	%
Runout Air Velocity:	442	ft./min.	Actual Winter Infil.:	0	CFM
Actual Loss:	0.123	in.wg./100 ft.	Actual Summer Infil.:	0	CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Frame wall-R-23 26 X 9	234	0.043	1.4	325	1.0	0	223
E -Wall-Frame wall-R-23 10 X 9	90	0.043	1.4	125	1.0	0	86
UP-Ceil-16A-38 10 X 26	260	0.026	0.8	216	2.1	0	541
Floor-19A1-11op 26 X 10	260	0.072	1.6	426	1.3	0	333
Subtotals for Structure:				1,092		0	1,183
Infil.: Win.: 0.0, Sum.: 0.0	324		0.000	0	0.000	0	0
Lighting:	200						682
Room Totals:				1,092		0	1,865

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	Basement Mechanical	140	645	21	1-5	289	847	0	39	39
2	Basement Theater	300	1,382	44	1-12	650	10,966	6,900	510	510
3	Basement Storage	130	608	20	1-5	449	1,316	0	61	61
4	Basement Bedroom	190	1,836	59	1-8	484	3,628	460	169	169
5	Basement Bathroom	100	547	18	1-5	418	1,224	0	57	57
6	Basement Flex Room	200	869	28	1-6	382	1,612	0	75	75
7	Basement Pumproom	490	1,948	62	1-7	494	2,835	0	132	132
8	Basement Lower Courtyaed	260	1,092	35	1-6	442	1,865	0	87	87
	Ventilation		5,570				4,351	5,729		
	Humidification		12,614							
	System 1 total	1,810	27,111	286			28,644	13,089	1,131	1,131

System 1 Main Trunk Size:	12x17	in.
Velocity:	798	ft./min
Loss per 100 ft.:	0.090	in.wg

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	3.48	69% / 31%	28,644	13,089	41,733
Actual:	3.50				42,000

Equipment Data

	Heating System	Cooling System
Type:	Electric Resistance	Standard Air Conditioner
Model:	Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F.	Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F
Indoor Model:		
Brand:		
Description:	0	0
Efficiency:	0%	16 SEER
Sound:	0	0
Capacity:	42,000 Btuh	42,000 Btuh
Sensible Capacity:	n/a	0 Btuh
Latent Capacity:	n/a	0 Btuh

This system's equipment was selected in accordance with ACCA Manual S.
Manual S equipment sizing data: SODB: 100F, SOWB: 74F, WODB: 40F, SIDB: 75F, SIRH: 50%, WIDB: 72F, Sen. gain: 28,644 Btuh, Lat. gain: 13,089 Btuh, Sen. loss: 27,111 Btuh, Entering clg. coil DB: 84F, Entering clg. coil WB: 66.9F, Entering htg. coil DB: 53.9F, Clg. coil TD: 20F, Htg. coil TD: 70F, Req. clg. airflow: 1131 CFM, Req. htg. airflow: 286 CFM

Building Rotation Duct Sizes

Room or Duct Name	Direction Front door Faces																Max Duct Size
	N		NE		E		SE		S		SW		W		NW		
	Htg Flow	Clg Flow	Htg Flow	Clg Flow	Htg Flow	Clg Flow	Htg Flow	Clg Flow	Htg Flow	Clg Flow	Htg Flow	Clg Flow	Htg Flow	Clg Flow	Htg Flow	Clg Flow	
System 1																	
Supply Runouts																	
Zone 1																	
1-Basement Mechanical	21	39	21	40	21	40	21	40	21	40	21	42	21	42	21	41	1--5
2-Basement Theater	44	510	44	513	44	522	44	519	44	514	44	539	44	546	44	530	1--12
3-Basement Storage	20	61	20	62	20	63	20	62	20	62	20	65	20	66	20	64	1--6
4-Basement Bedroom	59	169	59	223	59	221	59	175	59	170	59	182	59	231	59	231	1--9
5-Basement Bathroom	18	57	18	57	18	58	18	58	18	57	18	60	18	61	18	59	1--5
6-Basement Flex Room	28	75	28	75	28	77	28	76	28	76	28	79	28	80	28	78	1--6
7-Basement Pumproom	62	132	62	133	62	135	62	134	62	133	62	139	62	141	62	137	1--7
8-Basement Lower Courtyae	35	87	35	87	35	89	35	88	35	87	35	92	35	93	35	90	1--6
Other Ducts in System 1																	
Supply Main Trunk	286	1,131	286	1,190	286	1,204	286	1,153	286	1,139	286	1,197	286	1,260	286	1,229	12x17
Bldg. High Dir.: North																	
Sensible Gain: 28,644																	
Latent Gain: 13,089																	

Summary	
System 1	
Heating Flow:	286
Cooling Flow:	1131

Building Rotation Report

All rotation degree values in this report are clockwise with respect to the project's original orientation.
Building orientation as entered (zero degrees rotation): Front door faces North

Individual Rooms

Rm. No.	Room Name	0° Rot. CFM	45° Rot. CFM	90° Rot. CFM	135° Rot. CFM	180° Rot. CFM	225° Rot. CFM	270° Rot. CFM	315° Rot. CFM	High Duct Size
System 1:										
Zone 1:										
1	Basement Mechanical	39	40	40	40	40	42	*42	41	1--5
2	Basement Theater	510	513	522	519	514	539	*546	530	1--12
3	Basement Storage	61	62	63	62	62	65	*66	64	1--6
4	Basement Bedroom	169	223	221	175	170	182	*231	231	1--9
5	Basement Bathroom	57	57	58	58	57	60	*61	59	1--5
6	Basement Flex Room	75	75	77	76	76	79	*80	78	1--6
7	Basement Pumproom	132	133	135	134	133	139	*141	137	1--7
8	Basement Lower Courtyaed	87	87	89	88	87	92	*93	90	1--6

* Indicates highest CFM of all rotations.

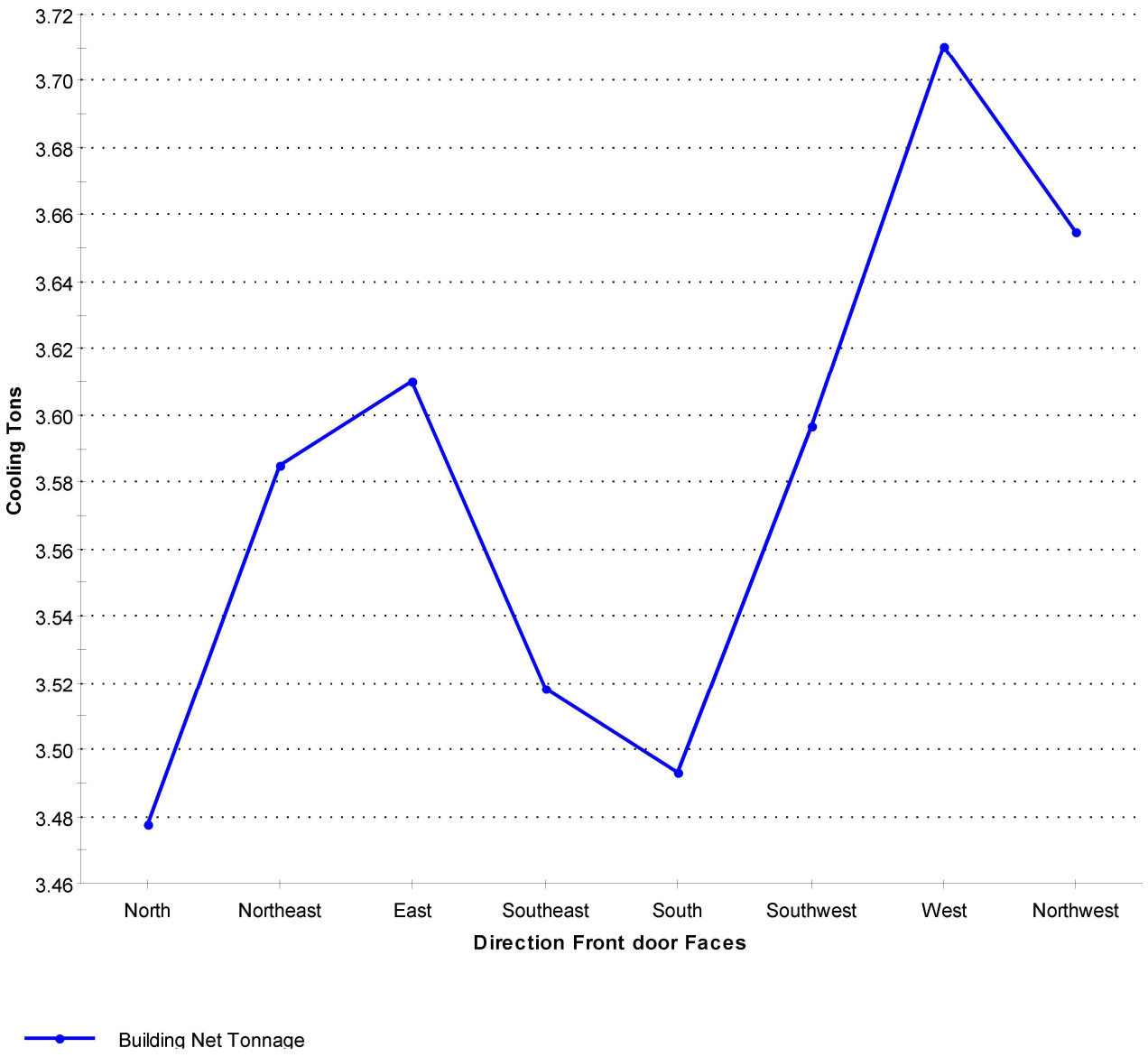
Whole Building

Rotation Degrees	Front door Faces	Supply CFM	Sensible Gain	Latent Gain	Net Tons
0°	North	1,131	28,644	*13,089	3.48
45°	Northeast	1,190	29,929	13,089	3.58
90°	East	1,204	30,230	13,089	3.61
135°	Southeast	1,153	29,130	13,089	3.52
180°	South	1,139	28,831	13,089	3.49
225°	Southwest	1,197	30,073	13,089	3.60
270°	West	*1,260	*31,435	13,089	*3.71
315°	Northwest	1,229	30,768	13,089	3.65

* Indicates highest value of all rotations.

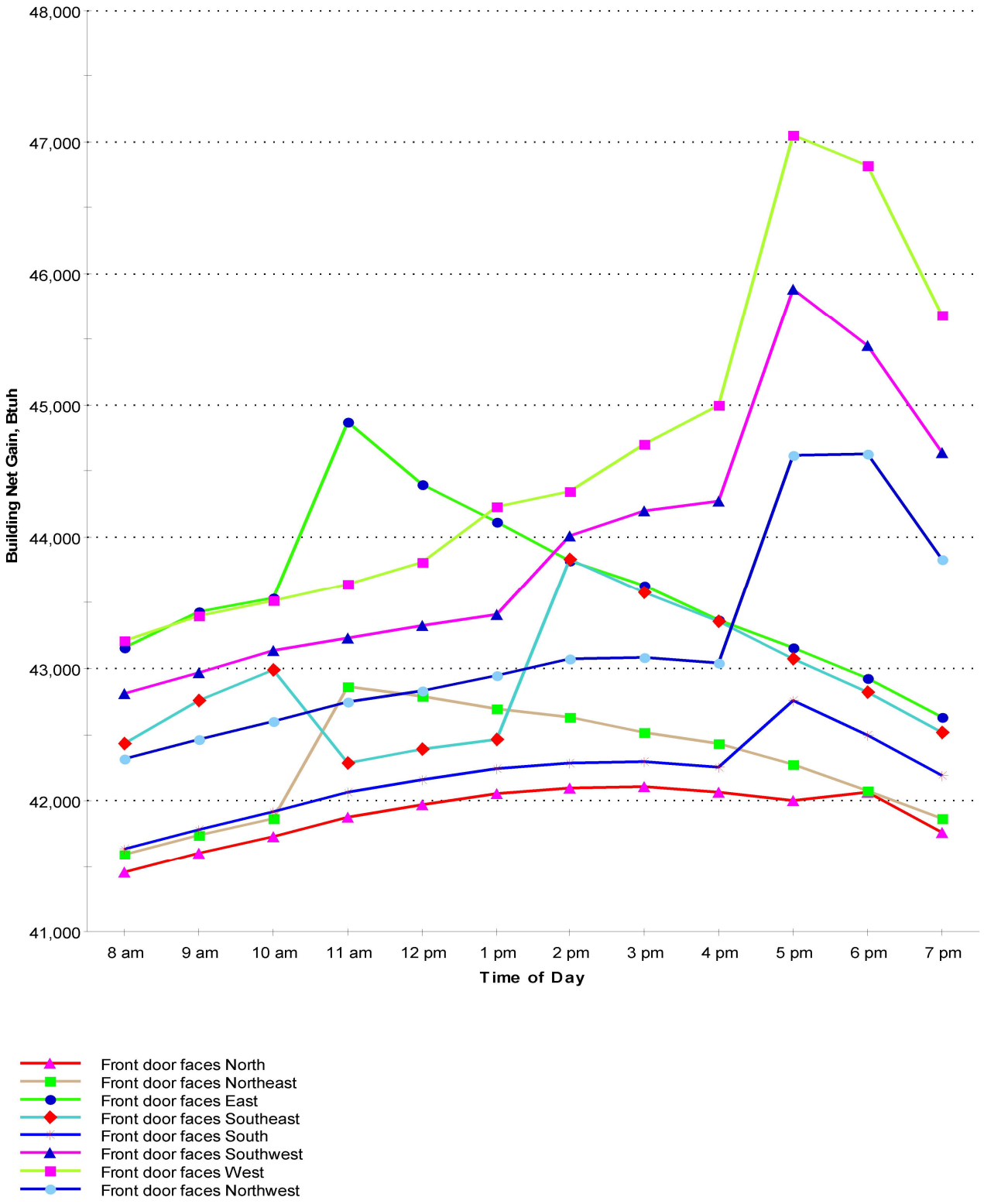
Building Rotation Report (cont'd)

Building Rotation Tonnage



Building Rotation Report (cont'd)

Building Rotation Hourly Net Gain



Residential Plans Examiner Review Form for HVAC System Design (Loads, Equipment, Ducts)

Form RPER 1.01 8 Mar 10

County, Town, Municipality, Jurisdiction Header Information

Contractor: John Doe

Mechanical License #: 12345

Building Plan #:

Home Address (Street or Lot#, Block, Subdivision):

REQUIRED ATTACHMENTS[1]			ATTACHED
Manual J1 Form (and supporting worksheets):	Yes ☐	No ☒	
or MJ1AE Form[2] (and supporting worksheets):	Yes ☐	No ☒	
OEM performance data (heating, cooling, blower):	Yes ☐	No ☒	
Manual D Friction Rate Worksheet:	Yes ☐	No ☒	
Duct distribution system sketch:	Yes ☐	No ☒	

HVAC LOAD CALCULATION (IRC M1401.3)

Design Conditions

Winter Design Conditions

Outdoor temperature	40	°F
Indoor temperature	72	°F
Total heat loss	27111	Btu/h

Summer Design Conditions

Outdoor temperature	100	°F
Indoor temperature	75	°F
Grains difference	21 △ Gr @ 50	% Rh
Sensible heat gain	28644	Btu/h
Latent heat gain	13089	Btu/h
Total heat gain	41733	Btu/h

Building Construction Information

Building

Orientation (Front door faces): North

North, East, West, South, Northeast, Northwest, Southeast, Southwest

Number of bedrooms: 1

Conditioned floor area: 1810 Sq Ft

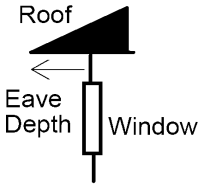
Number of occupants: 32

Windows

Eave overhang depth: 4 Ft

Internal shade (Blinds, drapes, etc):

Number of skylights: 0



HVAC EQUIPMENT SELECTION (IRC M1401.3)

Heating Equipment Data

Equipment type: Electric Resistance (Furnace, Heat pump, Boiler, etc.)

Model: Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F

Heating output capacity: 42000 Btu/h (Heat pumps - capacity at winter design outdoor conditions)

Auxiliary heat output capacity: Btu/h

Cooling Equipment Data

Equipment type: Standard Air Conditioner (Air Conditioner, Heat pump, etc)

Model: Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F

Sensible cooling capacity: 42000 Btu/h

Latent cooling capacity: Btu/h

Total cooling capacity: 42000 Btu/h

Blower Data

Heating CFM: 1131 CFM

Cooling CFM: 1131 CFM

HVAC DUCT DISTRIBUTION SYSTEM DESIGN (IRC M1601.1)

Design airflow: CFM

External Static Pressure (ESP): IWC

Component Pressure Losses (CPL): IWC

Available Static Pressure (ASP): IWC (ASP = ESP - CPL)

Longest supply duct: Ft

Longest return duct: Ft

Total Effective Length (TEL): Ft

Friction Rate: IWC (Friction Rate = (ASP × 100) ÷ TEL)

Duct Materials Used (circle)

Trunk Duct: Duct board, Flex, Sheet metal, Lined sheet metal, Other (specify)

Branch Duct: Duct board, Flex, Sheet metal, Lined sheet metal, Other (specify)

I declare the load calculation, equipment selection, and duct system design were rigorously performed based on the building plan listed above, I understand the claims made on these forms will be subject to review and verification.

Contractor's Printed Name: John Doe Date:

Contractor's Signature: John Doe

Reserved for use by County, Town, Municipality, or Authority having jurisdiction.

[1] The AHJ shall have the discretion to accept Required Attachments printed from approved ACCA software vendors, see list on page 2 of instructions.

[2] If abridged version of Manual J is used for load calculation, then verify residence meets requirements, see Abridged Edition Checklist on page 13 of instructions.

Residential Plans Examiner Review Form for HVAC System Design (Loads, Equipment, Ducts)

Form RPER 1.01 8 Mar 10

County, Town, Municipality, Jurisdiction Header Information

Contractor _____

Mechanical License # _____

Building Plan # _____

Home Address (Street or Lot#, Block, Subdivision) _____

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or MJ1AE Form[2] (and supporting worksheets):	Yes ☐	No ☐
OEM performance data (heating, cooling, blower):	Yes ☐	No ☐
Manual D Friction Rate Worksheet:	Yes ☐	No ☐
Duct distribution system sketch:	Yes ☐	No ☐

HVAC LOAD CALCULATION (IRC M1401.3)

Design Conditions

Winter Design Conditions

Outdoor temperature _____ °F

Indoor temperature _____ °F

Total heat loss _____ Btu/h

Summer Design Conditions

Outdoor temperature _____ °F

Indoor temperature _____ °F

Grains difference _____ △ Gr @ _____ % Rh

Sensible heat gain _____ Btu/h

Latent heat gain _____ Btu/h

Total heat gain _____ Btu/h

Building Construction Information

Building

Orientation (Front door faces) _____

North, East, West, South, Northeast, Northwest, Southeast, Southwest

Number of bedrooms _____

Conditioned floor area _____ Sq Ft

Number of occupants _____

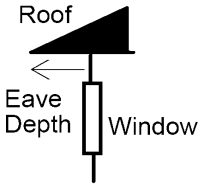
Windows

Eave overhang depth _____ Ft

Internal shade _____

Blinds, drapes, etc

Number of skylights _____



HVAC EQUIPMENT SELECTION (IRC M1401.3)

Heating Equipment Data

Equipment type _____

Furnace, Heat pump, Boiler, etc.

Model _____

Heating output capacity _____ Btu/h

Heat pumps - capacity at winter design outdoor conditions

Auxiliary heat output capacity _____ Btu/h

Cooling Equipment Data

Equipment type _____

Air Conditioner, Heat pump, etc

Model _____

Sensible cooling capacity _____ Btu/h

Latent cooling capacity _____ Btu/h

Total cooling capacity _____ Btu/h

Blower Data

Heating CFM _____ CFM

Cooling CFM _____ CFM

HVAC DUCT DISTRIBUTION SYSTEM DESIGN (IRC M1601.1)

Design airflow _____ CFM

External Static Pressure (ESP) _____ IWC

Component Pressure Losses (CPL) _____ IWC

Available Static Pressure (ASP) _____ IWC

ASP = ESP - CPL

Longest supply duct: _____ Ft

Longest return duct: _____ Ft

Total Effective Length (TEL) _____ Ft

Friction Rate: _____ IWC

Friction Rate = (ASP × 100) ÷ TEL

Duct Materials Used (circle)

Trunk Duct: Duct board, Flex, Sheet metal, Lined sheet metal, Other (specify)

_____

Branch Duct: Duct board, Flex, Sheet metal, Lined sheet metal, Other (specify)

_____

I declare the load calculation, equipment selection, and duct system design were rigorously performed based on the building plan listed above, I understand the claims made on these forms will be subject to review and verification.

Contractor's Printed Name _____ Date _____

Contractor's Signature _____

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[1] The AHJ shall have the discretion to accept Required Attachments printed from approved ACCA software vendors, see list on page 2 of instructions.

[2] If abridged version of Manual J is used for load calculation, then verify residence meets requirements, see Abridged Edition Checklist on page 13 of instructions.

Form generated by ACCA-approved Manual J Eighth Edition Version 2 Elite Software Rhvac program.

Residential Plans Examiner Review Form for HVAC System Design (Loads, Equipment, Ducts)

Form RPER 1.01 8 Mar 10

County, Town, Municipality, Jurisdiction Header Information

Contractor: John Doe

Mechanical License #: 12345

Building Plan #:

Home Address (Street or Lot#, Block, Subdivision):

REQUIRED ATTACHMENTS[1]			ATTACHED
Manual J1 Form (and supporting worksheets):	Yes ☐	No ☒	
or MJ1AE Form[2] (and supporting worksheets):	Yes ☐	No ☒	
OEM performance data (heating, cooling, blower):	Yes ☐	No ☒	
Manual D Friction Rate Worksheet:	Yes ☐	No ☒	
Duct distribution system sketch:	Yes ☐	No ☒	

HVAC LOAD CALCULATION (UMC 1106.1)

Design Conditions

Winter Design Conditions

Outdoor temperature	40	°F
Indoor temperature	72	°F
Total heat loss	27111	Btu/h

Summer Design Conditions

Outdoor temperature	100	°F
Indoor temperature	75	°F
Grains difference	21 △ Gr @ 50	% Rh
Sensible heat gain	28644	Btu/h
Latent heat gain	13089	Btu/h
Total heat gain	41733	Btu/h

Building Construction Information

Building

Orientation (Front door faces): North

North, East, West, South, Northeast, Northwest, Southeast, Southwest

Number of bedrooms: 1

Conditioned floor area: 1810 Sq Ft

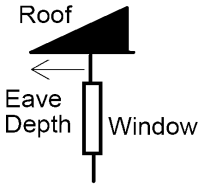
Number of occupants: 32

Windows

Eave overhang depth: 4 Ft

Internal shade (Blinds, drapes, etc):

Number of skylights: 0



HVAC EQUIPMENT SELECTION

Heating Equipment Data

Equipment type: Electric Resistance (Furnace, Heat pump, Boiler, etc.)

Model: Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F

Heating output capacity: 42000 Btu/h (Heat pumps - capacity at winter design outdoor conditions)

Auxiliary heat output capacity: Btu/h

Cooling Equipment Data

Equipment type: Standard Air Conditioner (Air Conditioner, Heat pump, etc)

Model: Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F

Sensible cooling capacity: 42000 Btu/h

Latent cooling capacity: Btu/h

Total cooling capacity: 42000 Btu/h

Blower Data

Heating CFM: 1131 CFM

Cooling CFM: 1131 CFM

HVAC DUCT DISTRIBUTION SYSTEM DESIGN (UMC 601.2)

Design airflow: CFM

External Static Pressure (ESP): IWC

Component Pressure Losses (CPL): IWC

Available Static Pressure (ASP): IWC (ASP = ESP - CPL)

Longest supply duct: Ft

Longest return duct: Ft

Total Effective Length (TEL): Ft

Friction Rate: IWC (Friction Rate = (ASP × 100) ÷ TEL)

Duct Materials Used (circle)

Trunk Duct: Duct board, Flex, Sheet metal, Lined sheet metal, Other (specify)

Branch Duct: Duct board, Flex, Sheet metal, Lined sheet metal, Other (specify)

I declare the load calculation, equipment selection, and duct system design were rigorously performed based on the building plan listed above, I understand the claims made on these forms will be subject to review and verification.

Contractor's Printed Name: John Doe Date:

Contractor's Signature: John Doe

Reserved for use by County, Town, Municipality, or Authority having jurisdiction.

[1] The AHJ shall have the discretion to accept Required Attachments printed from approved ACCA software vendors, see list on page 2 of instructions.

[2] If abridged version of Manual J is used for load calculation, then verify residence meets requirements, see Abridged Edition Checklist on page 13 of instructions.

Residential Plans Examiner Review Form for HVAC System Design (Loads, Equipment, Ducts)

Form RPER 1.01 8 Mar 10

County, Town, Municipality, Jurisdiction Header Information

Contractor _____

Mechanical License # _____

Building Plan # _____

Home Address (Street or Lot#, Block, Subdivision) _____

REQUIRED ATTACHMENTS[1]	ATTACHED	
Manual J1 Form (and supporting worksheets):	Yes ☐	No ☐
or MJ1AE Form[2] (and supporting worksheets):	Yes ☐	No ☐
OEM performance data (heating, cooling, blower):	Yes ☐	No ☐
Manual D Friction Rate Worksheet:	Yes ☐	No ☐
Duct distribution system sketch:	Yes ☐	No ☐

HVAC LOAD CALCULATION (UMC 1106.1)

Design Conditions

Winter Design Conditions

Outdoor temperature _____ °F

Indoor temperature _____ °F

Total heat loss _____ Btu/h

Summer Design Conditions

Outdoor temperature _____ °F

Indoor temperature _____ °F

Grains difference _____ △ Gr @ _____ % Rh

Sensible heat gain _____ Btu/h

Latent heat gain _____ Btu/h

Total heat gain _____ Btu/h

Building Construction Information

Building

Orientation (Front door faces) _____

North, East, West, South, Northeast, Northwest, Southeast, Southwest

Number of bedrooms _____

Conditioned floor area _____ Sq Ft

Number of occupants _____

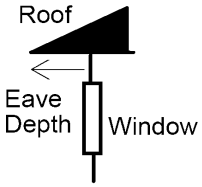
Windows

Eave overhang depth _____ Ft

Internal shade _____

Blinds, drapes, etc

Number of skylights _____



HVAC EQUIPMENT SELECTION

Heating Equipment Data

Equipment type _____

Furnace, Heat pump, Boiler, etc.

Model _____

Heating output capacity _____ Btu/h

Heat pumps - capacity at winter design outdoor conditions

Auxiliary heat output capacity _____ Btu/h

Cooling Equipment Data

Equipment type _____

Air Conditioner, Heat pump, etc

Model _____

Sensible cooling capacity _____ Btu/h

Latent cooling capacity _____ Btu/h

Total cooling capacity _____ Btu/h

Blower Data

Heating CFM _____ CFM

Cooling CFM _____ CFM

HVAC DUCT DISTRIBUTION SYSTEM DESIGN (UMC 601.2)

Design airflow _____ CFM

External Static Pressure (ESP) _____ IWC

Component Pressure Losses (CPL) _____ IWC

Available Static Pressure (ASP) _____ IWC

ASP = ESP - CPL

Longest supply duct: _____ Ft

Longest return duct: _____ Ft

Total Effective Length (TEL) _____ Ft

Friction Rate: _____ IWC

Friction Rate = (ASP × 100) ÷ TEL

Duct Materials Used (circle)

Trunk Duct: Duct board, Flex, Sheet metal, Lined sheet metal, Other (specify)

_____

Branch Duct: Duct board, Flex, Sheet metal, Lined sheet metal, Other (specify)

_____

I declare the load calculation, equipment selection, and duct system design were rigorously performed based on the building plan listed above, I understand the claims made on these forms will be subject to review and verification.

Contractor's Printed Name _____ Date _____

Contractor's Signature _____

Reserved for use by County, Town, Municipality, or Authority having jurisdiction.

[1] The AHJ shall have the discretion to accept Required Attachments printed from approved ACCA software vendors, see list on page 2 of instructions.

[2] If abridged version of Manual J is used for load calculation, then verify residence meets requirements, see Abridged Edition Checklist on page 13 of instructions.

Form generated by ACCA-approved Manual J Eighth Edition Version 2 Elite Software Rhvac program.

ENERGY STAR Single-Family New Homes
National HVAC Design Report, Version 3 / 3.1 / 3.2 (Rev. 13)[1]

HVAC Designer Responsibilities:

- Complete one National HVAC Design Report for each system design for a house plan, created for either the specific plan configuration (i.e., elevation, option, orientation, & county) of the home to be certified or for a plan that is intended to be built with different configurations (i.e., different elevations, options, and/or orientations). Visit www.energystar.gov/newhomeshvacdesign and see Footnote 2 for more information.[2]
- Obtain efficiency features (e.g., window performance, insulation levels, and infiltration rate) from the builder or Rater. [3]
- Provide the completed National HVAC Design Report to the builder or credentialed HVAC contractor and to the Rater.

1. Design Overview

1.1 Designer Name: Engr Rahaman Designer company: _____ Date: October 22, 2025

1.2 Select which party you are providing these design services to: ☐ Builder or ☐ Credentialed HVAC contractor

1.3 Name of company you are providing these design services to (if different than Item 1.1): _____

1.4 Area that system serves: ☐ Whole-house ☐ Upper-level ☐ Lower-level ☐ Other _____

1.5 Is cooling system for a temporary occupant load? [4] ☐ Yes ☐ No

1.6 House plan: 499 Jay Windom Martin Residence Hvac Design Check box to indicate whether the system design is site-specific or part of a group: [2]

☐ Site-specific design. Option(s) & elevation(s) modeled: _____

☐ Group design. Group #: _____ out of _____ total groups for this house plan. Configuration modeled: _____

2. Dwelling Unit Mechanical Ventilation System Design ("Vent System") [5, 6, 7] & Inlets in Return Duct [8]	Designer Verified
Airflow:	
2.1 Ventilation airflow design rate & run-time meet the requirements of ASHRAE 62.2-2010 or later. [9]	☑
2.2 Ventilation airflow rate required by 62.2 for a continuous system 188 CFM	-
2.3 Design for this system: Vent. airflow rate: 405 CFM Run-time per cycle: _____ minutes Cycle time: _____ minutes	-
System Type & Controls:	
2.4 Specified system type: ☐ Supply ☐ Exhaust ☐ Balanced	-
2.5 Specified control location: _____ (e.g., Master bath, utility room)	-
2.6 Specified controls allow the system to operate automatically, without occupant intervention	☐
2.7 Specified controls include a readily-accessible ventilation override and a label has also been specified if its function is not obvious (e.g., a label is required for a toggle wall switch, but not for a switch that's on the ventilation equipment).	☐
2.8 For any outdoor air inlet designed to connect to a ducted return of the HVAC system, specified controls automatically restrict airflow using a motorized damper during ventilation off-cycle and occupant override. [8, 10]	☐
Sound: 2.9 The fan of the specified system is rated ≤ 3 sones if intermittent and ≤ 1 sone if continuous, or exempted. [11]	☐
Efficiency:	
2.10 If Vent System controller operates the HVAC fan, then HVAC fan operation is intermittent and either the fan type in Item 4.7 is ECM / ICM or the controls will reduce the run-time by accounting for HVAC system heating or cooling hours. [12]	☐
2.11 If bathroom fans are specified as part of the system, then they are ENERGY STAR certified. [13]	☐
Air Inlet Location: (Complete this section if system has a specified air inlet location; otherwise check "N/A") [14] ☐ N/A	
2.12 Inlet pulls ventilation air directly from outdoors and not from attic, crawlspace, garage, or adjacent dwelling unit	☐
2.13 Inlet is ≥ 2 ft. above grade or roof deck; ≥ 10 ft. of stretched-string distance from known contamination sources (e.g., stack, vent, exhaust, vehicles) not exiting the roof, and ≥ 3 ft. from known sources exiting the roof. [15]	☐

3. Room-by-Room Heating & Cooling Loads [16]

3.1 Room-by-room loads calculated using: ☐ Unabridged ACCA Manual J v8 ☐ 2013 ASHRAE Fundamentals ☐ Other per AHJ [17] -

3.2 Indoor design temperatures used in loads are 70°F for heating and 75°F for cooling ☐

3.3 Outdoor design temperatures used in loads: (See Footnote 18 and www.energystar.gov/hvacdesigntemps) [18] -
County & State, or US Territory, selected: _____ Cooling season: 100 °F Heating season: 40 °F

3.4 Number of occupants used in loads: [19] 32 -

3.5 Conditioned floor area used in loads: [20] 1810 Sq. Ft. -

3.6 Window area used in loads: [21] 41 Sq. Ft. -

3.7 Predominant window SHGC used in loads: [22] 0.62 -

3.8 Infiltration rate used in loads: [23] Summer: 0 Winter: 0 -

3.9 Mechanical ventilation rate used in loads: 405 CFM -

Loads At Design Conditions (kBtuh)		N	NE	E	SE	S	SW	W	NW	
Cooling	3.10 Sensible heat gain (By orientation [24])	28.6	29.9	30.2	29.1	28.8	30.1	31.4	30.8	-
	3.11 Latent heat gain (Not by orientation)	13.1								-
	3.12 Total heat gain (By orientation [24])	41.7	43	43.3	42.2	41.9	43.2	44.5	43.9	-
	3.13 Maximum - minimum total heat gain (Item 3.12) across orientations = 2.8 kBtuh						Variation is ≤ 6 kBtuh [24, 25]			☑
Heating	3.14 Total heat loss (Not by orientation)	27.1								-

ENERGY STAR Single-Family New Homes
National HVAC Design Report, Version 3 / 3.1 / 3.2 (Rev. 13)[1]

4. Heating & Cooling Equipment Selection [16]	Designer Verified
4.1 Equipment selected per ACCA Manual S (see Footnote 25 & 26) [26, 27]	☑
Air Conditioner / Heat Pump (Complete if air conditioner or heat pump will be installed; otherwise check "N/A")	☐ N/A
4.2 Equipment type: ☐ Cooling-only air conditioner or ☐ Cooling & heating heat pump	-
4.3 Condenser manufacturer & model: GOODMAN, Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F	-
4.4 Evaporator / fan coil manufacturer & model: ,	-
4.5 AHRI reference #: [28]	-
4.6 Rated cooling efficiency: [29] 16 SEER / Rated heating efficiency:	-
4.7 Evaporator fan type: ☐ PSC ☐ ECM / ICM ☐ Other:	-
4.8 Compressor type: ☐ Single-speed ☐ Two-speed ☐ Variable-speed	-
4.9 Latent capacity at design conditions, from OEM expanded performance data: [31] 0 kBtuh	-
4.10 Sensible capacity at design conditions, from OEM expanded performance data: [31] 42 kBtuh	-
4.11 Total capacity at design conditions, from OEM expanded performance data: [31] 42 kBtuh	-
4.12 Air-source heat pump capacity: At 17°F: 0 kBtuh At 47°F: 0 kBtuh ☐ N/A	-
4.13 Cooling sizing % = Total capacity (Item 4.11) divided by maximum total heat gain (Item 3.12): 94 %	
4.14 Complete this item if Condition B Climate will be used to select sizing limit in Item 4.15. Otherwise, check "N/A": [32] ☐ N/A	-
4.14.1 Load sensible heat ratio = Max sensible heat gain (Item 3.10) / Max. total heat gain (Item 3.12) = 69 %	
4.14.2 HDD / CDD ratio (Visit energystar.gov/hvacdesigntemps to determine this value for the design location) =	
4.15 Check box of applicable cooling sizing limit from chart below: [26, 27]	-

Equipment Type (Per Item 4.2) & Climate Condition (Per Item 4.14)	Compressor Type (Per Item 4.8)		
	Single-Speed	Two-Speed	Variable-Speed
For Cooling-Only Equipment or For Cooling Mode of Heat Pump in Condition A Climate	☐ Recommended: 90 - 115% Allowed: 90 - 130%	☐ Recommended: 90 - 120% Allowed: 90 - 140%	☐ Recommended: 90 - 130% Allowed: 90 - 160%
For Cooling Mode of Heat Pump in Condition B Climate	☐ 90% - 100%, plus 15 kBtuh	☐ 90% - 100%, plus 15 kBtuh	☐ 90% - 100%, plus 15 kBtuh

4.16 Cooling sizing % (4.13) is within cooling sizing limit (4.15)	☐
Furnace (Complete if furnace will be installed; otherwise check "N/A")	☐ N/A
4.17 Furnace manufacturer & model: GOODMAN, Heat Pump:CHPF3743C6+.outdoor unit:GSX160421F.	-
4.18 Rated heating efficiency: 0 AFUE	-
4.19 Total capacity: [33] 42 kBtuh	-
4.20 Heating sizing % = Total capacity (Item 4.19) divided by total heat loss (Item 3.14): 155 %	-
4.21 Check box of applicable heating sizing limit from chart below:	-

When Used for Heating Only	When Paired With Cooling
☐ 100 - 140%	☑ Recommended: 100 – 140% Allowed: 100 – 400%

4.22 Heating sizing % (4.20) is within heating sizing limit (4.21)	☑
5. Duct Design (Complete if heating or cooling equipment will be installed with ducts; otherwise check "N/A") [16]	☐ N/A
5.1 Duct system designed for the equipment selected in Section 4, per ACCA Manual D	☐
5.2 Design HVAC fan airflow: [34] Cooling mode 1131 CFM Heating mode 286 CFM	-
5.3 Design HVAC fan speed setting (e.g., low, medium, high): [35] Cooling mode Heating mode	-
5.4 Design total external static pressure (corresponding to the mode with the higher airflow in Item 5.2): [36] 0 IWC	-
5.5 Room-by-room design airflows documented below (which must sum to the mode with the higher airflow in Item 5.2) [37, 38]	-

	Room Name	Design Airflow (CFM)		Room Name	Design Airflow (CFM)		Room Name	Design Airflow (CFM)
1	Basement Mechanical	39	12			23		
2	Basement Theater	510	13			24		
3	Basement Storage	61	14			25		
4	Basement Bedroom	169	15			26		
5	Basement Bathroom	57	16			27		
6	Basement Flex Room	75	17			28		
7	Basement Pumproom	132	18			29		
8	Basement Lower Courtyaed	87	19			30		
9			20			31		
10			21			32		
11			22				Total for all rooms	1131

ENERGY STAR Single-Family New Homes
National HVAC Design Report, Version 3 / 3.1 / 3.2 (Rev. 13)[1]

HVAC Designer Responsibilities:

- Complete one National HVAC Design Report for each system design for a house plan, created for either the specific plan configuration (i.e., elevation, option, orientation, & county) of the home to be certified or for a plan that is intended to be built with different configurations (i.e., different elevations, options, and/or orientations). Visit www.energystar.gov/newhomeshvacdesign and see Footnote 2 for more information.[2]
- Obtain efficiency features (e.g., window performance, insulation levels, and infiltration rate) from the builder or Rater. [3]
- Provide the completed National HVAC Design Report to the builder or credentialed HVAC contractor and to the Rater.

1. Design Overview

1.1 Designer Name: _____ Designer company: _____ Date: _____

1.2 Select which party you are providing these design services to: ☐ Builder or ☐ Credentialed HVAC contractor

1.3 Name of company you are providing these design services to (if different than Item 1.1): _____

1.4 Area that system serves: ☐ Whole-house ☐ Upper-level ☐ Lower-level ☐ Other _____

1.5 Is cooling system for a temporary occupant load? [4] ☐ Yes ☐ No

1.6 House plan: _____ Check box to indicate whether the system design is site-specific or part of a group: [2]

☐ Site-specific design. Option(s) & elevation(s) modeled: _____

☐ Group design. Group #: _____ out of _____ total groups for this house plan. Configuration modeled: _____

2. Dwelling Unit Mechanical Ventilation System Design ("Vent System") [5, 6, 7] & Inlets in Return Duct [8]	Designer Verified
Airflow:	
2.1 Ventilation airflow design rate & run-time meet the requirements of ASHRAE 62.2-2010 or later. [9]	☐
2.2 Ventilation airflow rate required by 62.2 for a continuous system _____ CFM	-
2.3 Design for this system: Vent. airflow rate: _____ CFM Run-time per cycle: _____ minutes Cycle time: _____ minutes	-
System Type & Controls:	
2.4 Specified system type: ☐ Supply ☐ Exhaust ☐ Balanced	-
2.5 Specified control location: _____ (e.g., Master bath, utility room)	-
2.6 Specified controls allow the system to operate automatically, without occupant intervention	☐
2.7 Specified controls include a readily-accessible ventilation override and a label has also been specified if its function is not obvious (e.g., a label is required for a toggle wall switch, but not for a switch that's on the ventilation equipment).	☐
2.8 For any outdoor air inlet designed to connect to a ducted return of the HVAC system, specified controls automatically restrict airflow using a motorized damper during ventilation off-cycle and occupant override. [8, 10]	☐
Sound: 2.9 The fan of the specified system is rated ≤ 3 sones if intermittent and ≤ 1 sone if continuous, or exempted. [11]	☐
Efficiency:	
2.10 If Vent System controller operates the HVAC fan, then HVAC fan operation is intermittent and either the fan type in Item 4.7 is ECM / ICM or the controls will reduce the run-time by accounting for HVAC system heating or cooling hours. [12]	☐
2.11 If bathroom fans are specified as part of the system, then they are ENERGY STAR certified. [13]	☐
Air Inlet Location: (Complete this section if system has a specified air inlet location; otherwise check "N/A") [14]	☐ N/A
2.12 Inlet pulls ventilation air directly from outdoors and not from attic, crawlspace, garage, or adjacent dwelling unit	☐
2.13 Inlet is ≥ 2 ft. above grade or roof deck; ≥ 10 ft. of stretched-string distance from known contamination sources (e.g., stack, vent, exhaust, vehicles) not exiting the roof, and ≥ 3 ft. from known sources exiting the roof. [15]	☐

3. Room-by-Room Heating & Cooling Loads [16]

3.1 Room-by-room loads calculated using: ☐ Unabridged ACCA Manual J v8 ☐ 2013 ASHRAE Fundamentals ☐ Other per AHJ [17]									-
3.2 Indoor design temperatures used in loads are 70°F for heating and 75°F for cooling									☐
3.3 Outdoor design temperatures used in loads: (See Footnote 18 and www.energystar.gov/hvacdesigntemps) [18] County & State, or US Territory, selected: _____ Cooling season: _____°F Heating season: _____°F									-
3.4 Number of occupants used in loads: [19] _____									-
3.5 Conditioned floor area used in loads: [20] _____ Sq. Ft.									-
3.6 Window area used in loads: [21] _____ Sq. Ft.									-
3.7 Predominant window SHGC used in loads: [22] _____									-
3.8 Infiltration rate used in loads: [23] Summer: _____ Winter: _____									-
3.9 Mechanical ventilation rate used in loads: _____ CFM									-
Loads At Design Conditions (kBtuh)	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**	-
Cooling 3.10 Sensible heat gain (By orientation [24])									-
Cooling 3.11 Latent heat gain (Not by orientation)									-
Cooling 3.12 Total heat gain (By orientation [24])									-
Cooling 3.13 Maximum - minimum total heat gain (Item 3.12) across orientations = _____ kBtuh						Variation is ≤ 6 kBtuh [24, 25]			☐
Heating 3.14 Total heat loss (Not by orientation)									-

ENERGY STAR Single-Family New Homes
National HVAC Design Report, Version 3 / 3.1 / 3.2 (Rev. 13)[1]

4. Heating & Cooling Equipment Selection [16]	**Designer Verified**
4.1 Equipment selected per ACCA Manual S (see Footnote 25 & 26) [26, 27]	☐
Air Conditioner / Heat Pump (Complete if air conditioner or heat pump will be installed; otherwise check "N/A")	☐ N/A
4.2 Equipment type: ☐ Cooling-only air conditioner or ☐ Cooling & heating heat pump	-
4.3 Condenser manufacturer & model: _____	-
4.4 Evaporator / fan coil manufacturer & model: _____	-
4.5 AHRI reference #: [28] _____	-
4.6 Rated cooling efficiency: [29] _____/_____ Rated heating efficiency: _____	-
4.7 Evaporator fan type: ☐ PSC ☐ ECM / ICM ☐ Other:_____	-
4.8 Compressor type: ☐ Single-speed ☐ Two-speed ☐ Variable-speed	-
4.9 Latent capacity at design conditions, from OEM expanded performance data: [31] _____ kBtuh	-
4.10 Sensible capacity at design conditions, from OEM expanded performance data: [31] _____ kBtuh	-
4.11 Total capacity at design conditions, from OEM expanded performance data: [31] _____ kBtuh	-
4.12 Air-source heat pump capacity: At 17°F: _____ kBtuh At 47°F: _____ kBtuh ☐ N/A	-
4.13 Cooling sizing % = Total capacity (Item 4.11) divided by maximum total heat gain (Item 3.12): _____ %	
4.14 Complete this item if Condition B Climate will be used to select sizing limit in Item 4.15. Otherwise, check "N/A": [32] ☐ N/A	-
4.14.1 Load sensible heat ratio = Max sensible heat gain (Item 3.10) / Max. total heat gain (Item 3.12) = _____ %	
4.14.2 HDD / CDD ratio (Visit energystar.gov/hvacdesigntemps to determine this value for the design location) = _____	
4.15 Check box of applicable cooling sizing limit from chart below: [26, 27]	-

Equipment Type (Per Item 4.2) & Climate Condition (Per Item 4.14)	Compressor Type (Per Item 4.8)		
	Single-Speed	Two-Speed	Variable-Speed
For Cooling-Only Equipment or For Cooling Mode of Heat Pump in Condition A Climate	☐ Recommended: 90 - 115% Allowed: 90 - 130%	☐ Recommended: 90 - 120% Allowed: 90 - 140%	☐ Recommended: 90 - 130% Allowed: 90 - 160%
For Cooling Mode of Heat Pump in Condition B Climate	☐ 90% - 100%, plus 15 kBtuh	☐ 90% - 100%, plus 15 kBtuh	☐ 90% - 100%, plus 15 kBtuh

4.16 Cooling sizing % (4.13) is within cooling sizing limit (4.15)	☐
Furnace (Complete if furnace will be installed; otherwise check "N/A")	☐ N/A
4.17 Furnace manufacturer & model: _____	-
4.18 Rated heating efficiency: _____ AFUE	-
4.19 Total capacity: [33] _____ kBtuh	-
4.20 Heating sizing % = Total capacity (Item 4.19) divided by total heat loss (Item 3.14): _____ %	-
4.21 Check box of applicable heating sizing limit from chart below:	-

When Used for Heating Only	When Paired With Cooling
☐ 100 - 140%	☐ Recommended: 100 – 140% Allowed: 100 – 400%

4.22 Heating sizing % (4.20) is within heating sizing limit (4.21)	☐
5. Duct Design (Complete if heating or cooling equipment will be installed with ducts; otherwise check "N/A") [16]	☐ N/A
5.1 Duct system designed for the equipment selected in Section 4, per ACCA Manual D	☐
5.2 Design HVAC fan airflow: [34] Cooling mode _____ CFM Heating mode _____ CFM	-
5.3 Design HVAC fan speed setting (e.g., low, medium, high): [35] Cooling mode _____ Heating mode _____	-
5.4 Design total external static pressure (corresponding to the mode with the higher airflow in Item 5.2): [36] _____ IWC	-
5.5 Room-by-room design airflows documented below (which must sum to the mode with the higher airflow in Item 5.2) [37, 38]	-

	Room Name	Design Airflow (CFM)		Room Name	Design Airflow (CFM)		Room Name	Design Airflow (CFM)
1			12			23		
2			13			24		
3			14			25		
4			15			26		
5			16			27		
6			17			28		
7			18			29		
8			19			30		
9			20			31		
10			21			32		
11			22				Total for all rooms	