

*Sample of Zoned Sytem
HVAC Load Calculations*

for

Sample Zoned System



RHVAC RESIDENTIAL
HVAC LOADS

Prepared By:

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Breen Design

970-596-4479
Wednesday, September 26, 2018

Rhvac is an ACCA approved Manual J and Manual D computer program.
Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.



Project Report

General Project Information

Project Title: Sample of Zoned Sytem
 Designed By: Carl Breen
 Project Date: 9/26/18
 Client Name: Sample Zoned System
 Company Name: Breen Design
 Company Representative: Carl Breen
 Company Phone: 970-596-4479
 Company E-Mail Address: breenhvacdsgn@gmail.com
 Company Website: breenhvacdsgn.com
 Company Comment:

Design Data

Reference City: Evergreen, Colorado
 Building Orientation: Front door faces Southeast
 Daily Temperature Range: High
 Latitude: 39 Degrees
 Elevation: 9400 ft.
 Altitude Factor: 0.704

	Outdoor <u>Dry Bulb</u>	Outdoor <u>Wet Bulb</u>	Outdoor <u>Rel.Hum</u>	Indoor <u>Rel.Hum</u>	Indoor <u>Dry Bulb</u>	Grains <u>Difference</u>
Winter:	-11	-11.52	81%	n/a	72	n/a
Summer:	90	59	19%	50%	75	-36

Check Figures

Total Building Supply CFM: 3,252 CFM Per Square ft.: 0.323 *
 Square ft. of Room Area: 10,057 Square ft. Per Ton: 0 **
 Volume (ft³) of Cond. Space: (htg.) 111,354

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

Building Loads

Total Heating Required Including Ventilation Air: 179,272 Btuh 179.272 MBH

Notes

Rhvac is an ACCA approved Manual J and Manual D computer program.
 Calculations are performed per ACCA Manual J 8th Edition, Version 2, 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.



Miscellaneous Report

System 1 System 1 Input Data	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
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Winter:	-11	-11.52	81%	n/a	72	n/a
Summer:	90	59	19%	50%	75	-35.57

System 2 System 2 Input Data	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
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Winter:	-11	-11.52	81%	n/a	72	n/a
Summer:	90	59	19%	50%	75	-35.57

System 3 Garage Input Data	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
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Winter:	-11	-11.52	81%	n/a	72	n/a
Summer:	90	59	19%	50%	75	-35.57

Duct Sizing Inputs

	Main Trunk	Runouts
Calculate:	Yes	Yes
Use Schedule:	Yes	Yes
Roughness Factor:	0.00300	0.01000
Pressure Drop:	0.1000 in.wg./100 ft.	0.1000 in.wg./100 ft.
Minimum Velocity:	650 ft./min	450 ft./min
Maximum Velocity:	900 ft./min	750 ft./min
Minimum Height:	0 in.	0 in.
Maximum Height:	0 in.	0 in.

Outside Air Data

	Winter	Summer
Infiltration Specified:	0.271 AC/hr 503 CFM	0.000 AC/hr 0 CFM
Infiltration Actual:	0.282 AC/hr	0.000 AC/hr
Above Grade Volume:	X 111,355 Cu.ft. 31,367 Cu.ft./hr	X 0 Cu.ft. 0 Cu.ft./hr
	X 0.0167	X 0.0167
Total Building Infiltration:	523 CFM	128 CFM
Total Building Ventilation:	0 CFM	0 CFM

---System 1---

Infiltration & Ventilation Sensible Gain Multiplier:	11.61 = (1.10 X 0.704 X 15.00 Summer Temp. Difference)
Infiltration & Ventilation Latent Gain Multiplier:	-17.03 = (0.68 X 0.704 X -35.57 Grains Difference)
Infiltration & Ventilation Sensible Loss Multiplier:	64.27 = (1.10 X 0.704 X 83.00 Winter Temp. Difference)
Winter Infiltration Specified:	0.250 AC/hr (234 CFM), Construction: Semi-Tight, Fireplaces: 1, 13 CFM, Semi-Tight
Summer Infiltration Specified:	0.000 AC/hr (0 CFM), Construction: Semi-Tight

---System 2---

Infiltration & Ventilation Sensible Gain Multiplier:	11.61 = (1.10 X 0.704 X 15.00 Summer Temp. Difference)
Infiltration & Ventilation Latent Gain Multiplier:	-17.03 = (0.68 X 0.704 X -35.57 Grains Difference)
Infiltration & Ventilation Sensible Loss Multiplier:	64.27 = (1.10 X 0.704 X 83.00 Winter Temp. Difference)
Winter Infiltration Specified:	0.250 AC/hr (157 CFM), Construction: Semi-Tight, Fireplaces: 1, 13 CFM, Semi-Tight
Summer Infiltration Specified:	0.000 AC/hr (0 CFM), Construction: Semi-Tight

---System 3---

Infiltration & Ventilation Sensible Gain Multiplier:	11.61 = (1.10 X 0.704 X 15.00 Summer Temp. Difference)
Infiltration & Ventilation Latent Gain Multiplier:	-17.03 = (0.68 X 0.704 X -35.57 Grains Difference)
Infiltration & Ventilation Sensible Loss Multiplier:	64.27 = (1.10 X 0.704 X 83.00 Winter Temp. Difference)
Winter Infiltration Specified:	0.250 AC/hr (73 CFM), Construction: Semi-Tight, Fireplaces: 1, 13 CFM, Semi-Tight
Summer Infiltration Specified:	0.000 AC/hr (0 CFM), Construction: Semi-Tight

Duct Load Factor Scenarios for System 1

No.	Type	Description	Location	Attic Ceiling	Duct Leakage	Duct Insulation	Surface Area	From [T]MDD
1	Supply	Main	Cond. Space	-	0.12	8	790.1	MDD



Miscellaneous Report (cont'd)

No.	Type	Description	Location	Attic Ceiling	Duct Leakage	Duct Insulation	Surface Area	From [T]MDD
1	Return	Main	Cond. Space	-	0.24	8	333.3	MDD
3	Supply	Garage	Open Crawl	-	0.12	8	121.6	MDD
3	Return	Garage	Open Crawl	-	0.24	8	154.6	MDD



Load Preview Report

Scope	Rec Ton	ft. ² /Ton	Area	Sen Gain	Lat Gain	Net Gain	Sen Loss	Sys Htg CFM	Sys Clg CFM	Sys Act CFM	Duct Size
Building	0.00	0	10,057	0	0	0	179,272	3,252	0	3,252	
System 1	0.00	0	5,259	0	0	0	80,072	1,422	0	1,422	25x12
Return Duct				0	0	0	3,008				
Zone 1 - Clg.: 0%, Htg.: 39%			1,897	0	0	0	30,226	558	0	558	
7-Theater			955	0	0	0	10,230	189	0	189	7,7
8-Storage 1			108	0	0	0	881	16	0	16	3
9-S4 Bath			93	0	0	0	2,199	41	0	41	5
10-Suite 4			275	0	0	0	5,372	99	0	99	7
11-Mech 2			205	0	0	0	6,225	115	0	115	7
12-Vault			127	0	0	0	1,936	36	0	36	5
15-Stair Well			134	0	0	0	3,383	62	0	62	6
Zone 2 - Clg.: 0%, Htg.: 30%			1,678	0	0	0	22,782	420	0	420	
21-Sitting			338	0	0	0	5,267	97	0	97	7
22-Laundry			172	0	0	0	1,755	32	0	32	5
27-Bath			62	0	0	0	1,004	19	0	19	4
28-Pantry			157	0	0	0	1,322	24	0	24	4
29-Kitchen/Dining			949	0	0	0	13,433	248	0	248	6,6,6
Zone 3 - Clg.: 0%, Htg.: 7%			511	0	0	0	5,683	105	0	105	
23-S2 Wic			70	0	0	0	172	3	0	3	3
24-S2 Bath			131	0	0	0	1,385	26	0	26	5
25-W/C			33	0	0	0	1,104	20	0	20	4
26-Suite 2			277	0	0	0	3,021	56	0	56	6
Zone 4 - Clg.: 0%, Htg.: 24%			1,172	0	0	0	18,374	339	0	339	
16-Guest Bath			129	0	0	0	2,298	42	0	42	6
17-Bedroom 2			193	0	0	0	3,157	58	0	58	6
18-Bedroom 1			195	0	0	0	2,968	55	0	55	6
19-Guest Suite			582	0	0	0	8,189	151	0	151	6,6
20-Wic			74	0	0	0	1,764	33	0	33	5
System 2	0.00	0	3,312	0	0	0	61,580	1,136	0	1,136	25x10
Zone 1 - Clg.: 0%, Htg.: 29%			839	0	0	0	17,732	327	0	327	
30-Great Room			515	0	0	0	13,140	242	0	242	6,6,6
31-Study			323	0	0	0	4,592	85	0	85	6,6
Zone 2 - Clg.: 0%, Htg.: 21%			791	0	0	0	12,767	236	0	236	
32-Master Bath			227	0	0	0	2,292	42	0	42	5,3
33-Mstr Wic			193	0	0	0	3,192	59	0	59	6
34-Master Bedroom			370	0	0	0	7,283	134	0	134	6,6
Zone 3 - Clg.: 0%, Htg.: 15%			413	0	0	0	9,144	169	0	169	
2-Suite 3			273	0	0	0	6,885	127	0	127	6,6
3-S3 Bath			85	0	0	0	1,527	28	0	28	3
4-S3 Wic			55	0	0	0	732	14	0	14	2
Zone 4 - Clg.: 0%, Htg.: 36%			1,269	0	0	0	21,937	405	0	405	
1-Exercise			271	0	0	0	3,611	67	0	67	5
5-Bar/Canning			198	0	0	0	1,693	31	0	31	3
6-Game Room			755	0	0	0	15,777	291	0	291	6,6,6
13-Mech 1			45	0	0	0	856	16	0	16	2
System 3	0.00	0	1,486	0	0	0	37,620	694	0	694	Not MDD: 9x13
Zone 1			1,486	0	0	0	37,620	694	0	694	
14-Garage			1,486	0	0	0	37,620	694	0	694	Not MDD: 7-6



Load Preview Report (cont'd)

Scope	Rec Ton	ft. ² /Ton	Area	Sen Gain	Lat Gain	Net Gain	Sen Loss	Sys Htg CFM	Sys Clg CFM	Sys Act CFM	Duct Size
<p>Sum of room airflows may be greater than system airflow because system has multiple zones and system room airflow option uses the greater of heating or cooling.</p>											



Manual D Ductsize Data - Duct System 1 - Supply

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: SR-120, Supplies: Kitchen/Dining (in Zone 2), Fittings: 2-I, 8-A2, 8-A2, 4-H, Effective Length: 80.5

Runout	0.0003	6	423	0.006
Up: ST-240	142	4.7	0.041	0.027
Rnd	13.7	6.6	66.8	0.033
Presize	83	21.6	0.409	0.391

---Duct Name: SR-150, Supplies: Bedroom 2 (in Zone 4), Fittings: 2-I, 4-G, Effective Length: 79.1

Runout	0.0003	6	295	0.005
Up: ST-880	142	4.7	0.022	0.013
Rnd	21.8	6.6	57.3	0.017
Presize	58	34.3	0.431	0.369

---Duct Name: SR-160, Supplies: Bedroom 1 (in Zone 4), Fittings: 2-I, 4-G, Effective Length: 79.2

Runout	0.0003	6	280	0.005
Up: ST-410	142	4.7	0.020	0.011
Rnd	22.7	6.6	56.5	0.016
Presize	55	35.6	0.448	0.352

---Duct Name: SR-170, Supplies: Guest Bath (in Zone 4), Fittings: 2-I, 4-H, Effective Length: 49.7

Runout	0.0003	6	214	0.001
Up: ST-420	142	4.7	0.012	0.005
Rnd	7.6	6.6	42.0	0.006
Presize	42	12	0.444	0.356

---Duct Name: SR-180, Supplies: Guest Suite (in Zone 4), Fittings: 2-I, 4-G, Effective Length: 69.5

Runout	0.0003	6	387	0.003
Up: ST-420	142	4.7	0.035	0.021
Rnd	8.3	6.6	61.2	0.024
Presize	76	13	0.426	0.374

---Duct Name: SR-190, Supplies: Guest Suite (in Zone 4), Fittings: 2-I, 4-G, Effective Length: 69.1

Runout	0.0003	6	387	0.003
Up: ST-870	142	4.7	0.035	0.021
Rnd	8.0	6.6	61.2	0.024
Presize	76	12.5	0.439	0.361

---Duct Name: SR-200, Supplies: Wic (in Zone 4), Fittings: 2-I, 4-H, Effective Length: 36.9

Runout	0.0003	5	242	0.000
Up: ST-260	142	3.9	0.019	0.007
Rnd	2.5	5.5	34.3	0.007
Presize	33	3.3	0.459	0.341

---Duct Name: SR-210, Supplies: W/C (in Zone 3), Fittings: 2-I, 4-G, Effective Length: 46.8

Runout	0.0003	4	229	0.003
Up: ST-150	142	3.1	0.024	0.008
Rnd	14.8	4.4	32.0	0.011
Presize	20	15.5	0.458	0.342

---Duct Name: SR-220, Supplies: S2 Bath (in Zone 3), Fittings: 2-I, 4-G, Effective Length: 53.5

Runout	0.0003	5	191	0.002
Up: ST-890	142	3.9	0.013	0.005
Rnd	12.9	5.5	40.6	0.007
Presize	26	16.8	0.462	0.338



Manual D Ductsize Data - Duct System 1 - Supply (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul
---Duct Name: SR-230, Supplies: S2 Wic (in Zone 3), Fittings: 2-I, 4-G, Effective Length: 15.6				
Runout	0.0003	3	61	0.000
Up: ST-310	142	2.4	0.004	0.001
Rnd	1.1	3.3	14.5	0.001
Presize	3	0.8	0.468	0.332
---Duct Name: SR-240, Supplies: Suite 2 (in Zone 3), Fittings: 2-I, 4-AD, Effective Length: 61.8				
Runout	0.0003	6	285	0.003
Up: ST-910	142	4.7	0.021	0.010
Rnd	12.9	6.6	48.9	0.013
Presize	56	20.2	0.455	0.345
---Duct Name: SR-250, Supplies: Sitting (in Zone 2), Fittings: 2-I, 4-G, Effective Length: 89.3				
Runout	0.0003	7	363	0.004
Up: ST-300	142	5.4	0.026	0.019
Rnd	16.0	7.7	73.2	0.023
Presize	97	29.3	0.443	0.357
---Duct Name: SR-260, Supplies: Laundry (in Zone 2), Fittings: 2-I, 4-G, Effective Length: 60.8				
Runout	0.0003	5	235	0.003
Up: ST-350	142	3.9	0.018	0.008
Rnd	17.9	5.5	43.0	0.011
Presize	32	23.4	0.446	0.354
---Duct Name: SR-270, Supplies: Pantry (in Zone 2), Fittings: 2-I, 4-G, Effective Length: 50.0				
Runout	0.0003	4	275	0.005
Up: ST-320	142	3.1	0.032	0.011
Rnd	16.4	4.4	33.6	0.016
Presize	24	17.2	0.432	0.369
---Duct Name: SR-280, Supplies: Bath (in Zone 2), Fittings: 2-I, 4-H, Effective Length: 28.9				
Runout	0.0003	4	218	0.001
Up: ST-340	142	3.1	0.022	0.005
Rnd	3.8	4.4	25.0	0.006
Presize	19	4	0.441	0.359
---Duct Name: SR-140, Supplies: Kitchen/Dining (in Zone 2), Fitting: 4-I, Effective Length: 5.9				
Runout	0.0003	6	423	0.001
Up: ST-220	142	4.7	0.041	0.002
Rnd	1.6	6.6	4.3	0.002
Presize	83	2.5	0.438	0.362
---Duct Name: SR-130, Supplies: Kitchen/Dining (in Zone 2), Fitting: 4-I, Effective Length: 6.1				
Runout	0.0003	6	423	0.001
Up: ST-220	142	4.7	0.041	0.002
Rnd	1.8	6.6	4.3	0.003
Presize	83	2.9	0.438	0.362
---Duct Name: ST-510, Feeds Into: S4 Bath, Supplies Zone: 1, Effective Length: 0.4				
Trunk	0.0003	12	226	0.000
Up: ST-370	142	12	0.006	0.000
Rect	0.4	10	0.0	0.000
Presize	188	1.3	0.454	0.346



Manual D Ductsize Data - Duct System 1 - Supply (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: ST-880, Feeds Into: Garage, Supplies Zone: 4, Effective Length: 1.1

Trunk	0.0003	3.8	696	0.002
Up: ST-420	142	3	0.202	0.000
Rect	1.1	4	0.0	0.002
Nearest Inch	58	1.2	0.448	0.352

---Duct Name: ST-910, Feeds Into: Suite 4, Supplies Zone: 3, Effective Length: 8.6

Trunk	0.0003	9.8	101	0.000
Up: ST-310	142	8	0.002	0.000
Rect	8.6	10	0.0	0.000
Presize	56	25.9	0.468	0.332

---Duct Name: ST-900, Feeds Into: Mech 2, Supplies Zone: 3, Effective Length: 0.6

Trunk	0.0003	9.8	106	0.000
Up: ST-890	142	8	0.002	0.000
Rect	0.6	10	0.0	0.000
Presize	59	1.8	0.468	0.332

---Duct Name: ST-890, Feeds Into: Mech 2, Supplies Zone: 3, Effective Length: 2.7

Trunk	0.0003	9.8	153	0.000
Up: ST-150	142	8	0.004	0.000
Rect	2.7	10	0.0	0.000
Presize	85	8.1	0.468	0.332

---Duct Name: ST-870, Feeds Into: Garage, Supplies Zone: 4, Effective Length: 3.2

Trunk	0.0003	12	302	0.000
Up: ST-410	142	12	0.011	0.000
Rect	3.2	10	0.0	0.000
Presize	252	11.9	0.463	0.337

---Duct Name: ST-420, Feeds Into: Garage, Supplies Zone: 4, Effective Length: 11.8

Trunk	0.0003	6.4	724	0.013
Up: ST-870	142	5	0.111	0.000
Rect	11.8	7	0.0	0.013
Nearest Inch	176	23.7	0.450	0.350

---Duct Name: ST-410, Feeds Into: Garage, Supplies Zone: 4, Effective Length: 15.6

Trunk	0.0003	12	368	0.002
Up: ST-260	142	12	0.015	0.000
Rect	15.6	10	0.0	0.002
Presize	307	57.3	0.463	0.337

---Duct Name: ST-350, Feeds Into: Suite 4, Supplies Zone: 2, Effective Length: 10.8

Trunk	0.0003	8.7	741	0.009
Up: ST-300	142	7	0.079	0.000
Rect	10.8	9	0.0	0.009
Nearest Inch	324	28.8	0.457	0.343

---Duct Name: ST-340, Feeds Into: S4 Bath, Supplies Zone: 2, Effective Length: 9.8

Trunk	0.0003	8	779	0.009
Up: ST-350	142	6	0.097	0.000
Rect	9.8	9	0.0	0.009
Nearest Inch	292	24.5	0.448	0.352



Manual D Ductsize Data - Duct System 1 - Supply (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: ST-330, Feeds Into: S4 Bath, Supplies Zone: 2, Effective Length: 8.0

Trunk	0.0003	8	664	0.006
Up: ST-320	142	6	0.073	0.000
Rect	8.0	9	0.0	0.006
Nearest Inch	249	20	0.442	0.358

---Duct Name: ST-320, Feeds Into: S4 Bath, Supplies Zone: 2, Effective Length: 0.6

Trunk	0.0003	12	328	0.000
Up: ST-340	142	12	0.012	0.000
Rect	0.6	10	0.0	0.000
Presize	273	2.2	0.448	0.352

---Duct Name: ST-310, Feeds Into: Mech 2, Supplies Zone: 3, Effective Length: 1.9

Trunk	0.0003	9.8	106	0.000
Up: ST-900	142	8	0.002	0.000
Rect	1.9	10	0.0	0.000
Presize	59	5.7	0.468	0.332

---Duct Name: ST-300, Feeds Into: Mech 2, Supplies Zone: 2, Effective Length: 1.2

Trunk	0.0003	12.9	433	0.000
Up: ST-170	142	14	0.019	0.000
Rect	1.2	10	0.0	0.000
Presize	421	5	0.466	0.334

---Duct Name: ST-240, Feeds Into: S4 Bath, Supplies Zone: 2, Effective Length: 0.3

Trunk	0.0003	12	299	0.000
Up: ST-330	142	12	0.010	0.000
Rect	0.3	10	0.0	0.000
Presize	249	1	0.442	0.358

---Duct Name: SMT-100, Feeds Into: Mech 2, Supplies Zones: 1, 2, 3, 4, Fitting: 1-H1, Effective Length: 198.0

Trunk	0.0003	18.6	683	0.000
Up: Fan	142	25	0.028	0.055
Rect	0.6	12	197.4	0.175
Presize	1,423	3.7	0.469	0.331

---Duct Name: ST-130, Feeds Into: Mech 2, Supplies Zone: 4, Fitting: 12-O1, Effective Length: 11.3

Trunk	0.0003	12.9	350	0.000
Up: ST-190	142	14	0.013	0.001
Rect	1.7	10	9.5	0.001
Presize	340	7	0.467	0.333

---Duct Name: ST-150, Feeds Into: Mech 2, Supplies Zone: 3, Fitting: 12-O1, Effective Length: 8.7

Trunk	0.0003	9.8	189	0.000
Up: ST-280	142	8	0.006	0.000
Rect	2.9	10	5.8	0.001
Presize	105	8.6	0.469	0.331

---Duct Name: ST-170, Feeds Into: Mech 2, Supplies Zone: 2, Fitting: 12-O1, Effective Length: 14.8

Trunk	0.0003	12.9	433	0.001
Up: ST-190	142	14	0.019	0.002
Rect	4.8	10	10.0	0.003
Presize	421	19.3	0.466	0.334



Manual D Ductsize Data - Duct System 1 - Supply (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: ST-180, Feeds Into: Mech 2, Supplies Zone: 1, Effective Length: 2.1

Trunk	0.0003	12.9	573	0.001
Up: ST-270	142	14	0.031	0.000
Rect	2.1	10	0.0	0.001
Presize	557	8.2	0.468	0.332

---Duct Name: ST-190, Feeds Into: Mech 2, Supplies Zones: 2, 4, Effective Length: 0.6

Trunk	0.0003	18.6	365	0.000
Up: ST-200	142	25	0.009	0.000
Rect	0.6	12	0.0	0.000
Presize	761	3.7	0.469	0.331

---Duct Name: ST-200, Feeds Into: Mech 2, Supplies Zones: 2, 4, Effective Length: 0.5

Trunk	0.0003	18.6	365	0.000
Up: ST-270	142	25	0.009	0.000
Rect	0.5	12	0.0	0.000
Presize	761	3.1	0.469	0.331

---Duct Name: ST-210, Feeds Into: Storage 1, Supplies Zone: 2, Effective Length: 15.1

Trunk	0.0003	12	199	0.001
Up: ST-240	142	12	0.005	0.000
Rect	15.1	10	0.0	0.001
Presize	166	55.4	0.441	0.359

---Duct Name: ST-220, Feeds Into: Theater, Supplies Zone: 2, Effective Length: 8.0

Trunk	0.0003	10	304	0.001
Up: ST-210	142	7.8	0.012	0.000
Rnd	8.0	10.9	0.0	0.001
Presize	166	20.9	0.440	0.360

---Duct Name: SR-100, Supplies: Theater (in Zone 1), Fittings: 2-I, 8-A2, 8-A2, 4-AD, Effective Length: 96.8

Runout	0.0003	7	352	0.003
Up: ST-360	142	5.4	0.024	0.020
Rnd	14.1	7.7	82.7	0.024
Presize	94	25.9	0.430	0.370

---Duct Name: SR-110, Supplies: Theater (in Zone 1), Fittings: 2-I, 8-A2, 8-A2, 4-AD, Effective Length: 100.3

Runout	0.0003	7	352	0.004
Up: ST-360	142	5.4	0.024	0.020
Rnd	17.5	7.7	82.7	0.024
Presize	94	32.1	0.429	0.371

---Duct Name: ST-260, Supplies Zone: 4, Effective Length: 7.8

Trunk	0.0003	12	408	0.001
Up: ST-130	142	12	0.018	0.000
Rect	7.8	10	0.0	0.001
Presize	340	28.7	0.466	0.334

---Duct Name: ST-270, Feeds Into: Mech 2, Supplies Zones: 1, 2, 4, Effective Length: 1.0

Trunk	0.0003	18.6	633	0.000
Up: ST-280	142	25	0.024	0.000
Rect	1.0	12	0.0	0.000
Presize	1,318	6.4	0.469	0.331



Manual D Ductsize Data - Duct System 1 - Supply (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: ST-280, Feeds Into: Mech 2, Supplies Zones: 1, 2, 3, 4, Effective Length: 0.3

Trunk	0.0003	18.6	683	0.000
Up: SMT-100	142	25	0.028	0.000
Rect	0.3	12	0.0	0.000
Presize	1,423	1.6	0.469	0.331

---Duct Name: SR-290, Supplies: Stair Well (in Zone 1), Fittings: 2-I, 4-AD, 8-A2, Effective Length: 72.9

Runout	0.0003	6	316	0.004
Up: ST-180	142	4.7	0.025	0.014
Rnd	14.7	6.6	58.2	0.018
Presize	62	23.1	0.450	0.350

---Duct Name: SR-320, Supplies: Storage 1 (in Zone 1), Fittings: 2-I, 4-AD, Effective Length: 31.5

Runout	0.0003	3	326	0.007
Up: ST-380	142	2.4	0.063	0.013
Rnd	10.7	3.3	20.9	0.020
Presize	16	8.4	0.434	0.366

---Duct Name: ST-360, Feeds Into: Theater, Supplies Zone: 1, Effective Length: 6.9

Trunk	0.0003	12	226	0.000
Up: ST-510	142	12	0.006	0.000
Rect	6.9	10	0.0	0.000
Presize	188	25.2	0.454	0.346

---Duct Name: ST-370, Feeds Into: S4 Bath, Supplies Zone: 1, Effective Length: 0.9

Trunk	0.0003	12	275	0.000
Up: ST-380	142	12	0.009	0.000
Rect	0.9	10	0.0	0.000
Presize	229	3.5	0.454	0.346

---Duct Name: ST-380, Feeds Into: S4 Bath, Supplies Zone: 1, Fitting: 12-O1, Effective Length: 15.9

Trunk	0.0003	8	653	0.007
Up: ST-390	142	6	0.071	0.004
Rect	10.0	9	6.0	0.011
Nearest Inch	245	24.9	0.454	0.346

---Duct Name: ST-390, Feeds Into: Suite 4, Supplies Zone: 1, Effective Length: 12.9

Trunk	0.0003	12.9	391	0.002
Up: ST-500	142	14	0.015	0.000
Rect	12.9	10	0.0	0.002
Presize	380	51.6	0.465	0.335

---Duct Name: ST-500, Feeds Into: Mech 2, Supplies Zone: 1, Effective Length: 2.8

Trunk	0.0003	12.9	509	0.001
Up: ST-180	142	14	0.025	0.000
Rect	2.8	10	0.0	0.001
Presize	495	11.1	0.467	0.333

---Duct Name: SR-330, Supplies: S4 Bath (in Zone 1), Fittings: 2-I, 4-AD, Effective Length: 49.7

Runout	0.0003	5	301	0.002
Up: ST-370	142	3.9	0.028	0.012
Rnd	7.1	5.5	42.6	0.014
Presize	41	9.3	0.440	0.360



Manual D Ductsize Data - Duct System 1 - Supply (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: SR-300, Supplies: Suite 4 (in Zone 1), Fittings: 2-I, 4-AD, Effective Length: 77.3

Runout	0.0003	7	370	0.004
Up: ST-390	142	5.4	0.027	0.017
Rnd	13.9	7.7	63.4	0.021
Presize	99	25.4	0.445	0.355

---Duct Name: SR-340, Supplies: Mech 2 (in Zone 1), Effective Length: 0.0

Runout	0.0003	7	430	0.000
Up: ST-500	142	5.4	0.035	0.000
Rnd	0.0	7.7	0.0	0.000
Presize	115	0	0.467	0.333

---Duct Name: SR-310, Supplies: Vault (in Zone 1), Fittings: 2-I, 4-AD, Effective Length: 54.7

Runout	0.0003	5	264	0.004
Up: ST-390	142	3.9	0.023	0.009
Rnd	16.5	5.5	38.2	0.012
Presize	36	21.6	0.453	0.347

Report Units: Pressure: in.wg, Duct lengths: feet, Duct sizes: inch, Airflow: CFM, Velocity: ft./min, Temperature: F

Notes: Static pressure available values for return ducts are at the entrance of the duct. For supply, they are at the exit. The cumulative static pressure loss value for a return trunk is with respect to the entry point of the return runout upstream with the highest static pressure available. Total and cumulative static pressure loss values for the supply main trunk include any device pressure losses entered, and the cumulative may also include the total static pressure loss of the return side.

Summary

Number of active trunks:	32		
Number of active runouts:	25		
Total runout outlet airflow:	1,423		
Main trunk airflow:	1,423		
Largest trunk diameter:	18.6	SMT-100	
Largest runout diameter:	7	SR-250	
Smallest trunk diameter:	3.8	ST-880	
Smallest runout diameter:	3	SR-230	
Supply fan external static pressure:	0.800		
Supply fan device pressure losses:	0.120		
Supply fan static pressure available:	0.680		
Runout maximum cumulative static pressure loss:	0.391	SR-120	
Return loss added to supply:	0.155		
Total effective length of return (ft.):	525.0	Hall Ceiling	
Total effective length of supply (ft.):	326.4	SR-120	
Overall total effective length (ft.):	851.5	Hall Ceiling to SR-120	
Design overall friction rate per 100 ft.:	0.080	(Available SP x 100 / TEL)	
System duct surface area (Scenario 1):	790.1	Main	(Linked to duct load)
System duct surface area (Scenario 3):	121.6	Garage	(Linked to duct load)
Total system duct surface area:	911.7		



Manual D Ductsize Data - Duct System 2 - Supply

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: SR-350, Supplies: Master Bedroom (in Zone 2), Fittings: 2-I, 4-G, Effective Length: 76.3

Runout	0.0003	6	341	0.005
Up: ST-940	142	4.7	0.028	0.017
Rnd	16.9	6.6	59.4	0.021
Presize	67	26.6	0.478	0.322

---Duct Name: SR-360, Supplies: Master Bedroom (in Zone 2), Effective Length: 16.8

Runout	0.0003	6	341	0.005
Up: ST-930	142	4.7	0.028	0.000
Rnd	16.8	6.6	0.0	0.005
Presize	67	26.4	0.495	0.305

---Duct Name: SR-370, Supplies: Master Bath (in Zone 2), Fittings: 2-I, 4-G, Effective Length: 54.3

Runout	0.0003	5	235	0.002
Up: ST-920	142	3.9	0.018	0.008
Rnd	11.3	5.5	43.0	0.010
Presize	32	14.8	0.491	0.309

---Duct Name: SR-380, Supplies: Master Bath (in Zone 2), Fittings: 2-I, 4-I, Effective Length: 12.5

Runout	0.0003	3	204	0.000
Up: ST-590	142	2.4	0.028	0.003
Rnd	1.5	3.3	11.0	0.004
Presize	10	1.2	0.497	0.303

---Duct Name: SR-390, Supplies: Mstr Wic (in Zone 2), Fittings: 2-I, 4-G, Effective Length: 57.8

Runout	0.0003	6	301	0.000
Up: ST-720	142	4.7	0.022	0.013
Rnd	0.3	6.6	57.5	0.013
Presize	59	0.5	0.487	0.313

---Duct Name: SR-400, Supplies: Study (in Zone 1), Fittings: 2-I, 4-G, Effective Length: 65.1

Runout	0.0003	6	214	0.001
Up: ST-760	142	4.7	0.012	0.007
Rnd	4.8	6.6	60.3	0.008
Presize	42	7.5	0.490	0.310

---Duct Name: SR-410, Supplies: Great Room (in Zone 1), Fittings: 2-I, 4-G, Effective Length: 77.2

Runout	0.0003	6	413	0.006
Up: ST-740	142	4.7	0.039	0.024
Rnd	15.1	6.6	62.1	0.030
Presize	81	23.7	0.466	0.334

---Duct Name: SR-420, Supplies: Great Room (in Zone 1), Fittings: 2-I, 4-G, Effective Length: 77.0

Runout	0.0003	6	413	0.006
Up: ST-860	142	4.7	0.039	0.024
Rnd	14.9	6.6	62.1	0.030
Presize	81	23.4	0.467	0.333

---Duct Name: SR-440, Supplies: Great Room (in Zone 1), Fittings: 2-I, 4-G, Effective Length: 69.0

Runout	0.0003	6	413	0.003
Up: ST-860	142	4.7	0.039	0.024
Rnd	6.9	6.6	62.1	0.027
Presize	81	10.9	0.470	0.330



Manual D Ductsize Data - Duct System 2 - Supply (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: SR-450, Supplies: Study (in Zone 1), Fittings: 2-I, 4-G, Effective Length: 78.9

Runout	0.0003	6	214	0.002
Up: ST-730	142	4.7	0.012	0.008
Rnd	14.9	6.6	64.0	0.010
Presize	42	23.4	0.489	0.311

---Duct Name: ST-940, Feeds Into: S3 Bath, Supplies Zone: 2, Effective Length: 12.8

Trunk	0.0003	12	80	0.000
Up: ST-720	142	12	0.001	0.000
Rect	12.8	10	0.0	0.000
Presize	67	46.9	0.500	0.300

---Duct Name: ST-930, Feeds Into: S3 Wic, Supplies Zone: 2, Effective Length: 10.1

Trunk	0.0003	12	232	0.001
Up: ST-920	142	12	0.007	0.000
Rect	10.1	10	0.0	0.001
Presize	193	36.9	0.500	0.300

---Duct Name: ST-920, Feeds Into: Exercise, Supplies Zone: 2, Effective Length: 1.1

Trunk	0.0003	12	270	0.000
Up: ST-590	142	12	0.009	0.000
Rect	1.1	10	0.0	0.000
Presize	225	4.1	0.501	0.299

---Duct Name: ST-850, Feeds Into: S3 Bath, Supplies Zone: 3, Effective Length: 2.6

Trunk	0.0003	9.8	115	0.000
Up: ST-840	142	8	0.003	0.000
Rect	2.6	10	0.0	0.000
Presize	64	7.8	0.497	0.303

---Duct Name: ST-840, Feeds Into: S3 Bath, Supplies Zone: 3, Effective Length: 5.3

Trunk	0.0003	9.8	166	0.000
Up: ST-830	142	8	0.005	0.000
Rect	5.3	10	0.0	0.000
Presize	92	15.9	0.497	0.303

---Duct Name: ST-830, Feeds Into: S3 Wic, Supplies Zone: 3, Effective Length: 0.8

Trunk	0.0003	9.8	306	0.000
Up: ST-580	142	8	0.014	0.000
Rect	0.8	10	0.0	0.000
Presize	170	2.3	0.497	0.303

---Duct Name: ST-860, Feeds Into: Game Room, Supplies Zone: 1, Effective Length: 7.0

Trunk	0.0003	12	292	0.001
Up: ST-760	142	12	0.010	0.000
Rect	7.0	10	0.0	0.001
Presize	243	25.7	0.497	0.303

---Duct Name: ST-760, Feeds Into: Bar/Canning, Supplies Zone: 1, Effective Length: 3.7

Trunk	0.0003	12	342	0.000
Up: ST-730	142	12	0.013	0.000
Rect	3.7	10	0.0	0.000
Presize	285	13.4	0.498	0.302



Manual D Ductsize Data - Duct System 2 - Supply (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: ST-740, Feeds Into: Game Room, Supplies Zone: 1, Fitting: 12-O1, Effective Length: 22.3

Trunk	0.0003	9.8	146	0.001
Up: ST-860	142	8	0.004	0.000
Rect	16.8	10	5.5	0.001
Presize	81	50.5	0.497	0.303

---Duct Name: ST-730, Feeds Into: Bar/Canning, Supplies Zone: 1, Effective Length: 3.5

Trunk	0.0003	12	392	0.001
Up: ST-550	142	12	0.017	0.000
Rect	3.5	10	0.0	0.001
Presize	327	12.8	0.499	0.301

---Duct Name: ST-720, Feeds Into: S3 Wic, Supplies Zone: 2, Effective Length: 0.3

Trunk	0.0003	12	151	0.000
Up: ST-930	142	12	0.003	0.000
Rect	0.3	10	0.0	0.000
Presize	126	1.1	0.500	0.300

---Duct Name: SMT-520, Feeds Into: Mech 1, Supplies Zones: 1, 2, 3, 4, Fitting: 1-H1, Effective Length: 168.4

Trunk	0.0003	16.9	655	0.000
Up: Fan	142	25	0.030	0.051
Rect	0.8	10	167.6	0.171
Presize	1,137	4.9	0.503	0.297

---Duct Name: ST-550, Feeds Into: Bar/Canning, Supplies Zone: 1, Fitting: 12-O1, Effective Length: 20.8

Trunk	0.0003	12	392	0.002
Up: SMT-520	142	12	0.017	0.002
Rect	11.8	10	9.0	0.004
Presize	327	43.4	0.499	0.301

---Duct Name: ST-580, Feeds Into: S3 Wic, Supplies Zone: 3, Effective Length: 16.2

Trunk	0.0003	9.8	306	0.002
Up: ST-620	142	8	0.014	0.000
Rect	16.2	10	0.0	0.002
Presize	170	48.6	0.497	0.303

---Duct Name: ST-590, Feeds Into: Mech 1, Supplies Zone: 2, Effective Length: 1.2

Trunk	0.0003	12	282	0.000
Up: ST-600	142	12	0.009	0.000
Rect	1.2	10	0.0	0.000
Presize	235	4.3	0.501	0.299

---Duct Name: ST-600, Feeds Into: Mech 1, Supplies Zone: 2, Fittings: 12-O1, 8-B1C, Effective Length: 29.4

Trunk	0.0003	12.9	242	0.000
Up: ST-670	142	14	0.007	0.002
Rect	3.2	10	26.2	0.002
Presize	235	12.7	0.501	0.299

---Duct Name: ST-610, Feeds Into: Mech 1, Supplies Zone: 3, Effective Length: 0.7

Trunk	0.0003	16.9	98	0.000
Up: ST-670	142	25	0.001	0.000
Rect	0.7	10	0.0	0.000
Presize	170	3.9	0.503	0.297



Manual D Ductsize Data - Duct System 2 - Supply (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: ST-620, Feeds Into: Mech 1, Supplies Zone: 3, Fittings: 8-B1C, 12-O1, Effective Length: 22.5

Trunk	0.0003	9.8	306	0.000
Up: ST-610	142	8	0.014	0.003
Rect	2.8	10	19.7	0.003
Presize	170	8.5	0.499	0.301

---Duct Name: ST-660, Feeds Into: Mech 1, Supplies Zone: 4, Fitting: 12-O1, Effective Length: 10.9

Trunk	0.0003	12	486	0.000
Up: ST-670	142	12	0.025	0.002
Rect	1.5	10	9.4	0.003
Presize	405	5.5	0.500	0.300

---Duct Name: ST-670, Feeds Into: Mech 1, Supplies Zones: 2, 3, 4, Effective Length: 0.8

Trunk	0.0003	16.9	467	0.000
Up: SMT-520	142	25	0.016	0.000
Rect	0.8	10	0.0	0.000
Presize	810	4.9	0.503	0.297

---Duct Name: SR-460, Supplies: Game Room (in Zone 4), Fittings: 2-I, 4-AD, Effective Length: 70.3

Runout	0.0003	6	494	0.008
Up: ST-790	142	4.7	0.054	0.030
Rnd	14.5	6.6	55.8	0.038
Nearest Inch	97	22.8	0.458	0.342

---Duct Name: SR-470, Supplies: Game Room (in Zone 4), Fittings: 2-I, 4-AD, Effective Length: 70.1

Runout	0.0003	6	494	0.008
Up: ST-800	142	4.7	0.054	0.030
Rnd	14.3	6.6	55.8	0.038
Nearest Inch	97	22.5	0.460	0.340

---Duct Name: SR-480, Supplies: Game Room (in Zone 4), Effective Length: 14.5

Runout	0.0003	6	494	0.008
Up: ST-770	142	4.7	0.054	0.000
Rnd	14.5	6.6	0.0	0.008
Nearest Inch	97	22.8	0.491	0.309

---Duct Name: ST-770, Feeds Into: Bar/Canning, Supplies Zone: 4, Effective Length: 1.4

Trunk	0.0003	12	349	0.000
Up: ST-810	142	12	0.014	0.000
Rect	1.4	10	0.0	0.000
Presize	291	5.2	0.498	0.302

---Duct Name: SR-500, Supplies: Exercise (in Zone 4), Fittings: 2-I, 8-A2, 8-A2, 4-AD, Effective Length: 80.1

Runout	0.0003	5	491	0.008
Up: ST-660	142	3.9	0.067	0.047
Rnd	11.1	5.5	69.0	0.054
Nearest Inch	67	14.6	0.446	0.354

---Duct Name: ST-790, Feeds Into: Game Room, Supplies Zone: 4, Fitting: 12-O1, Effective Length: 20.3

Trunk	0.0003	9.8	175	0.001
Up: ST-800	142	8	0.005	0.000
Rect	14.6	10	5.7	0.001
Presize	97	43.8	0.496	0.304



Manual D Ductsize Data - Duct System 2 - Supply (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: ST-800, Feeds Into: Game Room, Supplies Zone: 4, Effective Length: 13.6

Trunk	0.0003	12	233	0.001
Up: ST-770	142	12	0.007	0.000
Rect	13.6	10	0.0	0.001
Presize	194	49.8	0.497	0.303

---Duct Name: ST-810, Feeds Into: Bar/Canning, Supplies Zone: 4, Effective Length: 8.4

Trunk	0.0003	12	386	0.001
Up: ST-660	142	12	0.016	0.000
Rect	8.4	10	0.0	0.001
Presize	322	30.9	0.499	0.301

---Duct Name: SR-510, Supplies: Suite 3 (in Zone 3), Fittings: 2-I, 4-AD, Effective Length: 66.3

Runout	0.0003	6	326	0.004
Up: ST-850	142	4.7	0.026	0.013
Rnd	15.7	6.6	50.6	0.017
Presize	64	24.7	0.480	0.320

---Duct Name: SR-520, Supplies: Suite 3 (in Zone 3), Fittings: 2-I, 4-AD, Effective Length: 66.3

Runout	0.0003	6	326	0.004
Up: ST-830	142	4.7	0.026	0.013
Rnd	15.7	6.6	50.6	0.017
Presize	64	24.7	0.480	0.320

---Duct Name: SR-530, Supplies: S3 Wic (in Zone 3), Effective Length: 0.3

Runout	0.0003	2	642	0.001
Up: ST-830	142	1.6	0.348	0.000
Rnd	0.3	2.2	0.0	0.001
Nearest Inch	14	0.1	0.496	0.304

---Duct Name: SR-540, Supplies: S3 Bath (in Zone 3), Effective Length: 0.2

Runout	0.0003	3	570	0.000
Up: ST-840	142	2.4	0.168	0.000
Rnd	0.2	3.3	0.0	0.000
Nearest Inch	28	0.2	0.496	0.304

---Duct Name: SR-490, Supplies: Bar/Canning (in Zone 4), Effective Length: 0.3

Runout	0.0003	3	632	0.001
Up: ST-810	142	2.4	0.201	0.000
Rnd	0.3	3.3	0.0	0.001
Nearest Inch	31	0.2	0.498	0.302

---Duct Name: SR-550, Supplies: Mech 1 (in Zone 4), Effective Length: 0.2

Runout	0.0003	2	733	0.001
Up: ST-660	142	1.6	0.442	0.000
Rnd	0.2	2.2	0.0	0.001
Nearest Inch	16	0.1	0.499	0.301

Report Units: Pressure: in.wg, Duct lengths: feet, Duct sizes: inch, Airflow: CFM, Velocity: ft./min, Temperature: F



Manual D Ductsize Data - Duct System 2 - Supply (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

Notes: Static pressure available values for return ducts are at the entrance of the duct. For supply, they are at the exit. The cumulative static pressure loss value for a return trunk is with respect to the entry point of the return runout upstream with the highest static pressure available. Total and cumulative static pressure loss values for the supply main trunk include any device pressure losses entered, and the cumulative may also include the total static pressure loss of the return side.

Summary

Number of active trunks:	24		
Number of active runouts:	20		
Total runout outlet airflow:	1,137		
Main trunk airflow:	1,137		
Largest trunk diameter:	16.9	SMT-520	
Largest runout diameter:	6	SR-350	
Smallest trunk diameter:	9.8	ST-850	
Smallest runout diameter:	2	SR-530	
Supply fan external static pressure:	0.800		
Supply fan device pressure losses:	0.120		
Supply fan static pressure available:	0.680		
Runout maximum cumulative static pressure loss:	0.354	SR-500	
Return loss added to supply:	0.126		
Total effective length of return (ft.):	475.3	Mstr Low	
Total effective length of supply (ft.):	260.3	SR-500	
Overall total effective length (ft.):	735.6	Mstr Low to SR-500	
Design overall friction rate per 100 ft.:	0.092	(Available SP x 100 / TEL)	
System duct surface area (Scenario 1):	774.7	Main	(Linked to duct load)
Total system duct surface area:	774.7		



Manual D Ductsize Data - Duct System 1 - Return

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: S2 Low, Returns From: Suite 2, Fittings: 6-C, 12-S, 6-F, Effective Length: 43.0

Runout	0.0003	7	408	0.001
Up: RT-160	72	5.4	0.035	0.014
Rnd	1.6	7.7	41.5	0.015
Presize	109	2.9	-0.030	0.015

---Duct Name: Bed 2 Low, Returns From: Guest Suite, Fittings: 6-C, 12-S, 6-F, Effective Length: 118.6

Runout	0.0003	7	228	0.001
Up: RT-220	72	5.4	0.013	0.013
Rnd	11.2	7.7	107.4	0.015
Presize	61	20.5	-0.015	0.015

---Duct Name: Bed 1 Low, Returns From: Guest Suite, Fittings: 6-C, 12-S, 6-F, Effective Length: 60.4

Runout	0.0003	7	213	0.001
Up: RT-200	72	5.4	0.011	0.005
Rnd	11.6	7.7	48.8	0.007
Presize	57	21.2	-0.024	0.007

---Duct Name: GS Low, Returns From: Guest Suite, Fittings: 6-C, 12-S, 6-F, Effective Length: 69.7

Runout	0.0003	7	442	0.005
Up: RT-210	72	5.4	0.040	0.023
Rnd	11.6	7.7	58.1	0.028
Presize	118	21.3	-0.002	0.028

---Duct Name: Gs Low 2, Returns From: Guest Suite, Fittings: 6-C, 12-S, 6-F, Effective Length: 53.7

Runout	0.0003	7	442	0.005
Up: RT-140	72	5.4	0.040	0.017
Rnd	11.6	7.7	42.2	0.022
Presize	118	21.2	-0.009	0.022

---Duct Name: Hall Low 2, Returns From: Suite 2, Fittings: 6-C, 12-S, 6-F, Effective Length: 47.1

Runout	0.0003	7	412	0.002
Up: RT-240	72	5.4	0.035	0.015
Rnd	5.6	7.7	41.5	0.017
Presize	110	10.3	-0.030	0.017

---Duct Name: Hall Low, Returns From: Suite 2, Fittings: 6-C, 12-S, 6-F, Effective Length: 47.1

Runout	0.0003	7	412	0.002
Up: RT-170	72	5.4	0.035	0.015
Rnd	5.5	7.7	41.5	0.017
Presize	110	10.2	-0.029	0.017

---Duct Name: Hall Low 3, Returns From: S2 Wic, Fittings: 6-C, 12-S, 6-F, Effective Length: 49.7

Runout	0.0003	7	412	0.003
Up: RT-180	72	5.4	0.035	0.015
Rnd	8.2	7.7	41.5	0.018
Presize	110	15	-0.037	0.018

---Duct Name: Hall Low 4, Returns From: S2 Wic, Fittings: 6-C, 12-S, 6-F, Effective Length: 49.8

Runout	0.0003	7	412	0.003
Up: RT-110	72	5.4	0.035	0.015
Rnd	8.3	7.7	41.5	0.018
Presize	110	15.1	-0.037	0.018



Manual D Ductsize Data - Duct System 1 - Return (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul
---Duct Name: RT-220, Feeds From: Garage, Effective Length: 12.4				
Trunk	0.0003	12.9	63	0.000
Up: RT-200	72	14	0.001	0.000
Rect	12.4	10	0.0	0.000
Presize	61	49.7	-0.030	0.015
---Duct Name: RT-210, Feeds From: Garage, Effective Length: 1.2				
Trunk	0.0003	12.9	243	0.000
Up: RT-140	72	14	0.007	0.000
Rect	1.2	10	0.0	0.000
Presize	236	5	-0.030	0.015
---Duct Name: RT-200, Feeds From: Garage, Effective Length: 4.0				
Trunk	0.0003	12.9	121	0.000
Up: RT-210	72	14	0.002	0.000
Rect	4.0	10	0.0	0.000
Presize	118	16	-0.030	0.015
---Duct Name: RT-190, Feeds From: Suite 4, Fitting: 12-F1, Effective Length: 29.3				
Trunk	0.0003	16.9	524	0.001
Up: RT-180	72	25	0.022	0.005
Rect	5.1	10	24.2	0.007
Presize	910	29.6	-0.048	0.147
---Duct Name: RT-180, Feeds From: Mech 2, Effective Length: 1.1				
Trunk	0.0003	14	890	0.001
Up: RT-110	72	11	0.068	0.000
Rect	1.1	15	0.0	0.001
Nearest Inch	1,020	4.6	-0.054	0.154
---Duct Name: RT-170, Feeds From: Suite 4, Effective Length: 1.2				
Trunk	0.0003	10.2	715	0.001
Up: RT-240	72	8	0.067	0.000
Rect	1.2	11	0.0	0.001
Nearest Inch	437	3.7	-0.046	0.145
---Duct Name: RT-160, Feeds From: Suite 4, Effective Length: 0.7				
Trunk	0.0003	9.1	673	0.000
Up: RT-170	72	7	0.070	0.000
Rect	0.7	10	0.0	0.000
Nearest Inch	327	2	-0.045	0.145
---Duct Name: RT-150, Feeds From: S4 Bath, Effective Length: 10.1				
Trunk	0.0003	7.6	654	0.008
Up: RT-160	72	6	0.083	0.000
Rect	10.1	8	0.0	0.008
Nearest Inch	218	23.5	-0.037	0.137
---Duct Name: RMT-100, Feeds From: Mech 2, Fittings: 5-H1, 5-L, Effective Length: 297.9				
Trunk	0.0003	18.6	712	0.000
Up: Fan	72	25	0.033	0.099
Rect	0.5	12	297.5	0.100
Presize	1,484	2.9	-0.056	0.155



Manual D Ductsize Data - Duct System 1 - Return (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul
---Duct Name: RT-110, Feeds From: Mech 2, Effective Length: 4.0				
Trunk	0.0003	18.6	542	0.001
Up: RMT-100	72	25	0.020	0.000
Rect	4.0	12	0.0	0.001
Presize	1,130	24.7	-0.055	0.155
---Duct Name: RT-120, Feeds From: Mech 2, Effective Length: 1.7				
Trunk	0.0003	18.6	170	0.000
Up: RMT-100	72	25	0.003	0.000
Rect	1.7	12	0.0	0.000
Presize	354	10.5	-0.056	0.041
---Duct Name: RT-130, Feeds From: Mech 2, Fittings: 12-F1, 8-B1C, Effective Length: 28.0				
Trunk	0.0003	9.1	728	0.002
Up: RT-120	72	7	0.080	0.021
Rect	1.9	10	26.1	0.022
Nearest Inch	354	5.3	-0.033	0.018
---Duct Name: RT-140, Feeds From: Garage, Effective Length: 19.6				
Trunk	0.0003	12.9	364	0.003
Up: RT-130	72	14	0.015	0.000
Rect	19.6	10	0.0	0.003
Presize	354	78.5	-0.030	0.015
---Duct Name: RT-240, Feeds From: Suite 4, Effective Length: 3.9				
Trunk	0.0003	16.9	315	0.000
Up: RT-250	72	25	0.009	0.000
Rect	3.9	10	0.0	0.000
Presize	547	23	-0.047	0.146
---Duct Name: RT-250, Feeds From: Suite 4, Effective Length: 4.8				
Trunk	0.0003	16.9	441	0.001
Up: RT-190	72	25	0.016	0.000
Rect	4.8	10	0.0	0.001
Presize	765	27.8	-0.047	0.147
---Duct Name: S4 Low, Returns From: Suite 4, Fittings: 6-C, 12-S, 6-F, Effective Length: 49.7				
Runout	0.0003	8	415	0.000
Up: RT-190	72	6.2	0.030	0.015
Rnd	0.5	8.7	49.2	0.015
Presize	145	1	-0.033	0.015
---Duct Name: Hall Ceiling 2, Returns From: Theater, Fittings: 6-C, 6-M, Effective Length: 44.4				
Runout	0.0003	10	400	0.002
Up: RT-250	72	7.8	0.021	0.008
Rnd	8.0	10.9	36.4	0.010
Presize	218	20.8	-0.037	0.010
---Duct Name: Hall Ceiling, Returns From: Theater, Fittings: 6-C, 6-M, Effective Length: 172.1				
Runout	0.0003	10	400	0.002
Up: RT-150	72	7.8	0.021	0.035
Rnd	8.1	10.9	163.9	0.037
Presize	218	21.3	0.000	0.037



Manual D Ductsize Data - Duct System 1 - Return (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

Report Units: Pressure: in.wg, Duct lengths: feet, Duct sizes: inch, Airflow: CFM, Velocity: ft./min, Temperature: F

Notes: Static pressure available values for return ducts are at the entrance of the duct. For supply, they are at the exit. The cumulative static pressure loss value for a return trunk is with respect to the entry point of the return runout upstream with the highest static pressure available. Total and cumulative static pressure loss values for the supply main trunk include any device pressure losses entered, and the cumulative may also include the total static pressure loss of the return side.

Summary

Number of active trunks:	15		
Number of active runouts:	12		
Total runout outlet airflow:	1,484		
Main trunk airflow:	1,484		
Largest trunk diameter:	18.6	RMT-100	
Largest runout diameter:	10	Hall Ceiling 2	
Smallest trunk diameter:	7.6	RT-150	
Smallest runout diameter:	7	S2 Low	
Runout maximum cumulative static pressure loss:	0.037	Hall Ceiling	
Return loss added to supply:	0.155		
Total effective length of return (ft.):	525.0	Hall Ceiling	
System duct surface area (Scenario 1):	333.3	Main	(Linked to duct load)
System duct surface area (Scenario 3):	154.6	Garage	(Linked to duct load)
Total system duct surface area:	487.9		



Manual D Ductsize Data - Duct System 2 - Return

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: Study Low, Returns From: Study, Fittings: 6-C, 12-S, 6-F, Effective Length: 50.9

Runout	0.0003	7	318	0.003
Up: RT-290	72	5.4	0.022	0.009
Rnd	11.8	7.7	39.1	0.011
Presize	85	21.5	-0.046	0.011

---Duct Name: Floor, Returns From: Great Room, Fittings: 6-C, 6-G, Effective Length: 185.2

Runout	0.0003	10	444	0.001
Up: RT-340	72	7.8	0.026	0.047
Rnd	5.1	10.9	180.1	0.048
Presize	242	13.3	-0.004	0.048

---Duct Name: Mstr Low, Returns From: Master Bedroom, Fittings: 6-C, 12-S, 6-F, Effective Length: 128.0

Runout	0.0003	7	442	0.001
Up: RT-300	72	5.4	0.040	0.050
Rnd	2.4	7.7	125.5	0.051
Presize	118	4.4	0.000	0.051

---Duct Name: Mstr Low 2, Returns From: Master Bedroom, Fittings: 6-C, 12-S, 6-F, Effective Length: 60.4

Runout	0.0003	7	442	0.001
Up: RT-350	72	5.4	0.040	0.023
Rnd	2.4	7.7	58.1	0.024
Presize	118	4.3	-0.027	0.024

---Duct Name: RT-320, Feeds From: Game Room, Effective Length: 22.3

Trunk	0.0003	12.9	458	0.005
Up: RT-290	72	14	0.023	0.000
Rect	22.3	10	0.0	0.005
Presize	445	89.3	-0.053	0.054

---Duct Name: RT-300, Feeds From: S3 Bath, Effective Length: 1.0

Trunk	0.0003	13.7	106	0.000
Up: RT-350	72	16	0.002	0.000
Rect	1.0	10	0.0	0.000
Presize	118	4.3	-0.051	0.110

---Duct Name: RMT-260, Feeds From: Mech 1, Fittings: 5-H1, 5-L, Effective Length: 283.6

Trunk	0.0003	18.6	547	0.000
Up: Fan	72	25	0.021	0.059
Rect	0.7	12	283.0	0.059
Presize	1,139	4.1	-0.067	0.126

---Duct Name: RT-270, Feeds From: Exercise, Effective Length: 9.3

Trunk	0.0003	13.7	548	0.003
Up: RT-280	72	16	0.029	0.000
Rect	9.3	10	0.0	0.003
Presize	609	40.4	-0.052	0.111

---Duct Name: RT-280, Feeds From: Mech 1, Fittings: 12-F1, 8-B1C, Effective Length: 42.8

Trunk	0.0003	13.7	548	0.001
Up: RMT-260	72	16	0.029	0.012
Rect	2.2	10	40.6	0.013
Presize	609	9.4	-0.055	0.114



Manual D Ductsize Data - Duct System 2 - Return (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

---Duct Name: RT-290, Feeds From: Bar/Canning, Fitting: 12-F1, Effective Length: 31.9

Trunk	0.0003	12.9	545	0.004
Up: RMT-260	72	14	0.031	0.006
Rect	12.9	10	19.0	0.010
Presize	530	51.7	0.058	0.069

---Duct Name: Ceiling, Returns From: Exercise, Fittings: 6-C, 6-M, Effective Length: 53.8

Runout	0.0003	10	372	0.003
Up: RT-270	72	7.8	0.019	0.007
Rnd	18.0	10.9	35.9	0.010
Presize	203	47.1	-0.042	0.010

---Duct Name: RT-340, Feeds From: Game Room, Effective Length: 8.9

Trunk	0.0003	12.9	249	0.001
Up: RT-320	72	14	0.008	0.000
Rect	8.9	10	0.0	0.001
Presize	242	35.7	-0.052	0.053

---Duct Name: S3 Low, Returns From: Suite 3, Fittings: 6-C, 12-S, 6-F, Effective Length: 42.0

Runout	0.0003	6	433	0.003
Up: RT-360	72	4.7	0.047	0.016
Rnd	7.4	6.6	34.6	0.020
Presize	85	11.6	-0.032	0.020

---Duct Name: S3 Low 2, Returns From: Suite 3, Fittings: 6-C, 12-S, 6-F, 8-A2, Effective Length: 51.4

Runout	0.0003	6	433	0.004
Up: RT-370	72	4.7	0.047	0.020
Rnd	9.0	6.6	42.5	0.024
Presize	85	14.1	-0.028	0.024

---Duct Name: RT-350, Feeds From: S3 Wic, Effective Length: 6.7

Trunk	0.0003	13.7	212	0.000
Up: RT-360	72	16	0.005	0.000
Rect	6.7	10	0.0	0.000
Presize	236	29.1	-0.051	0.110

---Duct Name: RT-360, Feeds From: S3 Wic, Effective Length: 0.8

Trunk	0.0003	13.7	289	0.000
Up: RT-370	72	16	0.009	0.000
Rect	0.8	10	0.0	0.000
Presize	321	3.3	-0.052	0.110

---Duct Name: RT-370, Feeds From: S3 Wic, Effective Length: 3.1

Trunk	0.0003	13.7	365	0.000
Up: RT-270	72	16	0.014	0.000
Rect	3.1	10	0.0	0.000
Presize	406	13.6	-0.052	0.110

---Duct Name: Ceiling 2, Returns From: Game Room, Effective Length: 0.4

Runout	0.0003	7.6	609	0.000
Up: RT-320	72	6	0.073	0.000
Rect	0.4	8	0.0	0.000
Nearest Inch	203	1	-0.052	0.000



Manual D Ductsize Data - Duct System 2 - Return (cont'd)

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul

Report Units: Pressure: in.wg, Duct lengths: feet, Duct sizes: inch, Airflow: CFM, Velocity: ft./min, Temperature: F

Notes: Static pressure available values for return ducts are at the entrance of the duct. For supply, they are at the exit. The cumulative static pressure loss value for a return trunk is with respect to the entry point of the return runout upstream with the highest static pressure available. Total and cumulative static pressure loss values for the supply main trunk include any device pressure losses entered, and the cumulative may also include the total static pressure loss of the return side.

Summary

Number of active trunks:	10		
Number of active runouts:	8		
Total runout outlet airflow:	1,139		
Main trunk airflow:	1,139		
Largest trunk diameter:	18.6	RMT-260	
Largest runout diameter:	10	Floor	
Smallest trunk diameter:	12.9	RT-320	
Smallest runout diameter:	6	S3 Low	
Runout maximum cumulative static pressure loss:	0.051	Mstr Low	
Return loss added to supply:	0.126		
Total effective length of return (ft.):	475.3	Mstr Low	
System duct surface area (Scenario 1):	398.1	Main	(Linked to duct load)
Total system duct surface area:	398.1		

Notes

Rhvac is an ACCA approved Manual J and Manual D computer program. Calculations are performed per ACCA Manual J 8th Edition, Version 2, 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.



Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	1463.4	37,650	0	0	0
Case Door: Door-Case Door	168.1	4,603	0	0	0
Overhead Door: Door-Overhead Door	256	7,012	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	6833	31,190	0	0	0
14D-28s: Wall-insulated concrete form (ICF), ASTM R-Value R-26 to R-30 foam matrix form filled with site-poured concrete, stucco or siding finish, plus interior finish	3108.6	9,804	0	0	0
12F-0sw: Wall-Frame, R-21 insulation in 2 x 6 stud cavity, no board insulation, siding finish, wood studs	742.5	4,005	0	0	0
Ceiling R60: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Custom, Ceiling R60 Insulation	4991.2	7,458	0	0	0
21B-20-c: Floor-Basement, Concrete slab, any thickness, 2 or more feet below grade, R-3 or higher insulation installed below floor, carpet covering, shortest side of floor slab is 20' wide	2968.7	4,682	0	0	0
22C-10ph: Floor-Slab on grade, Horizontal board insulation extends 4' under slab, any floor cover, R-10 insulation, passive, heavy moist soil	294	29,795	0	0	0
20P-30: Floor-Over open crawl space or garage, Passive, R-30 blanket insulation, any cover	1366.9	3,971	0	0	0
21A-20: Floor-Basement, Concrete slab, any thickness, 2 or more feet below grade, no insulation below floor, any floor cover, shortest side of floor slab is 20' wide	28	63	0	0	0
Subtotals for structure:		140,233	0	0	0
People:	7		0	0	0
Equipment:			0	0	0
Lighting:	0		0	0	0
Ductwork:		5,442	0	0	0
Infiltration: Winter CFM: 523, Summer CFM: 128		33,597	0	0	0
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Exhaust: Winter CFM: 128, Summer CFM: 128			0	0	0
Total Building Load Totals:		179,272	0	0	0

Check Figures

Total Building Supply CFM:	3,252	CFM Per Square ft.:	0.323 *
Square ft. of Room Area:	10,057	Square ft. Per Ton:	0 **

Volume (ft³) of Cond. Space: (htg.) 111,354

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

Building Loads

Total Heating Required Including Ventilation Air: 179,272 Btuh 179.272 MBH

Notes

Rhvac is an ACCA approved Manual J and Manual D computer program.

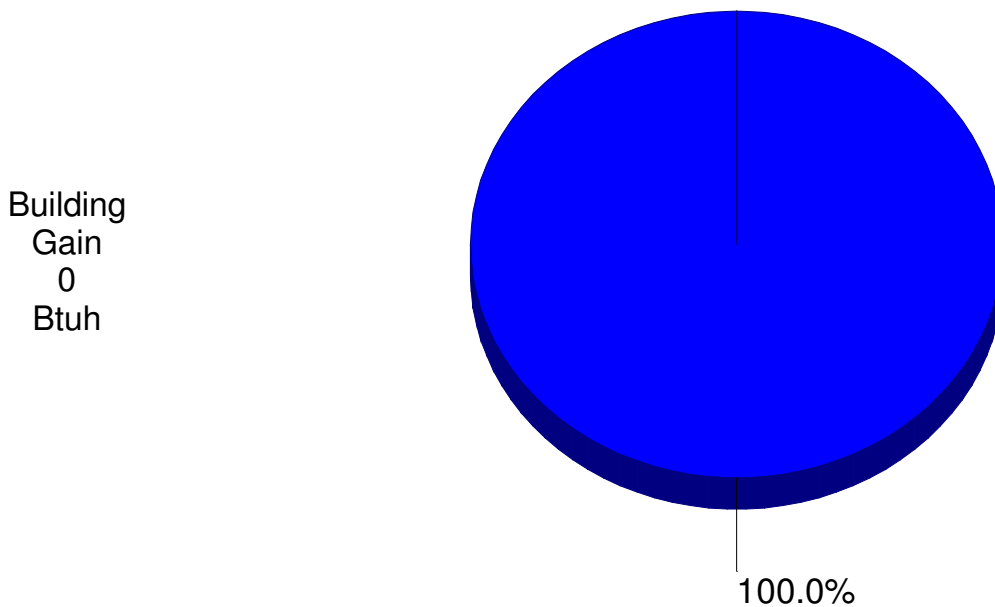
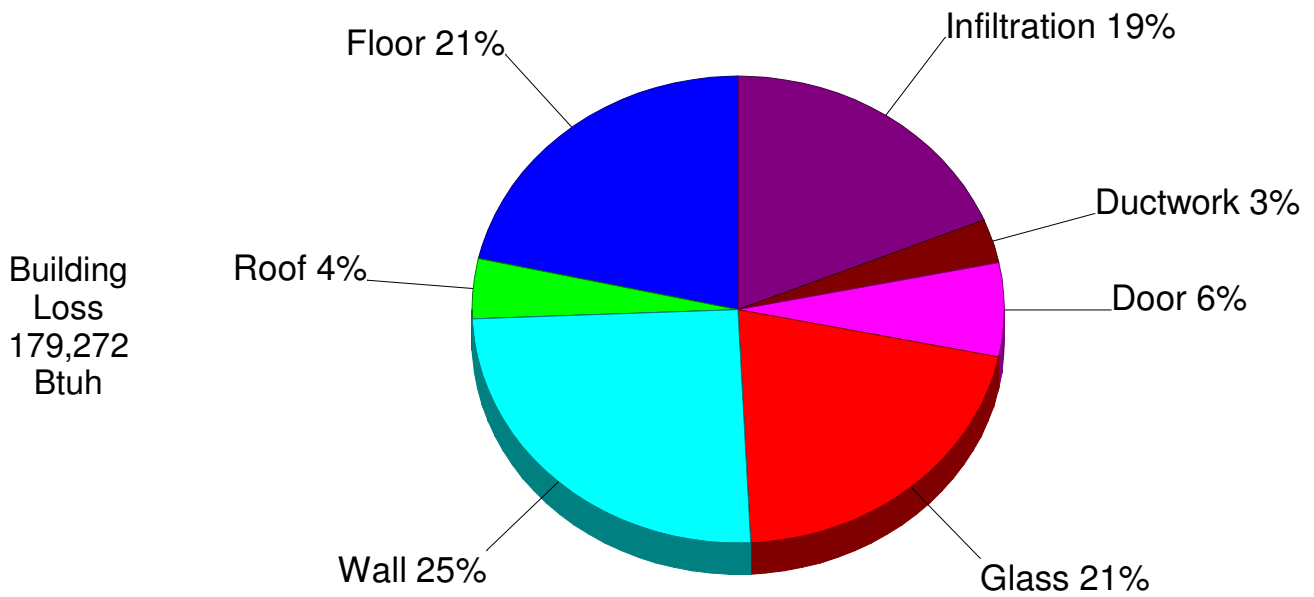
Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.

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.

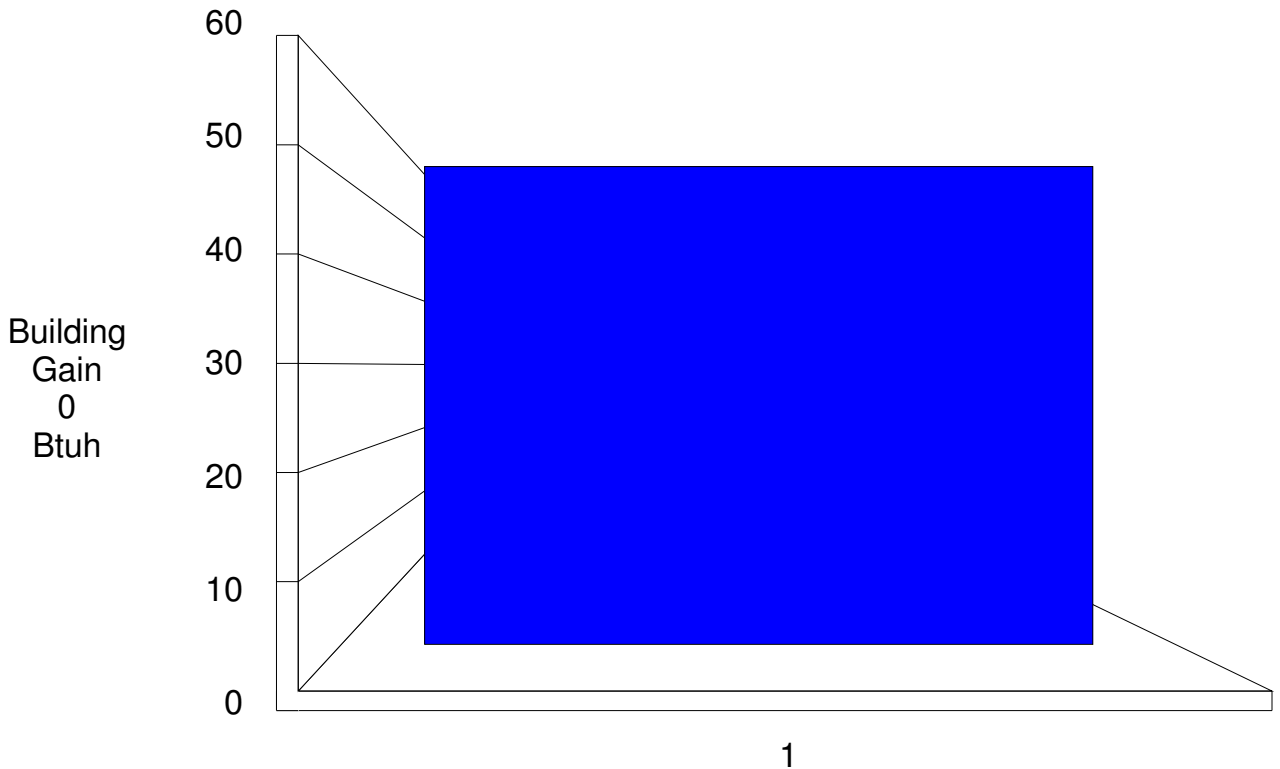
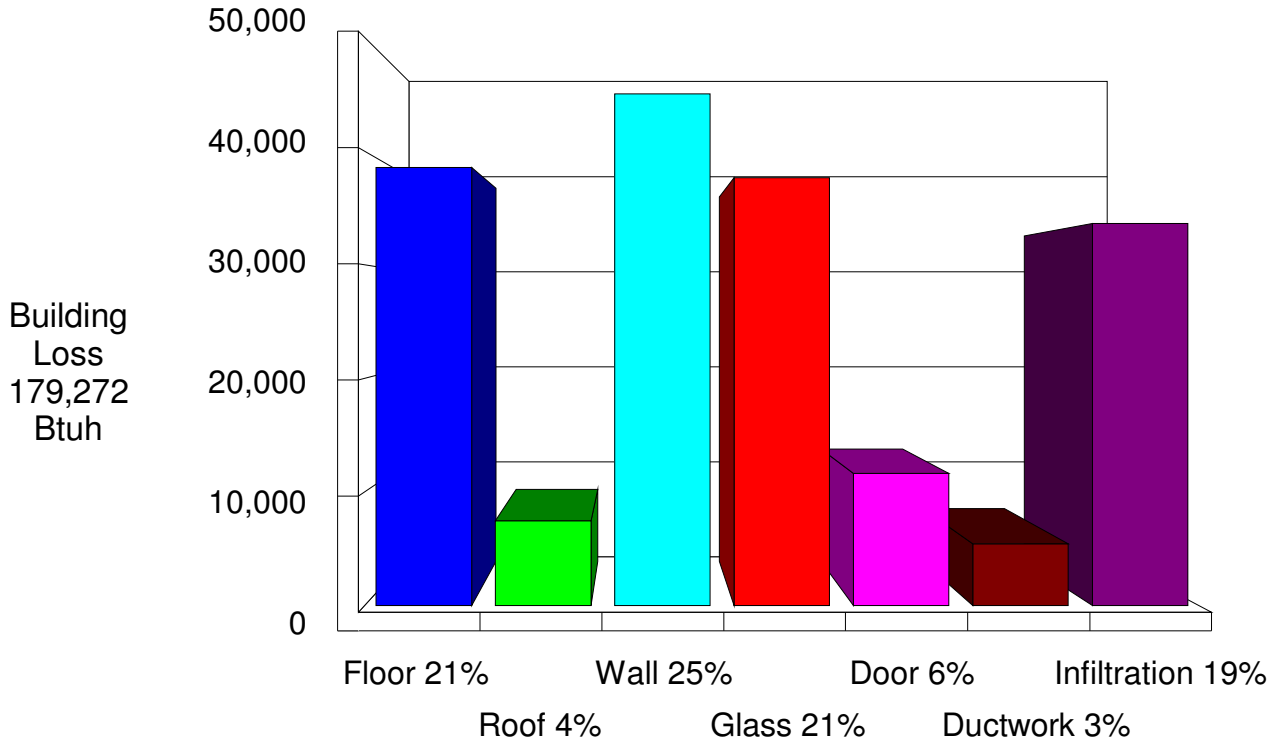


Building Pie Chart





Building Bar Graph





System 1 System 1 Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	489.5	12,594	0	0	0
Case Door: Door-Case Door	120.1	3,289	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	3796.9	17,330	0	0	0
14D-28s: Wall-insulated concrete form (ICF), ASTM R-Value R-26 to R-30 foam matrix form filled with site-poured concrete, stucco or siding finish, plus interior finish	1699.5	5,361	0	0	0
12F-0sw: Wall-Frame, R-21 insulation in 2 x 6 stud cavity, no board insulation, siding finish, wood studs	322.2	1,738	0	0	0
Ceiling R60: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Custom, Ceiling R60 Insulation	3361.7	5,023	0	0	0
21B-20-c: Floor-Basement, Concrete slab, any thickness, 2 or more feet below grade, R-3 or higher insulation installed below floor, carpet covering, shortest side of floor slab is 20' wide	1398.6	2,205	0	0	0
22C-10ph: Floor-Slab on grade, Horizontal board insulation extends 4' under slab, any floor cover, R-10 insulation, passive, heavy moist soil	66	6,689	0	0	0
20P-30: Floor-Over open crawl space or garage, Passive, R-30 blanket insulation, any cover	1366.9	3,971	0	0	0
21A-20: Floor-Basement, Concrete slab, any thickness, 2 or more feet below grade, no insulation below floor, any floor cover, shortest side of floor slab is 20' wide	28	63	0	0	0
Subtotals for structure:		58,263	0	0	0
People:	4		0	0	0
Equipment:			0	0	0
Lighting:	0		0	0	0
Ductwork:		5,442	0	0	0
Infiltration: Winter CFM: 255, Summer CFM: 64		16,367	0	0	0
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Exhaust: Winter CFM: 64, Summer CFM: 64					
System 1 System 1 Load Totals:		80,072	0	0	0

Check Figures

Supply CFM:	1,422	CFM Per Square ft.:	0.270 *
Square ft. of Room Area:	5,259	Square ft. Per Ton:	0 **
Volume (ft³) of Cond. Space: (htg.)	56,043		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

System Loads

Total Heating Required Including Ventilation Air: 80,072 Btuh 80.072 MBH

Notes

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System 2 System 2 Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	933.9	24,026	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	1974.6	9,015	0	0	0
14D-28s: Wall-insulated concrete form (ICF), ASTM R-Value R-26 to R-30 foam matrix form filled with site-poured concrete, stucco or siding finish, plus interior finish	1409.1	4,443	0	0	0
Ceiling R60: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Custom, Ceiling R60 Insulation	1629.5	2,435	0	0	0
21B-20-c: Floor-Basement, Concrete slab, any thickness, 2 or more feet below grade, R-3 or higher insulation installed below floor, carpet covering, shortest side of floor slab is 20' wide	1570.1	2,477	0	0	0
22C-10ph: Floor-Slab on grade, Horizontal board insulation extends 4' under slab, any floor cover, R-10 insulation, passive, heavy moist soil	74	7,499	0	0	0
Subtotals for structure:		49,895	0	0	0
People:	3		0	0	0
Equipment:			0	0	0
Lighting:	0			0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 182, Summer CFM: 64		11,685	0	0	0
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Exhaust: Winter CFM: 64, Summer CFM: 64					
System 2 System 2 Load Totals:		61,580	0	0	0

Check Figures

Supply CFM:	1,136	CFM Per Square ft.:	0.343 *
Square ft. of Room Area:	3,312	Square ft. Per Ton:	0 **
Volume (ft³) of Cond. Space: (htg.)	37,723		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

System Loads

Total Heating Required Including Ventilation Air: 61,580 Btuh 61.580 MBH

Notes

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All computed results are estimates as building use and weather may vary.

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



System 3 Garage Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	40	1,030	0	0	0
Case Door: Door-Case Door	48	1,314	0	0	0
Overhead Door: Door-Overhead Door	256	7,012	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	1061.5	4,845	0	0	0
12F-0sw: Wall-Frame, R-21 insulation in 2 x 6 stud cavity, no board insulation, siding finish, wood studs	420.2	2,267	0	0	0
22C-10ph: Floor-Slab on grade, Horizontal board insulation extends 4' under slab, any floor cover, R-10 insulation, passive, heavy moist soil	154	15,607	0	0	0
Subtotals for structure:		32,075	0	0	0
People:	0		0	0	0
Equipment:			0	0	0
Lighting:	0		0	0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 86, Summer CFM: 0		5,545	0	0	0
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
System 3 Garage Load Totals:		37,620	0	0	0

Check Figures

Supply CFM:	694	CFM Per Square ft.:	0.467 *
Square ft. of Room Area:	1,486	Square ft. Per Ton:	0 **
Volume (ft³) of Cond. Space: (htg.)	17,588		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

System Loads

Total Heating Required Including Ventilation Air: 37,620 Btuh 37.620 MBH

Notes

Rhvac is an ACCA approved Manual J and Manual D computer program.

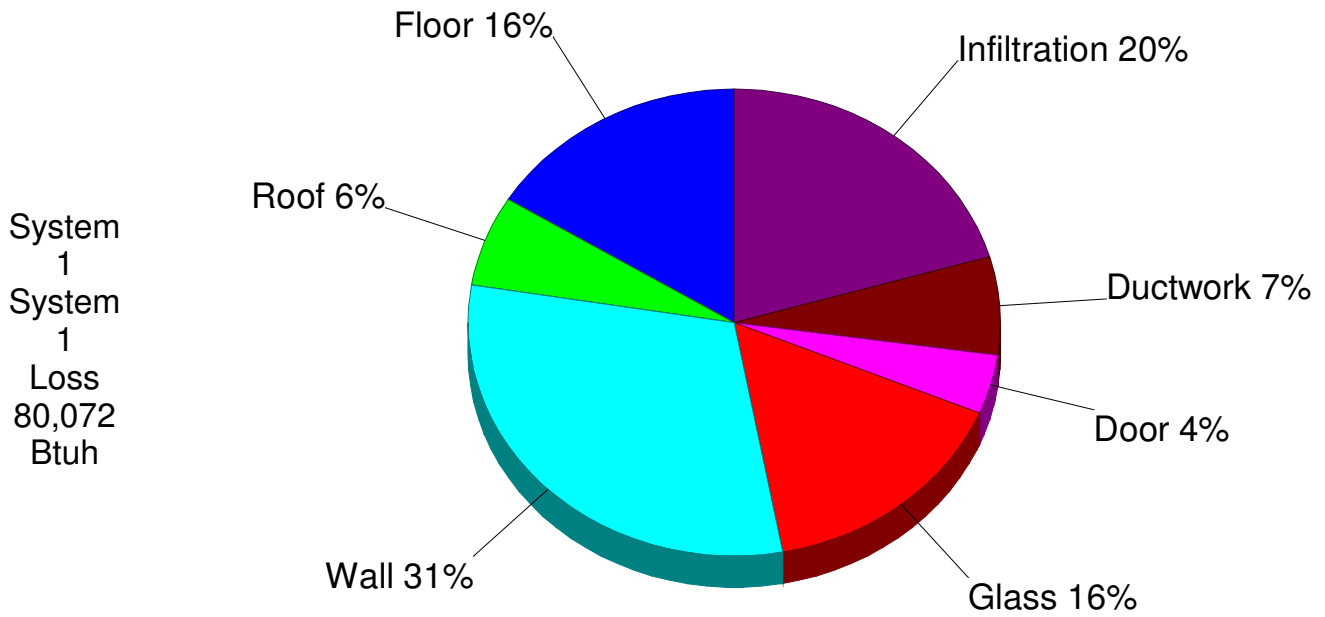
Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.

All computed results are estimates as building use and weather may vary.

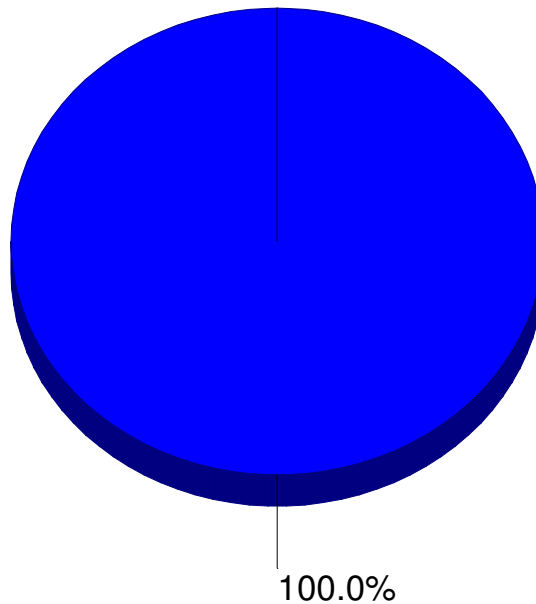
Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.



System 1 System 1 Pie Chart



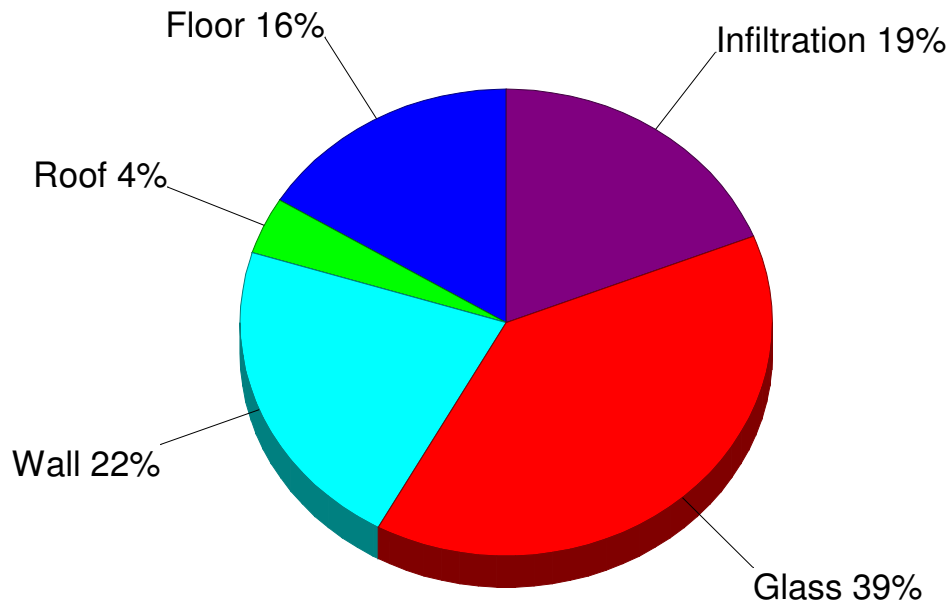
System 1
System 1
Gain
0
Btuh



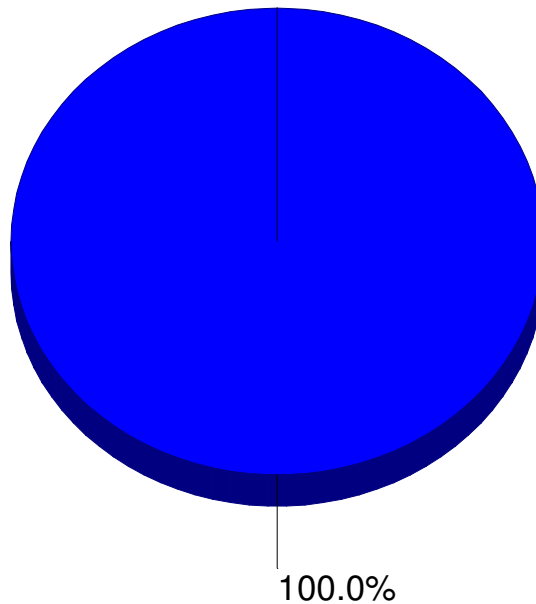


System 2 System 2 Pie Chart

System
2
System
2
Loss
61,580
Btuh

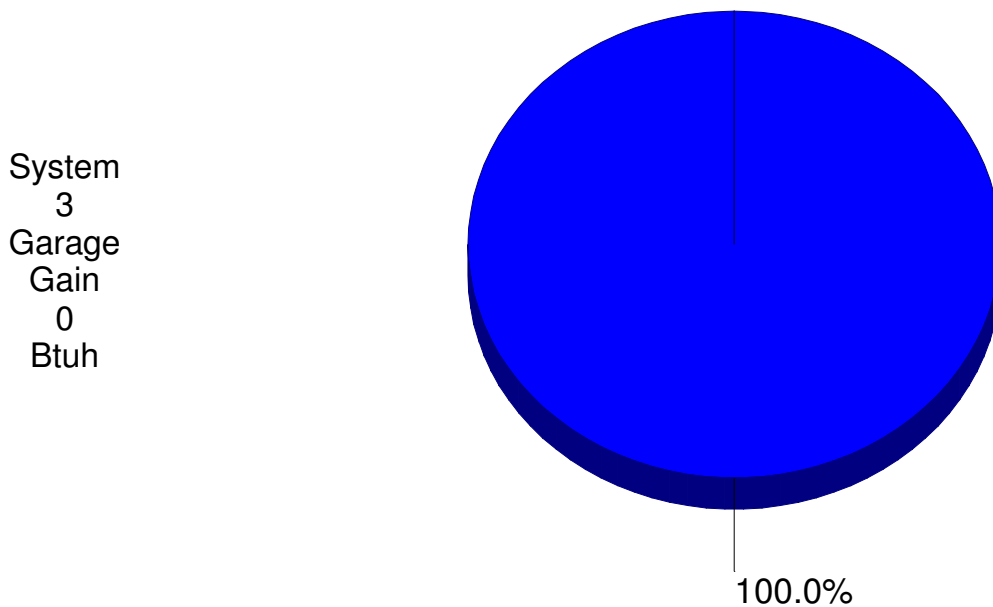
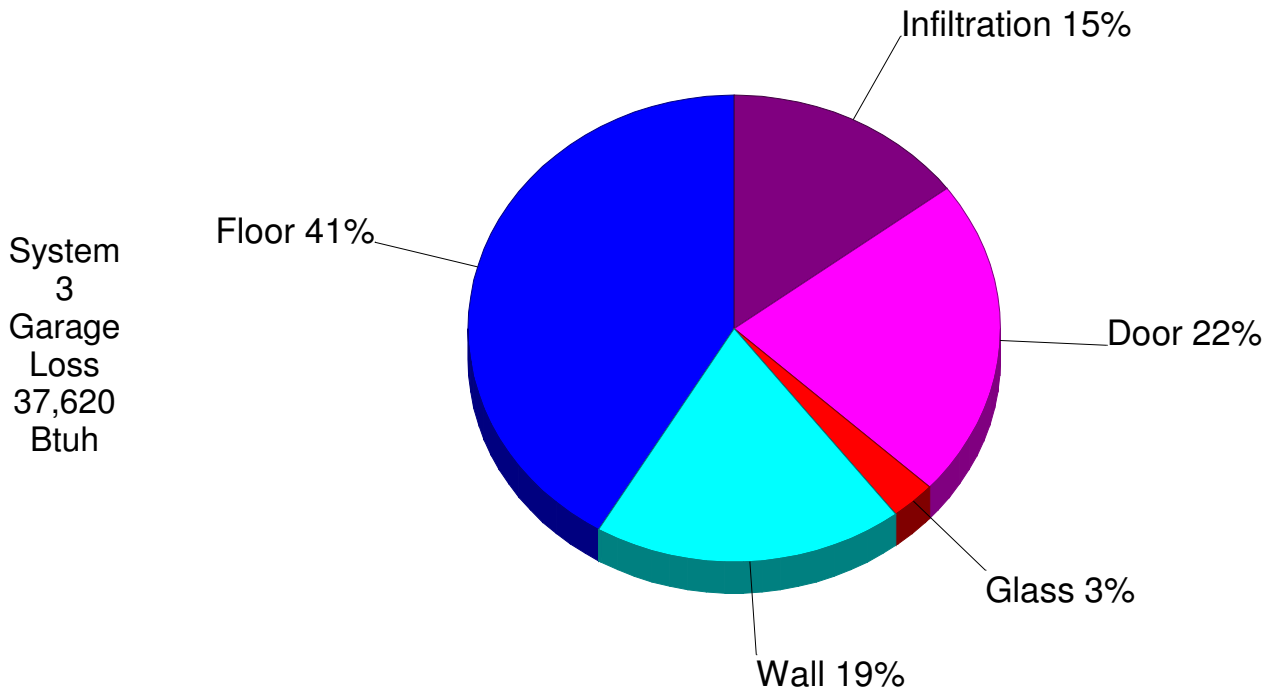


System
2
System
2
Gain
0
Btuh



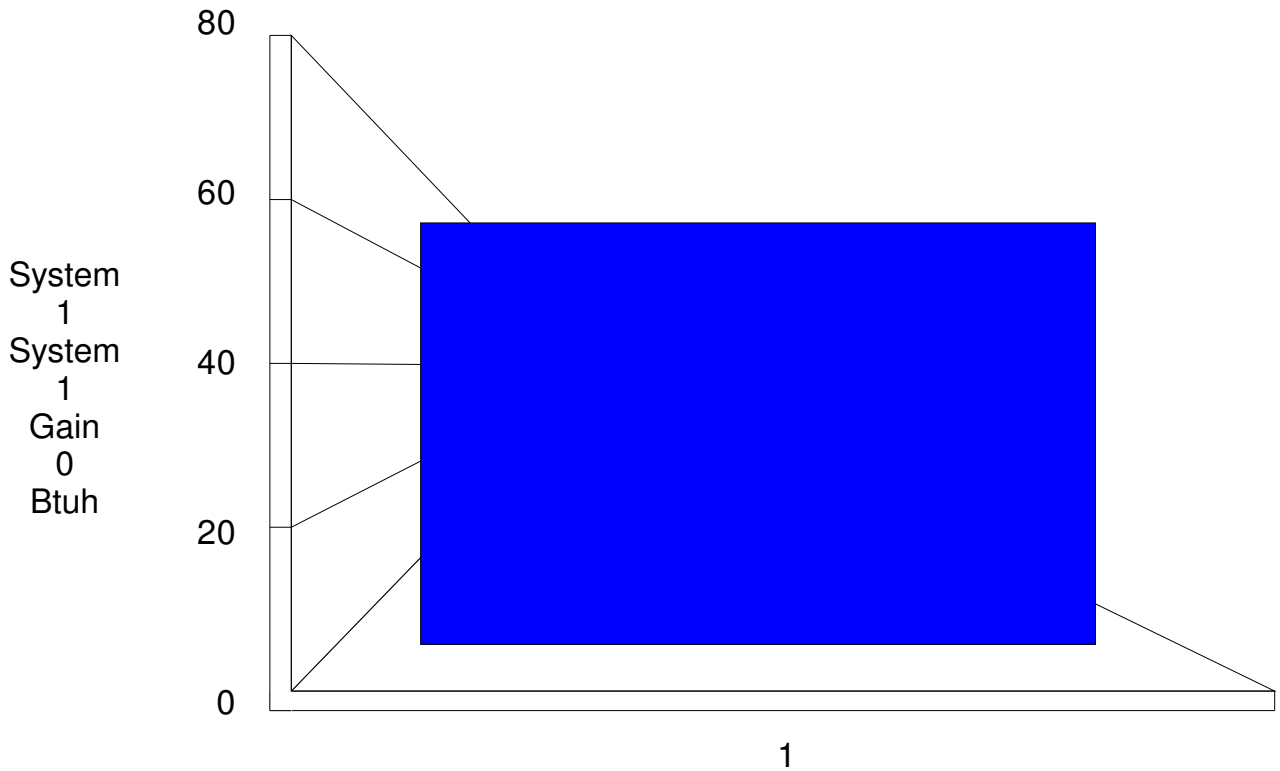
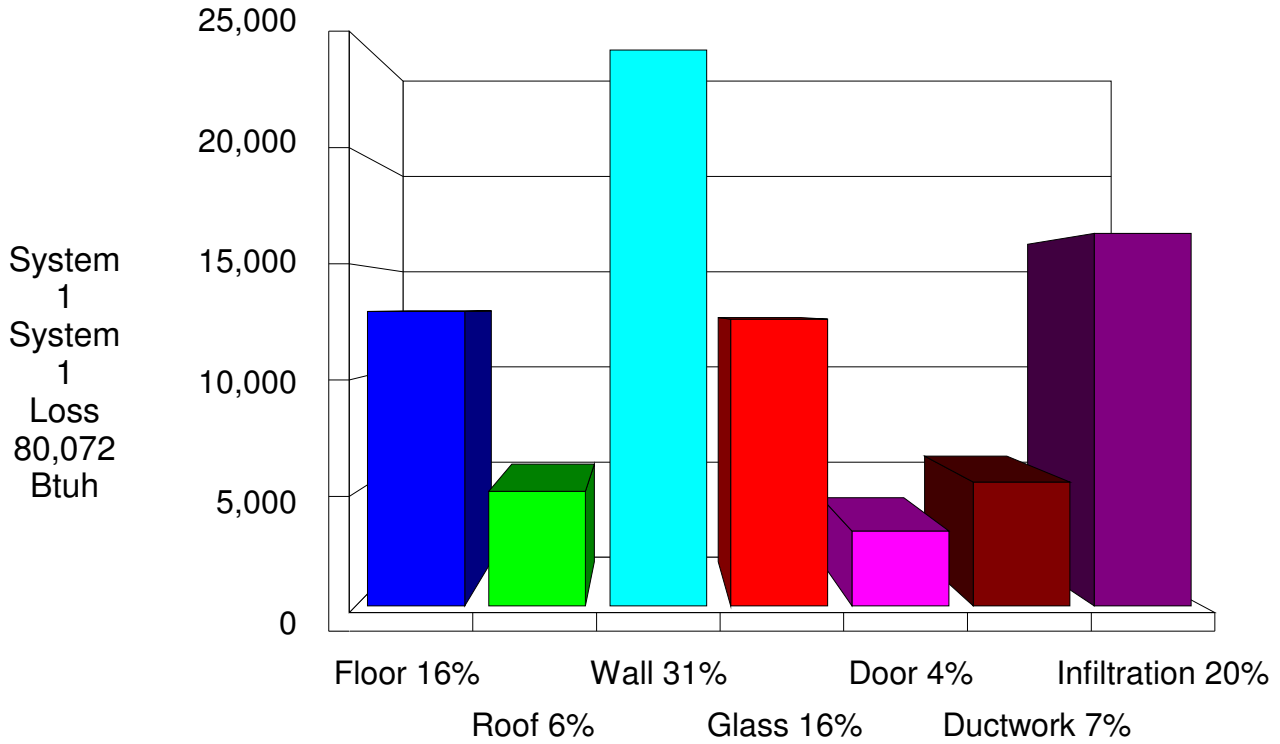


System 3 Garage Pie Chart



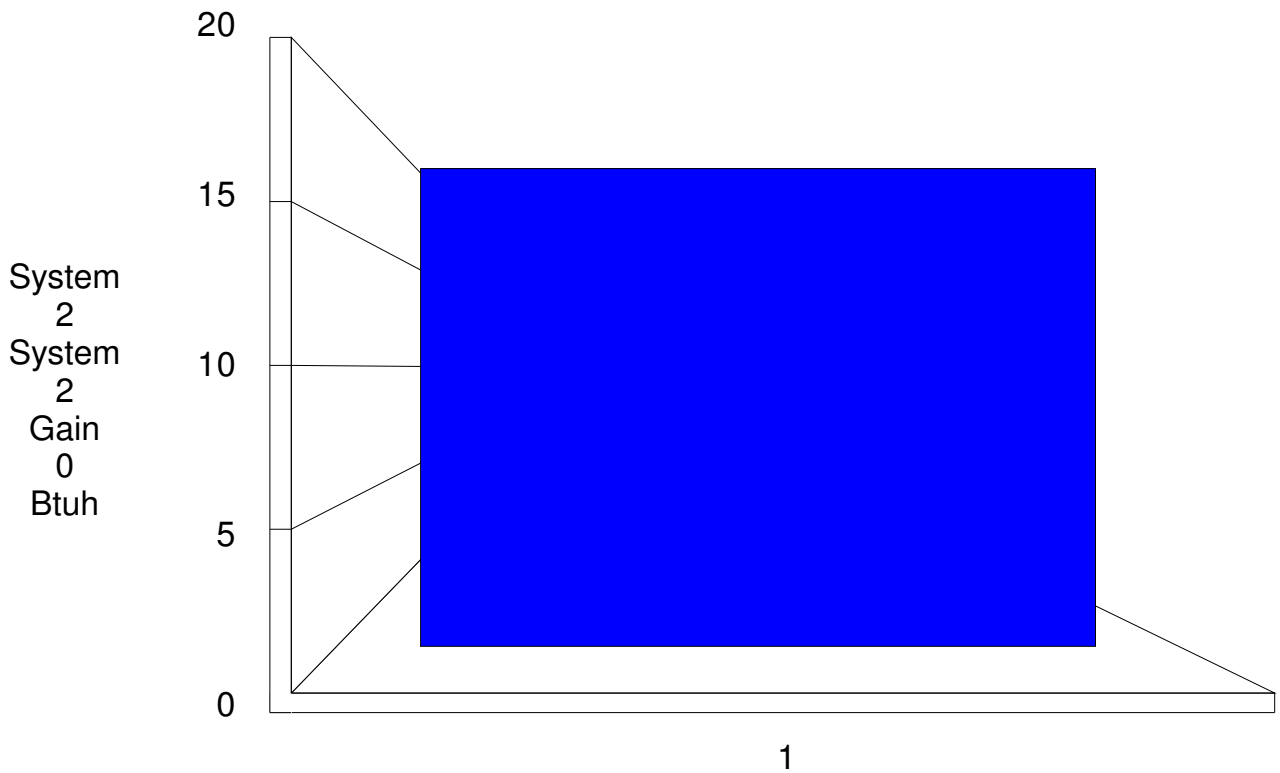
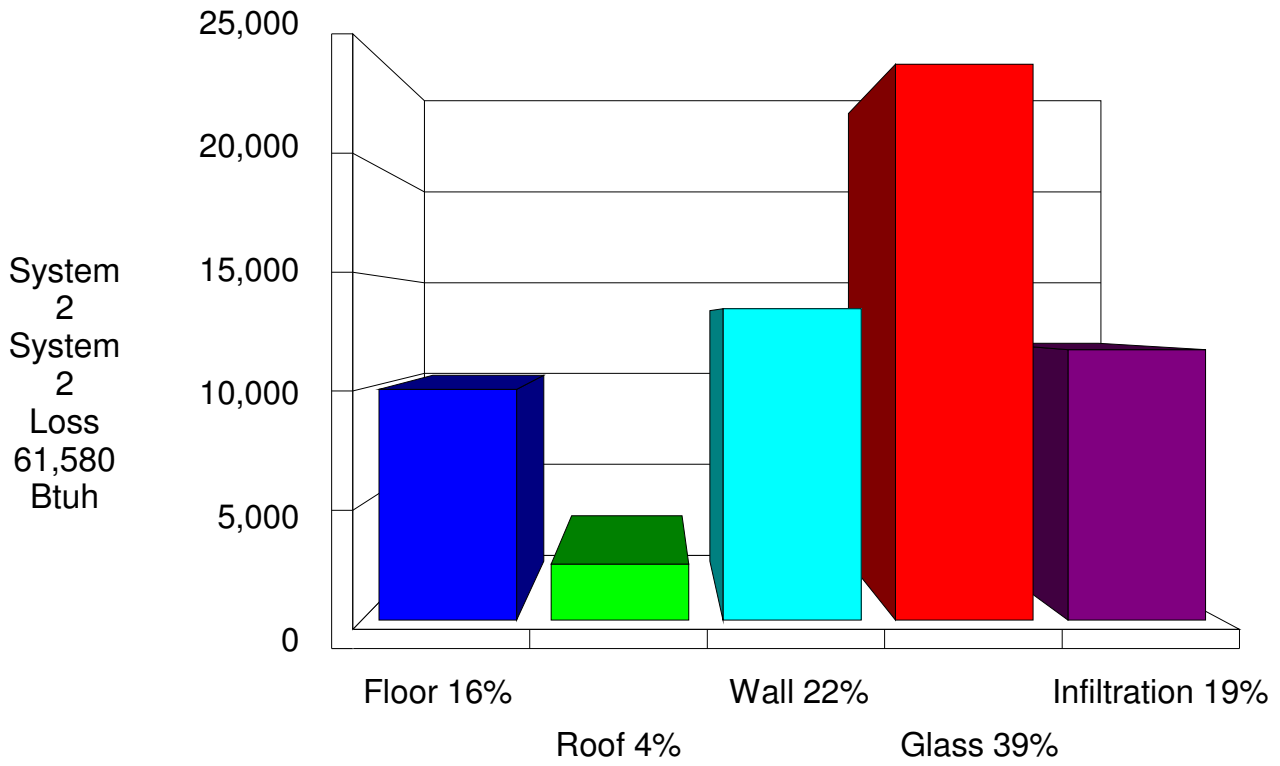


System 1 System 1 Bar Graph



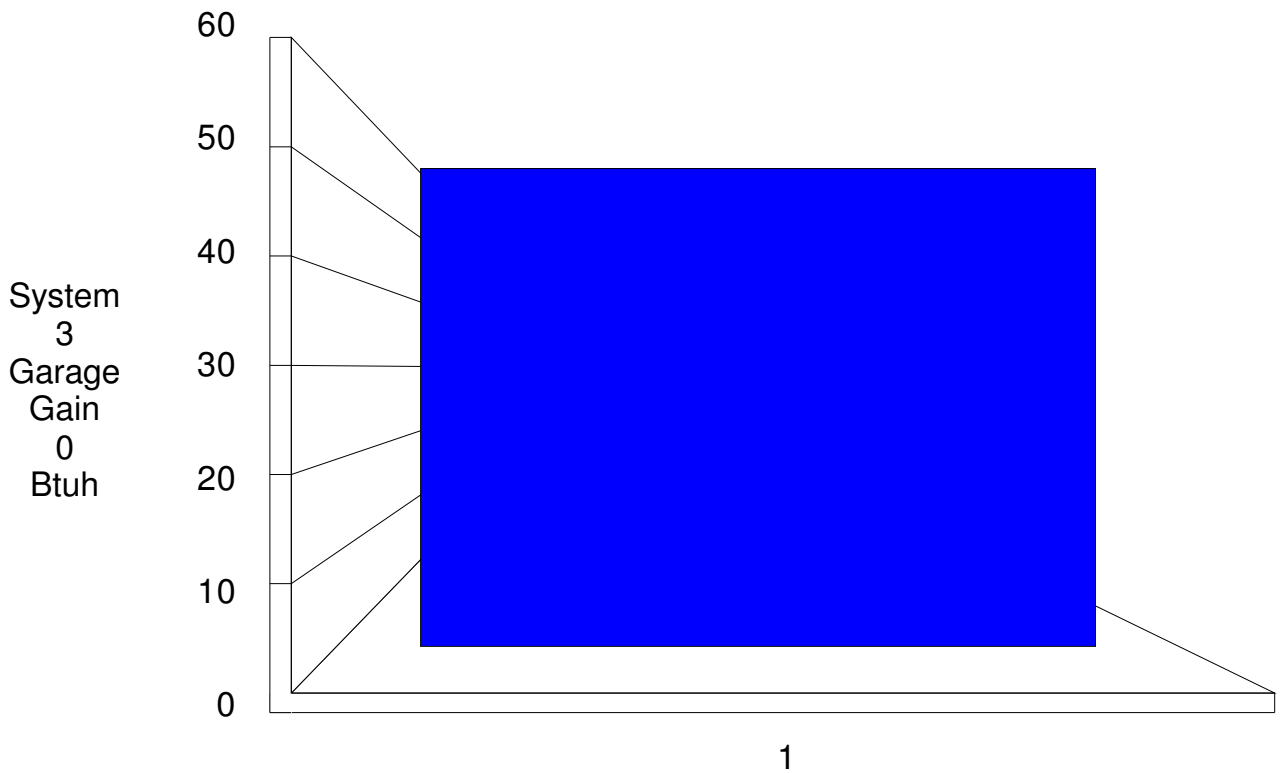
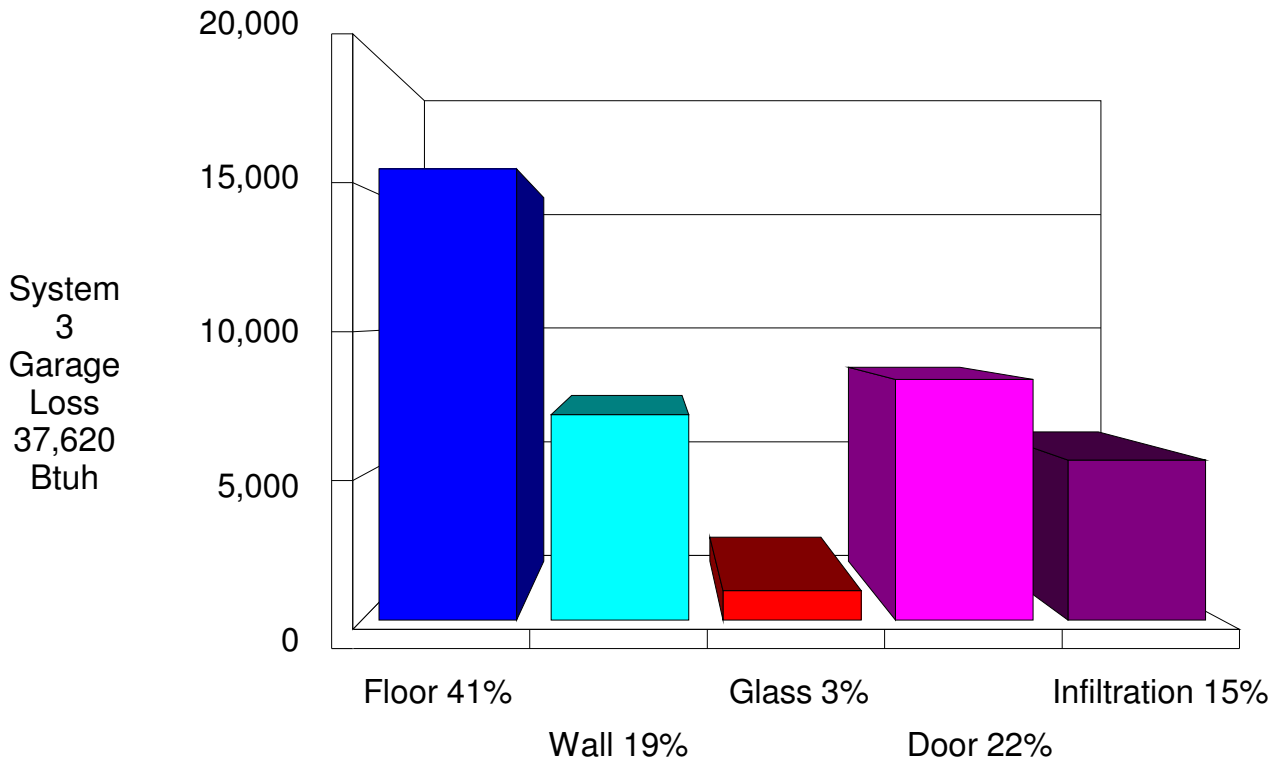


System 2 System 2 Bar Graph





System 3 Garage Bar Graph





Equipment Data - System 1 - System 1

Heating

System Type:	Propane Gas Hot Water Space Heater
Model:	CBWMV-60C-100
Tradename:	(Dave Lennox) Signature
Manufacturer:	LENNOX INDUSTRIES, INC.
Description:	Hydronic Airhandler
Comment:	Paired with Triangle tube 175
Capacity:	100000
Efficiency:	0 AFUE

Heating Equipment Picture





Equipment Data - System 2 - System 2

Heating

System Type:	Propane Gas Hot Water Space Heater
Model:	CBWMV-36B-070
Tradename:	(Dave Lennox) Signature
Manufacturer:	LENNOX INDUSTRIES, INC.
Description:	Hydronic Airhandler
Comment:	Paired with Triangle tube 110
Capacity:	70000
Efficiency:	0 AFUE

Heating Equipment Picture





Equipment Data - System 3 - Garage

Heating

System Type:	Hydronic Unit Heater
Model:	HOT DAWG H2O-HHD45
Tradename:	Modine
Manufacturer:	Modine
Description:	Hydronic Unit heater
Capacity:	106000
Efficiency:	97.5

Heating Equipment Picture





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

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	82	2,109	0	0	0
Case Door: Door-Case Door	21.4	585	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	727.5	3,321	0	0	0
14D-28s: Wall-insulated concrete form (ICF), ASTM R-Value R-26 to R-30 foam matrix form filled with site-poured concrete, stucco or siding finish, plus interior finish	1699.5	5,361	0	0	0
12F-0sw: Wall-Frame, R-21 insulation in 2 x 6 stud cavity, no board insulation, siding finish, wood studs	322.2	1,738	0	0	0
21B-20-c: Floor-Basement, Concrete slab, any thickness, 2 or more feet below grade, R-3 or higher insulation installed below floor, carpet covering, shortest side of floor slab is 20' wide	1398.6	2,205	0	0	0
22C-10ph: Floor-Slab on grade, Horizontal board insulation extends 4' under slab, any floor cover, R-10 insulation, passive, heavy moist soil	66	6,689	0	0	0
Subtotals for structure:		22,008	0	0	0
People:	1		0	0	0
Equipment:			0	0	0
Lighting:	0			0	0
Ductwork:		955	0	0	0
Infiltration: Winter CFM: 113, Summer CFM: 0		7,263	0	0	0
System 1, Zone 1 Load Totals:		30,226	0	0	0

Check Figures

Supply CFM:	558	CFM Per Square ft.:	0.294 *
Square ft. of Room Area:	1,897	Square ft. Per Ton:	0 **
Volume (ft³) of Cond. Space: (htg.)	22,447		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

Zone Loads

Total Heating Required: 30,226 Btuh 30.226 MBH

Notes

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System 1, Zone 2 Summary Loads (Peak Load Procedure for Rooms)

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	245	6,305	0	0	0
Case Door: Door-Case Door	49.4	1,352	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	1488.2	6,792	0	0	0
Ceiling R60: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Custom, Ceiling R60 Insulation	1678.5	2,509	0	0	0
20P-30: Floor-Over open crawl space or garage, Passive, R-30 blanket insulation, any cover	194.8	566	0	0	0
Subtotals for structure:		17,524	0	0	0
People:	0		0	0	0
Equipment:			0	0	0
Lighting:	0		0	0	0
Ductwork:		720	0	0	0
Infiltration: Winter CFM: 71, Summer CFM: 0		4,538	0	0	0
System 1, Zone 2 Load Totals:		22,782	0	0	0

Check Figures

Supply CFM:	420	CFM Per Square ft.:	0.250 *
Square ft. of Room Area:	1,678	Square ft. Per Ton:	0 **
Volume (ft³) of Cond. Space: (htg.)	18,683		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

Zone Loads

Total Heating Required: 22,782 Btuh 22.782 MBH

Notes

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System 1, Zone 3 Summary Loads (Peak Load Procedure for Rooms)

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	58.5	1,505	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	425.1	1,940	0	0	0
Ceiling R60: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Custom, Ceiling R60 Insulation	511.2	763	0	0	0
21A-20: Floor-Basement, Concrete slab, any thickness, 2 or more feet below grade, no insulation below floor, any floor cover, shortest side of floor slab is 20' wide	28	63	0	0	0
Subtotals for structure:		4,271	0	0	0
People:	1		0	0	0
Equipment:			0	0	0
Lighting:	0		0	0	0
Ductwork:		180	0	0	0
Infiltration: Winter CFM: 19, Summer CFM: 0		1,232	0	0	0
System 1, Zone 3 Load Totals:		5,683	0	0	0

Check Figures

Supply CFM:	105	CFM Per Square ft.:	0.205 *
Square ft. of Room Area:	511	Square ft. Per Ton:	0 **
Volume (ft³) of Cond. Space: (htg.)	5,389		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

Zone Loads

Total Heating Required: 5,683 Btuh 5.683 MBH

Notes

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System 1, Zone 4 Summary Loads (Peak Load Procedure for Rooms)

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	104	2,675	0	0	0
Case Door: Door-Case Door	49.3	1,352	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	1156.2	5,277	0	0	0
Ceiling R60: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Custom, Ceiling R60 Insulation	1172	1,751	0	0	0
20P-30: Floor-Over open crawl space or garage, Passive, R-30 blanket insulation, any cover	1172	3,405	0	0	0
Subtotals for structure:		14,460	0	0	0
People:	2		0	0	0
Equipment:			0	0	0
Lighting:	0		0	0	0
Ductwork:		580	0	0	0
Infiltration: Winter CFM: 52, Summer CFM: 0		3,334	0	0	0
System 1, Zone 4 Load Totals:		18,374	0	0	0

Check Figures

Supply CFM:	339	CFM Per Square ft.:	0.289 *
Square ft. of Room Area:	1,172	Square ft. Per Ton:	0 **
Volume (ft³) of Cond. Space: (htg.)	9,524		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

Zone Loads

Total Heating Required: 18,374 Btuh 18.374 MBH

Notes

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System 2, Zone 1 Summary Loads (Peak Load Procedure for Rooms)

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	442	11,371	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	537.9	2,456	0	0	0
Ceiling R60: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Custom, Ceiling R60 Insulation	838.7	1,253	0	0	0
Subtotals for structure:		15,080	0	0	0
People:	1		0	0	0
Equipment:			0	0	0
Lighting:	0			0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 41, Summer CFM: 0		2,652	0	0	0
System 2, Zone 1 Load Totals:		17,732	0	0	0

Check Figures

Supply CFM:	327	CFM Per Square ft.:	0.390 *
Square ft. of Room Area:	839	Square ft. Per Ton:	0 **
Volume (ft ³) of Cond. Space: (htg.)	9,718		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

Zone Loads

Total Heating Required:	17,732 Btuh	17.732 MBH
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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.



System 2, Zone 2 Summary Loads (Peak Load Procedure for Rooms)

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	188.6	4,853	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	855.6	3,906	0	0	0
Ceiling R60: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Custom, Ceiling R60 Insulation	790.8	1,182	0	0	0
Subtotals for structure:		9,941	0	0	0
People:	1		0	0	0
Equipment:			0	0	0
Lighting:	0			0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 44, Summer CFM: 0		2,826	0	0	0
System 2, Zone 2 Load Totals:		12,767	0	0	0

Check Figures

Supply CFM:	236	CFM Per Square ft.:	0.298 *
Square ft. of Room Area:	791	Square ft. Per Ton:	0 **
Volume (ft ³) of Cond. Space: (htg.)	8,094		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

Zone Loads

Total Heating Required:	12,767 Btuh	12.767 MBH
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Notes

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All computed results are estimates as building use and weather may vary.

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



System 2, Zone 3 Summary Loads (Peak Load Procedure for Rooms)

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	59.3	1,526	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	226.1	1,032	0	0	0
14D-28s: Wall-insulated concrete form (ICF), ASTM R-Value R-26 to R-30 foam matrix form filled with site-poured concrete, stucco or siding finish, plus interior finish	476.6	1,503	0	0	0
21B-20-c: Floor-Basement, Concrete slab, any thickness, 2 or more feet below grade, R-3 or higher insulation installed below floor, carpet covering, shortest side of floor slab is 20' wide	373.3	589	0	0	0
22C-10ph: Floor-Slab on grade, Horizontal board insulation extends 4' under slab, any floor cover, R-10 insulation, passive, heavy moist soil	24	2,432	0	0	0
Subtotals for structure:		7,082	0	0	0
People:	1		0	0	0
Equipment:			0	0	0
Lighting:	0			0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 32, Summer CFM: 0		2,062	0	0	0
System 2, Zone 3 Load Totals:		9,144	0	0	0

Check Figures

Supply CFM:	169	CFM Per Square ft.:	0.408 *
Square ft. of Room Area:	413	Square ft. Per Ton:	0 **
Volume (ft ³) of Cond. Space: (htg.)	4,891		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

Zone Loads

Total Heating Required: 9,144 Btuh 9.144 MBH

Notes

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All computed results are estimates as building use and weather may vary.

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



System 2, Zone 4 Summary Loads (Peak Load Procedure for Rooms)

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	244	6,276	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	355	1,621	0	0	0
14D-28s: Wall-insulated concrete form (ICF), ASTM R-Value R-26 to R-30 foam matrix form filled with site-poured concrete, stucco or siding finish, plus interior finish	932.4	2,940	0	0	0
21B-20-c: Floor-Basement, Concrete slab, any thickness, 2 or more feet below grade, R-3 or higher insulation installed below floor, carpet covering, shortest side of floor slab is 20' wide	1196.8	1,888	0	0	0
22C-10ph: Floor-Slab on grade, Horizontal board insulation extends 4' under slab, any floor cover, R-10 insulation, passive, heavy moist soil	50	5,067	0	0	0
Subtotals for structure:		17,792	0	0	0
People:	0		0	0	0
Equipment:			0	0	0
Lighting:	0			0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 64, Summer CFM: 0		4,145	0	0	0
System 2, Zone 4 Load Totals:		21,937	0	0	0

Check Figures

Supply CFM:	405	CFM Per Square ft.:	0.319 *
Square ft. of Room Area:	1,269	Square ft. Per Ton:	0 **
Volume (ft ³) of Cond. Space: (htg.)	15,020		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

Zone Loads

Total Heating Required: 21,937 Btuh 21.937 MBH

Notes

Rhvac is an ACCA approved Manual J and Manual D computer program. Calculations are performed per ACCA Manual J 8th Edition, Version 2, 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.



System 3, Zone 1 Summary Loads (Average Load Procedure for Rooms)

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
K&M Fixed/Oper: Glazing-Window Fixed/Operable, u-value 0.31, SHGC 0.31	40	1,030	0	0	0
Case Door: Door-Case Door	48	1,314	0	0	0
Overhead Door: Door-Overhead Door	256	7,012	0	0	0
Exterior-R31: Wall-Frame, Custom, Exterior wall-2x8"-R31 Insulation	1061.5	4,845	0	0	0
12F-0sw: Wall-Frame, R-21 insulation in 2 x 6 stud cavity, no board insulation, siding finish, wood studs	420.2	2,267	0	0	0
22C-10ph: Floor-Slab on grade, Horizontal board insulation extends 4' under slab, any floor cover, R-10 insulation, passive, heavy moist soil	154	15,607	0	0	0
Subtotals for structure:		32,075	0	0	0
People:	0		0	0	0
Equipment:			0	0	0
Lighting:	0		0	0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 86, Summer CFM: 0		5,545	0	0	0
System 3, Zone 1 Load Totals:		37,620	0	0	0

Check Figures

Supply CFM:	694	CFM Per Square ft.:	0.467 *
Square ft. of Room Area:	1,486	Square ft. Per Ton:	0 **
Volume (ft³) of Cond. Space: (htg.)	17,588		

* Based on area of rooms being heated or cooled (whichever governs system) rather than entire floor area.

** Based on area of rooms being cooled.

Zone Loads

Total Heating Required: 37,620 Btuh 37.620 MBH

Notes

Rhvac is an ACCA approved Manual J and Manual D computer program. Calculations are performed per ACCA Manual J 8th Edition, Version 2, 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.



Detailed Room Loads - Room 7 - Theater

General

Room is in zone 1, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	1
Area:	955.4 sq.ft.	Supply Air:	189 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	1.0 AC/hr
Volume:	11,305.9 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	2	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	40 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Exterior-R31 15 X 11.8	141.4	0.055	4.6	646	0.0	0	0
SE-Wall-14D-28s 4.2 X 11.8	49.9	0.038	3.2	157	0.0	0	0
NE-Wall-14D-28s 11.8 X 11.8	139.5	0.038	3.2	440	0.0	0	0
SE-Wall-14D-28s 11.5 X 11.8	136.2	0.038	3.2	429	0.0	0	0
SW-Wall-14D-28s 5.5 X 11.8	65.5	0.038	3.2	207	0.0	0	0
SE-Wall-14D-28s 3 X 11.8	35.5	0.038	3.2	112	0.0	0	0
E -Wall-14D-28s 3.2 X 11.8	37.6	0.038	3.2	119	0.0	0	0
S -Wall-14D-28s 20.6 X 11.8	243.3	0.038	3.2	768	0.0	0	0
W -Wall-14D-28s 6.7 X 11.8	79.1	0.038	3.2	250	0.0	0	0
W -Wall-12F-0sw 4.4 X 11.8	51.6	0.065	5.4	278	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	36	0.310	25.7	926	0.0	0	0
Floor-21B-20 1 X 931.7	931.7	0.019	1.6	1,469	0.0	0	0
Floor-22C-10ph 15 ft..Per.	15	1.221	101.3	1,520	0.0	0	0
Subtotals for Structure:				7,321		0	0
Infil.: Win.: 40.2, Sum.: 0.0	1,016		2.546	2,586	0.000	0	0
Ductwork:				323			0
Room Totals:				10,230		0	0



Detailed Room Loads - Room 8 - Storage 1

General

Room is in zone 1, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	1
Area:	108.1 sq.ft.	Supply Air:	16 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	0.8 AC/hr
Volume:	1,278.7 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	5 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
S -Wall-14D-28s 10.1 X 11.8	120	0.038	3.2	378	0.0	0	0
Floor-21B-20 1 X 108.1	108.1	0.019	1.6	170	0.0	0	0
Subtotals for Structure:				548		0	0
Infil.: Win.: 4.8, Sum.: 0.0	120		2.543	305	0.000	0	0
Ductwork:				28			0
Room Totals:				881		0	0



Detailed Room Loads - Room 9 - S4 Bath

General

Room is in zone 1, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	1
Area:	93.3 sq.ft.	Supply Air:	41 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	2.2 AC/hr
Volume:	1,104.5 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	4 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Exterior-R31 8.4 X 11.8	77.7	0.055	4.6	355	0.0	0	0
N -Door-Case Door 2.7 X 8	21.4	0.330	27.4	585	0.0	0	0
Floor-21B-20 1 X 80.4	80.4	0.019	1.6	127	0.0	0	0
Floor-22C-10ph 8 ft..Per.	8	1.221	101.3	811	0.0	0	0
Subtotals for Structure:				1,878		0	0
Infil.: Win.: 3.9, Sum.: 0.0	99		2.545	252	0.000	0	0
Ductwork:				69			0
Room Totals:				2,199		0	0



Detailed Room Loads - Room 10 - Suite 4

General

Room is in zone 1, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	1
Area:	275.2 sq.ft.	Supply Air:	99 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	1.8 AC/hr
Volume:	3,256.8 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	11 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Exterior-R31 15.9 X 11.8	151.9	0.055	4.6	693	0.0	0	0
E -Wall-Exterior-R31 6.6 X 11.8	77.6	0.055	4.6	354	0.0	0	0
S -Wall-12F-0sw 1.3 X 11.8	15.3	0.065	5.4	82	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	36	0.310	25.7	926	0.0	0	0
Floor-22C-10ph 24 ft..Per.	24	1.221	101.3	2,432	0.0	0	0
Subtotals for Structure:				4,487		0	0
Infil.: Win.: 11.1, Sum.: 0.0	281		2.547	715	0.000	0	0
Ductwork:				170			0
Room Totals:				5,372		0	0



Detailed Room Loads - Room 11 - Mech 2

General

Room is in zone 1, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	1
Area:	204.6 sq.ft.	Supply Air:	115 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	2.8 AC/hr
Volume:	2,420.8 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	19 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Exterior-R31 11.7 X 11.8	128.4	0.055	4.6	586	0.0	0	0
S -Wall-12F-0sw 11.6 X 11.8	136.9	0.065	5.4	738	0.0	0	0
W -Wall-12F-0sw 10 X 11.8	118.5	0.065	5.4	640	0.0	0	0
W -Wall-Exterior-R31 7.6 X 11.8	89.9	0.055	4.6	410	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	10	0.310	25.7	257	0.0	0	0
Floor-21B-20 1 X 151.8	151.8	0.019	1.6	239	0.0	0	0
Floor-22C-10ph 19 ft..Per.	19	1.221	101.3	1,926	0.0	0	0
Subtotals for Structure:				4,796		0	0
Infil.: Win.: 19.2, Sum.: 0.0	484		2.547	1,232	0.000	0	0
Ductwork:				197			0
Room Totals:				6,225		0	0



Detailed Room Loads - Room 12 - Vault

General

Room is in zone 1, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	1
Area:	126.7 sq.ft.	Supply Air:	36 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	1.4 AC/hr
Volume:	1,499.0 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	12 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
E -Wall-14D-28s 1.8 X 11.8	20.9	0.038	3.2	66	0.0	0	0
S -Wall-14D-28s 10.6 X 11.8	125.2	0.038	3.2	395	0.0	0	0
W -Wall-14D-28s 12.5 X 11.8	147.8	0.038	3.2	466	0.0	0	0
Floor-21B-20 1 X 126.7	126.7	0.019	1.6	200	0.0	0	0
Subtotals for Structure:				1,127		0	0
Infil.: Win.: 11.6, Sum.: 0.0	294		2.545	748	0.000	0	0
Ductwork:				61			0
Room Totals:				1,936		0	0



Detailed Room Loads - Room 15 - Stair Well

General

Room is in zone 1, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	1
Area:	133.6 sq.ft.	Supply Air:	62 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	2.4 AC/hr
Volume:	1,581.4 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	22 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14D-28s 9.2 X 11.8	109.2	0.038	3.2	344	0.0	0	0
E -Wall-14D-28s 14.4 X 11.8	170.5	0.038	3.2	538	0.0	0	0
S -Wall-14D-28s 4.2 X 11.8	50.3	0.038	3.2	159	0.0	0	0
S -Wall-Exterior-R31 5.1 X 11.8	60.6	0.055	4.6	277	0.0	0	0
W -Wall-14D-28s 14.3 X 11.8	169.1	0.038	3.2	533	0.0	0	0
Subtotals for Structure:				1,851		0	0
Infil.: Win.: 22.2, Sum.: 0.0	560		2.547	1,425	0.000	0	0
Ductwork:				107			0
Room Totals:				3,383		0	0



Detailed Room Loads - Room 21 - Sitting

General

Room is in zone 2, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	2
Area:	338.5 sq.ft.	Supply Air:	97 CFM
Ceiling Height:	10.0 ft.	Supply Air Changes:	1.7 AC/hr
Volume:	3,384.5 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	16 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-Exterior-R31 11.3 X 10	112.9	0.055	4.6	515	0.0	0	0
S -Wall-Exterior-R31 11.8 X 10	88	0.055	4.6	401	0.0	0	0
E -Wall-Exterior-R31 6.4 X 10	63.6	0.055	4.6	290	0.0	0	0
S -Wall-Exterior-R31 10 X 10	71.9	0.055	4.6	328	0.0	0	0
S -Gls-K&M Fixed/Oper shgc-0.31 0%S	29.9	0.310	25.7	771	0.0	0	0
S -Gls-K&M Fixed/Oper shgc-0.31 0%S	28	0.310	25.7	720	0.0	0	0
UP-Ceil-Ceiling R60 338.5 X 1	338.5	0.018	1.5	506	0.0	0	0
Floor-20P-30 1 X 194.8	194.8	0.035	2.9	566	0.0	0	0
Subtotals for Structure:				4,097		0	0
Infil.: Win.: 15.6, Sum.: 0.0	394		2.546	1,004	0.000	0	0
Ductwork:				166			0
Room Totals:				5,267		0	0



Detailed Room Loads - Room 22 - Laundry

General

Room is in zone 2, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	2
Area:	171.9 sq.ft.	Supply Air:	32 CFM
Ceiling Height:	10.0 ft.	Supply Air Changes:	1.1 AC/hr
Volume:	1,718.5 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	6 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
E -Wall-Exterior-R31 1.8 X 10	18.2	0.055	4.6	83	0.0	0	0
S -Wall-Exterior-R31 10.7 X 10	86.7	0.055	4.6	396	0.0	0	0
W -Wall-Exterior-R31 1.9 X 10	18.5	0.055	4.6	84	0.0	0	0
S -Gls-K&M Fixed/Oper shgc-0.31 0%S	20	0.310	25.7	515	0.0	0	0
UP-Ceil-Ceiling R60 171.9 X 1	171.9	0.018	1.5	257	0.0	0	0
Subtotals for Structure:				1,335		0	0
Infil.: Win.: 5.7, Sum.: 0.0	143		2.545	365	0.000	0	0
Ductwork:				55			0
Room Totals:				1,755		0	0



Detailed Room Loads - Room 27 - Bath

General

Room is in zone 2, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	2
Area:	61.9 sq.ft.	Supply Air:	19 CFM
Ceiling Height:	10.0 ft.	Supply Air Changes:	1.8 AC/hr
Volume:	619.3 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	2 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Exterior-R31 5.5 X 10	33.7	0.055	4.6	154	0.0	0	0
N -Door-Case Door 2.7 X 8	21.4	0.330	27.4	585	0.0	0	0
UP-Ceil-Ceiling R60 61.9 X 1	61.9	0.018	1.5	93	0.0	0	0
Subtotals for Structure:				832		0	0
Infil.: Win.: 2.2, Sum.: 0.0	55		2.541	140	0.000	0	0
Ductwork:				32			0
Room Totals:				1,004		0	0



Detailed Room Loads - Room 28 - Pantry

General

Room is in zone 2, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	2
Area:	157.2 sq.ft.	Supply Air:	24 CFM
Ceiling Height:	10.0 ft.	Supply Air Changes:	0.9 AC/hr
Volume:	1,572.1 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	4 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
S -Wall-Exterior-R31 10.2 X 10	87.3	0.055	4.6	399	0.0	0	0
S -Gls-K&M Fixed/Oper shgc-0.31 0%S	15	0.310	25.7	386	0.0	0	0
UP-Ceil-Ceiling R60 157.2 X 1	157.2	0.018	1.5	235	0.0	0	0
Subtotals for Structure:				1,020		0	0
Infil.: Win.: 4.1, Sum.: 0.0	102		2.542	260	0.000	0	0
Ductwork:				42			0
Room Totals:				1,322		0	0



Detailed Room Loads - Room 29 - Kitchen/Dining

General

Room is in zone 2, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	2
Area:	949.0 sq.ft.	Supply Air:	248 CFM
Ceiling Height:	12.0 ft.	Supply Air Changes:	1.3 AC/hr
Volume:	11,388.4 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	3	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	43 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-Exterior-R31 6.8 X 12	82.1	0.055	4.6	375	0.0	0	0
N -Wall-Exterior-R31 17.9 X 12	148.6	0.055	4.6	678	0.0	0	0
NW-Wall-Exterior-R31 3.3 X 12	39.5	0.055	4.6	180	0.0	0	0
SE-Wall-Exterior-R31 7.5 X 12	31.4	0.055	4.6	143	0.0	0	0
NE-Wall-Exterior-R31 11.6 X 12	139	0.055	4.6	634	0.0	0	0
SE-Wall-Exterior-R31 11.6 X 12	111.4	0.055	4.6	509	0.0	0	0
SW-Wall-Exterior-R31 5.4 X 12	64.6	0.055	4.6	295	0.0	0	0
SE-Wall-Exterior-R31 2.9 X 12	35	0.055	4.6	160	0.0	0	0
E -Wall-Exterior-R31 3.1 X 12	37.1	0.055	4.6	169	0.0	0	0
S -Wall-Exterior-R31 20.5 X 12	218.8	0.055	4.6	999	0.0	0	0
SE-Door-Case Door 3.5 X 8	28	0.330	27.4	767	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	66	0.310	25.7	1,698	0.0	0	0
SE-Gls-K&M Fixed/Oper shgc-0.31 0%S	9.4	0.310	25.7	241	0.0	0	0
SE-Gls-K&M Fixed/Oper shgc-0.31 0%S	9.4	0.310	25.7	241	0.0	0	0
SE-Gls-K&M Fixed/Oper shgc-0.31 0%S	12.3	0.310	25.7	318	0.0	0	0
SE-Gls-K&M Fixed/Oper shgc-0.31 0%S	28	0.310	25.7	720	0.0	0	0
S -Gls-K&M Fixed/Oper shgc-0.31 0%S	27	0.310	25.7	695	0.0	0	0
UP-Ceil-Ceiling R60 949 X 1	949	0.018	1.5	1,418	0.0	0	0
Subtotals for Structure:				10,240		0	0
Infil.: Win.: 43.1, Sum.: 0.0	1,087		2.546	2,769	0.000	0	0
Ductwork:				424			0
Room Totals:				13,433		0	0



Detailed Room Loads - Room 23 - S2 Wic

General

Room is in zone 3, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	3
Area:	69.6 sq.ft.	Supply Air:	3 CFM
Ceiling Height:	10.0 ft.	Supply Air Changes:	0.3 AC/hr
Volume:	696.1 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	0 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
UP-Ceiling R60 69.6 X 1	69.6	0.018	1.5	104	0.0	0	0
Floor-21A-20 1 X 28	28	0.027	2.2	63	0.0	0	0
Subtotals for Structure:				167		0	0
Infil.: Win.: 0.0, Sum.: 0.0	0		0	0	0	0	0
Ductwork:				5			0
Room Totals:				172		0	0



Detailed Room Loads - Room 24 - S2 Bath

General

Room is in zone 3, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	3
Area:	131.3 sq.ft.	Supply Air:	26 CFM
Ceiling Height:	10.0 ft.	Supply Air Changes:	1.2 AC/hr
Volume:	1,312.7 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	5 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-Exterior-R31 5.3 X 10	53.1	0.055	4.6	242	0.0	0	0
N -Wall-Exterior-R31 6.8 X 10	54.3	0.055	4.6	248	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	13.5	0.310	25.7	347	0.0	0	0
UP-Ceil-Ceiling R60 131.3 X 1	131.3	0.018	1.5	196	0.0	0	0
Subtotals for Structure:				1,033		0	0
Infil.: Win.: 4.8, Sum.: 0.0	121		2.548	308	0.000	0	0
Ductwork:				44			0
Room Totals:				1,385		0	0



Detailed Room Loads - Room 25 - W/C

General

Room is in zone 3, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	3
Area:	32.9 sq.ft.	Supply Air:	20 CFM
Ceiling Height:	10.0 ft.	Supply Air Changes:	3.7 AC/hr
Volume:	328.9 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	5 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Exterior-R31 4.9 X 10	48.9	0.055	4.6	223	0.0	0	0
W -Wall-Exterior-R31 6.8 X 10	58.7	0.055	4.6	268	0.0	0	0
W -Gls-K&M Fixed/Oper shgc-0.31 0%S	9	0.310	25.7	232	0.0	0	0
UP-Ceil-Ceiling R60 32.9 X 1	32.9	0.018	1.5	49	0.0	0	0
Subtotals for Structure:				772		0	0
Infil.: Win.: 4.6, Sum.: 0.0	117		2.547	297	0.000	0	0
Ductwork:				35			0
Room Totals:				1,104		0	0



Detailed Room Loads - Room 26 - Suite 2

General

Room is in zone 3, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	3
Area:	277.4 sq.ft.	Supply Air:	56 CFM
Ceiling Height:	11.0 ft.	Supply Air Changes:	1.1 AC/hr
Volume:	3,051.5 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	10 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Exterior-R31 15.9 X 11	138.7	0.055	4.6	633	0.0	0	0
E -Wall-Exterior-R31 6.5 X 11	71.4	0.055	4.6	326	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	36	0.310	25.7	926	0.0	0	0
UP-Ceil-Ceiling R60 277.4 X 1	277.4	0.018	1.5	414	0.0	0	0
Subtotals for Structure:				2,299		0	0
Infil.: Win.: 9.7, Sum.: 0.0	246		2.548	627	0.000	0	0
Ductwork:				95			0
Room Totals:				3,021		0	0



Detailed Room Loads - Room 16 - Guest Bath

General

Room is in zone 4, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	4
Area:	128.9 sq.ft.	Supply Air:	42 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	2.5 AC/hr
Volume:	1,030.9 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	7 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-Exterior-R31 8.7 X 8	59.7	0.055	4.6	272	0.0	0	0
N -Wall-Exterior-R31 5.9 X 8	35.1	0.055	4.6	160	0.0	0	0
S -Wall-Exterior-R31 6 X 8	48.2	0.055	4.6	220	0.0	0	0
N -Door-Case Door 2 X 6	12	0.330	27.4	329	0.0	0	0
W -Gls-K&M Fixed/Oper shgc-0.31 0%S	10	0.310	25.7	257	0.0	0	0
UP-Ceil-Ceiling R60 128.9 X 1	128.9	0.018	1.5	193	0.0	0	0
Floor-20P-30 1 X 128.9	128.9	0.035	2.9	374	0.0	0	0
Subtotals for Structure:				1,805		0	0
Infil.: Win.: 6.5, Sum.: 0.0	165		2.545	420	0.000	0	0
Ductwork:				73			0
Room Totals:				2,298		0	0



Detailed Room Loads - Room 17 - Bedroom 2

General

Room is in zone 4, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	4
Area:	192.8 sq.ft.	Supply Air:	58 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	2.3 AC/hr
Volume:	1,542.7 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	8 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-Exterior-R31 12.5 X 8	87.7	0.055	4.6	400	0.0	0	0
S -Wall-Exterior-R31 14.1 X 8	92.9	0.055	4.6	424	0.0	0	0
W -Door-Case Door 2 X 6	12	0.330	27.4	329	0.0	0	0
S -Gls-K&M Fixed/Oper shgc-0.31 0%S	20	0.310	25.7	515	0.0	0	0
UP-Ceil-Ceiling R60 192.8 X 1	192.8	0.018	1.5	288	0.0	0	0
Floor-20P-30 1 X 192.8	192.8	0.035	2.9	560	0.0	0	0
Subtotals for Structure:				2,516		0	0
Infil.: Win.: 8.4, Sum.: 0.0	213		2.545	541	0.000	0	0
Ductwork:				100			0
Room Totals:				3,157		0	0



Detailed Room Loads - Room 18 - Bedroom 1

General

Room is in zone 4, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	4
Area:	194.8 sq.ft.	Supply Air:	55 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	2.1 AC/hr
Volume:	1,558.6 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	9 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
E -Wall-Exterior-R31 11.3 X 8	90.7	0.055	4.6	414	0.0	0	0
S -Wall-Exterior-R31 16.7 X 8	113.5	0.055	4.6	518	0.0	0	0
S -Gls-K&M Fixed/Oper shgc-0.31 0%S	20	0.310	25.7	514	0.0	0	0
UP-Ceil-Ceiling R60 194.8 X 1	194.8	0.018	1.5	291	0.0	0	0
Floor-20P-30 1 X 194.8	194.8	0.035	2.9	566	0.0	0	0
Subtotals for Structure:				2,303		0	0
Infil.: Win.: 8.9, Sum.: 0.0	224		2.547	571	0.000	0	0
Ductwork:				94			0
Room Totals:				2,968		0	0



Detailed Room Loads - Room 19 - Guest Suite

General

Room is in zone 4, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	4
Area:	581.7 sq.ft.	Supply Air:	151 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	1.9 AC/hr
Volume:	4,653.2 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	2	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	22 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-Exterior-R31 10.4 X 8	83	0.055	4.6	379	0.0	0	0
N -Wall-Exterior-R31 30.9 X 8	193	0.055	4.6	881	0.0	0	0
E -Wall-Exterior-R31 11.1 X 8	88.6	0.055	4.6	404	0.0	0	0
N -Wall-Exterior-R31 8.3 X 8	66.4	0.055	4.6	303	0.0	0	0
S -Wall-Exterior-R31 8.4 X 8	53.6	0.055	4.6	245	0.0	0	0
S -Door-Case Door 2 X 6.7	13.3	0.330	27.4	365	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	10	0.310	25.7	257	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	10	0.310	25.7	257	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	20	0.310	25.7	515	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	14	0.310	25.7	360	0.0	0	0
UP-Ceil-Ceiling R60 581.7 X 1	581.7	0.018	1.5	869	0.0	0	0
Floor-20P-30 1 X 581.7	581.7	0.035	2.9	1,690	0.0	0	0
Subtotals for Structure:				6,525		0	0
Infil.: Win.: 21.9, Sum.: 0.0	552		2.546	1,405	0.000	0	0
Ductwork:				259			0
Room Totals:				8,189		0	0



Detailed Room Loads - Room 20 - Wic

General

Room is in zone 4, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	4
Area:	73.8 sq.ft.	Supply Air:	33 CFM
Ceiling Height:	10.0 ft.	Supply Air Changes:	2.6 AC/hr
Volume:	738.4 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	6 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Exterior-R31 8.9 X 10	89.3	0.055	4.6	408	0.0	0	0
W -Wall-Exterior-R31 6.7 X 10	54.5	0.055	4.6	249	0.0	0	0
W -Door-Case Door 2 X 6	12	0.330	27.4	329	0.0	0	0
UP-Ceil-Ceiling R60 73.8 X 1	73.8	0.018	1.5	110	0.0	0	0
Floor-20P-30 1 X 73.8	73.8	0.035	2.9	215	0.0	0	0
Subtotals for Structure:				1,311		0	0
Infil.: Win.: 6.2, Sum.: 0.0	156		2.548	397	0.000	0	0
Ductwork:				56			0
Room Totals:				1,764		0	0



Detailed Room Loads - Room 30 - Great Room

General

Room is in zone 1, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	1
Area:	515.2 sq.ft.	Supply Air:	242 CFM
Ceiling Height:	12.6 ft.	Supply Air Changes:	2.2 AC/hr
Volume:	6,483.2 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	3	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	28 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
NW-Wall-Exterior-R31 22 X 12.6	98.3	0.055	4.6	449	0.0	0	0
NE-Wall-Exterior-R31 2.2 X 12.6	28.1	0.055	4.6	128	0.0	0	0
SE-Wall-Exterior-R31 22 X 12.6	98.3	0.055	4.6	449	0.0	0	0
SW-Wall-Exterior-R31 6.1 X 12.6	76.7	0.055	4.6	350	0.0	0	0
NW-Gls-K&M Fixed/Oper shgc-0.31 0%S	128	0.310	25.7	3,293	0.0	0	0
NW-Gls-K&M Fixed/Oper shgc-0.31 0%S (2)	21	0.310	25.7	540	0.0	0	0
NW-Gls-K&M Fixed/Oper shgc-0.31 0%S	30	0.310	25.7	772	0.0	0	0
SE-Gls-K&M Fixed/Oper shgc-0.31 0%S	10.5	0.310	25.7	270	0.0	0	0
SE-Gls-K&M Fixed/Oper shgc-0.31 0%S	10.5	0.310	25.7	270	0.0	0	0
SE-Gls-K&M Fixed/Oper shgc-0.31 0%S	30	0.310	25.7	772	0.0	0	0
SE-Gls-K&M Fixed/Oper shgc-0.31 0%S	128	0.310	25.7	3,293	0.0	0	0
UP-Ceil-Ceiling R60 515.2 X 1	515.2	0.018	1.5	770	0.0	0	0
Subtotals for Structure:				11,356		0	0
Infil.: Win.: 27.8, Sum.: 0.0	659		2.706	1,784	0.000	0	0
Ductwork:				0			0
Room Totals:				13,140		0	0



Detailed Room Loads - Room 31 - Study

General

Room is in zone 1, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	1
Area:	323.5 sq.ft.	Supply Air:	85 CFM
Ceiling Height:	10.0 ft.	Supply Air Changes:	1.6 AC/hr
Volume:	3,234.7 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	2	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	14 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
NW-Wall-Exterior-R31 14.7 X 10	110.7	0.055	4.6	505	0.0	0	0
NE-Wall-Exterior-R31 1.8 X 10	18.1	0.055	4.6	83	0.0	0	0
SE-Wall-Exterior-R31 15.6 X 10	107.8	0.055	4.6	492	0.0	0	0
NW-Gls-K&M Fixed/Oper shgc-0.31 0%S	36	0.310	25.7	926	0.0	0	0
SE-Gls-K&M Fixed/Oper shgc-0.31 0%S	48	0.310	25.7	1,235	0.0	0	0
UP-Ceil-Ceiling R60 323.5 X 1	323.5	0.018	1.5	483	0.0	0	0
Subtotals for Structure:				3,724		0	0
Infil.: Win.: 13.5, Sum.: 0.0	321		2.707	868	0.000	0	0
Ductwork:				0			0
Room Totals:				4,592		0	0



Detailed Room Loads - Room 32 - Master Bath

General

Room is in zone 2, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	2
Area:	227.4 sq.ft.	Supply Air:	42 CFM
Ceiling Height:	10.0 ft.	Supply Air Changes:	1.1 AC/hr
Volume:	2,274.3 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	2	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	8 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
E -Wall-Exterior-R31 7 X 10	64.8	0.055	4.6	296	0.0	0	0
S -Wall-Exterior-R31 3.1 X 10	31.2	0.055	4.6	142	0.0	0	0
SE-Wall-Exterior-R31 7.8 X 10	53	0.055	4.6	242	0.0	0	0
E -Gls-K&M Fixed/Oper shgc-0.31 0%S	5.6	0.310	25.7	143	0.0	0	0
SE-Gls-K&M Fixed/Oper shgc-0.31 0%S	25	0.310	25.7	643	0.0	0	0
UP-Ceil-Ceiling R60 227.4 X 1	227.4	0.018	1.5	340	0.0	0	0
Subtotals for Structure:				1,806		0	0
Infil.: Win.: 7.6, Sum.: 0.0	180		2.706	486	0.000	0	0
Ductwork:				0			0
Room Totals:				2,292		0	0



Detailed Room Loads - Room 33 - Mstr Wic

General

Room is in zone 2, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	2
Area:	193.1 sq.ft.	Supply Air:	59 CFM
Ceiling Height:	10.0 ft.	Supply Air Changes:	1.8 AC/hr
Volume:	1,931.3 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	15 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-Exterior-R31 7.3 X 10	73.1	0.055	4.6	334	0.0	0	0
E -Wall-Exterior-R31 15.8 X 10	146.8	0.055	4.6	670	0.0	0	0
S -Wall-Exterior-R31 2.7 X 10	26.5	0.055	4.6	121	0.0	0	0
E -Wall-Exterior-R31 9.3 X 10	87.5	0.055	4.6	400	0.0	0	0
E -Gls-K&M Fixed/Oper shgc-0.31 0%S	5.6	0.310	25.7	143	0.0	0	0
E -Gls-K&M Fixed/Oper shgc-0.31 0%S	5.6	0.310	25.7	143	0.0	0	0
E -Gls-K&M Fixed/Oper shgc-0.31 0%S	5.6	0.310	25.7	143	0.0	0	0
UP-Ceil-Ceiling R60 193.1 X 1	193.1	0.018	1.5	289	0.0	0	0
Subtotals for Structure:				2,243		0	0
Infil.: Win.: 14.8, Sum.: 0.0	351		2.707	949	0.000	0	0
Ductwork:				0			0
Room Totals:				3,192		0	0



Detailed Room Loads - Room 34 - Master Bedroom

General

Room is in zone 2, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	2
Area:	370.3 sq.ft.	Supply Air:	134 CFM
Ceiling Height:	10.5 ft.	Supply Air Changes:	2.1 AC/hr
Volume:	3,888.0 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	2	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	22 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-Exterior-R31 26.7 X 10.5	198.6	0.055	4.6	906	0.0	0	0
N -Wall-Exterior-R31 14.7 X 10.5	94.3	0.055	4.6	431	0.0	0	0
E -Wall-Exterior-R31 3.5 X 10.5	37.1	0.055	4.6	169	0.0	0	0
N -Wall-Exterior-R31 1.8 X 10.5	18.6	0.055	4.6	85	0.0	0	0
NW-Wall-Exterior-R31 2.3 X 10.5	24	0.055	4.6	110	0.0	0	0
W -Gls-K&M Fixed/Oper shgc-0.31 0%S	30	0.310	25.7	772	0.0	0	0
W -Gls-K&M Fixed/Oper shgc-0.31 0%S	30	0.310	25.7	772	0.0	0	0
W -Gls-K&M Fixed/Oper shgc-0.31 0%S	21.4	0.310	25.7	550	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	60	0.310	25.7	1,544	0.0	0	0
UP-Ceil-Ceiling R60 370.3 X 1	370.3	0.018	1.5	553	0.0	0	0
Subtotals for Structure:				5,892		0	0
Infil.: Win.: 21.6, Sum.: 0.0	514		2.706	1,391	0.000	0	0
Ductwork:				0			0
Room Totals:				7,283		0	0



Detailed Room Loads - Room 2 - Suite 3

General

Room is in zone 3, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	3
Area:	272.8 sq.ft.	Supply Air:	127 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	2.4 AC/hr
Volume:	3,228.0 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	2	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	18 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-Exterior-R31 18.4 X 11.8	181.4	0.055	4.6	828	0.0	0	0
N -Wall-Exterior-R31 5.3 X 11.8	44.7	0.055	4.6	204	0.0	0	0
N -Wall-14D-28s 9.5 X 11.8	112.6	0.038	3.2	355	0.0	0	0
E -Wall-14D-28s 3.6 X 11.8	42.1	0.038	3.2	133	0.0	0	0
W -Gls-K&M Fixed/Oper shgc-0.31 0%S	18	0.310	25.7	463	0.0	0	0
W -Gls-K&M Fixed/Oper shgc-0.31 0%S	18	0.310	25.7	463	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 0%S	18	0.310	25.7	463	0.0	0	0
Floor-21B-20 1 X 232.8	232.8	0.019	1.6	367	0.0	0	0
Floor-22C-10ph 24 ft..Per.	24	1.221	101.3	2,432	0.0	0	0
Subtotals for Structure:				5,708		0	0
Infil.: Win.: 18.3, Sum.: 0.0	435		2.707	1,177	0.000	0	0
Ductwork:				0			0
Room Totals:				6,885		0	0



Detailed Room Loads - Room 3 - S3 Bath

General

Room is in zone 3, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	3
Area:	85.3 sq.ft.	Supply Air:	28 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	1.7 AC/hr
Volume:	1,009.5 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	9 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14D-28s 9.2 X 11.8	108.4	0.038	3.2	342	0.0	0	0
E -Wall-14D-28s 9.2 X 11.8	103.4	0.038	3.2	326	0.0	0	0
E -Gls-K&M Fixed/Oper shgc-0.31 0%S	5.3	0.310	25.7	137	0.0	0	0
Floor-21B-20 1 X 85.3	85.3	0.019	1.6	135	0.0	0	0
Subtotals for Structure:				940		0	0
Infil.: Win.: 9.1, Sum.: 0.0	217		2.704	587	0.000	0	0
Ductwork:				0			0
Room Totals:				1,527		0	0



Detailed Room Loads - Room 4 - S3 Wic

General

Room is in zone 3, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	3
Area:	55.2 sq.ft.	Supply Air:	14 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	1.2 AC/hr
Volume:	653.7 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	5 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
E -Wall-14D-28s 6.7 X 11.8	78.8	0.038	3.2	248	0.0	0	0
S -Wall-14D-28s 2.7 X 11.8	31.3	0.038	3.2	99	0.0	0	0
Floor-21B-20 1 X 55.2	55.2	0.019	1.6	87	0.0	0	0
Subtotals for Structure:				434		0	0
Infil.: Win.: 4.6, Sum.: 0.0	110		2.706	298	0.000	0	0
Ductwork:				0			0
Room Totals:				732		0	0



Detailed Room Loads - Room 1 - Exercise

General

Room is in zone 4, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	4
Area:	271.1 sq.ft.	Supply Air:	67 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	1.2 AC/hr
Volume:	3,207.7 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	10 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-Exterior-R31 8.1 X 11.8	60.2	0.055	4.6	275	0.0	0	0
E -Wall-14D-28s 10.5 X 11.8	124	0.038	3.2	391	0.0	0	0
NW-Wall-Exterior-R31 1.2 X 11.8	14.8	0.055	4.6	68	0.0	0	0
W -Gls-K&M Fixed/Oper shgc-0.31 0%S	36	0.310	25.7	926	0.0	0	0
Floor-21B-20 1 X 255.3	255.3	0.019	1.6	403	0.0	0	0
Floor-22C-10ph 9 ft..Per.	9	1.221	101.3	912	0.0	0	0
Subtotals for Structure:				2,975		0	0
Infil.: Win.: 9.9, Sum.: 0.0	235		2.707	636	0.000	0	0
Ductwork:				0			0
Room Totals:				3,611		0	0



Detailed Room Loads - Room 5 - Bar/Canning

General

Room is in zone 4, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	4
Area:	198.0 sq.ft.	Supply Air:	31 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	0.8 AC/hr
Volume:	2,343.5 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	10 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
SE-Wall-14D-28s 5.5 X 11.8	65.1	0.038	3.2	205	0.0	0	0
NE-Wall-14D-28s 1.8 X 11.8	20.7	0.038	3.2	65	0.0	0	0
SE-Wall-14D-28s 12.7 X 11.8	149.9	0.038	3.2	473	0.0	0	0
Floor-21B-20 1 X 198	198	0.019	1.6	312	0.0	0	0
Subtotals for Structure:				1,055		0	0
Infil.: Win.: 9.9, Sum.: 0.0	236		2.707	638	0.000	0	0
Ductwork:				0			0
Room Totals:				1,693		0	0



Detailed Room Loads - Room 6 - Game Room

General

Room is in zone 4, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	4
Area:	754.8 sq.ft.	Supply Air:	291 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	2.0 AC/hr
Volume:	8,931.9 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	3	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	39 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
NW-Wall-Exterior-R31 41.2 X 11.8	280	0.055	4.6	1,278	0.0	0	0
SE-Wall-14D-28s 3.1 X 11.8	36.9	0.038	3.2	116	0.0	0	0
NE-Wall-14D-28s 2.3 X 11.8	27.1	0.038	3.2	85	0.0	0	0
SE-Wall-14D-28s 22 X 11.8	260.7	0.038	3.2	822	0.0	0	0
SW-Wall-14D-28s 6.3 X 11.8	74.4	0.038	3.2	235	0.0	0	0
SE-Wall-14D-28s 3.4 X 11.8	40	0.038	3.2	126	0.0	0	0
NW-Gls-K&M Fixed/Oper shgc-0.31 0%S	48	0.310	25.7	1,235	0.0	0	0
NW-Gls-K&M Fixed/Oper shgc-0.31 0%S	28	0.310	25.7	720	0.0	0	0
NW-Gls-K&M Fixed/Oper shgc-0.31 0%S	28	0.310	25.7	720	0.0	0	0
NW-Gls-K&M Fixed/Oper shgc-0.31 0%S	28	0.310	25.7	720	0.0	0	0
NW-Gls-K&M Fixed/Oper shgc-0.31 0%S	28	0.310	25.7	720	0.0	0	0
NW-Gls-K&M Fixed/Oper shgc-0.31 0%S	48	0.310	25.7	1,235	0.0	0	0
Floor-21B-20 1 X 698.1	698.1	0.019	1.6	1,101	0.0	0	0
Floor-22C-10ph 41 ft..Per.	41	1.221	101.3	4,155	0.0	0	0
Subtotals for Structure:				13,268		0	0
Infil.: Win.: 39.0, Sum.: 0.0	927		2.706	2,509	0.000	0	0
Ductwork:				0			0
Room Totals:				15,777		0	0



Detailed Room Loads - Room 13 - Mech 1

General

Room is in zone 4, which peaks at 7 pm

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	2
Room Width:	n/a	Zone Number:	4
Area:	45.4 sq.ft.	Supply Air:	16 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	1.8 AC/hr
Volume:	537.1 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
		Percent of Supply.:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	6 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
E -Wall-14D-28s 5.9 X 11.8	70	0.038	3.2	221	0.0	0	0
S -Wall-14D-28s 3.3 X 11.8	39.2	0.038	3.2	124	0.0	0	0
SE-Wall-14D-28s 2.1 X 11.8	24.5	0.038	3.2	77	0.0	0	0
Floor-21B-20 1 X 45.4	45.4	0.019	1.6	72	0.0	0	0
Subtotals for Structure:				494		0	0
Infil.: Win.: 5.6, Sum.: 0.0	134		2.708	362	0.000	0	0
Ductwork:				0			0
Room Totals:				856		0	0



Detailed Room Loads - Room 14 - Garage

General

Calculation Mode:	Htg. only	Occurrences:	1
Room Length:	n/a	System Number:	3
Room Width:	n/a	Zone Number:	1
Area:	1,486.4 sq.ft.	Supply Air:	694 CFM
Ceiling Height:	11.8 ft.	Supply Air Changes:	2.4 AC/hr
Volume:	17,588.0 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	7	Actual Winter Vent.:	0 CFM
Runout Air:	99 CFM	Percent of Supply.:	0 %
Runout Duct Size:	6 in.	Actual Summer Vent.:	0 CFM
Runout Air Velocity:	505 ft./min.	Percent of Supply:	0 %
Runout Air Velocity:	505 ft./min.	Actual Winter Infil.:	86 CFM
Actual Loss:	0.100 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-Exterior-R31 42.7 X 11.8	441.5	0.055	4.6	2,015	0.0	0	0
E -Wall-12F-0sw 9.6 X 11.8	113.7	0.065	5.4	613	0.0	0	0
N -Wall-12F-0sw 11.3 X 11.8	133.2	0.065	5.4	719	0.0	0	0
S -Wall-12F-0sw 12.2 X 11.8	144.7	0.065	5.4	781	0.0	0	0
E -Wall-12F-0sw 2.4 X 11.8	28.6	0.065	5.4	154	0.0	0	0
S -Wall-Exterior-R31 45.4 X 11.8	257.4	0.055	4.6	1,175	0.0	0	0
W -Wall-Exterior-R31 30.6 X 11.8	362.6	0.055	4.6	1,655	0.0	0	0
N -Door-Case Door 3 X 8	24	0.330	27.4	657	0.0	0	0
S -Door-Case Door 3 X 8	24	0.330	27.4	657	0.0	0	0
S -Door-Overhead Door 16 X 8	128	0.330	27.4	3,506	0.0	0	0
S -Door-Overhead Door 16 X 8	128	0.330	27.4	3,506	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 100%S	20	0.310	25.7	515	0.0	0	0
N -Gls-K&M Fixed/Oper shgc-0.31 100%S	20	0.310	25.7	515	0.0	0	0
Floor-22C-10ph 154 ft..Per.	154	1.221	101.3	15,607	0.0	0	0
Subtotals for Structure:				32,075		0	0
Infil.: Win.: 86.3, Sum.: 0.0	1,826		3.037	5,545	0.000	0	0
Ductwork:				0			0
Room Totals:				37,620		0	0



System 1 Room Load Summary

Room No	Room Name	Area SF	Htg Sens Btuh	Min Htg CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Min Clg CFM	Act Sys CFM
---Zone 1---										
7	Theater	955	10,230	189	7,7	-	0	0	0	189
8	Storage 1	108	881	16	3	-	0	0	0	16
9	S4 Bath	93	2,199	41	5	-	0	0	0	41
10	Suite 4	275	5,372	99	7	-	0	0	0	99
11	Mech 2	205	6,225	115	7	-	0	0	0	115
12	Vault	127	1,936	36	5	-	0	0	0	36
15	Stair Well	134	3,383	62	6	-	0	0	0	62
Zone 1 subtotal		1,897	30,226	558			0	0	0	558
---Zone 2---										
21	Sitting	338	5,267	97	7	-	0	0	0	97
22	Laundry	172	1,755	32	5	-	0	0	0	32
27	Bath	62	1,004	19	4	-	0	0	0	19
28	Pantry	157	1,322	24	4	-	0	0	0	24
29	Kitchen/Dining	949	13,433	248	6,6,6	-	0	0	0	248
Zone 2 subtotal		1,678	22,782	420			0	0	0	420
---Zone 3---										
23	S2 Wic	70	172	3	3	-	0	0	0	3
24	S2 Bath	131	1,385	26	5	-	0	0	0	26
25	W/C	33	1,104	20	4	-	0	0	0	20
26	Suite 2	277	3,021	56	6	-	0	0	0	56
Zone 3 subtotal		511	5,683	105			0	0	0	105
---Zone 4---										
16	Guest Bath	129	2,298	42	6	-	0	0	0	42
17	Bedroom 2	193	3,157	58	6	-	0	0	0	58
18	Bedroom 1	195	2,968	55	6	-	0	0	0	55
19	Guest Suite	582	8,189	151	6,6	-	0	0	0	151
20	Wic	74	1,764	33	5	-	0	0	0	33
Zone 4 subtotal		1,172	18,374	339			0	0	0	339
Return Duct			3,008				0	0		
System 1 total		5,259	80,072	1,422			0	0	0	1,422

System 1 Main Trunk Size: 25x12 in.
 Velocity: 683 ft./min
 Loss per 100 ft.: 0.028 in.wg

Duct size results above are from Manual D Ductsize.
 Runout duct velocities are not printed with duct size results from Manual D Ductsize since they can vary within the room.
 See the Manual D Ductsize report for duct velocities and other data.

Note: Since the system is multizone, the Peak Fenestration Gain Procedure was used to determine glass sensible gains at the room and zone levels, so the sums of the zone sensible gains and airflows for cooling shown above are not intended to equal the totals at the system level. Room and zone sensible gains and cooling CFM values are for the hour in which the glass sensible gain for the zone is at its peak. Sensible gains at the system level are based on the "Average Load Procedure + Excursion" method.

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Recommended:	0.00	90% / 10%	0	0	0

Equipment Data

	<u>Heating System</u>	<u>Cooling System</u>
Model:	Heating System	Cooling System
Indoor Model:	CBWMV-60C-100	



System 1 Room Load Summary (cont'd)

Equipment Data

Brand:	(Dave Lennox) Signature	
Description:	Hydronic Airhandler	
Efficiency:	0 AFUE	14.5 SEER
Comment :	Paired with Triangle tube 175	
Sound:	0	0
Capacity:	100,000 Btuh	0 Btuh
Sensible Capacity:	n/a	0 Btuh
Latent Capacity:	n/a	0 Btuh



System 2 Room Load Summary

Room No	Room Name	Area SF	Htg Sens Btuh	Min Htg CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Min Clg CFM	Act Sys CFM
---Zone 1---										
30	Great Room	515	13,140	242	6,6,6	-	0	0	0	242
31	Study	323	4,592	85	6,6	-	0	0	0	85
Zone 1 subtotal		839	17,732	327			0	0	0	327
---Zone 2---										
32	Master Bath	227	2,292	42	5,3	-	0	0	0	42
33	Mstr Wic	193	3,192	59	6	-	0	0	0	59
34	Master Bedroom	370	7,283	134	6,6	-	0	0	0	134
Zone 2 subtotal		791	12,767	236			0	0	0	236
---Zone 3---										
2	Suite 3	273	6,885	127	6,6	-	0	0	0	127
3	S3 Bath	85	1,527	28	3	-	0	0	0	28
4	S3 Wic	55	732	14	2	-	0	0	0	14
Zone 3 subtotal		413	9,144	169			0	0	0	169
---Zone 4---										
1	Exercise	271	3,611	67	5	-	0	0	0	67
5	Bar/Canning	198	1,693	31	3	-	0	0	0	31
6	Game Room	755	15,777	291	6,6,6	-	0	0	0	291
13	Mech 1	45	856	16	2	-	0	0	0	16
Zone 4 subtotal		1,269	21,937	405			0	0	0	405
System 2 total		3,312	61,580	1,136			0	0	0	1,136

System 2 Main Trunk Size: 25x10 in.
Velocity: 655 ft./min
Loss per 100 ft.: 0.030 in.wg

Duct size results above are from Manual D Ductsize.

Runout duct velocities are not printed with duct size results from Manual D Ductsize since they can vary within the room. See the Manual D Ductsize report for duct velocities and other data.

Note: Since the system is multizone, the Peak Fenestration Gain Procedure was used to determine glass sensible gains at the room and zone levels, so the sums of the zone sensible gains and airflows for cooling shown above are not intended to equal the totals at the system level. Room and zone sensible gains and cooling CFM values are for the hour in which the glass sensible gain for the zone is at its peak. Sensible gains at the system level are based on the "Average Load Procedure + Excursion" method.

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Recommended:	0.00	90% / 10%	0	0	0

Equipment Data

	Heating System	Cooling System
Model:	Heating System	Cooling System
Indoor Model:	CBWMV-36B-070	
Brand:	(Dave Lennox) Signature	
Description:	Hydronic Airhandler	
Efficiency:	0 AFUE	13 SEER
Comment :	Paired with Triangle tube 110	
Sound:	0	0
Capacity:	70,000 Btuh	0 Btuh
Sensible Capacity:	n/a	0 Btuh
Latent Capacity:	n/a	0 Btuh



System 3 Room Load Summary

Room No	Room Name	Area SF	Htg Sens Btuh	Min Htg CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Min Clg CFM	Act Sys CFM
---Zone 1---										
14	Garage	1,486	37,620	694	17-6	505	0	0	0	694
System 3 total		1,486	37,620	694			0	0	0	694

System 3 Main Trunk Size: 19x13 in.
Velocity: 854 ft./min
Loss per 100 ft.: 0.094 in.wg

Duct size results above are from Manual D Ductsize except where indicated otherwise.
Runout duct velocities are not printed with duct size results from Manual D Ductsize since they can vary within the room.
See the Manual D Ductsize report for duct velocities and other data.

¹ Indicates duct sized with Rhvac's built-in duct sizing rather than with Manual D Ductsize.

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Recommended:	0.00	90% / 10%	0	0	0

Equipment Data

	<u>Heating System</u>	<u>Cooling System</u>
Model:	Heating System	Cooling System
Indoor Model:	HOT DAWG H2O-HHD45	
Brand:	Modine	
Description:	Hydronic Unit heater	
Efficiency:	97.5	13 SEER
Sound:	0	0
Capacity:	106,000 Btuh	0 Btuh
Sensible Capacity:	n/a	0 Btuh
Latent Capacity:	n/a	0 Btuh