Pascal & Caroline Aghyarian
HVAC Load Calculations

for

340 Orchid Hill Lane Tract 5 A0050A J. B
Town of Copper Canyon, Denton County, Tx

Elite Software

RHVAC RESIDENTIAL HVAC LOADS

Prepared By:

340 Orchid Hill Lane Tract 5 A0050A J. B
Town of Copper Canyon, Denton County, Tx

Monday, November 17, 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 Title:	Pascal & Caroline Aghyarian
Designed By:	Engr Rahaman
Project Date:	Monday, November 17, 2025
Client Address:	340 Orchid Hill Lane Tract 5 A0050A J. B
Client City:	Town of Copper Canyon, Denton County, Tx
Company Address:	340 Orchid Hill Lane Tract 5 A0050A J. B
Company City:	Town of Copper Canyon, Denton County, Tx
Permit Number(s):	HV11172025

Design Data

Reference City:		Denton, Texas
Building Orientation:		Front door faces North
Daily Temperature Range:		Medium
Latitude:	33	Degrees
Elevation:	642	ft.
Altitude Factor:	0.977	

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	22	20.42	n/a	n/a	72	n/a
Summer:	99	74	31%	50%	75	23

Check Figures

Total Building Supply CFM:	6,529	CFM Per Square ft.:	0.660
Square ft. of Room Area:	9,890	Square ft. Per Ton:	507
Volume (ft³):	118,922		

Building Loads

Total Heating Required Including Ventilation Air:	166,810	Btuh	166.810	MBH
Total Sensible Gain:	173,860	Btuh	74	%
Total Latent Gain:	60,075	Btuh	26	%
Total Cooling Required Including Ventilation Air:	233,935	Btuh	19.49	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.

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	
Building	19.49	507	9,890	173,860	60,075	233,935	166,810	1,289	6,529	6,529	
System 1	19.49	507	9,890	173,860	60,075	233,935	166,810	1,289	6,529	6,529	28x38
Ventilation				33,531	19,775	53,306	69,857	1,300	1,300	1,300	
Zone 1			9,890	140,329	40,300	180,629	96,953	1,289	6,529	6,529	28x38
1-First Floor			7,527	107,691	33,000	140,691	74,270	987	5,010	5,010	1--35
2-Second Floor			2,363	32,638	7,300	39,938	22,683	302	1,518	1,518	1--20

Duct Size Preview

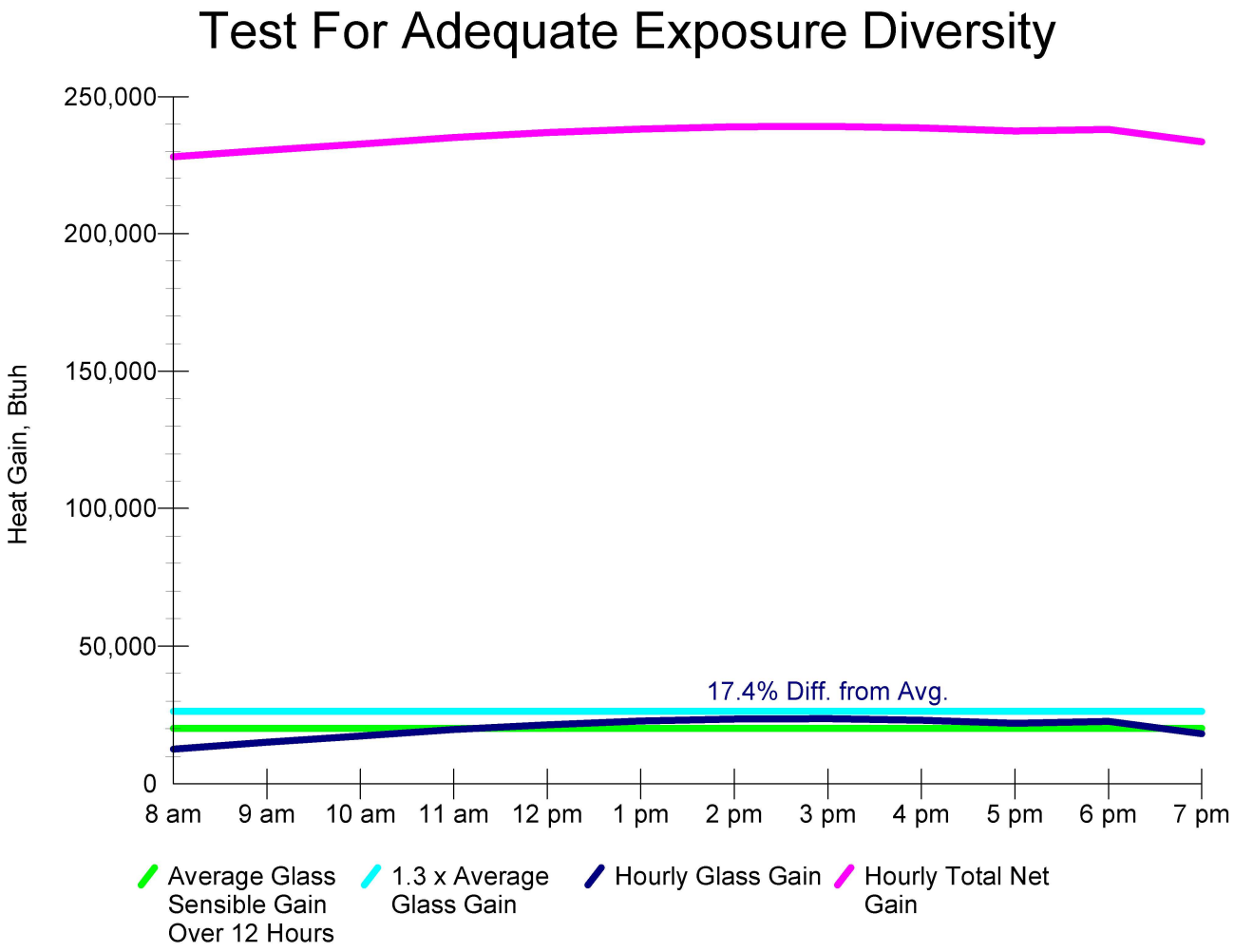
Room or Duct Name	Source	Minimum Velocity	Maximum Velocity	Rough. Factor	Design L/100	SP Loss	Duct Velocity	Duct Length	Htg Flow	Clg Flow	Act. Flow	Duct Size	Reg Size
System 1													
Supply Runouts													
Zone 1													
1-First Floor	Built-In	0	750	0.01	0.1		749.9		987	5,010	5,010	1--35	
2-Second Floor	Built-In	0	750	0.01	0.1		696		302	1,518	1,518	1--20	
Other Ducts in System 1													
Supply Main Trunk	Built-In	0	900	0.003	0.1		883.6		1,289	6,529	6,529	28x38	

Summary

System 1

Heating Flow:	1289
Cooling Flow:	6529

System 1 - Main Floor - Adequate Exposure Diversity Test



AED Calculation Summary

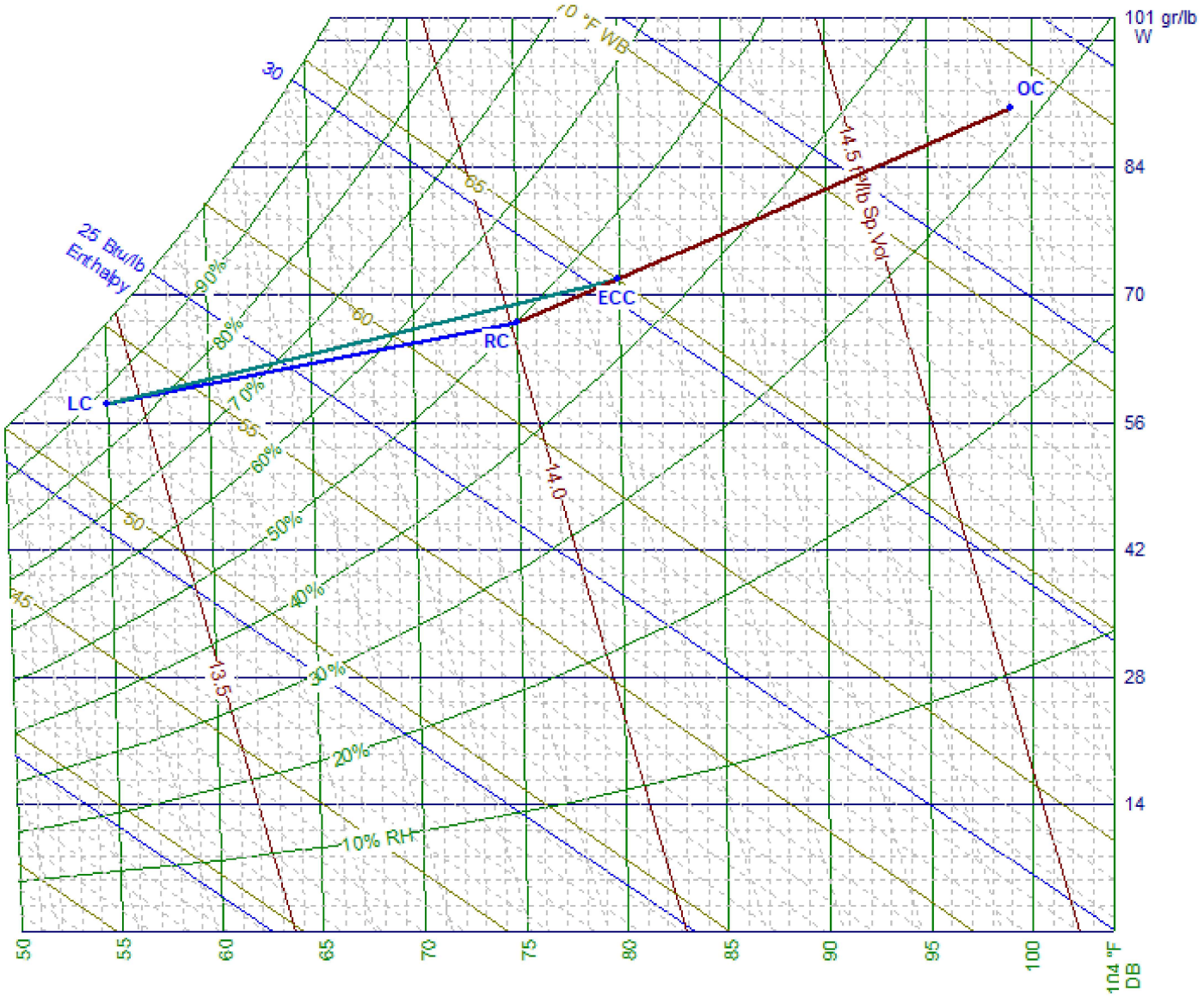
--- SYSTEM HAS ADEQUATE EXPOSURE DIVERSITY. ---

System is on N, E, S, W rosette.
Peak load exceeds 12-hour average load by 17.4%.
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	99	74
LC	Leaving Coil Condition	55	52.8	ECC	Entering Coil Condition	79.9	65
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	79.9	65
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	n/a	n/a				



Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
window: Glazing-window R-49 and SHGC 0.62, U-value 0.32, SHGC 0.25	1444	23,104	0	18,492	18,492
11F: Door-Wood - Solid Core With Metal Storm, U-value 0.32	984	15,744	0	11,021	11,021
WALL ASSEMBLY: Wall-Frame, Custom, Exterior Walls: Install open-cell spray foam in all 2x6 exterior wall cavities, fully filling stud bays to achieve R-21, exceeding IECC Climate Zone 3A prescriptive requirement (R-20 cavity or R-13 cavity + R-5 continuous)., U-value 0.048	6566.2	15,628	0	8,251	8,251
open-cell spray foa: Roof/Ceiling-Roof Joists Between Roof Deck and Ceiling or Foam Encapsulated Roof Joists, Custom, Roof Deck: Provide 8" minimum open-cell spray foam (\~R-30) on the underside of all roof decking for a thermal and air barrier, U-value 0.033	9890	16,466	0	9,221	9,221
Exposed / Cantilever: Floor-Over open crawl space or garage, Custom, Exposed / Cantilevered Floors: Apply 1" closed-cell spray foam (\~R-7) plus additional open-cell spray foam to achieve minimum R-19 insulation at exposed floor assemblies., U-value 0.053	9890	26,011	0	9,884	9,884
Subtotals for structure:		96,953	0	56,869	56,869
People:	110		25,300	33,000	58,300
Equipment:			15,000	30,000	45,000
Lighting:	6000			20,460	20,460
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Ventilation: Winter CFM: 1,300, Summer CFM: 1,300		69,857	19,775	33,531	53,306
Total Building Load Totals:		166,810	60,075	173,860	233,935

Check Figures

Total Building Supply CFM:	6,529	CFM Per Square ft.:	0.660
Square ft. of Room Area:	9,890	Square ft. Per Ton:	507
Volume (ft³):	118,922		

Building Loads

Total Heating Required Including Ventilation Air:	166,810	Btuh	166.810	MBH
Total Sensible Gain:	173,860	Btuh	74	%
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Notes

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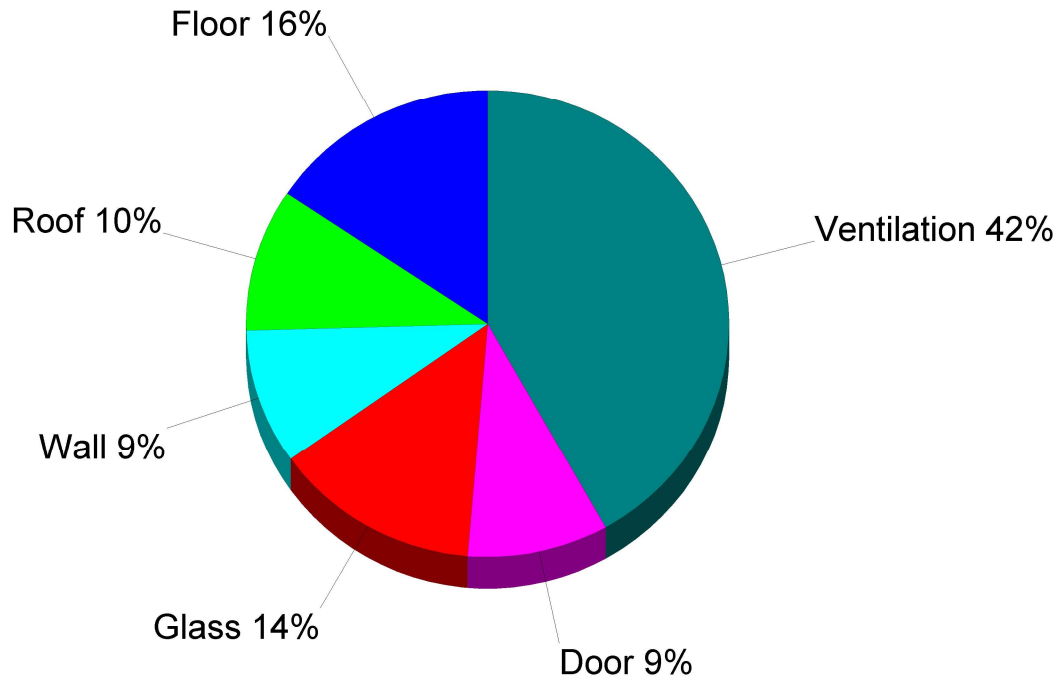
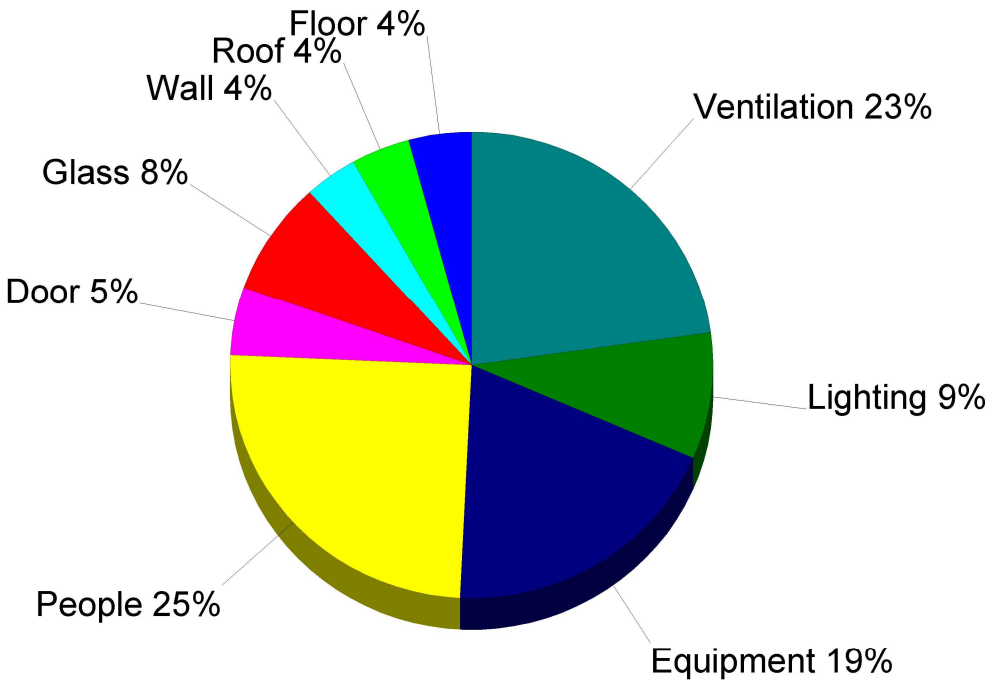
Building Pie Chart

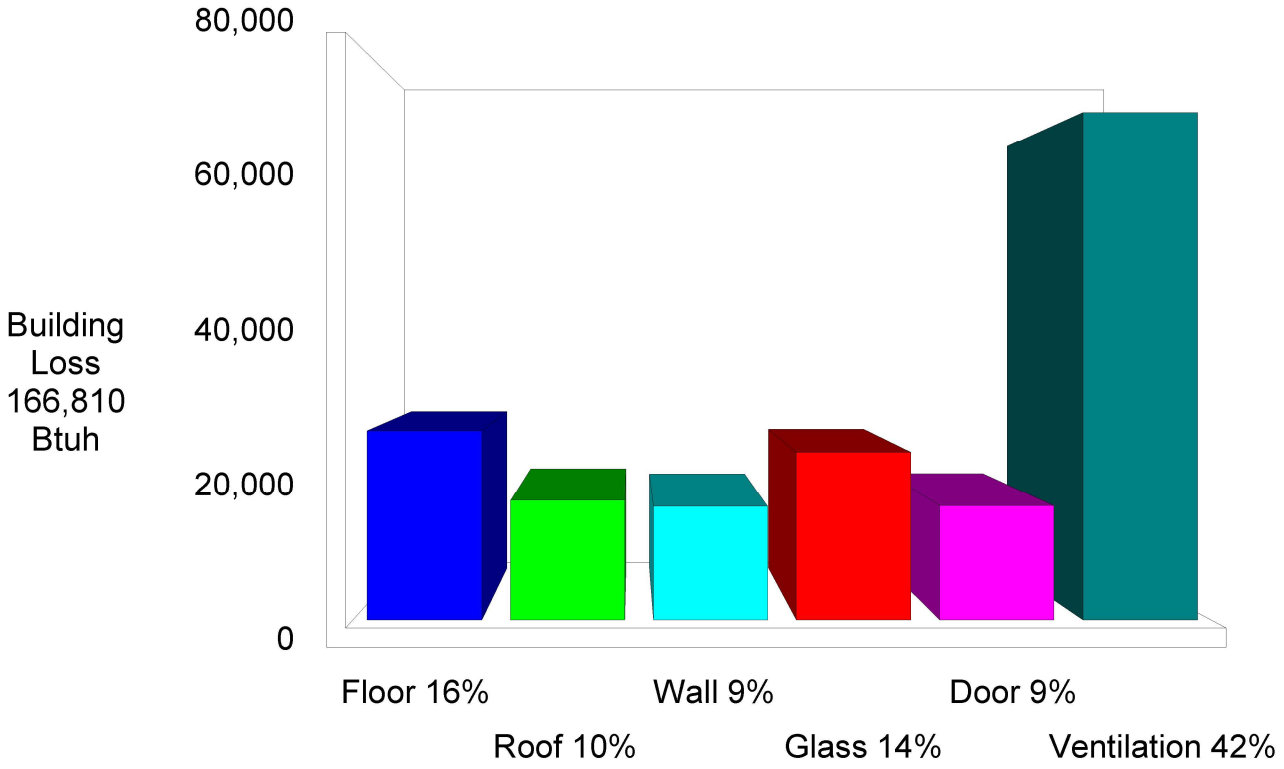
Building Loss 166,810 Btuh

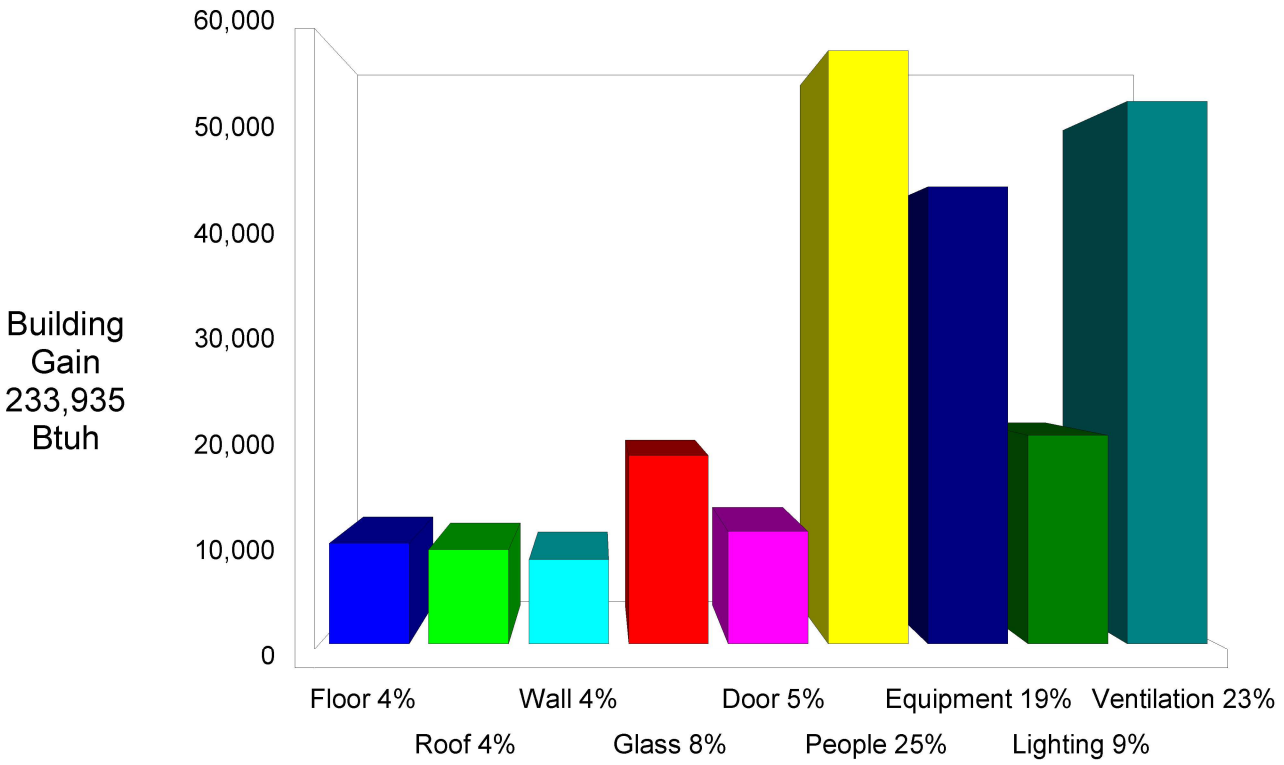


Building Gain 233,935 Btuh



Building Bar Graph





System 1 Main Floor Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
window: Glazing-window R-49 and SHGC 0.62, U-value 0.32, SHGC 0.25	1444	23,104	0	18,492	18,492
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Subtotals for structure:		96,953	0	56,869	56,869
People:	110		25,300	33,000	58,300
Equipment:			15,000	30,000	45,000
Lighting:	6000			20,460	20,460
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Ventilation: Winter CFM: 1,300, Summer CFM: 1,300		69,857	19,775	33,531	53,306
System 1 Main Floor Load Totals:		166,810	60,075	173,860	233,935

Check Figures

Supply CFM:	6,529	CFM Per Square ft.:	0.660
Square ft. of Room Area:	9,890	Square ft. Per Ton:	507
Volume (ft³):	118,922		

System Loads

Total Heating Required Including Ventilation Air:	166,810	Btuh	166.810	MBH
Total Sensible Gain:	173,860	Btuh	74	%
Total Latent Gain:	60,075	Btuh	26	%
Total Cooling Required Including Ventilation Air:	233,935	Btuh	19.49	Tons (Based On Sensible + Latent)

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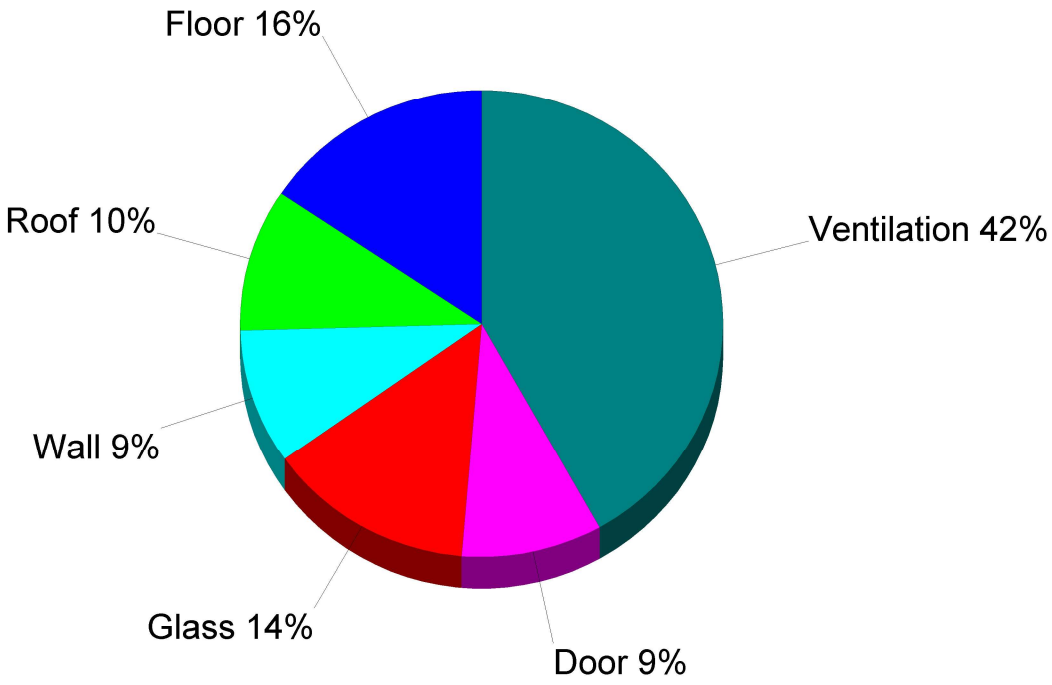
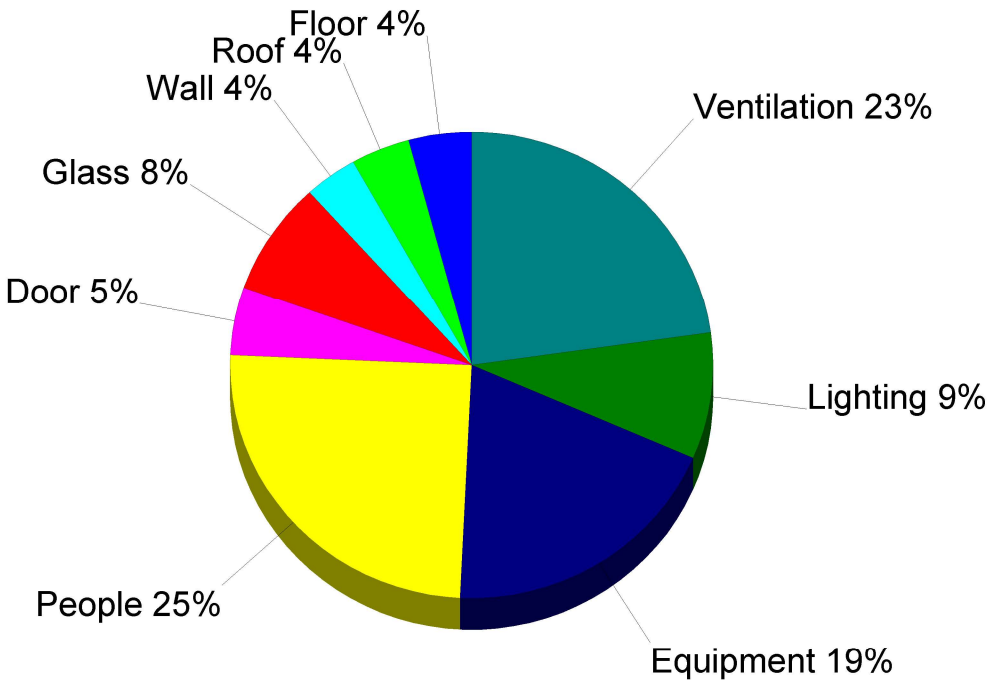
System 1 Main Floor Pie Chart

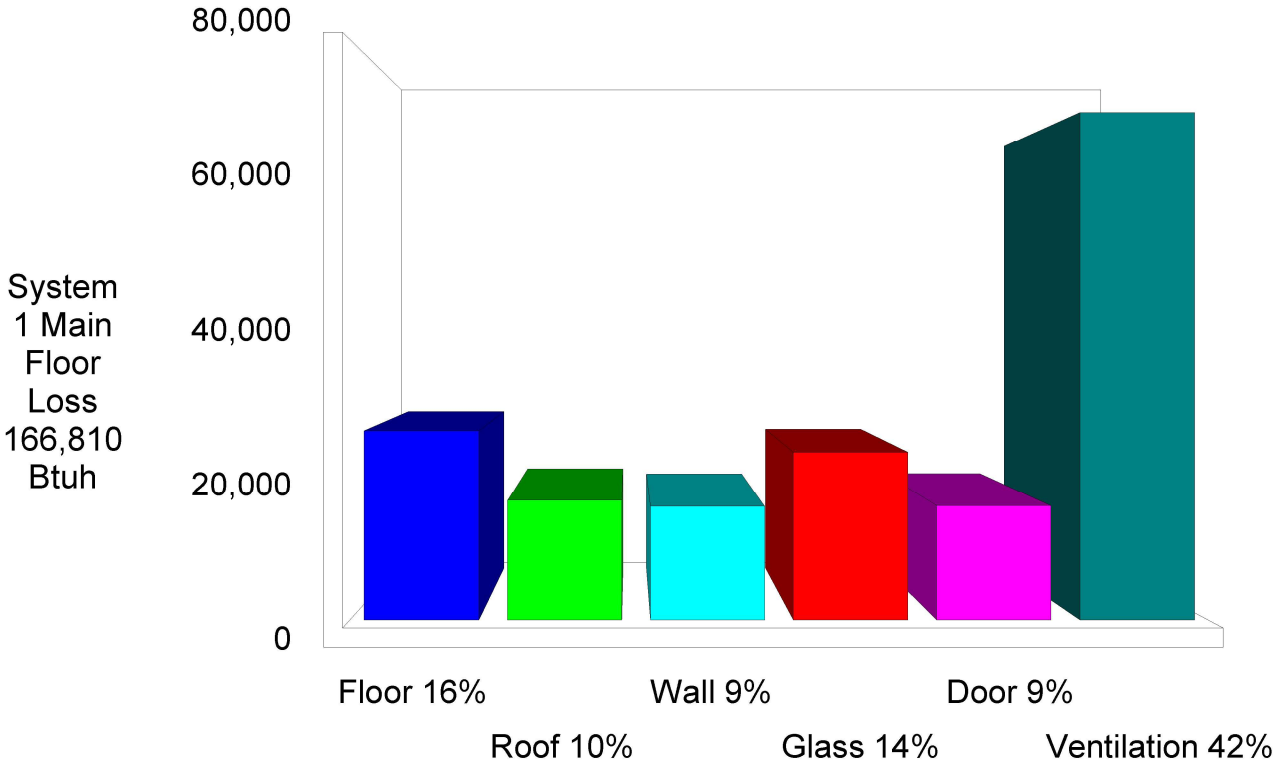
System 1 Main Floor Loss 166,810 Btuh

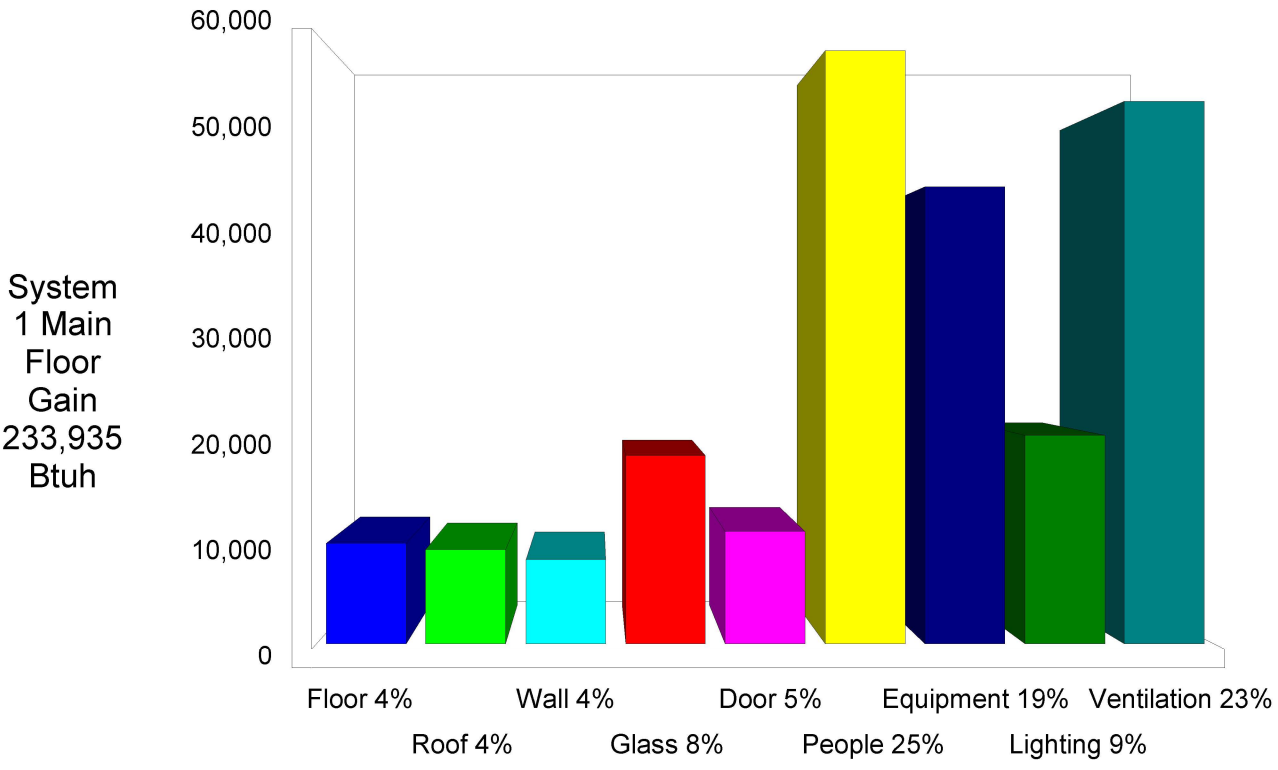


System 1 Main Floor Gain 233,935 Btuh



System 1 Main Floor Bar Graph





Equipment Data - System 1 - Main Floor

Cooling

System Type:	Standard Air Conditioner
Outdoor Model:	LRP13GXK60-108EP , 5 Ton
Indoor Model:	LRP13GXK60-108EP , 5 Ton
Outdoor Manufacturer:	LENNOX
Description:	0
Nominal Capacity:	300,000
Adjusted Capacity:	300000
Adjusted Sensible Capacity:	177420
Adjusted Latent Capacity:	122580
Efficiency:	0 SEER

Heating

System Type:	Electric Resistance
Model:	LRP13GXK60-108EP , 5 Ton
Manufacturer:	LENNOX
Description:	0
Capacity:	540,000
Efficiency:	0%

This system's equipment was selected in accordance with ACCA Manual S.
Manual S equipment sizing data: SODB: 99F, SOWB: 74F, WODB: 22F, SIDB: 75F, SIRH: 50%, WIDB: 72F, Sen. gain: 173,860 Btuh, Lat. gain: 60,075 Btuh, Sen. loss: 166,810 Btuh, Entering clg. coil DB: 79.8F, Entering clg. coil WB: 65F, Entering htg. coil DB: 21.6F, Clg. coil TD: 20F, Htg. coil TD: 70F, Req. clg. airflow: 6529 CFM, Req. htg. airflow: 1289 CFM

Manual S Performance Data - System 1 - Main Floor

Loads and Design Conditions

Cooling:

Outdoor Dry Bulb:	99	Sensible Gain:	173.860
Outdoor Wet Bulb:	74	Latent Gain:	60.075
Indoor Dry Bulb:	75	Total Gain:	233.935
Indoor RH:	50	Load SHR:	0.74
Supply Airflow:	6,527	Entering Dry Bulb:	80.6
		Entering Wet Bulb:	65.4

Heating:

Outdoor Dry Bulb:	22	Sensible Loss:	166.810
Indoor Dry Bulb:	72	Entering Dry Bulb:	21.6
Indoor RH:	30	Supply Airflow:	1,289

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, Outdoor Model: LRP13GXK60-108EP , 5 Ton, Indoor Model: LRP13GXK60-108EP , 5 Ton
Nominal Capacity: 300.000, Manufacturer: LENNOX

Entered Interpolation Data:

EWB °F	Air Flow CFM	ODB °F	Total Capacity MBtuh	Power Input kW	EDB 80.6 °F	
					S/T	Sensible Capacity MBtuh
65.35817	6527	99	300	0	0.591	177.42

Interpolation Results:

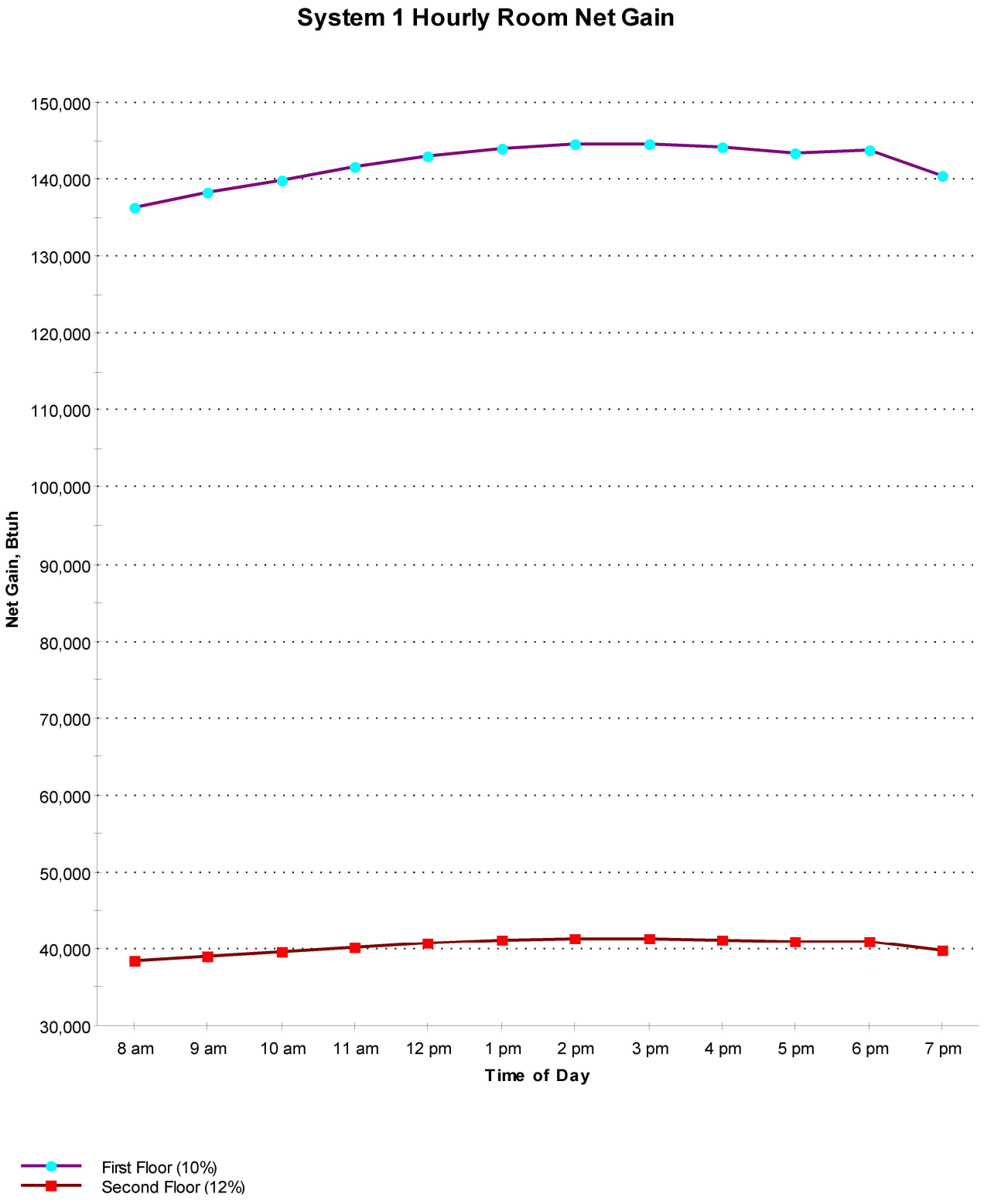
		Load	Percent of Load
Sensible Capacity:	177.420	173.860	102%
Latent Capacity:	122.580	60.075	204%
Total Capacity:	300.000	233.935	128%

Heating:
Model Type: Electric Resistance, Model: LRP13GXK60-108EP , 5 Ton, Nominal Capacity: 540.000, Manufacturer: LENNOX

Results:

		Load	Percent of Load
Heating Capacity:	540.000	166.810	324%

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
window: Glazing-window R-49 and SHGC 0.62, U-value 0.32, SHGC 0.25	1444	23,104	0	18,492	18,492
11F: Door-Wood - Solid Core With Metal Storm, U-value 0.32	984	15,744	0	11,021	11,021
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Subtotals for structure:		96,953	0	56,869	56,869
People:	110		25,300	33,000	58,300
Equipment:			15,000	30,000	45,000
Lighting:	6000			20,460	20,460
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 0, Summer CFM: 0		0	0	0	0
System 1, Zone 1 Load Totals:		96,953	40,300	140,329	180,629

Check Figures

Supply CFM:	6,529	CFM Per Square ft.:	0.660
Square ft. of Room Area:	9,890	Square ft. Per Ton:	657
Volume (ft³):	118,922		

Zone Loads

Total Heating Required:	96,953	Btuh	96.953	MBH
Total Sensible Gain:	140,329	Btuh	78	%
Total Latent Gain:	40,300	Btuh	22	%
Total Cooling Required:	180,629	Btuh	15.05	Tons (Based On Sensible + Latent)

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Detailed Room Loads - Room 1 - First Floor (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.		Occurrences:	1	
Room Length:	39.0	ft.	System Number:	1	
Room Width:	193.0	ft.	Zone Number:	1	
Area:	7,527.0	sq.ft.	Supply Air:	5,010	CFM
Ceiling Height:	12.7	ft.	Supply Air Changes:	3.2	AC/hr
Volume:	95,292	cu.ft.	Req. Vent. Clg:	1,300	CFM
Number of Registers:	1		Actual Winter Vent.:	996	CFM
Runout Air:	5,010	CFM	Percent of Supply.:	20	%
Runout Duct Size:	35	in.	Actual Summer Vent.:	998	CFM
Runout Air Velocity:	750	ft./min.	Percent of Supply:	20	%
Runout Air Velocity:	750	ft./min.	Actual Winter Infil.:	0	CFM
Actual Loss:	0.033	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-WALL ASSEMBLY 193 X 12.7	390.4	0.048	2.4	929	1.3	0	491
E -Wall-WALL ASSEMBLY 39 X 12.7	493.7	0.048	2.4	1,175	1.3	0	620
S -Wall-WALL ASSEMBLY 193 X 12.7	2443.4	0.048	2.4	5,815	1.3	0	3,070
W -Wall-WALL ASSEMBLY 39 X 12.7	493.7	0.048	2.4	1,175	1.3	0	620
N -Door-11F 16 X 10	160	0.320	16.0	2,560	11.2	0	1,792
N -Door-11F 26 X 10	260	0.320	16.0	4,160	11.2	0	2,912
N -Door-11F 3 X 8	24	0.320	16.0	384	11.2	0	269
N -Door-11F 18 X 10	180	0.320	16.0	2,880	11.2	0	2,016
N -Door-11F 18 X 10	180	0.320	16.0	2,880	11.2	0	2,016
N -Door-11F 18 X 10	180	0.320	16.0	2,880	11.2	0	2,016
N -Gls-window shgc-0.25 100%S	16	0.320	16.0	256	12.8	0	205
N -Gls-window shgc-0.25 100%S	30	0.320	16.0	480	12.8	0	384
N -Gls-window shgc-0.25 100%S	30	0.320	16.0	480	12.8	0	384
N -Gls-window shgc-0.25 100%S	30	0.320	16.0	480	12.8	0	384
N -Gls-window shgc-0.25 100%S	30	0.320	16.0	480	12.8	0	384
N -Gls-window shgc-0.25 100%S	30	0.320	16.0	480	12.8	0	384
N -Gls-window shgc-0.25 100%S	30	0.320	16.0	480	12.8	0	384
N -Gls-window shgc-0.25 100%S	80	0.320	16.0	1,280	12.8	0	1,025
N -Gls-window shgc-0.25 100%S	80	0.320	16.0	1,280	12.8	0	1,025
N -Gls-window shgc-0.25 100%S	45	0.320	16.0	720	12.8	0	576
N -Gls-window shgc-0.25 100%S	32	0.320	16.0	512	12.8	0	410
N -Gls-window shgc-0.25 100%S	96	0.320	16.0	1,536	12.8	0	1,229
N -Gls-window shgc-0.25 100%S	96	0.320	16.0	1,536	12.8	0	1,229
N -Gls-window shgc-0.25 100%S	96	0.320	16.0	1,536	12.8	0	1,229
N -Gls-window shgc-0.25 100%S	96	0.320	16.0	1,536	12.8	0	1,229
N -Gls-window shgc-0.25 100%S	50	0.320	16.0	800	12.8	0	640
N -Gls-window shgc-0.25 100%S	150	0.320	16.0	2,400	12.8	0	1,921
N -Gls-window shgc-0.25 100%S	18	0.320	16.0	288	12.8	0	231
N -Gls-window shgc-0.25 100%S	18	0.320	16.0	288	12.8	0	231
N -Gls-window shgc-0.25 100%S	16	0.320	16.0	256	12.8	0	205
UP-Roof-open-cell spray foa 39 X 193	7527	0.033	1.7	12,532	0.9	0	7,018
Floor-Exposed / Cantilever 193 X 39	7527	0.053	2.6	19,796	1.0	0	7,522
Subtotals for Structure:				74,270		0	44,051
Infil.: Win.: 0.0, Sum.: 0.0	5,874		0.000	0	0.000	0	0
People: 230 lat/per, 300 sen/per:	100					23,000	30,000
Equipment:						10,000	20,000
Lighting:	4,000						13,640
Room Totals:				74,270		33,000	107,691

Detailed Room Loads - Room 2 - Second Floor (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.		Occurrences:	1	
Room Length:	17.0	ft.	System Number:	1	
Room Width:	139.0	ft.	Zone Number:	1	
Area:	2,363.0	sq.ft.	Supply Air:	1,518	CFM
Ceiling Height:	10.0	ft.	Supply Air Changes:	3.9	AC/hr
Volume:	23,630	cu.ft.	Req. Vent. Clg:	0	CFM
Number of Registers:	1		Actual Winter Vent.:	304	CFM
Runout Air:	1,518	CFM	Percent of Supply.:	20	%
Runout Duct Size:	20	in.	Actual Summer Vent.:	302	CFM
Runout Air Velocity:	696	ft./min.	Percent of Supply:	20	%
Runout Air Velocity:	696	ft./min.	Actual Winter Infil.:	0	CFM
Actual Loss:	0.060	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-WALL ASSEMBLY 139 X 10	1015	0.048	2.4	2,416	1.3	0	1,275
E -Wall-WALL ASSEMBLY 17 X 10	170	0.048	2.4	405	1.3	0	214
S -Wall-WALL ASSEMBLY 139 X 10	1390	0.048	2.4	3,308	1.3	0	1,747
W -Wall-WALL ASSEMBLY 17 X 10	170	0.048	2.4	405	1.3	0	214
N -Gls-window shgc-0.25 100%S	25	0.320	16.0	400	12.8	0	320
N -Gls-window shgc-0.25 100%S	25	0.320	16.0	400	12.8	0	320
N -Gls-window shgc-0.25 100%S	25	0.320	16.0	400	12.8	0	320
N -Gls-window shgc-0.25 100%S	25	0.320	16.0	400	12.8	0	320
N -Gls-window shgc-0.25 100%S	25	0.320	16.0	400	12.8	0	320
N -Gls-window shgc-0.25 100%S	6	0.320	16.0	96	12.8	0	77
N -Gls-window shgc-0.25 100%S	6	0.320	16.0	96	12.8	0	77
N -Gls-window shgc-0.25 100%S	6	0.320	16.0	96	12.8	0	77
N -Gls-window shgc-0.25 100%S	32	0.320	16.0	512	12.8	0	410
N -Gls-window shgc-0.25 100%S	32	0.320	16.0	512	12.8	0	410
N -Gls-window shgc-0.25 100%S	32	0.320	16.0	512	12.8	0	410
N -Gls-window shgc-0.25 100%S	32	0.320	16.0	512	12.8	0	410
N -Gls-window shgc-0.25 100%S	16	0.320	16.0	256	12.8	0	205
N -Gls-window shgc-0.25 100%S	16	0.320	16.0	256	12.8	0	205
N -Gls-window shgc-0.25 100%S	48	0.320	16.0	768	12.8	0	615
N -Gls-window shgc-0.25 100%S	24	0.320	16.0	384	12.8	0	307
UP-Roof-open-cell spray foa 17 X 139	2363	0.033	1.7	3,934	0.9	0	2,203
Floor-Exposed / Cantilever 139 X 17	2363	0.053	2.6	6,215	1.0	0	2,362
Subtotals for Structure:				22,683		0	12,818
Infil.: Win.: 0.0, Sum.: 0.0	3,120		0.000	0	0.000	0	0
People: 230 lat/per, 300 sen/per:	10					2,300	3,000
Equipment:						5,000	10,000
Lighting:	2,000						6,820
Room Totals:				22,683		7,300	32,638

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	First Floor	7,527	74,270	987	1-35	750	107,691	33,000	5,010	5,010
2	Second Floor	2,363	22,683	302	1-20	696	32,638	7,300	1,518	1,518
	Ventilation		69,857				33,531	19,775		
	System 1 total	9,890	166,810	1,289			173,860	60,075	6,529	6,529

System 1 Main Trunk Size:	28x38	in.
Velocity:	884	ft./min
Loss per 100 ft.:	0.039	in.wg

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	19.49	74% / 26%	173,860	60,075	233,935
Actual:	25.00				300,000

Equipment Data

	Heating System	Cooling System
Type:	Electric Resistance	Standard Air Conditioner
Model:	LRP13GXK60-108EP , 5 Ton	LRP13GXK60-108EP , 5 Ton
Indoor Model:		LRP13GXK60-108EP , 5 Ton
Brand:		
Description:	0	0
Efficiency:	0%	0 SEER
Sound:	0	0
Capacity:	540,000 Btuh	300,000 Btuh
Adjusted Capacity:	n/a	300,000 Btuh
Sensible Capacity:	n/a	0 Btuh
Adjusted Sensible Capacity:	n/a	177,420 Btuh
Latent Capacity:	n/a	0 Btuh
Adjusted Latent Capacity:	n/a	122,580 Btuh

This system's equipment was selected in accordance with ACCA Manual S.
Manual S equipment sizing data: SODB: 99F, SOWB: 74F, WODB: 22F, SIDB: 75F, SIRH: 50%, WIDB: 72F, Sen. gain: 173,860 Btuh, Lat. gain: 60,075 Btuh, Sen. loss: 166,810 Btuh, Entering clg. coil DB: 79.8F, Entering clg. coil WB: 65F, Entering htg. coil DB: 21.6F, Clg. coil TD: 20F, Htg. coil TD: 70F, Req. clg. airflow: 6529 CFM, Req. htg. airflow: 1289 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-First Floor	987	5,010	987	5,564	987	5,890	987	5,478	987	5,107	987	5,965	987	6,545	987	6,018	1--40
2-Second Floor	302	1,518	302	1,713	302	1,642	302	1,568	302	1,548	302	1,707	302	1,825	302	1,853	1--22
Other Ducts in System																	
Supply Main Trunk	1,289	6,529	1,289	7,277	1,289	7,533	1,289	7,046	1,289	6,655	1,289	7,672	1,289	8,370	1,289	7,871	32x43
Bldg. High Dir.: West																	
Sensible Gain: 213,433																	
Latent Gain: 60,075																	

Summary

System 1

Heating Flow:	1289
Cooling Flow:	6529

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

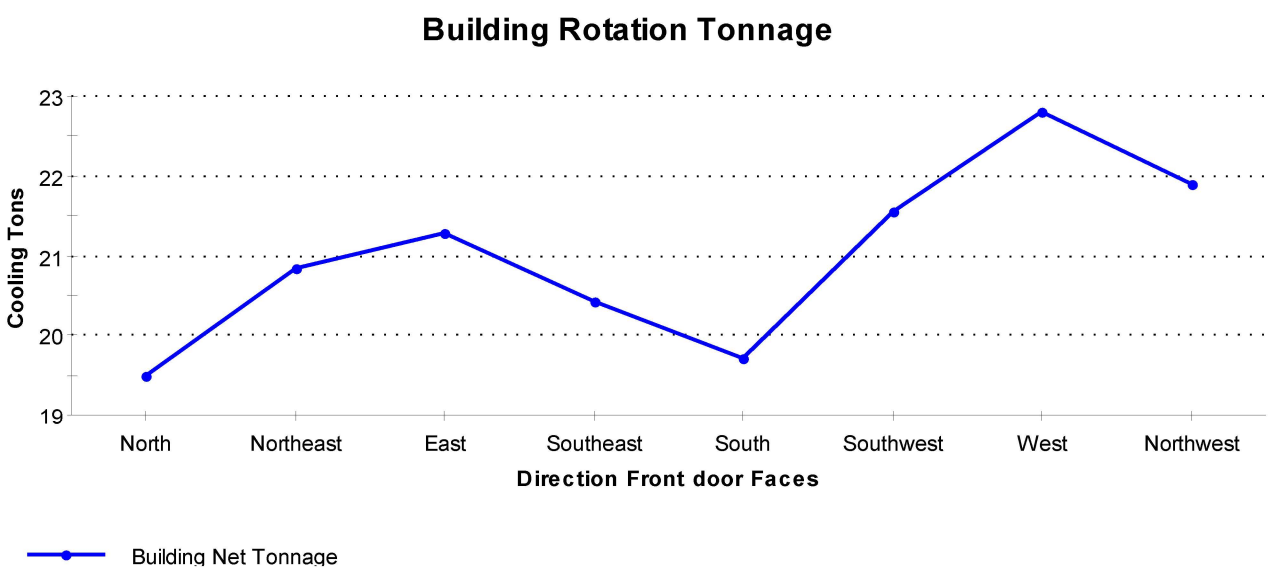
Rm. No.	Room Name	0° Rot. CFM	45° Rot. CFM	90° Rot. CFM	135° Rot. CFM	180° Rot. CFM	225° Rot. CFM	270° Rot. CFM	315° Rot. CFM	High Duct Size
System 1:										
Zone 1:										
1	First Floor	5,010	5,564	5,890	5,478	5,107	5,965	*6,545	6,018	1--40
2	Second Floor	1,518	1,713	1,642	1,568	1,548	1,707	1,825	*1,853	1--22

* Indicates highest CFM of all rotations.

Whole Building

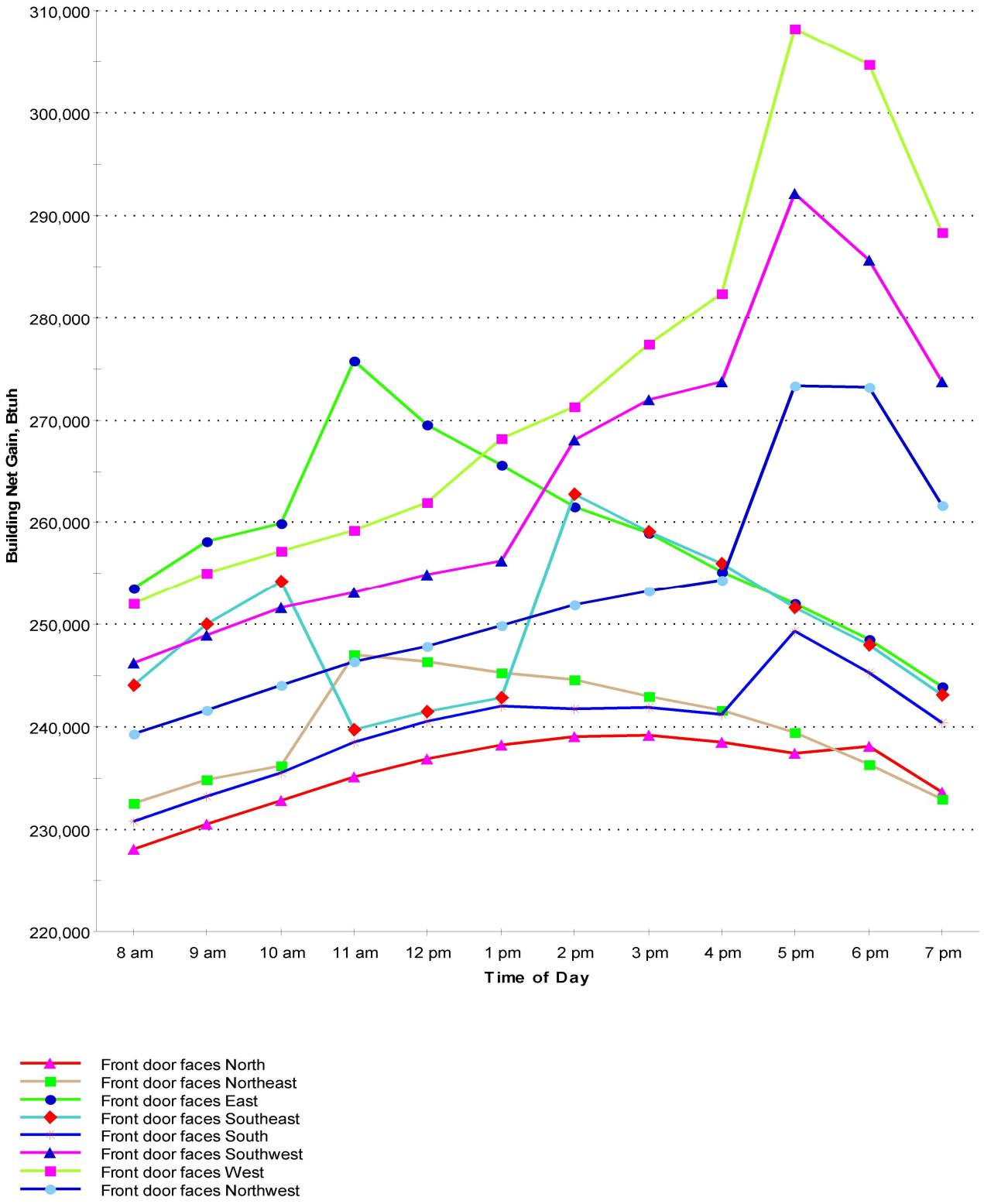
Rotation Degrees	Front door Faces	Supply CFM	Sensible Gain	Latent Gain	Net Tons
0°	North	6,529	173,860	*60,075	19.49
45°	Northeast	7,277	189,945	60,075	20.83
90°	East	7,533	195,444	60,075	21.29
135°	Southeast	7,046	184,986	60,075	20.42
180°	South	6,655	176,577	60,075	19.72
225°	Southwest	7,672	198,435	60,075	21.54
270°	West	*8,370	*213,433	60,075	*22.79
315°	Northwest	7,871	202,712	60,075	21.90

* Indicates highest value of all rotations.



Building Rotation Report (cont'd)

Building Rotation Hourly Net Gain



Sales Proposal

Project Information

Project title: Pascal & Caroline Aghyarian
Designed by: Engr Rahaman
Project date: Monday, November 17, 2025
Project comment:
Client name:
Client address: 340 Orchid Hill Lane Tract 5 A0050A J. B
Client city: Town of Copper Canyon, Denton County, Tx
Client phone:
Client fax:
Client comment:
Company name:
Company representative:
Company address: 340 Orchid Hill Lane Tract 5 A0050A J. B
Company city: Town of Copper Canyon, Denton County, Tx
Company phone:
Company fax:
Company comment:

Item	System 1
Air Handler Name	Main Floor
Cooling Description	0
Cooling Model Type	Standard Air Conditioner
Cooling Model Number	LRP13GXK60-108EP , 5 Ton
Cooling Capacity	300000
Cooling Efficiency	0 SEER
Heating Description	0
Heating Model Type	Electric Resistance
Heating Model Number	LRP13GXK60-108EP , 5 Ton
Heating Capacity	540000
Heating Efficiency	0%

ANSI / RESNET / ACCA 310 HVAC Design Report [1, 2]

1. Design Basis & Architectural Scope

1.1 Design description (optional):	Pascal & Caroline Aghyarian	
1.2 Designer company:	Designer name: Engr Rahaman	Date: 11/17/2025
1.3 Software name and version used to complete design:	Rhvac Version 10.01.41	N/A ☐

For a Dwelling, Townhouse, or Dwelling / Sleeping Unit Within (i.e., duplex):

1.4 Architectural plan name or address of the property:	340 Orchid Hill Lane Tract 5 A0050A J. B, Town of Copper Canyon, Denton County, Tx
1.5 Architectural options used in the design: [3]	
1.6 Other architectural options that the design can be used with: [4]	

For a Dwelling / Sleeping Unit Not Within a Dwelling or Townhouse (e.g., condo, apartment):

1.7 Unique ID for the bldg. that the dwelling / sleeping unit is in: [5]	
1.8 Architectural plan used in design (e.g., dwelling unit model):	
1.9 Other architectural plans that the design can be used with: [6]	
1.10 Architectural options used in the design: [3]	
1.11 Other architectural options that the design can be used with: [4]	
1.12 Dwelling / sleeping unit location used in design: [7]	

2. Dwelling-Unit Mechanical Ventilation System Design

Ventilation System Type & Control Location:	System	System	System
2.1 Unique name or ID for each system: [8]			
2.2 Vent. equipment manufacturer & model #: [9]			
2.3 Specified system type: [10]			
2.4 Specified control location: [11]			
2.5 Ventilation zone name(s) served by system: [12]			
Ventilation Zone Served by Ventilation System:	**Zone**	**Zone**	**Zone**
2.6 Ventilation zone name: [12]			
2.7 Design basis: [13]			
2.8 Floor area (sq. ft.) and # bedrooms in vent. zone:			
2.9 Ventilation design airflow rate (CFM): [14]			
2.10 Vent. runtime per cycle & cycle time (mins):	of every	of every	of every
2.11 Time-averaged mechanical vent. rate (CFM): [15]			

3. Heat Gain & Heat Loss Loads

3.1 Design basis for the loads: [16]	ACCA Manual J v8 2016	3.2 Load methodology: [17]	Room-by-Room
3.3 Indoor design temperatures used in loads (°F):	Heating Season: 72	Cooling Season:	75
3.4 Outdoor design temperatures used in loads (°F):	Heating Season: 22	Cooling Season:	99
3.5 Outdoor design temperature location & data source:	Denton, Texas	Data Source:	ACCA

Zone-Specific Inputs & Loads at Design Conditions	Zone 1			Zone			Zone		
3.6 Name of heated or cooled zone: [20]	Main Floor								
3.7 Occupants & total occup. internal gains (Btuh): [21]	110	58300							
3.8 Total non-occupant internal gains (Btuh):	65460								
3.9 Conditioned floor area (sq. ft.): [22]	9890								
3.10 Window area (sq. ft.): [23]	1444								
3.11 Predominant window SHGC: [24]	0.25								
3.12 Predominant insulation nominal R-value: [24, 25]	Wall: 59	Ceiling:30		Wall:	Ceiling:		Wall:	Ceiling:	
3.13 Infiltration rate (Qualitative or ACH50): [26]	Tight								
3.14 Time-averaged mechanical vent. rate (CFM):									
3.15 Heat gain (kBtuh): [27]	Sensible	Latent	Total	Sensible	Latent	Total	Sensible	Latent	Total
N	173.9	60.1	233.9						
NE	189.9	60.1	250						
E	195.4	60.1	255.5						
SE	185	60.1	245.1						
S	176.6	60.1	236.7						
SW	198.4	60.1	258.5						
W	213.4	60.1	273.5						
NW			262.8						
3.16 Maximum - minimum total heat gain (kBtuh): [28]			166.8						
3.17 Total heat loss (kBtuh):			39.6						

ANSI / RESNET / ACCA 310 HVAC Design Report [1, 2]

4. Heating & Cooling Equipment Selection	Equip. / System 1	Equip. / System	Equip. / System
Air Conditioners, Heat Pumps, & Other Cooling Equipment (If none of these will be installed, check "N/A")			N/A ☐
4.1 Unique name or ID for each system:	Main Floor		
4.2 Zone that system serves (See Item 3.6):	Main Floor		
4.3 Equipment type: [29]	AC		
4.4 Evaporator / fan coil mfr. & model #: [30]	LRP13GXK60-108EP , 5 Ton		
4.5 Condenser mfr. & model #: [30]	LENNOX LRP13GXK60-108EP , 5 Ton	N/A ☐	N/A ☐
4.6 AHRI ref. #, or check box for alt. OEM doc.: [31]	OEM ☐	OEM ☐	OEM ☐
4.7 If AC / HP, rated cooling efficiency: [32]	N/A ☐	N/A ☐	N/A ☐
4.8 If HP, rated heating efficiency: [33]	N/A ☐	N/A ☐	N/A ☐
4.9 If HP, ratio of max. to min. rated capacity:	N/A ☐	N/A ☐	N/A ☐
4.10 If AC / HP, blower fan motor & speed type: [34]	N/A ☐	N/A ☐	N/A ☐
4.11 If AC / HP, compressor speed type: [35]	N/A ☐	N/A ☐	N/A ☐
4.12 If AC / HP, meter device type: [36]	N/A ☐	N/A ☐	N/A ☐
4.13 If TXV or EEV, OEM subcooling target (°F): [37]	N/A ☐	N/A ☐	N/A ☐
4.14 Filter performance metric and rating: [38]	N/A ☐	N/A ☐	N/A ☐
Furnaces, Boilers, & Other Heating Equipment (If none of these will be installed, check "N/A")			N/A ☐
4.15 Unique name or ID for each system:	Main Floor		
4.16 Zone that system serves (See Item 3.6):	Main Floor		
4.17 Equipment type: [39]	Other		
4.18 Equipment manufacturer & model #:	LENNOX LRP13GXK60-108EP , 5 Ton		
4.19 AHRI ref. #, or check box for alt. OEM doc.: [31]	OEM ☐	OEM ☐	OEM ☐
4.20 If furnace or boiler, rated heating efficiency:	N/A ☐	N/A ☐	N/A ☐
4.21 If furnace, blower fan motor & speed type: [34]	N/A ☐	N/A ☐	N/A ☐
4.22 If furnace or boiler, heating capacity type: [40]	N/A ☐	N/A ☐	N/A ☐
4.23 If furnace or boiler, venting type: [41]	N/A ☐	N/A ☐	N/A ☐
4.24 Filter performance metric and rating: [38]	N/A ☐	N/A ☐	N/A ☐
5. Duct Design (Complete if duct system will be installed; otherwise check "N/A")			N/A ☐
5.1 Unique name or ID for each system:	Main Floor		
5.2 Zone that system serves (See Item 3.6):			
Design Values for Cooling and Heating Mode	Cooling / Heating	Cooling / Heating	Cooling / Heating
5.3 Design blower fan airflow (CFM): [42]	6529 / 1289		
5.4 Design blower fan speed setting: [43]			
5.5 Design external static pressure (IWC): [44]	0		

5.6 Room-by-room design airflows (CFM):	Room Name	Airflow	Room Name	Airflow	Room Name	Airflow
Total Design Airflow:	[All rooms]	6529	[All rooms]		[All rooms]	
1.	First Floor	5010				
2.	Second Floor	1518				
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						

ANSI / RESNET / ACCA 310 HVAC Design Report [1, 2]

5.6 Room-by-room design airflows (Continued):	Room Name	Airflow	Room Name	Airflow	Room Name	Airflow
21.						
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
30.						
31.						
32.						
33.						
34.						
35.						

Footnotes

1. The purpose of this report is to document the design information required by ANSI / RESNET / ACCA 310 – a standard for grading the installation of HVAC systems - for a dwelling, townhouse, or dwelling / sleeping unit. The HVAC designer should complete one report per dwelling, townhouse, or dwelling / sleeping unit that encompasses all HVAC systems (e.g., for a dwelling with two zones, the HVAC system for each zone should be documented in the same report).
2. Note that this report will be reviewed by users of the standard (e.g., a rater) to ensure that the design meets the tolerances defined in Section 4.3 of ANSI / RESNET / ACCA 310. The HVAC systems will not be eligible to earn recognition for proper installation unless all tolerances are met.
3. If the HVAC design documented in this report incorporated one or more options (e.g., media room option), then list those options.
4. If this same HVAC design could be used with other options (e.g., bonus room, balcony with sliding glass door), then list those option(s).
5. For example, the name of the development or the building's address.
6. If this same HVAC design could be used with other plans (e.g., other dwelling unit models) in the building, then list those plan(s).
7. Because the loads are dependent on the dwelling / sleeping unit's location in the building, indicate whether the design is for the **Top-Floor**, a **Mid-Level-Floor**, or the **Bottom-Floor** of the building; and either a **Corner Unit** or **Middle Unit** that is between two other units.
8. For example, the unique ID might be "Powder Bath Fan" or "Whole-House ERV".
9. The ventilation equipment manufacturer and model number are required to be reported for dwelling / sleeping units not within a dwelling or townhouse; and are optional for dwellings, townhouses, and sleeping / dwelling units within (i.e., duplex).
10. Ventilation system types are: **Supply** - a supply-only system, **Exhaust** - an exhaust-only system, **Balanced w/o Recov.** - a balanced system without energy or heat recovery, **ERV** - an energy recovery ventilator, **HRV** - a heat recovery ventilator, **Vent. Dehumidifier** - a ventilation system with integrated dehumidifier, or **Other** - any other system type.
11. For example, common ventilation control locations include a bathroom or utility room.
12. For example, the ventilation zone name may be "Whole Dwelling", "Upper Level", "Lower Level", or "Basement".
13. Design basis options are: **62.2-2010** - ASHRAE 62.2-2010, **62.2-2013** - ASHRAE 62.2-2013, **62.2-2016** - ASHRAE 62.2-2016, **62.2-2019** - ASHRAE 62.2-2019, or **Other** - any other ventilation standard.
14. Enter the airflow rate of the ventilation system when operating (e.g., a 50 CFM cycled bath fan has a ventilation airflow rate of 50 CFM).
15. The following formula shall be used to determine the time-averaged ventilation airflow rate:

    Time Averaged Vent Rate = Vent Rate * Runtime Per Cycle / Cycle Time

    Where:

    - Time Averaged Vent Rate = The time-averaged ventilation airflow rate.
    - Vent Rate = The design's ventilation airflow rate reported in Item 2.9.
    - Runtime Per Cycle = The runtime per cycle reported in Item 2.10.
    - Cycle Time = The cycle time reported in Item 2.10.
16. Design basis options for the heat gain and heat loss loads are: **ACCA Manual J v8 2013** - ACCA Manual J v8, 2013 edition; **ACCA Manual J v8 2016** - ACCA Manual J v8, 2016 edition; **2017 ASHRAE Fund.** - 2017 ASHRAE Fundamentals; or **Per AHJ** - a design basis prescribed by the Authority Having Jurisdiction.
17. Load methodology options are: **Room-by-Room** or **Single Block**. Note that for dwellings, townhouses, and dwelling / sleeping units within (i.e., duplex), the room-by-room load methodology must be used. See Fn. 2 for details.
18. Note that the outdoor design temperatures must meet the limits defined in ANSI / RESNET / ACCA 310 Appendix A for the county or U.S. Territory where the project will be constructed. See Fn. 2 for details.
19. The location shall include the city or weather station and the state. The data source options are: **ACCA** - ACCA Manual J, **ASHRAE** - ASHRAE Handbook of Fundamentals, or **AHJ** - design conditions prescribed by the Authority Having Jurisdiction.
20. For example, the heated or cooled zone name may be "Upper Level", "Master Suite", or "Basement".

21. To determine the number of occupants, calculate the number of bedrooms in the zone and add one.

    ANSI / RESNET / ACCA 310 defines a "bedroom" for one- and two-family dwellings and townhouses as a room or space 70 square feet of floor area or greater, with egress window or skylight, and doorway to the main body of the dwelling unit, that can be used for sleeping. For all other Dwelling Units, a room or space that can be used for sleeping. For all dwelling or sleeping units, the number of bedrooms shall not be less than one. ANSI / RESNET / ACCA 310 defines an "egress window" as an operable window that provides for a means of escape and access for rescue in the event of an emergency and with the following attributes:

    - Has a sill height of not more than 44 inches above the floor; and,
    - Has a minimum net clear opening of 5.7 sq. ft., opening height of 24 in., and opening width of 20 in.; and,
    - Is operational from the inside of the room without the use of keys, tools or special knowledge.

    The number of occupants must fall within the tolerance specified in ANSI / RESNET / ACCA 310. See Fn. 2 for details.

22. The difference between the Conditioned Floor Area (CFA) used in the design and the actual dwelling, townhouse, or dwelling / sleeping unit must fall within the tolerance specified in ANSI / RESNET / ACCA 310. See Fn. 2 for details. Be advised, the CFA will be evaluated using the definition in ANSI / RESNET / ACCA 310, which defines this value, in part, as the floor area of the Conditioned Space Volume within a building or dwelling unit, not including the floor area of attics, crawlspaces, and basements below air sealed and insulated floors.
23. The difference between the window area used in the design and the actual dwelling, townhouse, or dwelling / sleeping unit must fall within the tolerance specified in ANSI / RESNET / ACCA 310. See Fn. 2 for details. Be advised, the window area will be evaluated by calculating it using the on-site inspection protocol provided in Normative Appendix B of ANSI / RESNET / ICC 301, which instructs the user to measure the width and height of the rough opening for the window and round to the nearest inch, and then to use these measurements to calculate window area, rounding to the nearest tenth of a square foot. See https://codes.iccsafe.org/content/chapter/16191/ for the complete protocol.
24. "Predominant" is defined as the SHGC or R-value used in the greatest amount of window, wall, or ceiling area in the zone.
25. If both cavity and continuous insulation are used, report the sum of the nominal R-value of the cavity and continuous insulation.
26. The infiltration rate shall be reported using a qualitative input (i.e., **Tight**, **Semi-Tight**, **Average**, **Semi-Leaky**, **Leaky**) or in units of ACH50.
27. Provide loads for the orientation(s) that the design is intended to be used in (e.g., N, S, E, W), where orientation is defined as the direction that the front door of the dwelling is facing. For example, if a site-specific design has been completed for a single project, only the loads for the single orientation of that project need to be provided.
28. If the heat gain has been provided for multiple orientations, then the difference between the max. and min. total heat gain across the orientations specified must be reported and fall within the tolerance specified in ANSI / RESNET / ACCA 310. See Fn. 2 for details.
29. Equipment type options are: **AC** - Air Conditioner, **HP** - Heat Pump, **MNAC** - Mini-Split Air Conditioner, **MNHP** - Mini-Split Heat Pump, **MTAC** - Multi-Split Air Conditioner, **MTHP** - Multi-Split Heat Pump, and **Other** - any other cooling equipment type.
30. For single-package systems or systems without a condenser (e.g., evaporative cooler), provide manufacturer and model number in Item 4.4 and select "N/A" for Item 4.5.
31. If an AHRI Reference Number is not available, OEM-provided documentation shall be collected with the rated efficiency of the equipment. If the equipment contains multiple components, the rated efficiency shall reflect the specific combination of indoor and outdoor components, along with confirmation from the OEM that the two components are designed to be used together.
32. For example, if the metric for the rated efficiency of the equipment is SEER, then its SEER rating shall be reported; if the metric is EER, then its EER rating shall be reported; if both SEER and EEER, then both rated values shall be reported.
33. For example, if the metric for the rated efficiency of the equipment is HSPF, then its HSPF rating shall be reported; if the metric is COP, then its COP rating shall be reported; if both HSPF and COP, then both rated values shall be reported.
34. Blower fan motor type options are: **PSC** - Permanent Split Capacitor, **ECM** - Electronically Commutated Motor, or **Other** - any other motor type. For blower fan speed type, while equipment typically has multiple speed settings to select from during installation, this parameter is related to the number of operational speeds that the blower fan is capable of: **Single** - a system that operates at no more than one speed setting each for heating mode and cooling mode, **Two** - a system that can operate at no more than two speeds each for heating mode and cooling mode, **Variable** - a system that can operate at more than two speeds.
35. The compressor speed type is related to the number of operational speeds that the compressor is capable of: **Single** - a system that operates at no more than one speed setting each for heating mode and cooling mode, **Two** - a system that can operate at no more than two speeds each for heating mode and cooling mode, **Variable** - a system that can operate at more than two speeds.
36. Meter device type options are: **Piston/Cap** - piston / capillary tube, **TXV** - thermal expansion valve, or **EEV** - electronic expansion valve.
37. If the meter device type is TXV or EEV, then provide then the OEM-specified subcooling target at the service valve.
38. For example, MERV or FPR.
39. Equipment type options are: **Furnace**, **Boiler**, or **Other** - any other heating equipment type.
40. Heating capacity type options are: **Single-Stage**, **Two-Stage**, or **Modulating**.
41. Vent. type options are: **Natural Draft** - natural draft system, **Mech. Draft** - mechanical draft system, or **Direct Vent** - direct-vent appliance.
42. Provide design airflow in cubic feet per minute of air with a density of 0.075 pounds per cubic feet. Airflow at this air density is often referred to as Standard CFM (SCFM) and represents air at 68 °F, 50% relative humidity, and at a barometric pressure of 29.92" Hg.
43. This is the OEM setting that corresponds with the design blower fan airflow. Common examples include low, medium-low, medium, medium-high, and high, but also may be defined in terms of dip-switch settings or other classifications.
44. This is the sum of the supply-side and return-side static pressure, corresponding to the mode with the higher design blower fan airflow.

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1. Design Basis & Architectural Scope

1.1 Design description (optional):

1.2 Designer company: Designer name: Date:

1.3 Software name and version used to complete design: N/A ☐

For a Dwelling, Townhouse, or Dwelling / Sleeping Unit Within (i.e., duplex):

1.4 Architectural plan name or address of the property:

1.5 Architectural options used in the design: [3]

1.6 Other architectural options that the design can be used with: [4]

For a Dwelling / Sleeping Unit Not Within a Dwelling or Townhouse (e.g., condo, apartment):

1.7 Unique ID for the bldg. that the dwelling / sleeping unit is in: [5]

1.8 Architectural plan used in design (e.g., dwelling unit model):

1.9 Other architectural plans that the design can be used with: [6]

1.10 Architectural options used in the design: [3]

1.11 Other architectural options that the design can be used with: [4]

1.12 Dwelling / sleeping unit location used in design: [7]

2. Dwelling-Unit Mechanical Ventilation System Design

Ventilation System Type & Control Location:	**System**	**System**	**System**
2.1 Unique name or ID for each system: [8]			
2.2 Vent. equipment manufacturer & model #: [9]			
2.3 Specified system type: [10]			
2.4 Specified control location: [11]			
2.5 Ventilation zone name(s) served by system: [12]			
Ventilation Zone Served by Ventilation System:	**Zone**	**Zone**	**Zone**
2.6 Ventilation zone name: [12]			
2.7 Design basis: [13]			
2.8 Floor area (sq. ft.) and # bedrooms in vent. zone:			
2.9 Ventilation design airflow rate (CFM): [14]			
2.10 Vent. runtime per cycle & cycle time (mins):			
2.11 Time-averaged mechanical vent. rate (CFM): [15]			

3. Heat Gain & Heat Loss Loads

3.1 Design basis for the loads: [16] 3.2 Load methodology: [17]

3.3 Indoor design temperatures used in loads (°F): Heating Season: Cooling Season:

3.4 Outdoor design temperatures used in loads (°F): Heating Season: Cooling Season:

3.5 Outdoor design temperature location & data source: Data Source:

Zone-Specific Inputs & Loads at Design Conditions	**Zone**			**Zone**			**Zone**		
3.6 Name of heated or cooled zone: [20]									
3.7 Occupants & total occup. internal gains (Btuh): [21]									
3.8 Total non-occupant internal gains (Btuh):									
3.9 Conditioned floor area (sq. ft.): [22]									
3.10 Window area (sq. ft.): [23]									
3.11 Predominant window SHGC: [24]									
3.12 Predominant insulation nominal R-value: [24, 25]	Wall: Ceiling:			Wall: Ceiling:			Wall: Ceiling:		
3.13 Infiltration rate (Qualitative or ACH50): [26]									
3.14 Time-averaged mechanical vent. rate (CFM):									
3.15 Heat gain (kBtuh): [27]	Sensible	Latent	Total	Sensible	Latent	Total	Sensible	Latent	Total
N	173.9	60.1	233.9						
NE	189.9	60.1	250						
E	195.4	60.1	255.5						
SE	185	60.1	245.1						
S	176.6	60.1	236.7						
SW	198.4	60.1	258.5						
W	213.4	60.1	273.5						
NW	202.7	60.1	262.8						
3.16 Maximum - minimum total heat gain (kBtuh): [28]									
3.17 Total heat loss (kBtuh):									

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4. Heating & Cooling Equipment Selection	Equip. / System	Equip. / System	Equip. / System
Air Conditioners, Heat Pumps, & Other Cooling Equipment (If none of these will be installed, check "N/A")			N/A ☐
4.1 Unique name or ID for each system:			
4.2 Zone that system serves (See Item 3.6):			
4.3 Equipment type: [29]			
4.4 Evaporator / fan coil mfr. & model #: [30]			
4.5 Condenser mfr. & model #: [30]	☐	☐	☐
4.6 AHRI ref. #, or check box for alt. OEM doc.: [31]	☐	☐	☐
4.7 If AC / HP, rated cooling efficiency: [32]	☐	☐	☐
4.8 If HP, rated heating efficiency: [33]	☐	☐	☐
4.9 If HP, ratio of max. to min. rated capacity:	☐	☐	☐
4.10 If AC / HP, blower fan motor & speed type: [34]	☐	☐	☐
4.11 If AC / HP, compressor speed type: [35]	☐	☐	☐
4.12 If AC / HP, meter device type: [36]	☐	☐	☐
4.13 If TXV or EEV, OEM subcooling target (°F): [37]	☐	☐	☐
4.14 Filter performance metric and rating: [38]	☐	☐	☐
Furnaces, Boilers, & Other Heating Equipment (If none of these will be installed, check "N/A")			N/A ☐
4.15 Unique name or ID for each system:			
4.16 Zone that system serves (See Item 3.6):			
4.17 Equipment type: [39]			
4.18 Equipment manufacturer & model #:			
4.19 AHRI ref. #, or check box for alt. OEM doc.: [31]	☐	☐	☐
4.20 If furnace or boiler, rated heating efficiency:	☐	☐	☐
4.21 If furnace, blower fan motor & speed type: [34]	☐	☐	☐
4.22 If furnace or boiler, heating capacity type: [40]	☐	☐	☐
4.23 If furnace or boiler, venting type: [41]	☐	☐	☐
4.24 Filter performance metric and rating: [38]	☐	☐	☐
5. Duct Design (Complete if duct system will be installed; otherwise check "N/A")			N/A ☐
5.1 Unique name or ID for each system:			
5.2 Zone that system serves (See Item 3.6):			

Design Values for Cooling and Heating Mode	Cooling	Heating	Cooling	Heating	Cooling	Heating
5.3 Design blower fan airflow (CFM): [42]						
5.4 Design blower fan speed setting: [43]						
5.5 Design external static pressure (IWC): [44]						

5.6 Room-by-room design airflows (CFM):	Room Name	Airflow	Room Name	Airflow	Room Name	Airflow
Total Design Airflow:	[All rooms]		[All rooms]		[All rooms]	
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						

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5.6 Room-by-room design airflows (Continued):	Room Name	Airflow	Room Name	Airflow	Room Name	Airflow
21.						
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
30.						
31.						
32.						
33.						
34.						
35.						

Footnotes

1. The purpose of this report is to document the design information required by ANSI / RESNET / ACCA 310 – a standard for grading the installation of HVAC systems - for a dwelling, townhouse, or dwelling / sleeping unit. The HVAC designer should complete one report per dwelling, townhouse, or dwelling / sleeping unit that encompasses all HVAC systems (e.g., for a dwelling with two zones, the HVAC system for each zone should be documented in the same report).
2. Note that this report will be reviewed by users of the standard (e.g., a rater) to ensure that the design meets the tolerances defined in Section 4.3 of ANSI / RESNET / ACCA 310. The HVAC systems will not be eligible to earn recognition for proper installation unless all tolerances are met.
3. If the HVAC design documented in this report incorporated one or more options (e.g., media room option), then list those options.
4. If this same HVAC design could be used with other options (e.g., bonus room, balcony with sliding glass door), then list those option(s).
5. For example, the name of the development or the building's address.
6. If this same HVAC design could be used with other plans (e.g., other dwelling unit models) in the building, then list those plan(s).
7. Because the loads are dependent on the dwelling / sleeping unit's location in the building, indicate whether the design is for the **Top-Floor**, a **Mid-Level-Floor**, or the **Bottom-Floor** of the building; and either a **Corner Unit** or **Middle Unit** that is between two other units.
8. For example, the unique ID might be "Powder Bath Fan" or "Whole-House ERV".
9. The ventilation equipment manufacturer and model number are required to be reported for dwelling / sleeping units not within a dwelling or townhouse; and are optional for dwellings, townhouses, and sleeping / dwelling units within (i.e., duplex).
10. Ventilation system types are: **Supply** - a supply-only system, **Exhaust** - an exhaust-only system, **Balanced w/o Recov.** - a balanced system without energy or heat recovery, **ERV** - an energy recovery ventilator, **HRV** - a heat recovery ventilator, **Vent. Dehumidifier** - a ventilation system with integrated dehumidifier, or **Other** - any other system type.
11. For example, common ventilation control locations include a bathroom or utility room.
12. For example, the ventilation zone name may be "Whole Dwelling", "Upper Level", "Lower Level", or "Basement".
13. Design basis options are: **62.2-2010** - ASHRAE 62.2-2010, **62.2-2013** - ASHRAE 62.2-2013, **62.2-2016** - ASHRAE 62.2-2016, **62.2-2019** - ASHRAE 62.2-2019, or **Other** - any other ventilation standard.
14. Enter the airflow rate of the ventilation system when operating (e.g., a 50 CFM cycled bath fan has a ventilation airflow rate of 50 CFM).
15. The following formula shall be used to determine the time-averaged ventilation airflow rate:

    Time Averaged Vent Rate = Vent Rate * Runtime Per Cycle / Cycle Time

    Where:

    - Time Averaged Vent Rate = The time-averaged ventilation airflow rate.
    - Vent Rate = The design's ventilation airflow rate reported in Item 2.9.
    - Runtime Per Cycle = The runtime per cycle reported in Item 2.10.
    - Cycle Time = The cycle time reported in Item 2.10.
16. Design basis options for the heat gain and heat loss loads are: **ACCA Manual J v8 2013** - ACCA Manual J v8, 2013 edition; **ACCA Manual J v8 2016** - ACCA Manual J v8, 2016 edition; **2017 ASHRAE Fund.** - 2017 ASHRAE Fundamentals; or **Per AHJ** - a design basis prescribed by the Authority Having Jurisdiction.
17. Load methodology options are: **Room-by-Room** or **Single Block**. Note that for dwellings, townhouses, and dwelling / sleeping units within (i.e., duplex), the room-by-room load methodology must be used. See Fn. 2 for details.
18. Note that the outdoor design temperatures must meet the limits defined in ANSI / RESNET / ACCA 310 Appendix A for the county or U.S. Territory where the project will be constructed. See Fn. 2 for details.
19. The location shall include the city or weather station and the state. The data source options are: **ACCA** - ACCA Manual J, **ASHRAE** - ASHRAE Handbook of Fundamentals, or **AHJ** - design conditions prescribed by the Authority Having Jurisdiction.
20. For example, the heated or cooled zone name may be "Upper Level", "Master Suite", or "Basement".

21. To determine the number of occupants, calculate the number of bedrooms in the zone and add one.

    ANSI / RESNET / ACCA 310 defines a "bedroom" for one- and two-family dwellings and townhouses as a room or space 70 square feet of floor area or greater, with egress window or skylight, and doorway to the main body of the dwelling unit, that can be used for sleeping. For all other Dwelling Units, a room or space that can be used for sleeping. For all dwelling or sleeping units, the number of bedrooms shall not be less than one. ANSI / RESNET / ACCA 310 defines an "egress window" as an operable window that provides for a means of escape and access for rescue in the event of an emergency and with the following attributes:

    - Has a sill height of not more than 44 inches above the floor; and,
    - Has a minimum net clear opening of 5.7 sq. ft., opening height of 24 in., and opening width of 20 in.; and,
    - Is operational from the inside of the room without the use of keys, tools or special knowledge.

    The number of occupants must fall within the tolerance specified in ANSI / RESNET / ACCA 310. See Fn. 2 for details.

22. The difference between the Conditioned Floor Area (CFA) used in the design and the actual dwelling, townhouse, or dwelling / sleeping unit must fall within the tolerance specified in ANSI / RESNET / ACCA 310. See Fn. 2 for details. Be advised, the CFA will be evaluated using the definition in ANSI / RESNET / ACCA 310, which defines this value, in part, as the floor area of the Conditioned Space Volume within a building or dwelling unit, not including the floor area of attics, crawlspaces, and basements below air sealed and insulated floors.
23. The difference between the window area used in the design and the actual dwelling, townhouse, or dwelling / sleeping unit must fall within the tolerance specified in ANSI / RESNET / ACCA 310. See Fn. 2 for details. Be advised, the window area will be evaluated by calculating it using the on-site inspection protocol provided in Normative Appendix B of ANSI / RESNET / ICC 301, which instructs the user to measure the width and height of the rough opening for the window and round to the nearest inch, and then to use these measurements to calculate window area, rounding to the nearest tenth of a square foot. See https://codes.iccsafe.org/content/chapter/16191/ for the complete protocol.
24. "Predominant" is defined as the SHGC or R-value used in the greatest amount of window, wall, or ceiling area in the zone.
25. If both cavity and continuous insulation are used, report the sum of the nominal R-value of the cavity and continuous insulation.
26. The infiltration rate shall be reported using a qualitative input (i.e., **Tight**, **Semi-Tight**, **Average**, **Semi-Leaky**, **Leaky**) or in units of ACH50.
27. Provide loads for the orientation(s) that the design is intended to be used in (e.g., N, S, E, W), where orientation is defined as the direction that the front door of the dwelling is facing. For example, if a site-specific design has been completed for a single project, only the loads for the single orientation of that project need to be provided.
28. If the heat gain has been provided for multiple orientations, then the difference between the max. and min. total heat gain across the orientations specified must be reported and fall within the tolerance specified in ANSI / RESNET / ACCA 310. See Fn. 2 for details.
29. Equipment type options are: **AC** - Air Conditioner, **HP** - Heat Pump, **MNAC** - Mini-Split Air Conditioner, **MNHP** - Mini-Split Heat Pump, **MTAC** - Multi-Split Air Conditioner, **MTHP** - Multi-Split Heat Pump, and **Other** - any other cooling equipment type.
30. For single-package systems or systems without a condenser (e.g., evaporative cooler), provide manufacturer and model number in Item 4.4 and select "N/A" for Item 4.5.
31. If an AHRI Reference Number is not available, OEM-provided documentation shall be collected with the rated efficiency of the equipment. If the equipment contains multiple components, the rated efficiency shall reflect the specific combination of indoor and outdoor components, along with confirmation from the OEM that the two components are designed to be used together.
32. For example, if the metric for the rated efficiency of the equipment is SEER, then its SEER rating shall be reported; if the metric is EER, then its EER rating shall be reported; if both SEER and EEER, then both rated values shall be reported.
33. For example, if the metric for the rated efficiency of the equipment is HSPF, then its HSPF rating shall be reported; if the metric is COP, then its COP rating shall be reported; if both HSPF and COP, then both rated values shall be reported.
34. Blower fan motor type options are: **PSC** - Permanent Split Capacitor, **ECM** - Electronically Commutated Motor, or **Other** - any other motor type. For blower fan speed type, while equipment typically has multiple speed settings to select from during installation, this parameter is related to the number of operational speeds that the blower fan is capable of: **Single** - a system that operates at no more than one speed setting each for heating mode and cooling mode, **Two** - a system that can operate at no more than two speeds each for heating mode and cooling mode, **Variable** - a system that can operate at more than two speeds.
35. The compressor speed type is related to the number of operational speeds that the compressor is capable of: **Single** - a system that operates at no more than one speed setting each for heating mode and cooling mode, **Two** - a system that can operate at no more than two speeds each for heating mode and cooling mode, **Variable** - a system that can operate at more than two speeds.
36. Meter device type options are: **Piston/Cap** - piston / capillary tube, **TXV** - thermal expansion valve, or **EEV** - electronic expansion valve.
37. If the meter device type is TXV or EEV, then provide then the OEM-specified subcooling target at the service valve.
38. For example, MERV or FPR.
39. Equipment type options are: **Furnace**, **Boiler**, or **Other** - any other heating equipment type.
40. Heating capacity type options are: **Single-Stage**, **Two-Stage**, or **Modulating**.
41. Vent. type options are: **Natural Draft** - natural draft system, **Mech. Draft** - mechanical draft system, or **Direct Vent** - direct-vent appliance.
42. Provide design airflow in cubic feet per minute of air with a density of 0.075 pounds per cubic feet. Airflow at this air density is often referred to as Standard CFM (SCFM) and represents air at 68 °F, 50% relative humidity, and at a barometric pressure of 29.92" Hg.
43. This is the OEM setting that corresponds with the design blower fan airflow. Common examples include low, medium-low, medium, medium-high, and high, but also may be defined in terms of dip-switch settings or other classifications.
44. This is the sum of the supply-side and return-side static pressure, corresponding to the mode with the higher design blower fan airflow.