

*Breen Sample Residence
HVAC Load Calculations*

for

Sample Inc.
1266 Fake St
Littleton, Co 80125



RHVAC RESIDENTIAL
HVAC LOADS

Prepared By:

Carl Breen
Breen Design
6847 Brook Forest Rd
Evergreen, Co 80439
970-596-4479
Monday, January 10, 2011



Project Report

General Project Information

Project Title: Breen Sample Residence
 Designed By: Carl Breen
 Project Date: Saturday, February 27, 2010
 Project Comment: Manual J based on the following. 2x6 exterior walls with R-21 insulation, Windows at U-.35/SHGC-.35, Basement and crawl space with R-11, Roof/ceiling at R-38, BUILDER SHOULD VERIFY FOR ACCURACY.

Client Name: Sample Inc.
 Client Address: 1266 Fake St
 Client City: Littleton, Co 80125
 Client Phone: 720-522-5555
 Client Fax: 303-255-5555
 Client E-Mail Address: SampleInc@fake.com
 Company Name: Breen Design
 Company Representative: Carl Breen
 Company Address: 6847 Brook Forest Rd
 Company City: Evergreen, Co 80439
 Company Phone: 970-596-4479

Design Data

Reference City: Denver, Colorado
 Building Orientation: Front door faces North
 Daily Temperature Range: High
 Latitude: 39 Degrees
 Elevation: 5283 ft.
 Altitude Factor: 0.823
 Elevation Sensible Adj. Factor: 0.832
 Elevation Total Adj. Factor: 1.000
 Elevation Heating Adj. Factor: 1.000
 Elevation Heating Adj. Factor: 1.000

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	1	0.21	80%	50%	72	65.44
Summer:	91	59	15%	50%	75	-39

Check Figures

Total Building Supply CFM: 780 CFM Per Square ft.: 0.178
 Square ft. of Room Area: 4,385 Square ft. Per Ton: 4,080
 Volume (ft³) of Cond. Space: 40,387

Building Loads

Total Heating Required Including Ventilation Air: 49,460 Btuh 49.460 MBH
 Total Sensible Gain: 13,789 Btuh 100 %
 Total Latent Gain: -892 Btuh 0 %
 Total Cooling Required Including Ventilation Air: 13,789 Btuh 1.15 Tons (Based On Sensible + Latent)

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
Winter:	1	0.21	80%	50%	72	65.44
Summer:	91	59	15%	50%	75	-39.13

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:	0.252 AC/hr 103 CFM	0.110 AC/hr 45 CFM
Infiltration Actual:	0.281 AC/hr	0.166 AC/hr
Above Grade Volume:	X 24,594 Cu.ft. 6,906 Cu.ft./hr	X 24,594 Cu.ft. 4,084 Cu.ft./hr
	X 0.0167	X 0.0167
Total Building Infiltration:	115 CFM	68 CFM
Total Building Ventilation:	0 CFM	0 CFM

---System 1---

Infiltration & Ventilation Sensible Gain Multiplier: 14.49 = (1.10 X 0.823 X 16.00 Summer Temp. Difference)
 Infiltration & Ventilation Latent Gain Multiplier: -21.90 = (0.68 X 0.823 X -39.13 Grains Difference)
 Infiltration & Ventilation Sensible Loss Multiplier: 64.30 = (1.10 X 0.823 X 71.00 Winter Temp. Difference)
 Winter Infiltration Specified: 0.220 AC/hr (90 CFM), Construction: Semi-Tight, Fireplaces: 1, 13 CFM, Semi-Tight
 Summer Infiltration Specified: 0.110 AC/hr (45 CFM), Construction: Semi-Tight



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	1.62	2,699	4,385	13,789	-892	13,789	49,460	780	761	780	
System 1	1.62	2,699	4,385	13,789	-892	13,789	49,460	780	761	780	15x19
Humidification							3,779				
Zone 1			4,385	13,789	-892	13,789	45,681	780	761	780	10x13
1-Unfinished Basement			1,655	1,068	-91	1,068	8,906	152	59	152	6.6
2-Great Room			537	4,365	-234	4,365	8,347	143	241	241	6.5,5
3-Kitchen/Nook			340	2,359	-257	2,359	4,146	71	130	130	5.5
4-Master Bath			165	267	-53	267	938	16	15	16	3
5-Master Wic			65	147	-53	147	754	13	8	13	3
6-Master Bedroom			307	2,035	-4	2,035	4,308	74	112	112	5.5
7-Entry/Hall			304	650	-72	650	1,787	31	36	36	4
8-Bedroom 2			206	1,479	9	1,488	3,268	56	82	82	6
9-Dining			163	1,221	-83	1,221	1,774	30	67	67	5
10-Bathroom 1			106	198	-54	198	842	14	11	14	3
11-Crawl Space			537	0	0	0	10,611	181	0	181	6.6
Sum of room airflows may be greater than system airflow because system room airflow option uses the greater of heating or cooling.											



Manual D Duct Sizer 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: ST-220, Feeds Into: Unfinished Basement, Fitting: 12-O1, Effective Length: 9.0

Trunk	0.0003	9.8	457	0.001
Up: ST-160	55	10	0.037	0.002
Rect	3.3	8	5.6	0.003
Presize	254	10	0.373	0.427

---Duct Name: ST-210, Feeds Into: Unfinished Basement, Effective Length: 1.5

Trunk	0.0003	9.8	437	0.001
Up: ST-220	55	10	0.034	0.000
Rect	1.5	8	0.0	0.001
Presize	243	4.5	0.373	0.427

---Duct Name: ST-180, Feeds Into: Unfinished Basement, Effective Length: 7.5

Trunk	0.0003	9.8	403	0.002
Up: ST-250	55	10	0.029	0.000
Rect	7.5	8	0.0	0.002
Presize	224	22.5	0.380	0.420

---Duct Name: ST-170, Feeds Into: Unfinished Basement, Effective Length: 3.3

Trunk	0.0003	9.8	268	0.000
Up: ST-240	55	10	0.014	0.000
Rect	3.3	8	0.0	0.000
Presize	149	10	0.372	0.428

---Duct Name: ST-160, Feeds Into: Unfinished Basement, Effective Length: 1.3

Trunk	0.0003	10.7	435	0.000
Up: ST-110	55	12	0.031	0.000
Rect	1.3	8	0.0	0.000
Presize	290	4.2	0.377	0.423

---Duct Name: ST-150, Feeds Into: Unfinished Basement, Effective Length: 1.0

Trunk	0.0003	11.5	588	0.000
Up: ST-120	142	14	0.043	0.000
Rect	1.0	8	0.0	0.000
Presize	457	3.7	0.383	0.417

---Duct Name: ST-140, Feeds Into: Unfinished Basement, Effective Length: 1.0

Trunk	0.0003	9.8	259	0.000
Up: ST-180	55	10	0.013	0.000
Rect	1.0	8	0.0	0.000
Presize	144	3	0.380	0.420

---Duct Name: ST-130, Feeds Into: Unfinished Basement, Effective Length: 2.0

Trunk	0.0003	9.8	23	0.000
Up: ST-140	142	10	0.000	0.000
Rect	2.0	8	0.0	0.000
Presize	13	6	0.380	0.420

---Duct Name: SMT-100, Feeds Into: Unfinished Basement, Fitting: 1-P, Effective Length: 27.8

Trunk	0.0003	18.4	395	0.000
Up: Fan	142	15	0.011	0.003
Rect	0.7	19	27.1	0.285
Presize	782	3.8	0.385	0.415



Manual D Duct Sizer 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-110, Feeds Into: Unfinished Basement, Fitting: 12-O1, Effective Length: 17.5					
Trunk	0.0003	10.7	533	0.005	
Up: SMT-100	55	12	0.044	0.003	
Rect	11.2	8	6.4	0.008	
Presize	355	37.2	0.377	0.423	
---Duct Name: ST-120, Feeds Into: Unfinished Basement, Effective Length: 2.5					
Trunk	0.0003	11.5	649	0.001	
Up: SMT-100	142	14	0.051	0.000	
Rect	2.5	8	0.0	0.001	
Presize	505	9.2	0.383	0.417	
---Duct Name: SR-250, Supplies: Unfinished Basement, Fittings: 4-AD, 2-I, Effective Length: 75.5					
Runout	0.0003	6	387	0.006	
Up: ST-150	142	4.7	0.040	0.024	
Rnd	15.7	6.6	59.9	0.030	
Presize	76	24.6	0.353	0.447	
---Duct Name: ST-230, Feeds Into: Unfinished Basement, Effective Length: 0.7					
Trunk	0.0003	11.5	490	0.000	
Up: ST-150	142	14	0.031	0.000	
Rect	0.7	8	0.0	0.000	
Presize	381	2.4	0.383	0.417	
---Duct Name: SR-260, Supplies: Unfinished Basement, Fittings: 4-AD, 2-I, Effective Length: 82.0					
Runout	0.0003	6	387	0.009	
Up: ST-210	142	4.7	0.040	0.023	
Rnd	24.0	6.6	58.0	0.032	
Presize	76	37.7	0.340	0.460	
---Duct Name: ST-240, Feeds Into: Unfinished Basement, Effective Length: 2.3					
Trunk	0.0003	9.8	385	0.001	
Up: ST-210	55	10	0.027	0.000	
Rect	2.3	8	0.0	0.001	
Presize	214	7	0.372	0.428	
---Duct Name: SR-270, Supplies: Crawl Space, Effective Length: 10.5					
Runout	0.0003	6	464	0.006	
Up: ST-230	142	4.7	0.054	0.000	
Rnd	10.5	6.6	0.0	0.006	
Nearest Inch	91	16.5	0.377	0.423	
---Duct Name: ST-250, Feeds Into: Unfinished Basement, Effective Length: 0.7					
Trunk	0.0003	11.5	379	0.000	
Up: ST-230	55	14	0.022	0.000	
Rect	0.7	8	0.0	0.000	
Presize	295	2.4	0.383	0.417	
---Duct Name: SR-280, Supplies: Crawl Space, Fittings: 4-AD, 2-I, Effective Length: 83.2					
Runout	0.0003	6	464	0.015	
Up: ST-230	142	4.7	0.054	0.031	
Rnd	26.7	6.6	56.5	0.045	
Nearest Inch	91	41.9	0.337	0.463	



Manual D Duct Sizer 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-120, Supplies: Great Room, Fittings: 4-H, 2-I, Effective Length: 43.9					
Runout	0.0003	6	407	0.003	
Up: ST-140	55	4.7	0.049	0.019	
Rnd	5.3	6.6	38.6	0.021	
Presize	80	8.4	0.359	0.441	
---Duct Name: SR-130, Supplies: Great Room, Fittings: 4-G, 2-I, Effective Length: 76.2					
Runout	0.0003	5	587	0.025	
Up: ST-120	55	3.9	0.118	0.065	
Rnd	21.5	5.5	54.7	0.090	
Nearest Inch	80	28.1	0.293	0.507	
---Duct Name: SR-140, Supplies: Great Room, Fittings: 2-I, 4-G, 8-A6A, Effective Length: 71.5					
Runout	0.0003	5	587	0.015	
Up: ST-180	55	3.9	0.118	0.070	
Rnd	12.5	5.5	59.0	0.084	
Nearest Inch	80	16.4	0.296	0.504	
---Duct Name: SR-150, Supplies: Kitchen/Nook, Fittings: 4-G, 2-I, Effective Length: 65.9					
Runout	0.0003	5	477	0.019	
Up: ST-110	55	3.9	0.081	0.035	
Rnd	23.2	5.5	42.7	0.054	
Nearest Inch	65	30.3	0.323	0.477	
---Duct Name: SR-160, Supplies: Kitchen/Nook, Fittings: 4-G, 2-I, Effective Length: 59.0					
Runout	0.0003	5	477	0.011	
Up: ST-240	55	3.9	0.081	0.037	
Rnd	13.5	5.5	45.5	0.048	
Nearest Inch	65	17.7	0.324	0.476	
---Duct Name: SR-170, Supplies: Master Bath, Fittings: 4-G, 2-I, Effective Length: 33.1					
Runout	0.0003	3	326	0.008	
Up: ST-250	142	2.4	0.071	0.015	
Rnd	11.5	3.3	21.6	0.023	
Presize	16	9	0.359	0.441	
---Duct Name: SR-180, Supplies: Master Wic, Fittings: 4-G, 2-I, Effective Length: 39.9					
Runout	0.0003	3	265	0.010	
Up: ST-130	142	2.4	0.049	0.010	
Rnd	19.5	3.3	20.4	0.020	
Presize	13	15.3	0.361	0.439	
---Duct Name: SR-190, Supplies: Master Bedroom, Fittings: 4-H, 2-I, Effective Length: 55.9					
Runout	0.0003	5	411	0.016	
Up: ST-140	55	3.9	0.062	0.019	
Rnd	25.2	5.5	30.7	0.035	
Presize	56	32.9	0.345	0.455	
---Duct Name: SR-200, Supplies: Master Bedroom, Fittings: 4-G, 2-I, Effective Length: 67.5					
Runout	0.0003	5	411	0.018	
Up: ST-250	55	3.9	0.062	0.024	
Rnd	28.8	5.5	38.7	0.042	
Presize	56	37.7	0.340	0.460	



Manual D Duct Sizer 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-210, Supplies: Bathroom 1, Fittings: 4-H, 2-I, Effective Length: 33.7					
Runout	0.0003	3	285	0.007	
Up: ST-220	142	2.4	0.056	0.012	
Rnd	12.2	3.3	21.5	0.019	
Presize	14	9.6	0.354	0.446	
---Duct Name: SR-220, Supplies: Entry/Hall, Fittings: 4-G, 2-I, Effective Length: 58.2					
Runout	0.0003	4	413	0.024	
Up: ST-160	55	3.1	0.084	0.024	
Rnd	29.0	4.4	29.2	0.049	
Presize	36	30.4	0.328	0.472	
---Duct Name: SR-230, Supplies: Bedroom 2, Fittings: 4-G, 2-I, Effective Length: 78.2					
Runout	0.0003	6	418	0.015	
Up: ST-170	55	4.7	0.051	0.025	
Rnd	29.3	6.6	48.9	0.040	
Presize	82	46.1	0.332	0.468	
---Duct Name: SR-240, Supplies: Dining, Fittings: 4-G, 2-I, 8-A6A, Effective Length: 53.9					
Runout	0.0003	5	491	0.005	
Up: ST-170	55	3.9	0.086	0.042	
Rnd	5.3	5.5	48.6	0.046	
Nearest Inch	67	7	0.325	0.475	

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:	14	
Number of active runouts:	17	
Total runout outlet airflow:	1,044	
Main trunk airflow:	782	
Largest trunk diameter:	18.4	SMT-100
Largest runout diameter:	6	SR-250
Smallest trunk diameter:	9.8	ST-220
Smallest runout diameter:	3	SR-170
Supply fan external static pressure:	0.800	
Supply fan device pressure losses:	0.282	
Supply fan static pressure available:	0.518	
Runout maximum cumulative static pressure loss:	0.507	SR-130
Return loss added to supply:	0.130	
Total effective length of return (ft.):	188.6	Basement Return
Total effective length of supply (ft.):	189.7	SR-130
Overall total effective length (ft.):	378.3	Basement Return to SR-130
Design overall friction rate per 100 ft.:	0.137	(Available SP x 100 / TEL)



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

Summary

System duct surface area (Scenario 1):	535.5	Main	(Linked to duct load)
Total system duct surface area:	535.5		



Manual D Duct Sizer 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: RT-160, Feeds From: Unfinished Basement, Fitting: 12-F1, Effective Length: 26.9

Trunk	0.0003	12.9	637	0.004
Up: RT-110	72	14	0.046	0.008
Rect	9.7	10	17.2	0.013
Presize	619	38.7	-0.092	0.105

---Duct Name: RT-150, Feeds From: Unfinished Basement, Effective Length: 1.2

Trunk	0.0003	12.9	490	0.000
Up: RT-160	72	14	0.029	0.000
Rect	1.2	10	0.0	0.000
Presize	476	4.7	-0.092	0.092

---Duct Name: RT-140, Feeds From: Unfinished Basement, Effective Length: 2.0

Trunk	0.0003	12.9	343	0.000
Up: RT-150	72	14	0.015	0.000
Rect	2.0	10	0.0	0.000
Presize	333	8	-0.091	0.092

---Duct Name: RMT-100, Feeds From: Unfinished Basement, Fittings: 5-K, 5-M, Effective Length: 39.2

Trunk	0.0003	16.4	661	0.000
Up: Fan	72	19	0.037	0.014
Rect	1.0	12	38.2	0.015
Presize	1,046	5.2	-0.116	0.130

---Duct Name: RT-110, Feeds From: Unfinished Basement, Fitting: 12-F1, Effective Length: 27.1

Trunk	0.0003	15.2	652	0.003
Up: RMT-100	72	20	0.041	0.008
Rect	6.7	10	20.4	0.011
Presize	905	33.3	-0.105	0.116

---Duct Name: RT-120, Feeds From: Unfinished Basement, Fitting: 12-F1, Effective Length: 15.2

Trunk	0.0003	8.7	317	0.001
Up: RMT-100	72	8	0.021	0.002
Rect	5.8	8	9.3	0.003
Presize	141	15.6	-0.112	0.087

---Duct Name: Basement Return, Returns From: Unfinished Basement, Fittings: 6-C, 6-M, Effective Length: 175.5

Runout	0.0003	10	611	0.009
Up: RT-140	72	7.8	0.052	0.082
Rnd	17.7	10.9	157.8	0.091
Presize	333	46.3	0.000	0.091

---Duct Name: Master Return, Returns From: Master Bedroom, Fittings: 6-F, 6-C, 12-T, Effective Length: 134.3

Runout	0.0003	7	528	0.012
Up: RT-120	72	5.4	0.062	0.072
Rnd	19.0	7.7	115.3	0.084
Presize	141	34.8	-0.029	0.084



Manual D Duct Sizer 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: Main High 1, Returns From: Dining, Fittings: 12-S, 6-C, 6-F, Effective Length: 51.0

Runout	0.0003	7	535	0.008
Up: RT-150	72	5.4	0.064	0.025
Rnd	12.2	7.7	38.8	0.033
Presize	143	22.3	-0.059	0.033

---Duct Name: Main Low 1, Returns From: Dining, Fittings: 12-S, 6-C, 6-F, Effective Length: 42.8

Runout	0.0003	7	535	0.003
Up: RT-160	72	5.4	0.064	0.025
Rnd	4.0	7.7	38.8	0.027
Presize	143	7.3	-0.065	0.027

---Duct Name: Main Low 2, Returns From: Entry/Hall, Fittings: 12-S, 6-C, 6-F, 8-A6A, Effective Length: 63.4

Runout	0.0003	7	535	0.007
Up: RT-110	72	5.4	0.064	0.033
Rnd	11.3	7.7	52.1	0.041
Presize	143	20.8	-0.064	0.041

---Duct Name: Main high 2, Returns From: Entry/Hall, Fittings: 12-T, 6-C, 6-F, Effective Length: 56.7

Runout	0.0003	7	535	0.011
Up: RT-110	72	5.4	0.064	0.025
Rnd	17.8	7.7	38.8	0.036
Presize	143	32.7	-0.068	0.036

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:	6		
Number of active runouts:	6		
Total runout outlet airflow:	1,046		
Main trunk airflow:	1,046		
Largest trunk diameter:	16.4	RMT-100	
Largest runout diameter:	10	Basement Return	
Smallest trunk diameter:	8.7	RT-120	
Smallest runout diameter:	7	Master Return	
Runout maximum cumulative static pressure loss:	0.091	Basement Return	
Return loss added to supply:	0.130		
Total effective length of return (ft.):	188.6	Basement Return	
System duct surface area (Scenario 1):	269.5	Main	(Linked to duct load)
Total system duct surface area:	269.5		

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.



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

Notes

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
vinyle Frame: Glazing-Standard 06 IRC, u-value 0.35, SHGC 0.35	290.1	7,212	0	7,338	7,338
11Q: Door-Metal - Polyurethane Core With Storm	24	290	0	90	90
R11 Draped-6: Wall-Basement, , R11 With 2x6 R19 above	513.4	2,359	0	76	76
R11 Draped-8: Wall-Basement, , R11 Draped 8' with 2x6 R19 above	588	2,129	0	0	0
12F-0bw: Wall-Frame, R-21 insulation in 2 x 6 stud cavity, no board insulation, brick finish, wood studs	1827.7	8,434	0	781	781
R11 draped-4: Wall-	373.4	1,644	0	0	0
16B-38: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Vented Attic, No Radiant Barrier, Dark Asphalt Shingles or Dark Metal, Tar and Gravel or Membrane, R-38 insulation	2193.3	4,049	0	2,624	2,624
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	1655.3	3,173	0	0	0
20P-30: Floor-Over open crawl space or garage, Passive, R-30 blanket insulation, any cover	9	22	0	2	2
22A-ph: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, heavy moist soil	93	8,967	0	0	0
Subtotals for structure:		38,279	0	10,911	10,911
People:	3		600	690	1,290
Equipment:			0	1,200	1,200
Lighting:	0			0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 115, Summer CFM: 68		7,402	-1,492	988	-504
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Humidification (Winter) 10.31 gal/day :		3,779	0	0	0
Total Building Load Totals:		49,460	-892	13,789	12,897

Check Figures

Total Building Supply CFM:	780	CFM Per Square ft.:	0.178
Square ft. of Room Area:	4,385	Square ft. Per Ton:	4,080
Volume (ft³) of Cond. Space:	40,387		

Building Loads

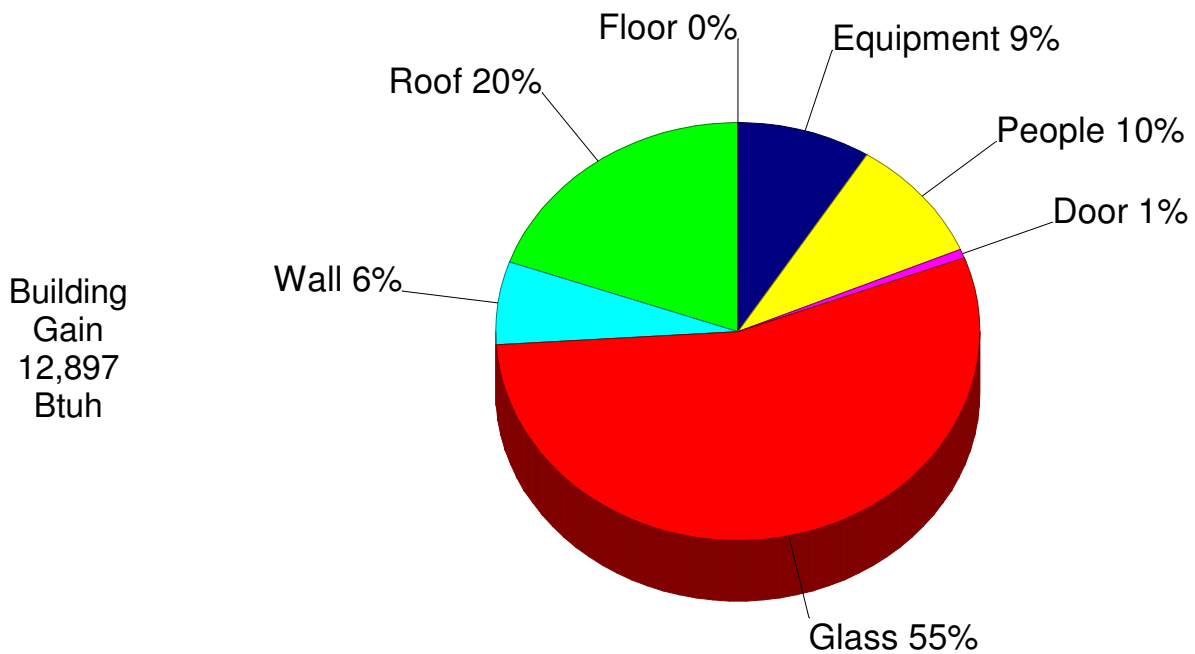
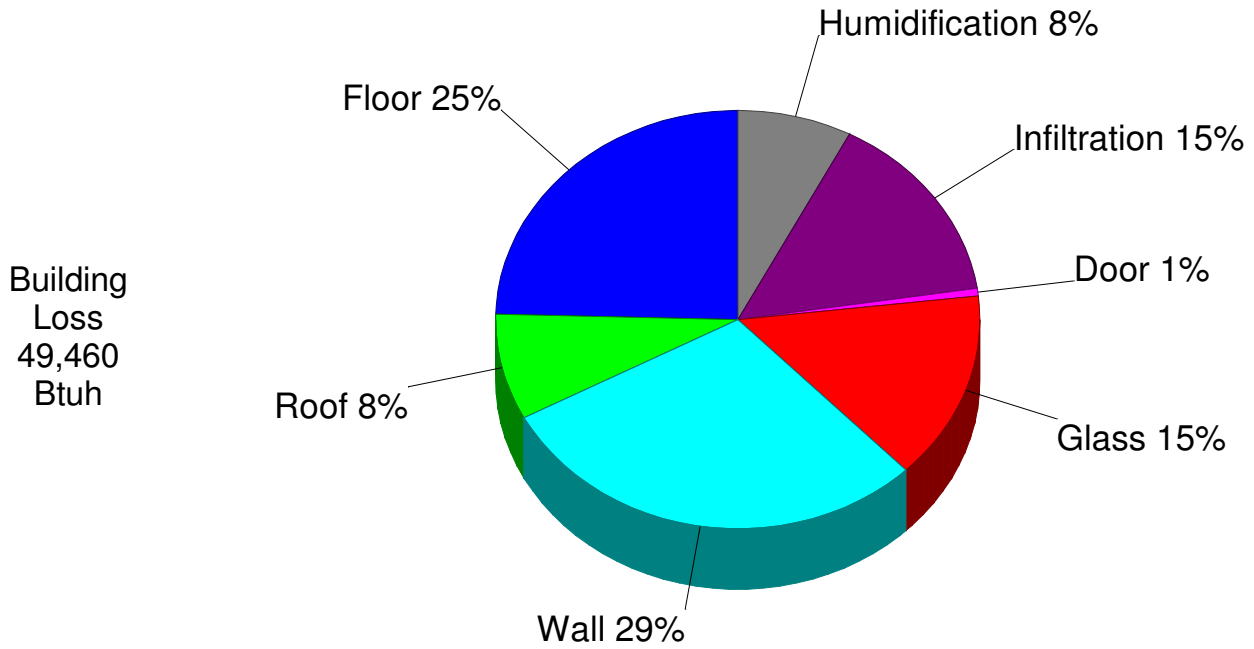
Total Heating Required Including Ventilation Air:	49,460 Btuh	49.460 MBH
Total Sensible Gain:	13,789 Btuh	100 %
Total Latent Gain:	-892 Btuh	0 %
Total Cooling Required Including Ventilation Air:	13,789 Btuh	1.15 Tons (Based On Sensible + Latent)

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.

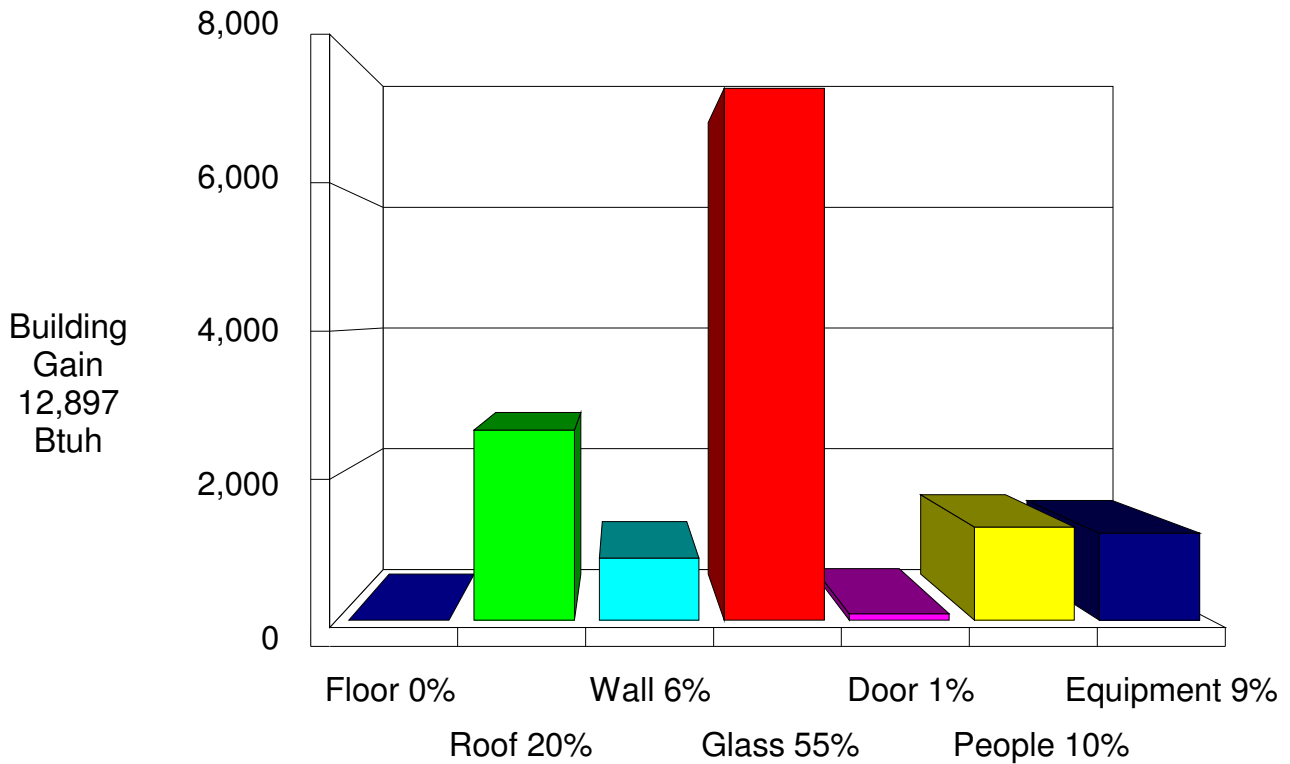
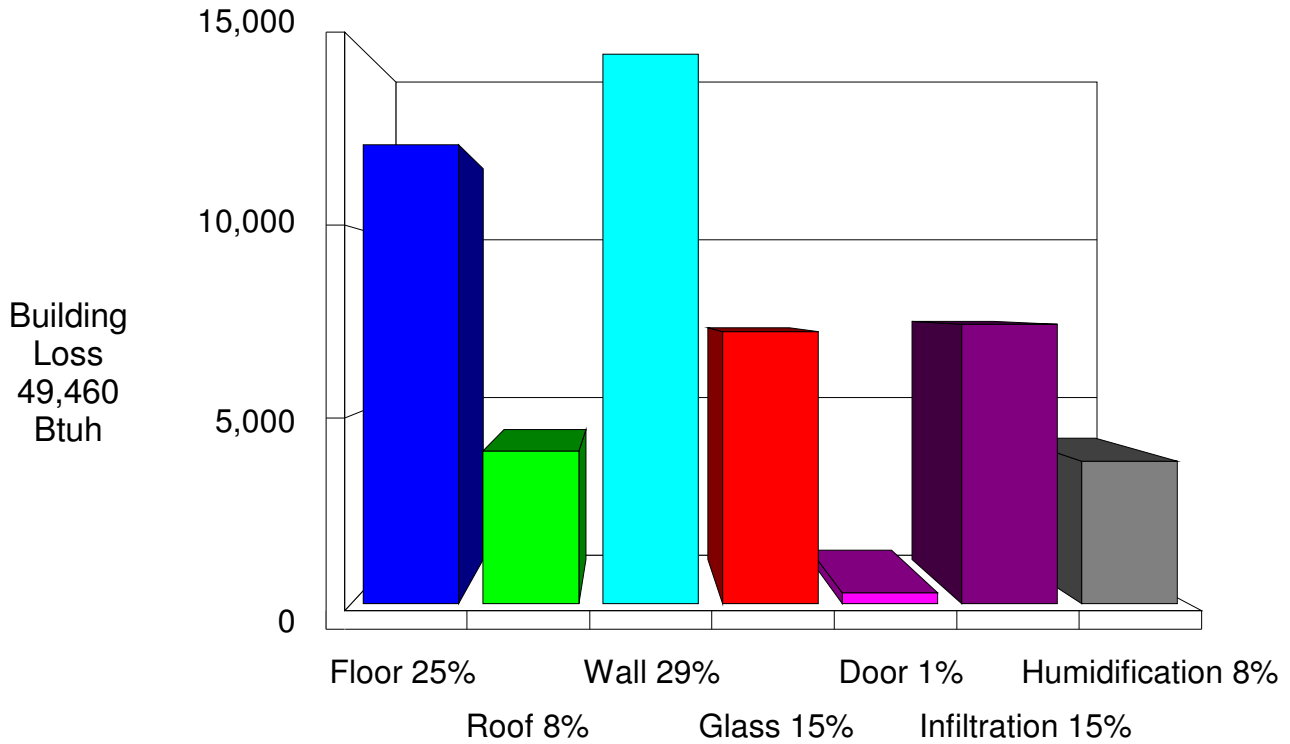


Building Pie Chart





Building Bar Graph





System 1 System 1 Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
vinyle Frame: Glazing-Standard 06 IRC, u-value 0.35, SHGC 0.35	290.1	7,212	0	7,338	7,338
11Q: Door-Metal - Polyurethane Core With Storm	24	290	0	90	90
R11 Draped-6: Wall-Basement, , R11 With 2x6 R19 above	513.4	2,359	0	76	76
R11 Draped-8: Wall-Basement, , R11 Draped 8' with 2x6 R19 above	588	2,129	0	0	0
12F-0bw: Wall-Frame, R-21 insulation in 2 x 6 stud cavity, no board insulation, brick finish, wood studs	1827.7	8,434	0	781	781
R11 draped-4: Wall-	373.4	1,644	0	0	0
16B-38: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Vented Attic, No Radiant Barrier, Dark Asphalt Shingles or Dark Metal, Tar and Gravel or Membrane, R-38 insulation	2193.3	4,049	0	2,624	2,624
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	1655.3	3,173	0	0	0
20P-30: Floor-Over open crawl space or garage, Passive, R-30 blanket insulation, any cover	9	22	0	2	2
22A-ph: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, heavy moist soil	93	8,967	0	0	0
Subtotals for structure:		38,279	0	10,911	10,911
People:	3		600	690	1,290
Equipment:			0	1,200	1,200
Lighting:	0			0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 115, Summer CFM: 68		7,402	-1,492	988	-504
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Humidification (Winter) 10.31 gal/day :		3,779	0	0	0
System 1 System 1 Load Totals:		49,460	-892	13,789	12,897

Check Figures

Supply CFM:	780	CFM Per Square ft.:	0.178
Square ft. of Room Area:	4,385	Square ft. Per Ton:	4,080
Volume (ft³) of Cond. Space:	40,387		

System Loads

Total Heating Required Including Ventilation Air:	49,460 Btuh	49.460 MBH
Total Sensible Gain:	13,789 Btuh	100 %
Total Latent Gain:	-892 Btuh	0 %
Total Cooling Required Including Ventilation Air:	13,789 Btuh	1.15 Tons (Based On Sensible + Latent)

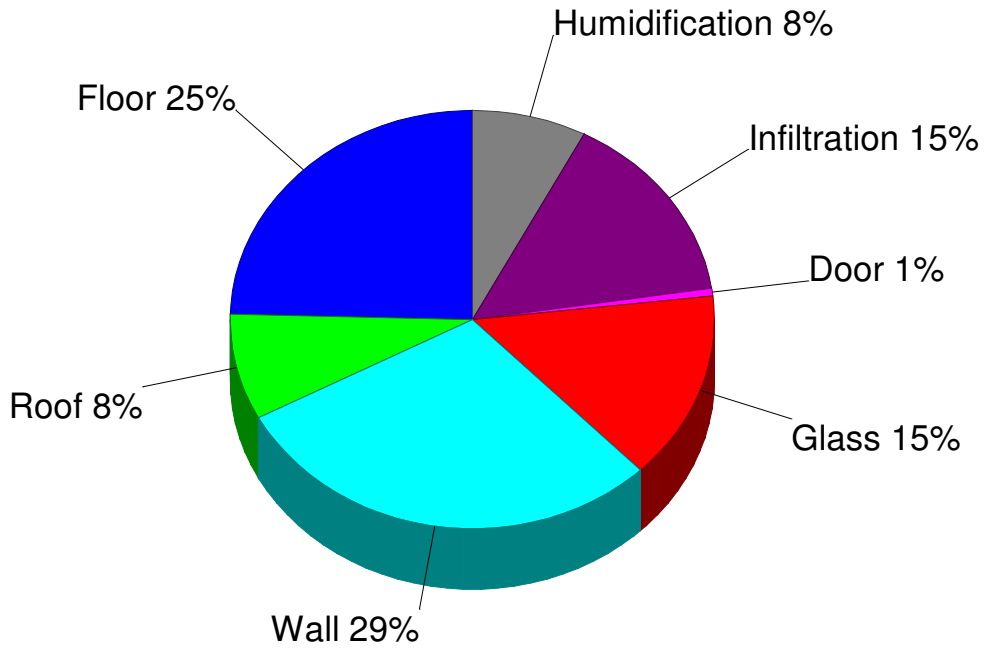
Notes

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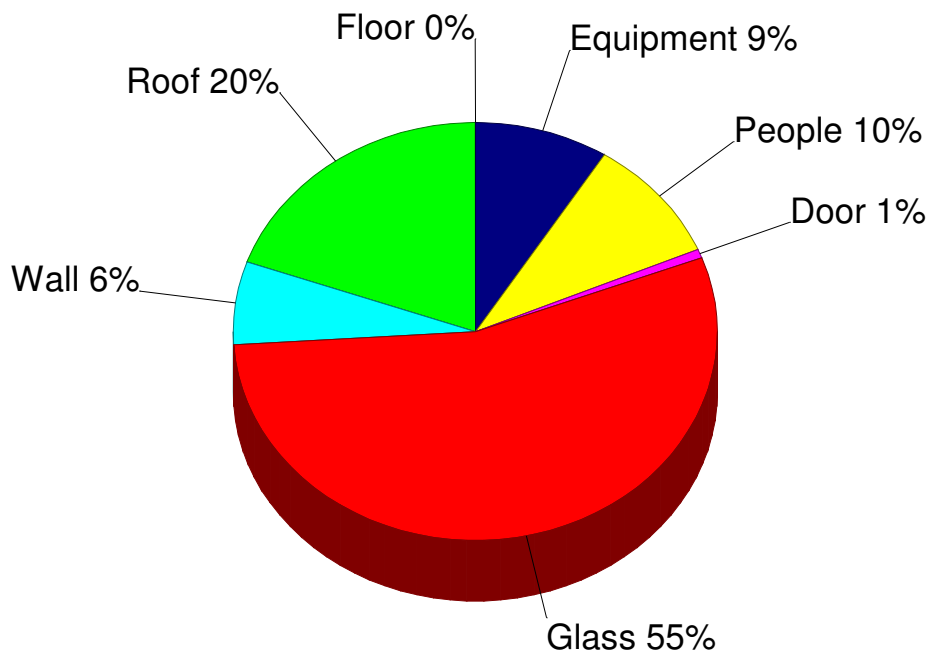


System 1 System 1 Pie Chart

System
1
System
1
Loss
49,460
Btuh

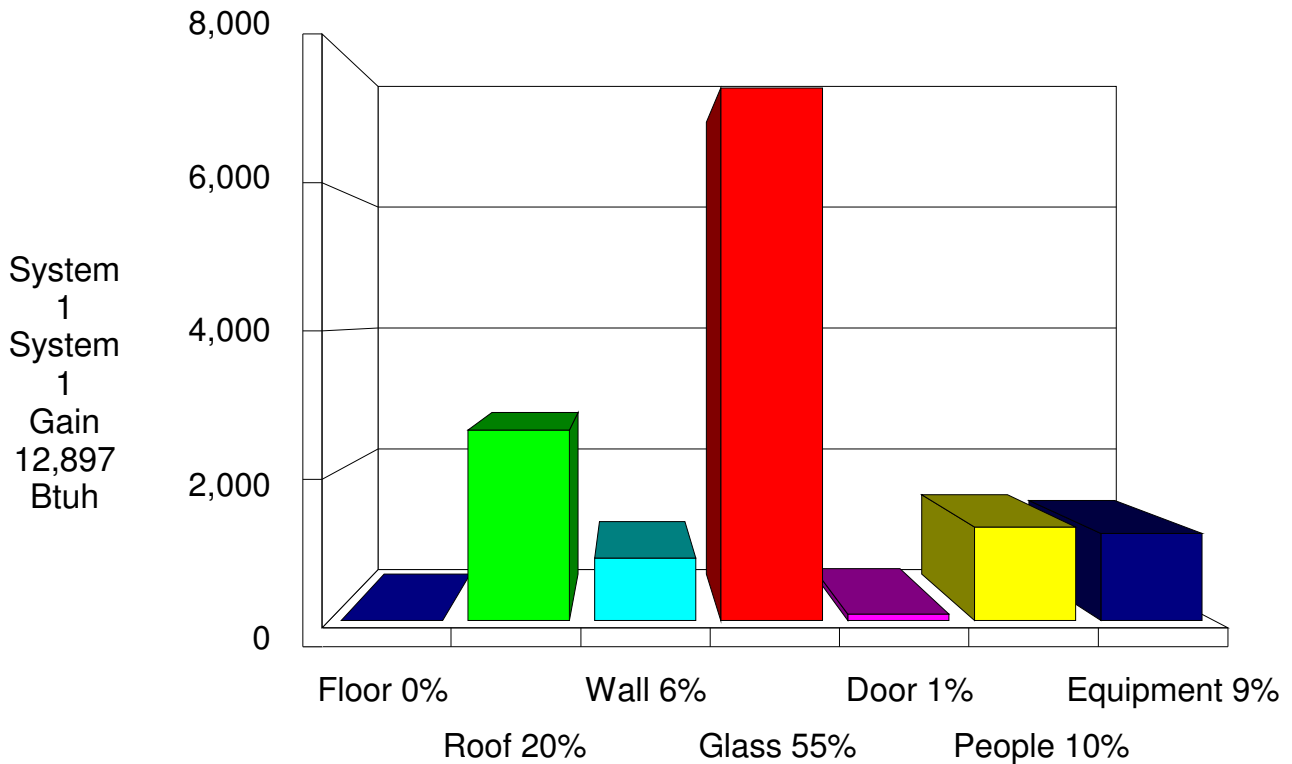
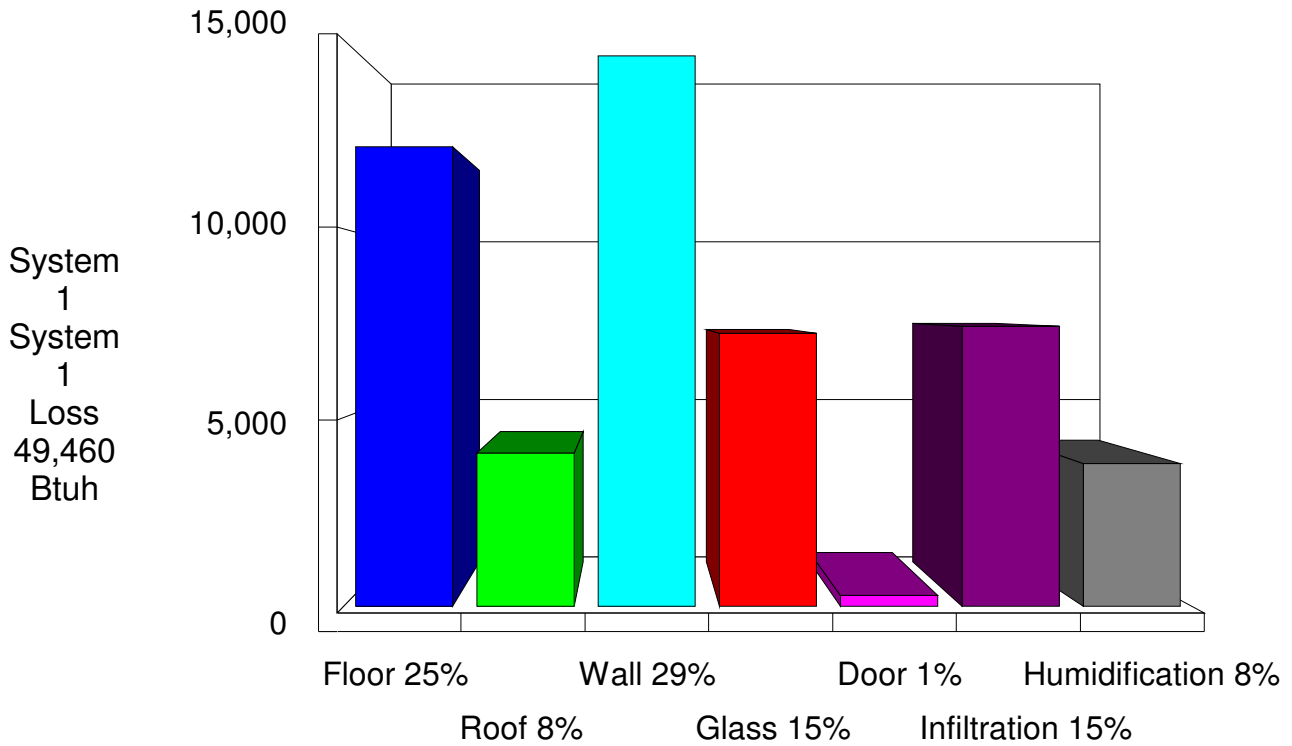


System
1
System
1
Gain
12,897
Btuh





System 1 System 1 Bar Graph





Equipment Data - System 1 - System 1

Cooling

System Type:	Standard Air Conditioner
Outdoor Model:	113AN(A,W)024-D
Indoor Model:	CNPV*3017A**+TDR
Tradename:	LEGACY RNC 13 PURON AC
Outdoor Manufacturer:	BRYANT HEATING AND COOLING SYSTEMS
AHRI Reference No.:	3251103
Nominal Capacity:	23,200 Btuh
Efficiency:	13 SEER

Heating

System Type:	Natural Gas Furnace
Model:	340AAV048080***
Tradename:	Bryant
Manufacturer:	BRYANT HEATING & COOLING SYSTEMS
Description:	Natural Gas or Propane Furnace
Capacity:	74,000 Btuh
Efficiency:	92.1 AFUE

Cooling Equipment Picture



Heating Equipment Picture





Equipment Data - System 1 - System 1 (cont'd)



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

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
vinyle Frame: Glazing-Standard 06 IRC, u-value 0.35, SHGC 0.35	290.1	7,212	0	7,338	7,338
11Q: Door-Metal - Polyurethane Core With Storm	24	290	0	90	90
R11 Draped-6: Wall-Basement, , R11 With 2x6 R19 above	513.4	2,359	0	76	76
R11 Draped-8: Wall-Basement, , R11 Draped 8' with 2x6 R19 above	588	2,129	0	0	0
12F-0bw: Wall-Frame, R-21 insulation in 2 x 6 stud cavity, no board insulation, brick finish, wood studs	1827.7	8,434	0	781	781
R11 draped-4: Wall-	373.4	1,644	0	0	0
16B-38: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Vented Attic, No Radiant Barrier, Dark Asphalt Shingles or Dark Metal, Tar and Gravel or Membrane, R-38 insulation	2193.3	4,049	0	2,624	2,624
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	1655.3	3,173	0	0	0
20P-30: Floor-Over open crawl space or garage, Passive, R-30 blanket insulation, any cover	9	22	0	2	2
22A-ph: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, heavy moist soil	93	8,967	0	0	0
Subtotals for structure:		38,279	0	10,911	10,911
People:	3		600	690	1,290
Equipment:			0	1,200	1,200
Lighting:	0			0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 115, Summer CFM: 68		7,402	-1,492	988	-504
System 1, Zone 1 Load Totals:		45,681	-892	13,789	12,897

Check Figures

Supply CFM:	780	CFM Per Square ft.:	0.178
Square ft. of Room Area:	4,385	Square ft. Per Ton:	4,080
Volume (ft ³) of Cond. Space:	40,387		

Zone Loads

Total Heating Required:	45,681 Btuh	45.681 MBH
Total Sensible Gain:	13,789 Btuh	100 %
Total Latent Gain:	-892 Btuh	0 %
Total Cooling Required:	13,789 Btuh	1.15 Tons (Based On Sensible + Latent)

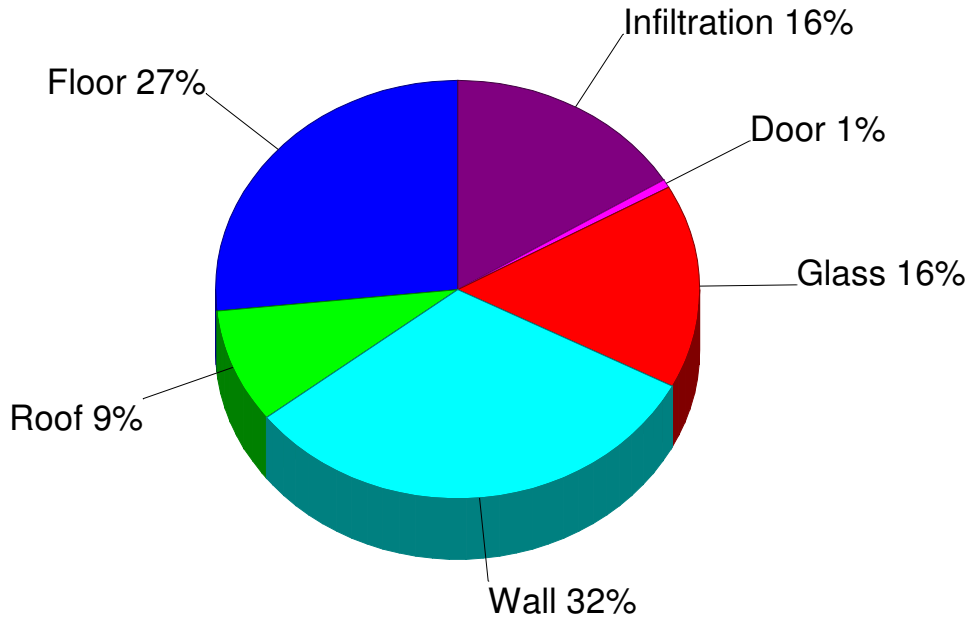
Notes

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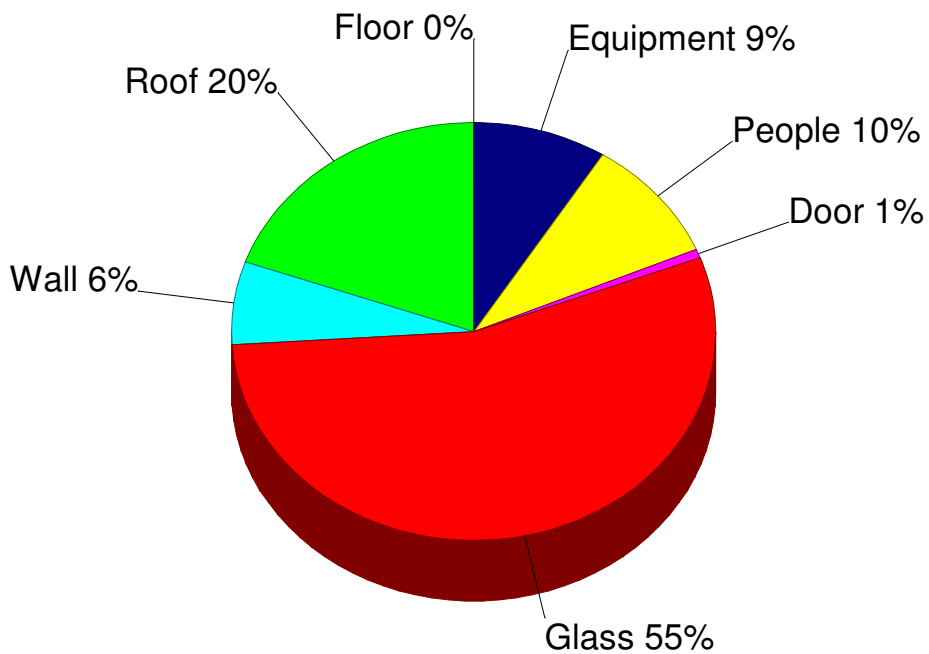


System 1, Zone 1 Pie Chart

System
1, Zone
1
Loss
45,681
Btuh

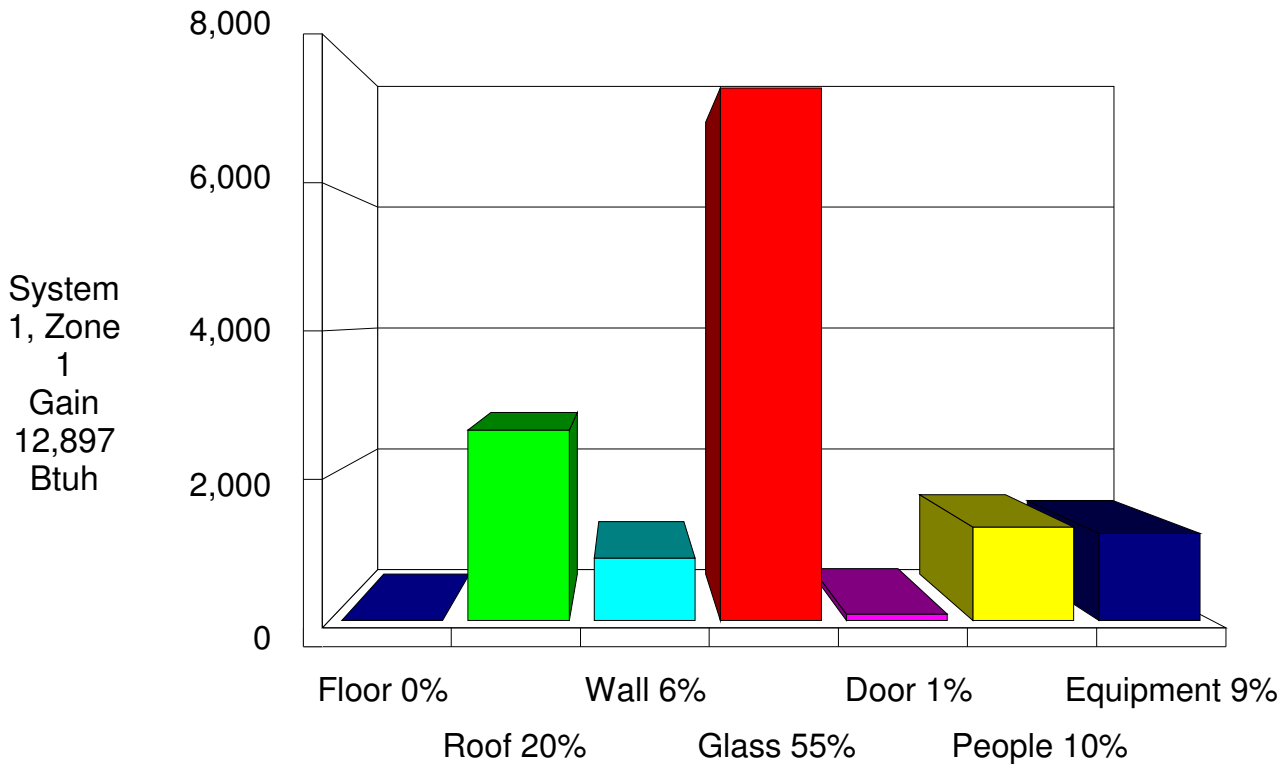
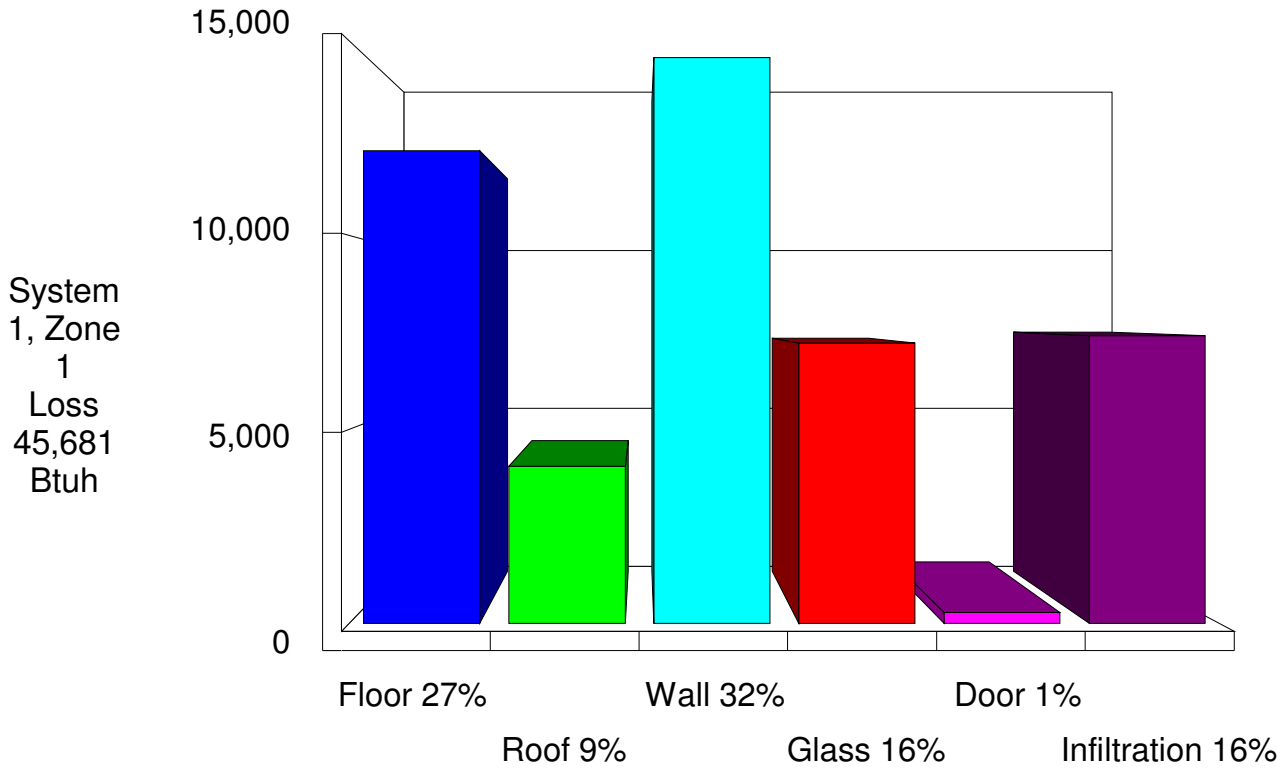


System
1, Zone
1
Gain
12,897
Btuh





System 1, Zone 1 Bar Graph





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

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1,655.3 ft.	System Number:	1
Room Width:	1.0 ft.	Zone Number:	1
Area:	1,655.0 sq.ft.	Supply Air:	152 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	0.6 AC/hr
Volume:	14,898.0 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.:	7 CFM
		Actual Summer Infil.:	4 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
S -Wall-R11 Draped-6 42.2 X 8	321.4	0.056	4.6	1,486	0.2	0	50
W -Wall-R11 Draped-8 52 X 8	416	0.051	3.6	1,506	0.0	0	0
N -Wall-R11 Draped-8 21.5 X 8	172	0.051	3.6	623	0.0	0	0
E -Wall-R11 Draped-6 26 X 8	192	0.056	4.5	873	0.1	0	26
S -Gls-vinyle Frame shgc-0.35 0%S	16	0.350	24.9	398	19.6	0	313
E -Gls-vinyle Frame shgc-0.35 0%S	16	0.350	24.9	398	38.7	0	619
Floor-21A-20 1 X 1655.3	1655.3	0.027	1.9	3,173	0.0	0	0
Subtotals for Structure:				8,457		0	1,008
Infil.: Win.: 7.0, Sum.: 4.1	136		3.293	449	0.440	-91	60
Room Totals:				8,906		-91	1,068



Detailed Room Loads - Room 2 - Great Room (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	20.7 ft.	System Number:	1
Room Width:	26.0 ft.	Zone Number:	1
Area:	537.0 sq.ft.	Supply Air:	241 CFM
Ceiling Height:	13.0 ft.	Supply Air Changes:	2.1 AC/hr
Volume:	6,986.0 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.:	33 CFM
		Actual Summer Infil.:	20 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
S -Wall-12F-0bw 20.7 X 14	226.4	0.065	4.6	1,045	0.4	0	97
E -Wall-12F-0bw 26 X 14	319	0.065	4.6	1,472	0.4	0	137
S -Gls-vinyle Frame shgc-0.35 0%S	15	0.350	24.9	373	19.5	0	293
S -Gls-vinyle Frame shgc-0.35 0%S	48	0.350	24.9	1,193	19.5	0	938
E -Gls-vinyle Frame shgc-0.35 0%S	15	0.350	24.9	373	38.7	0	580
E -Gls-vinyle Frame shgc-0.35 0%S	15	0.350	24.9	373	38.7	0	580
E -Gls-vinyle Frame shgc-0.35 0%S	15	0.350	24.9	373	38.7	0	580
UP-Ceil-16B-38 537.3 X 1	537.3	0.026	1.8	992	1.2	0	643
Subtotals for Structure:				6,194		0	3,848
Infil.: Win.: 33.5, Sum.: 19.8	653		3.295	2,153	0.439	-434	287
People: 200 lat/per, 230 sen/per:	1					200	230
Room Totals:				8,347		-234	4,365



Detailed Room Loads - Room 3 - Kitchen/Nook (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	340.0 ft.	System Number:	1
Room Width:	1.0 ft.	Zone Number:	1
Area:	340.0 sq.ft.	Supply Air:	130 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	2.6 AC/hr
Volume:	3,060.0 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.:	20 CFM
		Actual Summer Infil.:	12 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
S -Wall-12F-0bw 1 X 10	10	0.065	4.6	46	0.4	0	4
SE-Wall-12F-0bw 2 X 10	20.5	0.065	4.6	95	0.4	0	9
S -Wall-12F-0bw 4.5 X 10	29.2	0.065	4.6	135	0.4	0	13
SW-Wall-12F-0bw 1.9 X 10	19.3	0.065	4.6	89	0.4	0	8
S -Wall-12F-0bw 13.7 X 10	130.7	0.065	4.6	603	0.4	0	56
W -Wall-12F-0bw 15.5 X 10	155	0.065	4.6	715	0.4	0	66
S -Gls-vinyle Frame shgc-0.35 0%S	7.7	0.350	24.9	192	19.6	0	151
S -Gls-vinyle Frame shgc-0.35 0%S	8	0.350	24.9	199	19.5	0	156
S -Gls-vinyle Frame shgc-0.35 0%S	6	0.350	24.9	149	19.5	0	117
UP-Ceil-16B-38 340 X 1	340	0.026	1.8	628	1.2	0	407
Floor-20P-30 1 X 9	9	0.035	2.5	22	0.2	0	2
Subtotals for Structure:				2,873		0	989
Infil.: Win.: 19.8, Sum.: 11.7	386		3.295	1,273	0.440	-257	170
Equipment:						0	1,200
Room Totals:				4,146		-257	2,359



Detailed Room Loads - Room 4 - Master Bath (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	20.7 ft.	System Number:	1
Room Width:	8.0 ft.	Zone Number:	1
Area:	165.0 sq.ft.	Supply Air:	16 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	0.6 AC/hr
Volume:	1,488.0 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.:	4 CFM
		Actual Summer Infil.:	2 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
E -Wall-12F-0bw 8 X 10	80	0.065	4.6	369	0.4	0	34
UP-Ceil-16B-38 165.3 X 1	165.3	0.026	1.8	305	1.2	0	198
Subtotals for Structure:				674		0	232
Infil.: Win.: 4.1, Sum.: 2.4	80		3.300	264	0.438	-53	35
Room Totals:				938		-53	267



Detailed Room Loads - Room 5 - Master Wic (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	8.2 ft.	System Number:	1
Room Width:	8.0 ft.	Zone Number:	1
Area:	65.0 sq.ft.	Supply Air:	13 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	1.3 AC/hr
Volume:	588.0 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.:	4 CFM
		Actual Summer Infil.:	2 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
E -Wall-12F-0bw 8 X 10	80	0.065	4.6	369	0.4	0	34
UP-Ceil-16B-38 65.3 X 1	65.3	0.026	1.8	121	1.2	0	78
Subtotals for Structure:				490		0	112
Infil.: Win.: 4.1, Sum.: 2.4	80		3.300	264	0.438	-53	35
Room Totals:				754		-53	147



Detailed Room Loads - Room 6 - Master Bedroom (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	306.7 ft.	System Number:	1
Room Width:	1.0 ft.	Zone Number:	1
Area:	307.0 sq.ft.	Supply Air:	112 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	2.4 AC/hr
Volume:	2,760.0 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.:	16 CFM
		Actual Summer Infil.:	9 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-12F-0bw 20.7 X 10	156.7	0.065	4.6	723	0.4	0	67
E -Wall-12F-0bw 10 X 10	85	0.065	4.6	392	0.4	0	36
N -Gls-vinyle Frame shgc-0.35 100%S	15	0.350	24.9	373	12.4	0	186
N -Gls-vinyle Frame shgc-0.35 100%S	15	0.350	24.9	373	12.4	0	186
N -Gls-vinyle Frame shgc-0.35 100%S	20	0.350	24.9	497	12.4	0	248
E -Gls-vinyle Frame shgc-0.35 0%S	15	0.350	24.9	373	38.7	0	580
UP-Ceil-16B-38 306.7 X 1	306.7	0.026	1.8	566	1.2	0	367
Subtotals for Structure:				3,297		0	1,670
Infil.: Win.: 15.7, Sum.: 9.3	307		3.296	1,011	0.440	-204	135
People: 200 lat/per, 230 sen/per:	1					200	230
Room Totals:				4,308		-4	2,035



Detailed Room Loads - Room 7 - Entry/Hall (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	8.3 ft.	System Number:	1
Room Width:	36.5 ft.	Zone Number:	1
Area:	304.0 sq.ft.	Supply Air:	36 CFM
Ceiling Height:	12.0 ft.	Supply Air Changes:	0.6 AC/hr
Volume:	3,649.0 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.:	6 CFM
		Actual Summer Infil.:	3 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-12F-0bw 8.3 X 13	74.9	0.065	4.6	346	0.4	0	32
N -Door-11Q 3 X 8	24	0.170	12.1	290	3.7	0	90
N -Gls-vinyle Frame shgc-0.35 100%S	9.4	0.350	24.9	233	12.4	0	116
UP-Ceil-16B-38 304.2 X 1	304.2	0.026	1.8	561	1.2	0	364
Subtotals for Structure:				1,430		0	602
Infil.: Win.: 5.5, Sum.: 3.3	108		3.297	357	0.443	-72	48
Room Totals:				1,787		-72	650



Detailed Room Loads - Room 8 - Bedroom 2 (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	13.0 ft.	System Number:	1
Room Width:	15.8 ft.	Zone Number:	1
Area:	206.0 sq.ft.	Supply Air:	82 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	2.6 AC/hr
Volume:	1,852.0 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.:	15 CFM
		Actual Summer Infil.:	9 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-12F-0bw 15.8 X 10	143.3	0.065	4.6	661	0.4	0	61
N -Wall-12F-0bw 13 X 10	115	0.065	4.6	531	0.4	0	49
W -Gls-vinyle Frame shgc-0.35 0%S	15	0.350	24.9	373	38.7	0	580
N -Gls-vinyle Frame shgc-0.35 100%S	15	0.350	24.9	373	12.4	0	186
UP-Ceil-16B-38 205.8 X 1	205.8	0.026	1.8	380	1.2	0	246
Subtotals for Structure:				2,318		0	1,122
Infil.: Win.: 14.8, Sum.: 8.7	288		3.295	950	0.441	-191	127
People: 200 lat/per, 230 sen/per:	1					200	230
Room Totals:				3,268		9	1,479



Detailed Room Loads - Room 9 - Dining (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	13.0 ft.	System Number:	1
Room Width:	12.5 ft.	Zone Number:	1
Area:	163.0 sq.ft.	Supply Air:	67 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	2.8 AC/hr
Volume:	1,463.0 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.:	6 CFM
		Actual Summer Infil.:	4 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-12F-0bw 12.5 X 10	101	0.065	4.6	466	0.4	0	43
W -Gls-vinyle Frame shgc-0.35 0%S	24	0.350	24.9	596	38.7	0	929
UP-Ceil-16B-38 162.5 X 1	162.5	0.026	1.8	300	1.2	0	194
Subtotals for Structure:				1,362		0	1,166
Infil.: Win.: 6.4, Sum.: 3.8	125		3.296	412	0.440	-83	55
Room Totals:				1,774		-83	1,221



Detailed Room Loads - Room 10 - Bathroom 1 (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	13.0 ft.	System Number:	1
Room Width:	8.2 ft.	Zone Number:	1
Area:	106.0 sq.ft.	Supply Air:	14 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	0.9 AC/hr
Volume:	956.0 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.:	4 CFM
		Actual Summer Infil.:	2 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-12F-0bw 8.2 X 10	81.7	0.065	4.6	377	0.4	0	35
UP-Ceil-16B-38 106.2 X 1	106.2	0.026	1.8	196	1.2	0	127
Subtotals for Structure:				573		0	162
Infil.: Win.: 4.2, Sum.: 2.5	82		3.293	269	0.441	-54	36
Room Totals:				842		-54	198



Detailed Room Loads - Room 11 - Crawl Space (Average Load Procedure)

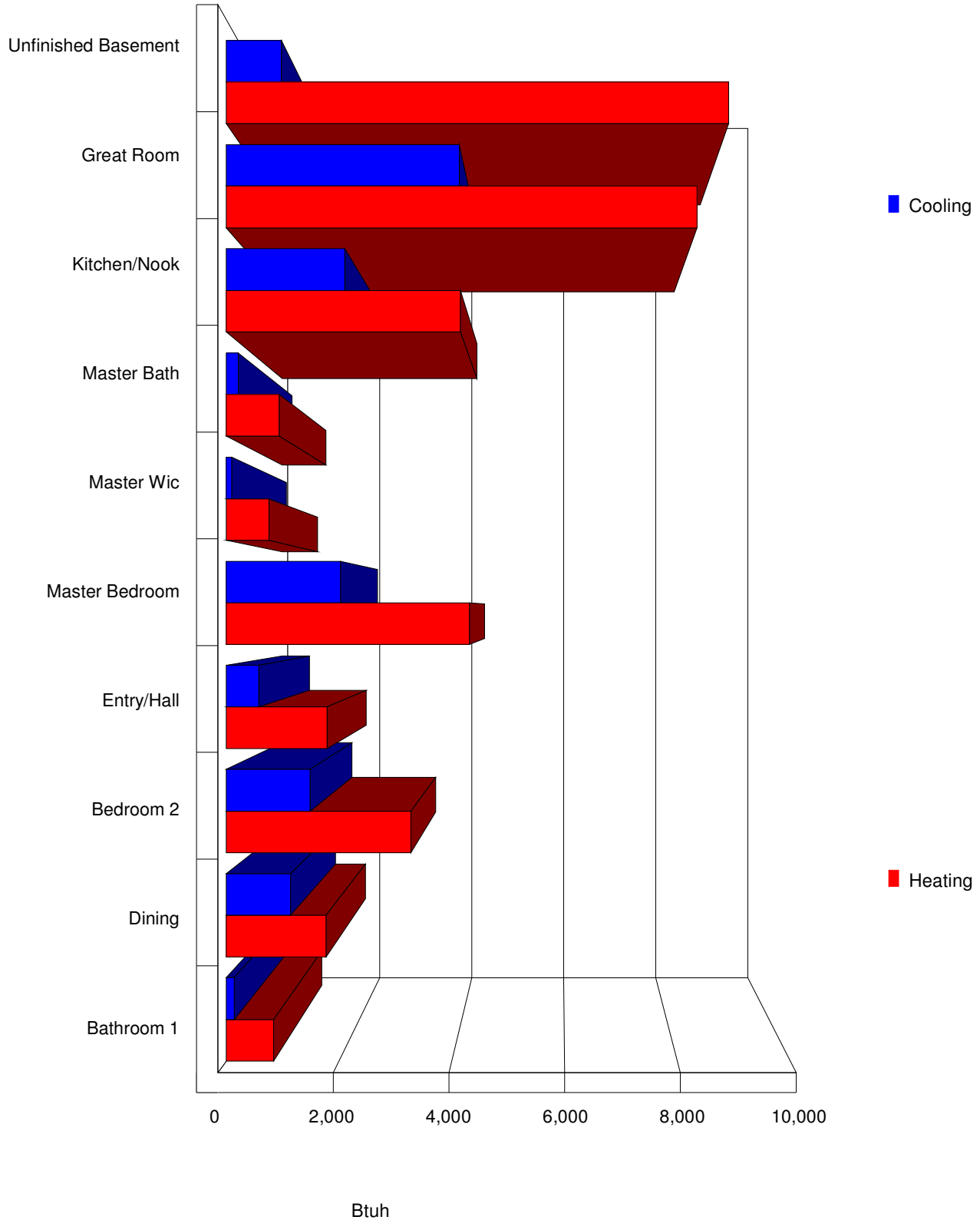
General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	20.7 ft.	System Number:	1
Room Width:	26.0 ft.	Zone Number:	1
Area:	537.0 sq.ft.	Supply Air:	181 CFM
Ceiling Height:	5.0 ft.	Supply Air Changes:	4.0 AC/hr
Volume:	2,687.0 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.:	0 CFM
		Actual Summer Infil.:	0 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
S -Wall-R11 draped-4 20.7 X 4	82.7	0.062	4.4	364	0.0	0	0
W -Wall-R11 draped-4 26 X 4	104	0.062	4.4	458	0.0	0	0
N -Wall-R11 draped-4 20.7 X 4	82.7	0.062	4.4	364	0.0	0	0
E -Wall-R11 draped-4 26 X 4	104	0.062	4.4	458	0.0	0	0
Floor-22A-ph 93 ft..Per.	93	1.358	96.4	8,967	0.0	0	0
Subtotals for Structure:				10,611		0	0
Infil.: Win.: 0.0, Sum.: 0.0	0		0	0	0	0	0
Room Totals:				10,611		0	0

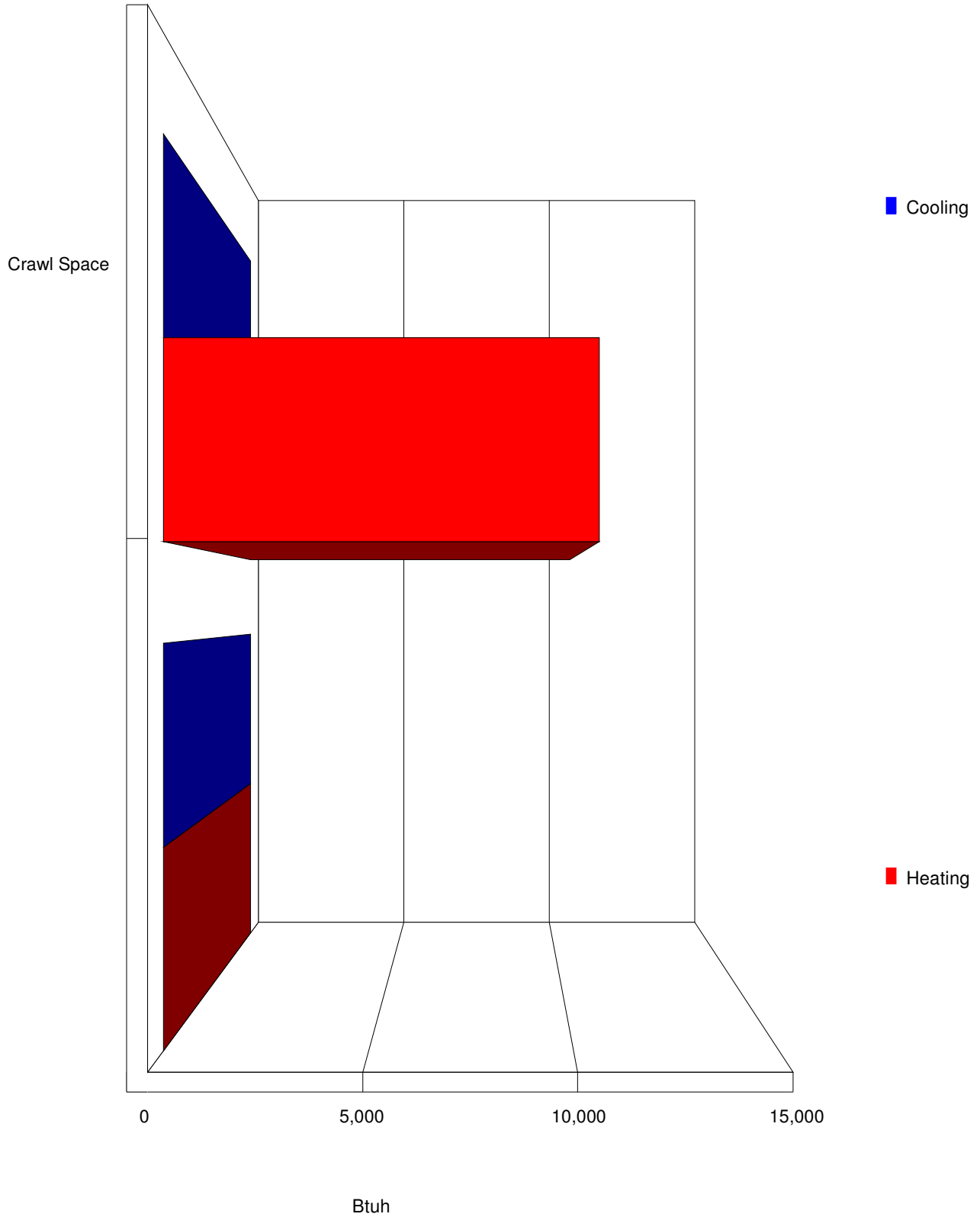


Room Cooling and Heating Loads Bar Graphs



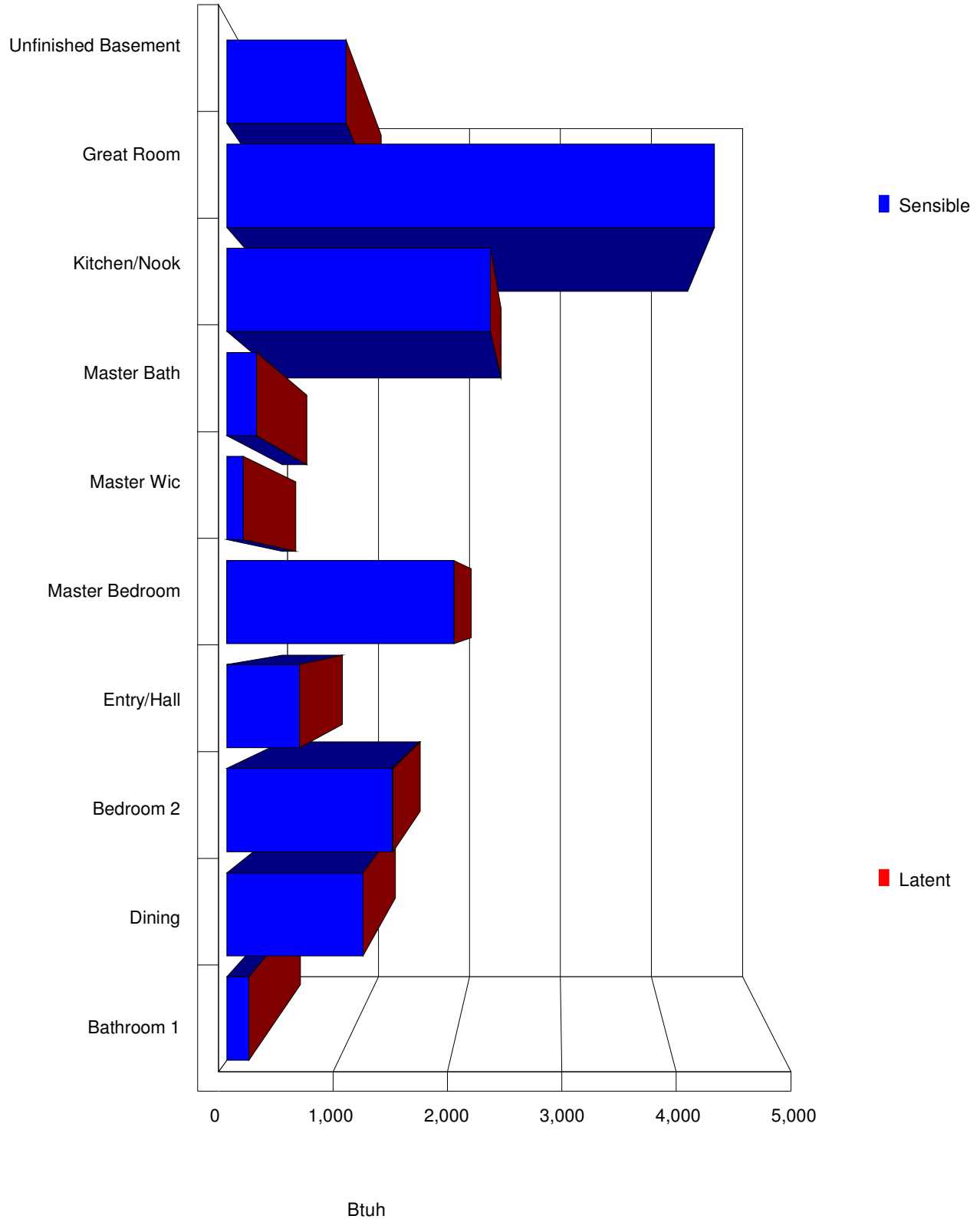


Room Cooling and Heating Loads Bar Graphs



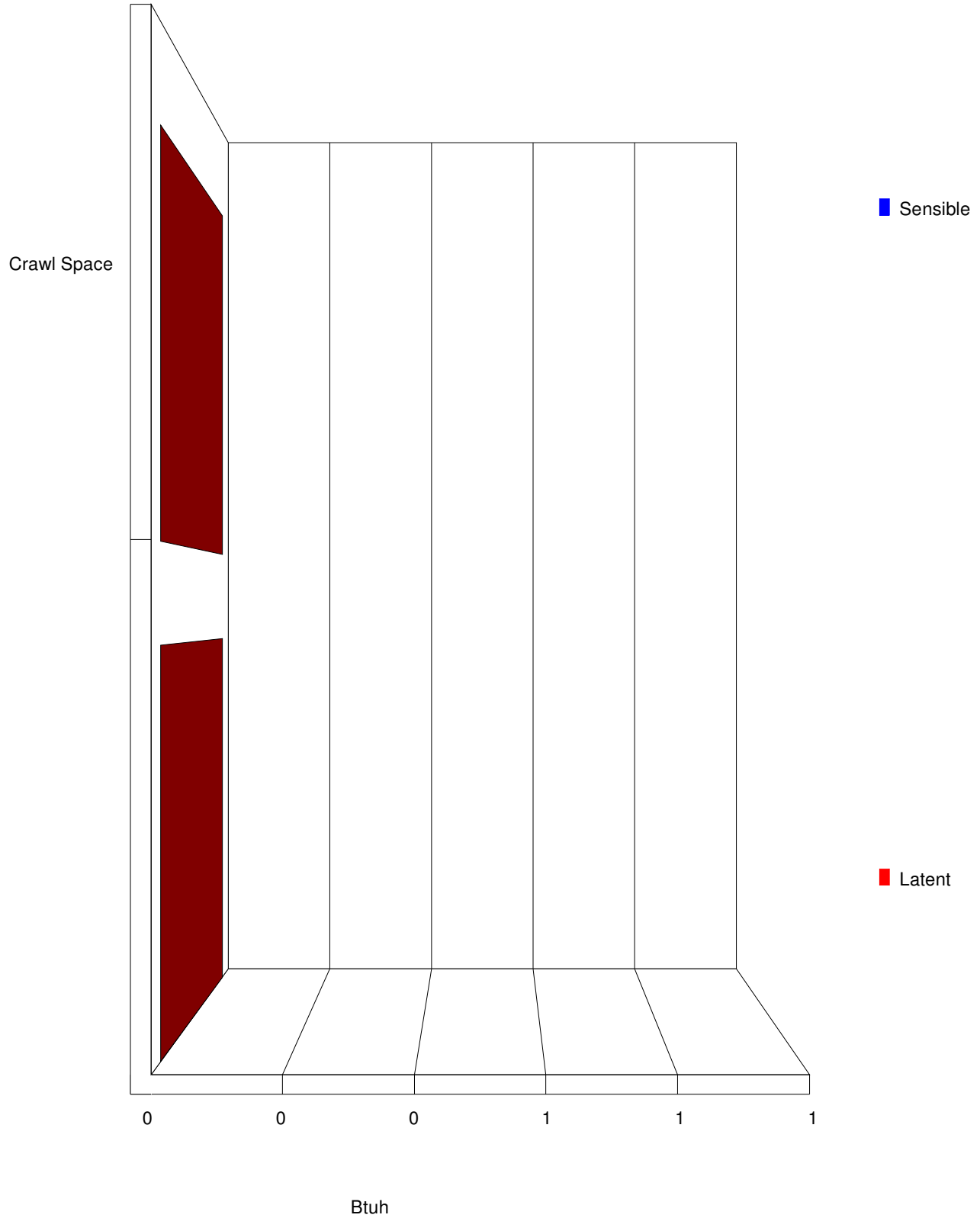


Room Cooling Loads Bar Graphs





Room Cooling Loads Bar Graphs





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---										
1	Unfinished Basement	1,655	8,906	152	6,6	-	1,068	-91	59	152
2	Great Room	537	8,347	143	6,5,5	-	4,365	-234	241	241
3	Kitchen/Nook	340	4,146	71	5,5	-	2,359	-257	130	130
4	Master Bath	165	938	16	3	-	267	-53	15	16
5	Master Wic	65	754	13	3	-	147	-53	8	13
6	Master Bedroom	307	4,308	74	5,5	-	2,035	-4	112	112
7	Entry/Hall	304	1,787	31	4	-	650	-72	36	36
8	Bedroom 2	206	3,268	56	6	-	1,479	9	82	82
9	Dining	163	1,774	30	5	-	1,221	-83	67	67
10	Bathroom 1	106	842	14	3	-	198	-54	11	14
11	Crawl Space	537	10,611	181	6,6	-	0	0	0	181
Humidification			3,779							
System 1 total		4,385	49,460	780			13,789	-892	761	780

System 1 Main Trunk Size: 15x19 in.
Velocity: 395 ft./min
Loss per 100 ft.: 0.011 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.

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	1.15	107% / -7%	13,789	-892	13,789
Actual:	1.93	85% / 15%	19,720	3,480	23,200

Equipment Data

	Heating System	Cooling System
Type:	Natural Gas Furnace	Standard Air Conditioner
Model:	340AAV048080***	113AN(A,W)024-D
Indoor Model:		CNPV*3017A**+TDR
Brand:	Bryant	LEGACY RNC 13 PURON AC
Description:	Natural Gas or Propane Furnace	
Efficiency:	92.1 AFUE	13 SEER
Sound:		
Capacity:	74,000 Btuh	23,200 Btuh
Sensible Capacity:	n/a	19,720 Btuh
Latent Capacity:	n/a	3,480 Btuh
AHRI Reference No.:	n/a	3251103



Building Rotation Report

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

Individual Rooms

Rm. No.	Room Name	0° Rot. CFM	45° Rot. CFM	90° Rot. CFM	135° Rot. CFM	180° Rot. CFM	225° Rot. CFM	270° Rot. CFM	315° Rot. CFM	High Duct Size
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System 1:

Zone 1:

1	Unfinished Basement	*152	152	152	152	152	152	152	152	2-5
2	Great Room	241	*273	260	259	218	241	242	260	3-6
3	Kitchen/Nook	130	146	*153	142	123	140	153	146	2-5
4	Master Bath	*16	16	16	16	16	16	16	16	1-4
5	Master Wic	*13	13	13	13	13	13	13	13	1-4
6	Master Bedroom	112	149	*169	167	133	160	163	145	2-5
7	Entry/Hall	36	44	*49	47	40	47	49	44	1-4
8	Bedroom 2	82	85	82	91	88	*94	88	89	1-6
9	Dining	67	53	33	53	*68	60	42	60	1-5
10	Bathroom 1	*14	14	14	14	14	14	14	14	1-4
11	Crawl Space	*181	181	181	181	181	181	181	181	2-6

* Indicates highest CFM of all rotations.

Whole Building

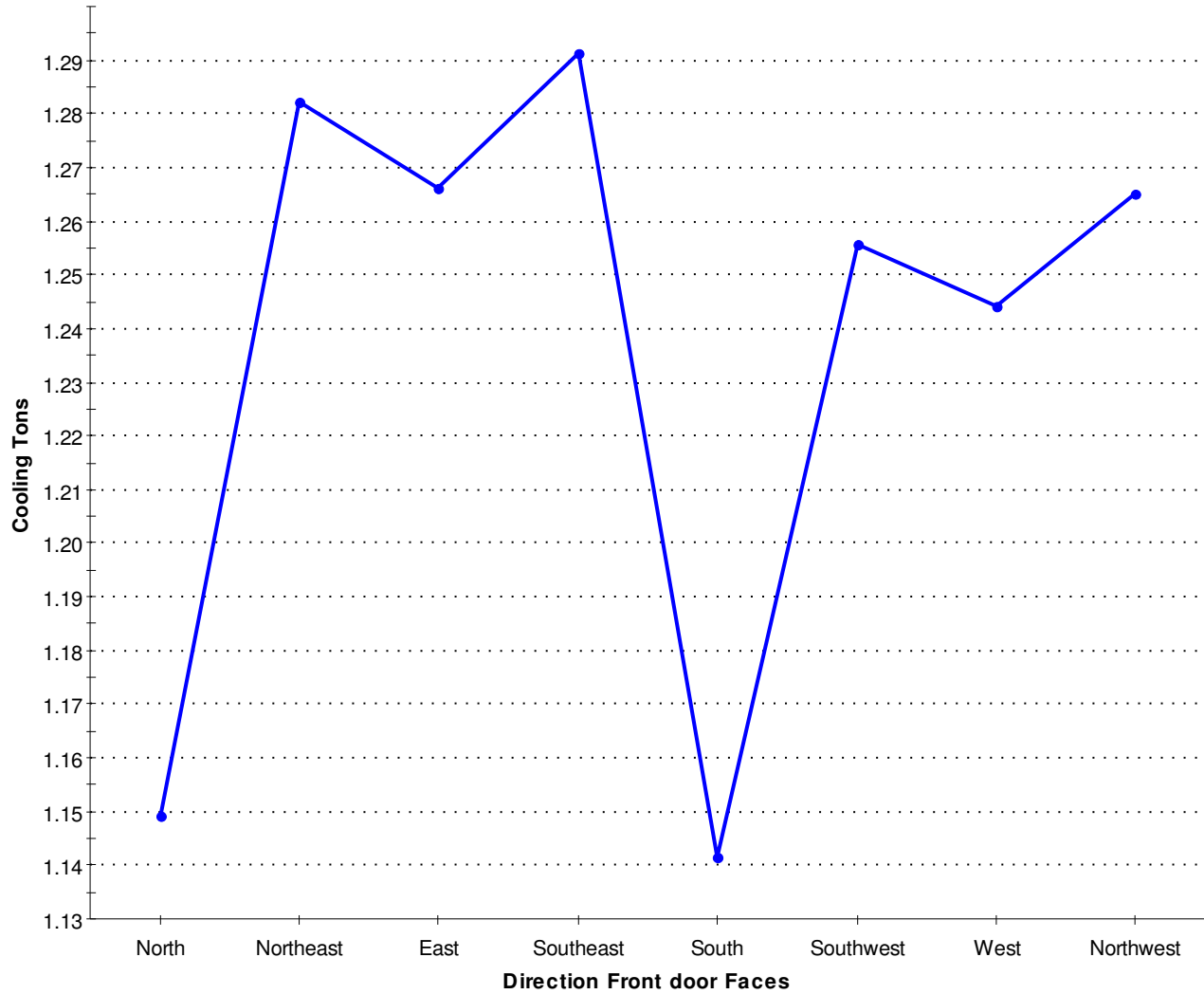
Rotation Degrees	Front door Faces	Supply CFM	Sensible Gain	Latent Gain	Net Tons
0°	North	780	13,789	*-892	1.15
45°	Northeast	849	15,385	-892	1.28
90°	East	839	15,193	-892	1.27
135°	Southeast	*855	*15,494	-892	*1.29
180°	South	780	13,698	-892	1.14
225°	Southwest	832	15,068	-892	1.26
270°	West	824	14,929	-892	1.24
315°	Northwest	838	15,183	-892	1.27

* Indicates highest value of all rotations.



Building Rotation Report (cont'd)

Building Rotation Tonnage

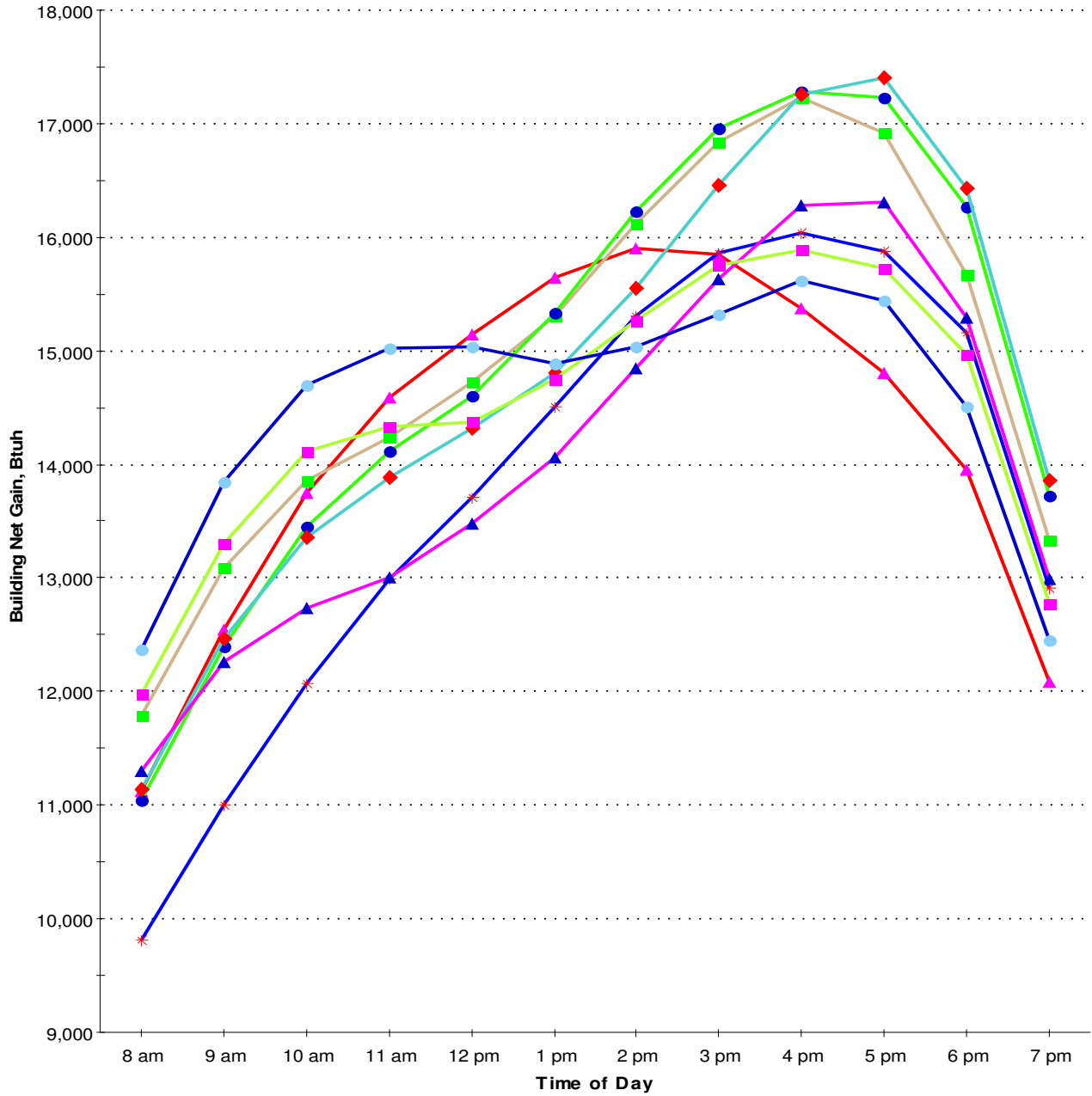


—●— Building Net Tonnage



Building Rotation Report (cont'd)

Building Rotation Hourly Net Gain



- ▲ Front door faces North
- Front door faces Northeast
- Front door faces East
- ◆ Front door faces Southeast
- ★ Front door faces South
- ▲ Front door faces Southwest
- Front door faces West
- Front door faces Northwest