

3835 Roland Ave., Baltimore, MD 21211
HVAC Load Calculations

for

Josh Hartl
3835 Roland Ave
Baltimore, MD 21211



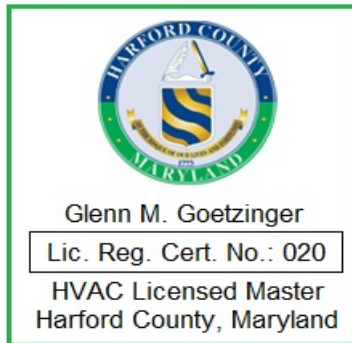
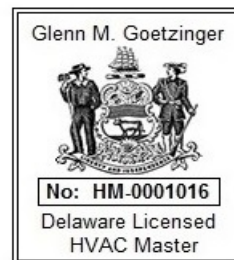
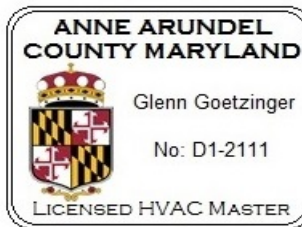
Manual J, N, D, & S Report Services!

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"PROFESSIONAL CERTIFICATION.
I hereby certify that these documents
were prepared or approved by me, and
that I am a duly licensed HVAC Master
under the laws of the State of Maryland
& Delaware."

Glenn M. Goetzinger



Prepared By:

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Correct Air Engineering
100 Waibel Road
Port Deposit, MD 21904
443-465-9218
Sunday, October 15, 2023

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

Project Report

General Project Information

Project Title: 3835 Roland Ave., Baltimore, MD 21211
 Project Date: Saturday, October 14, 2023
 Project Comment: All data to perform load calculations provided by drawings and data provided. Note: block loads provide overall building required btu's for heating and cooling only and do not provide actual cfm and btu's required for each room. Btu's and cfm's for each room can vary due to exterior exposures of N, S, E, and W, by as much as 2.83 tons in some residential cases.

Client Name: Josh Hartl
 Client Address: 3835 Roland Ave
 Client City: Baltimore, MD 21211
 Client Phone: 212-767-9553
 Client E-Mail Address: mr_hartl@yahoo.com
 Client Comment: All data to perform load calculations provided by drawings and data provided.
 Company Name: Correct Air Engineering
 Company Representative: GMG
 Company Address: 100 Waibel Road
 Company City: Port Deposit, MD 21904
 Company Phone: 443-465-9218
 Company E-Mail Address: correctairmd@gmail.com
 Company Website: www.CorrectAirMd.com
 Company Comment: This report and calculations are intended only for the project specified on this report, address changes will alter load calculations. This report is not to be reproduced or used by others without written permission by Correct Air Engineering. Unauthorized use or copying of this report is prohibited.

Design Data

Reference City: Balitmore CO, Maryland
 Building Orientation: Front door faces West
 Daily Temperature Range: Medium
 Latitude: 39 Degrees
 Elevation: 24 ft.
 Altitude Factor: 0.999

	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:	17	15.7	80%	30%	70	22.17
Summer:	89	76	56%	50%	75	50

Check Figures

Total Building Supply CFM:	1,229	CFM Per Square ft.:	0.800
Square ft. of Room Area:	1,537	Square ft. Per Ton:	503
Volume (ft ³) (Above Grade):	10,980	Air Turnover Rate (per hour):	5.9
Volume (ft ³) (Total):	12,521		

Building Loads

Total Heating Required Including Ventilation Air:	30,006 Btuh	30.006 MBH
Total Sensible Gain:	27,491 Btuh	82 %
Total Latent Gain:	5,853 Btuh	18 %
Total Cooling Required Including Ventilation Air:	33,344 Btuh	2.78 Tons (Based On Sensible + Latent)
		3.05 Tons (Based On 75% Sensible Capacity)

Notes

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Project Report (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.

Miscellaneous Report

System 1 Main Input Data	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	17	15.7	80%	30%	70	22.17
Summer:	89	76	56%	50%	75	49.90

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.

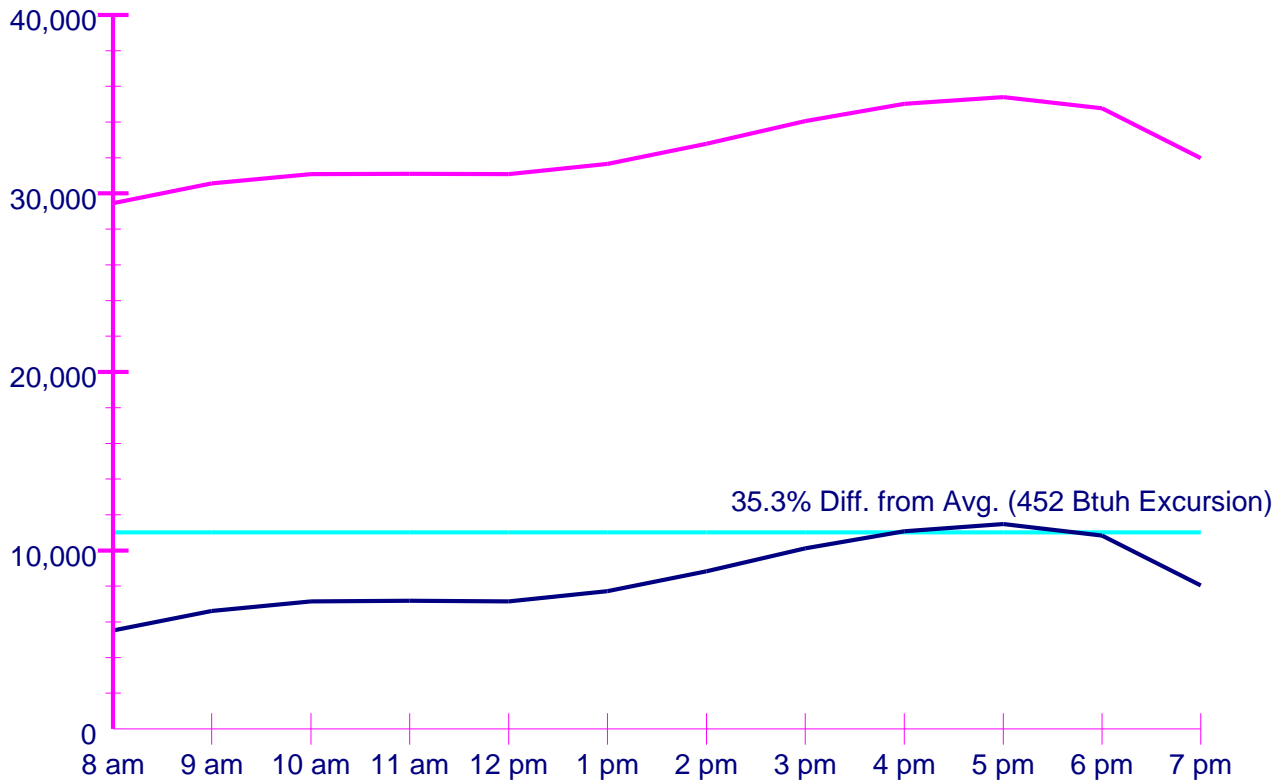
Outside Air Data

	Winter	Summer
Infiltration Specified:	0.770 AC/hr 141 CFM	0.400 AC/hr 73 CFM
Infiltration Actual:	0.752 AC/hr	0.364 AC/hr
Above Grade Volume:	X 10,980 Cu.ft. 8,256 Cu.ft./hr	X 10,980 Cu.ft. 3,996 Cu.ft./hr
	X 0.0167	X 0.0167
Total Building Infiltration:	138 CFM	67 CFM
Total Building Ventilation:	30 CFM	30 CFM

---System 1---

Infiltration & Ventilation Sensible Gain Multiplier: 15.39 = (1.10 X 0.999 X 14.00 Summer Temp. Difference)
 Infiltration & Ventilation Latent Gain Multiplier: 33.90 = (0.68 X 0.999 X 49.90 Grains Difference)
 Infiltration & Ventilation Sensible Loss Multiplier: 58.25 = (1.10 X 0.999 X 53.00 Winter Temp. Difference)
 Winter Infiltration Specified: 0.770 AC/hr (141 CFM), Construction: Semi-Loose, Fireplaces: 1, 0 CFM, Tight
 Summer Infiltration Specified: 0.400 AC/hr (73 CFM), Construction: Semi-Loose

System 1 - Main - Adequate Exposure Diversity Test



AED Calculation Summary

--- SYSTEM DOES NOT HAVE ADEQUATE EXPOSURE DIVERSITY. ---

System is on N, E, S, W rosette.

Peak load exceeds 12-hour average load by 35.3%.

AED Excursion (amount by which peak exceeds 1.3 x average): 452 Btuh

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

Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
1D-cv-o: Glazing-Double pane, operable window, clear, vinyl frame, U-value 0.57, SHGC 0.56	198.7	6,005	0	9,410	9,410
11D: Door-Wood - Solid Core, U-value 0.39	53.3	1,104	0	519	519
15B11-4w-8: Wall-Basement, , framing with R-11 sill to floor in 2 x 4 cavity, core, 3' R-4 board insulation, plus interior finish, wood studs, 8' floor depth, U-value 0.045, above grade U-value 0.071	326.7	780	0	0	0
15B11-4w-2: Wall-Basement, , framing with R-11 sill to floor in 2 x 4 cavity, core, 3' R-4 board insulation, plus interior finish, wood studs, 2' floor depth, U-value 0.053, above grade U-value 0.071	41.6	134	0	13	13
14E-10-8b: Wall-two courses brick, brick on concrete or 8 inches concrete, two courses (8 inches) brick with R-10 board insulation, U-value 0.079	2034.2	8,515	0	1,671	1,671
16B-50: 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-50 insulation, U-value 0.02	670.6	711	0	657	657
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, U-value 0.027	274	392	0	0	0
Subtotals for structure:		17,641	0	12,270	12,270
People:	6		1,200	1,380	2,580
Equipment:			1,366	10,100	11,466
Lighting:	527			1,797	1,797
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 138, Summer CFM: 67		8,015	2,256	1,024	3,280
Ventilation: Winter CFM: 30, Summer CFM: 30		1,771	1,031	468	1,498
Humidification (Winter) 7.03 gal/day :		2,579	0	0	0
AED Excursion:		0	0	452	452
Total Building Load Totals:		30,006	5,853	27,491	33,344

Check Figures

Total Building Supply CFM:	1,229	CFM Per Square ft.:	0.800
Square ft. of Room Area:	1,537	Square ft. Per Ton:	503
Volume (ft³) (Above Grade):	10,980	Air Turnover Rate (per hour):	5.9
Volume (ft³) (Total):	12,521		

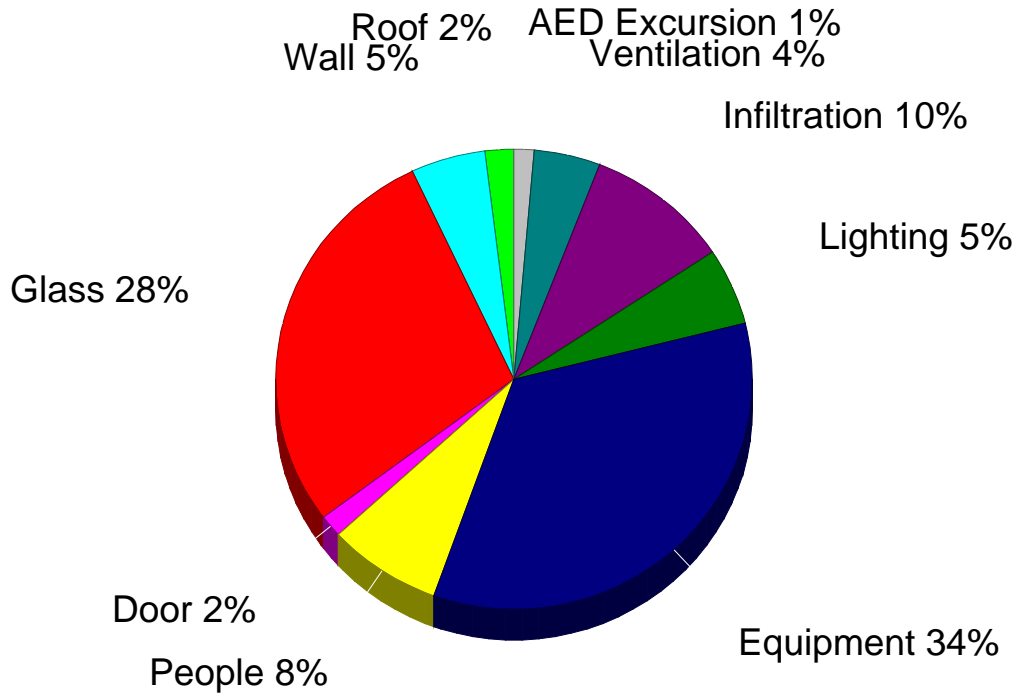
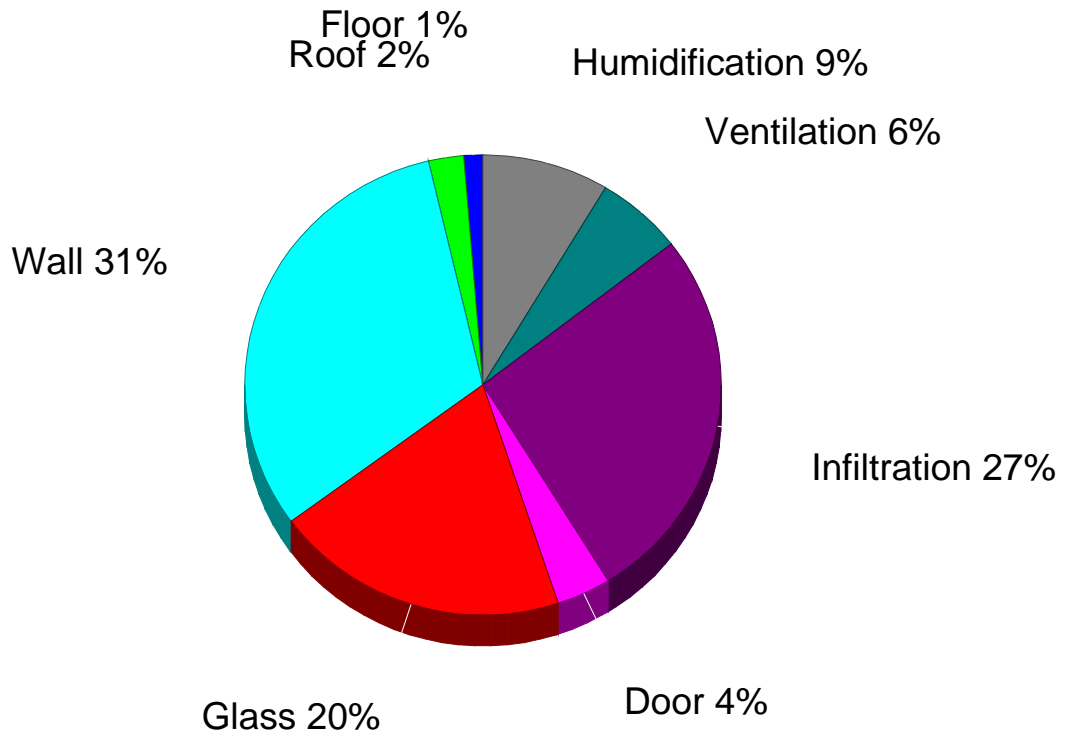
Building Loads

Total Heating Required Including Ventilation Air:	30,006 Btuh	30.006 MBH
Total Sensible Gain:	27,491 Btuh	82 %
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Total Cooling Required Including Ventilation Air:	33,344 Btuh	2.78 Tons (Based On Sensible + Latent)
		3.05 Tons (Based On 75% Sensible Capacity)

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.

Building Pie Chart



System 1 Main Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
1D-cv-o: Glazing-Double pane, operable window, clear, vinyl frame, U-value 0.57, SHGC 0.56	198.7	6,005	0	9,410	9,410
11D: Door-Wood - Solid Core, U-value 0.39	53.3	1,104	0	519	519
15B11-4w-8: Wall-Basement, , framing with R-11 sill to floor in 2 x 4 cavity, core, 3' R-4 board insulation, plus interior finish, wood studs, 8' floor depth, U-value 0.045, above grade U-value 0.071	326.7	780	0	0	0
15B11-4w-2: Wall-Basement, , framing with R-11 sill to floor in 2 x 4 cavity, core, 3' R-4 board insulation, plus interior finish, wood studs, 2' floor depth, U-value 0.053, above grade U-value 0.071	41.6	134	0	13	13
14E-10-8b: Wall-two courses brick, brick on concrete or 8 inches concrete, two courses (8 inches) brick with R-10 board insulation, U-value 0.079	2034.2	8,515	0	1,671	1,671
16B-50: 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-50 insulation, U-value 0.02	670.6	711	0	657	657
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, U-value 0.027	274	392	0	0	0
Subtotals for structure:		17,641	0	12,270	12,270
People:	6		1,200	1,380	2,580
Equipment:			1,366	10,100	11,466
Lighting:	527			1,797	1,797
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 138, Summer CFM: 67		8,015	2,256	1,024	3,280
Ventilation: Winter CFM: 30, Summer CFM: 30		1,771	1,031	468	1,498
Humidification (Winter) 7.03 gal/day :		2,579	0	0	0
AED Excursion:		0	0	452	452
System 1 Main Load Totals:		30,006	5,853	27,491	33,344

Check Figures

Supply CFM:	1,229	CFM Per Square ft.:	0.800
Square ft. of Room Area:	1,537	Square ft. Per Ton:	503
Volume (ft³) (Above Grade):	10,980	Air Turnover Rate (per hour):	5.9
Volume (ft³) (Total):	12,521		

System Loads

Total Heating Required Including Ventilation Air:	30,006 Btuh	30.006 MBH
Total Sensible Gain:	27,491 Btuh	82 %
Total Latent Gain:	5,853 Btuh	18 %
Total Cooling Required Including Ventilation Air:	33,344 Btuh	2.78 Tons (Based On Sensible + Latent)
		3.05 Tons (Based On 75% Sensible Capacity)

Notes

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Detailed Room Loads - Room 1 - Basement Master Bedroom (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	10.5 ft.	System Number:	1
Room Width:	12.0 ft.	Zone Number:	1
Area:	126.0 sq.ft.	Supply Air:	117 CFM
Ceiling Height:	6.7 ft.	Supply Air Changes:	8.3 AC/hr
Volume:	840 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	2	Actual Winter Vent.:	2 CFM
Runout Air:	58 CFM	Percent of Supply.:	1 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	3 CFM
Runout Air Velocity:	428 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	428 ft./min.	Actual Winter Infil.:	2 CFM
Actual Loss:	0.152 in.wg./100 ft.	Actual Summer Infil.:	1 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-15B11-4w-8 12 X 6.7 - Abv. grade U-value 0.071	80	0.045	2.4	191	0.0	0	0
E -Wall-15B11-4w-8 4.5 X 6.7 - Abv. grade U-value 0.071	30	0.045	2.4	72	0.0	0	0
W -Wall-15B11-4w-8 12 X 6.7 - Abv. grade U-value 0.071	80	0.045	2.4	191	0.0	0	0
E -Wall-15B11-4w-2 6 X 6.7 - Abv. grade U-value 0.071	13.1	0.053	2.9	38	0.1	0	1
E -Door-11D 2.7 X 6.7	17.8	0.390	20.7	368	9.8	0	173
E -Gls-1D-cv-o shgc-0.56 0%S	9.2	0.570	30.2	277	61.0	0	559
Floor-21A-20 12 X 10.5	126	0.027	1.4	180	0.0	0	0
Subtotals for Structure:				1,317		0	733
Infil.: Win.: 1.7, Sum.: 0.8	28		3.464	97	0.429	27	12
AED Excursion:							43
People: 200 lat/per, 230 sen/per:	2					400	460
Equipment:						0	1,218
Lighting:	30						102
Room Totals:				1,414		427	2,568

Equipment Cooling Loads

Item Name	Cont. Output Sens. Btuh	Cont. Output Lat. Btuh	Avg. In-Use Output	Pct Used /Hour	Sens. Load Btuh	Lat. Load Btuh
Color television LED 55"	1218	0	100	100	1218	0
Total					1218	0

Detailed Room Loads - Room 2 - Basement Stairs And Hallway (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	1
Area:	94.0 sq.ft.	Supply Air:	8 CFM
Ceiling Height:	6.7 ft.	Supply Air Changes:	0.8 AC/hr
Volume:	627 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	1 CFM
Runout Air:	8 CFM	Percent of Supply.:	9 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	0 CFM
Runout Air Velocity:	59 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	59 ft./min.	Actual Winter Infil.:	1 CFM
Actual Loss:	0.003 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
S -Wall-15B11-4w-8 10 X 6.7 - Abv. grade U-value 0.071	66.7	0.045	2.4	159	0.0	0	0
N -Wall-15B11-4w-8 7 X 6.7 - Abv. grade U-value 0.071	46.7	0.045	2.4	111	0.0	0	0
S -Wall-15B11-4w-2 3 X 6.7 - Abv. grade U-value 0.071	17.3	0.053	3.4	60	0.4	0	8
S -Gls-1D-cv-o shgc-0.56 0%S	2.7	0.570	30.2	81	30.4	0	81
Floor-21A-20 94 X 1	94	0.027	1.4	135	0.0	0	0
Subtotals for Structure:				546		0	89
Infil.: Win.: 0.8, Sum.: 0.4	14		3.500	49	0.429	14	6
AED Excursion:							3
Lighting:	23						78
Room Totals:				595		14	176

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

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	9.0 ft.	System Number:	1
Room Width:	6.0 ft.	Zone Number:	1
Area:	54.0 sq.ft.	Supply Air:	27 CFM
Ceiling Height:	6.7 ft.	Supply Air Changes:	4.5 AC/hr
Volume:	360 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	1 CFM
Runout Air:	27 CFM	Percent of Supply.:	2 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	1 CFM
Runout Air Velocity:	199 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	199 ft./min.	Actual Winter Infil.:	1 CFM
Actual Loss:	0.034 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-15B11-4w-8 3.5 X 6.7 - Abv. grade U-value 0.071	23.3	0.045	2.4	56	0.0	0	0
E -Wall-15B11-4w-2 3 X 6.7 - Abv. grade U-value 0.071	11.2	0.053	3.3	36	0.3	0	4
E -Gls-1D-cv-o shgc-0.56 0%S	8.8	0.570	30.2	267	61.0	0	538
Floor-21A-20 6 X 9	54	0.027	1.4	77	0.0	0	0
Subtotals for Structure:				436		0	542
Infil.: Win.: 0.8, Sum.: 0.4	14		3.500	49	0.429	14	6
AED Excursion:							10
Lighting:	11						38
Room Totals:				485		14	595

Detailed Room Loads - Room 4 - 1st Flr Foyer (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	n/a	System Number:	1
Room Width:	n/a	Zone Number:	1
Area:	19.2 sq.ft.	Supply Air:	23 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	7.9 AC/hr
Volume:	173 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	2 CFM
Runout Air:	23 CFM	Percent of Supply.:	10 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	1 CFM
Runout Air Velocity:	167 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	167 ft./min.	Actual Winter Infil.:	12 CFM
Actual Loss:	0.024 in.wg./100 ft.	Actual Summer Infil.:	6 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
S -Wall-14E-10-8b 19.2 X 9	172.8	0.079	4.2	724	0.8	0	142
W -Wall-14E-10-8b 4 X 9	18.2	0.079	4.2	76	0.8	0	15
W -Door-11D 2.7 X 6.7	17.8	0.390	20.7	368	9.8	0	173
Subtotals for Structure:				1,168		0	330
Infil.: Win.: 12.5, Sum.: 6.0	209		3.477	726	0.445	205	93
AED Excursion:							8
Lighting:	20						68
Room Totals:				1,894		205	500

Detailed Room Loads - Room 5 - 1st Flr Dining Rm (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	10.2 ft.	System Number:	1
Room Width:	12.7 ft.	Zone Number:	1
Area:	128.8 sq.ft.	Supply Air:	109 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	5.7 AC/hr
Volume:	1,159 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	3 CFM
Runout Air:	109 CFM	Percent of Supply.:	3 %
Runout Duct Size:	6 in.	Actual Summer Vent.:	3 CFM
Runout Air Velocity:	557 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	557 ft./min.	Actual Winter Infil.:	12 CFM
Actual Loss:	0.198 in.wg./100 ft.	Actual Summer Infil.:	6 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14E-10-8b 12.7 X 9	114	0.079	4.2	477	0.8	0	94
W -Wall-14E-10-8b 10.2 X 9	59	0.079	4.2	247	0.8	0	48
W -Gls-1D-cv-o shgc-0.56 0%S (2)	32.5	0.570	30.2	982	60.9	0	1,980
Subtotals for Structure:				1,706		0	2,122
Infil.: Win.: 12.3, Sum.: 5.9	206		3.479	715	0.443	201	91
AED Excursion:							40
Lighting:	44						150
Room Totals:				2,421		201	2,403

Detailed Room Loads - Room 6 - 1st Flr Hall To Dining Rm (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	6.5 ft.	System Number:	1
Room Width:	4.0 ft.	Zone Number:	1
Area:	26.0 sq.ft.	Supply Air:	5 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	1.3 AC/hr
Volume:	234 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	1 CFM
Runout Air:	5 CFM	Percent of Supply.:	11 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	0 CFM
Runout Air Velocity:	37 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	37 ft./min.	Actual Winter Infil.:	3 CFM
Actual Loss:	0.001 in.wg./100 ft.	Actual Summer Infil.:	2 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14E-10-8b 6.5 X 9	58.5	0.079	4.2	245	0.8	0	48
Subtotals for Structure:				245		0	48
Infil.: Win.: 3.5, Sum.: 1.7	59		3.487	204	0.444	57	26
AED Excursion:							2
Lighting:	10						34
Room Totals:				449		57	110

Detailed Room Loads - Room 7 - 1st Flr Living Room (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	14.0 ft.	System Number:	1
Room Width:	12.3 ft.	Zone Number:	1
Area:	171.5 sq.ft.	Supply Air:	24 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	0.9 AC/hr
Volume:	1,544 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	2 CFM
Runout Air:	24 CFM	Percent of Supply.:	8 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	1 CFM
Runout Air Velocity:	178 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	178 ft./min.	Actual Winter Infil.:	13 CFM
Actual Loss:	0.028 in.wg./100 ft.	Actual Summer Infil.:	6 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14E-10-8b 12.2 X 9	110.2	0.079	4.2	462	0.8	0	91
S -Wall-14E-10-8b 12.2 X 9	110.2	0.079	4.2	462	0.8	0	91
Subtotals for Structure:				924		0	182
Infil.: Win.: 13.2, Sum.: 6.4	221		3.478	767	0.444	216	98
AED Excursion:							9
Lighting:	72						246
Room Totals:				1,691		216	534

Detailed Room Loads - Room 8 - 1st Flr Bath & Stairs Hall (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	11.8 ft.	System Number:	1
Room Width:	8.0 ft.	Zone Number:	1
Area:	94.0 sq.ft.	Supply Air:	23 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	1.7 AC/hr
Volume:	846 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	2 CFM
Runout Air:	23 CFM	Percent of Supply.:	7 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	1 CFM
Runout Air Velocity:	172 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	172 ft./min.	Actual Winter Infil.:	9 CFM
Actual Loss:	0.026 in.wg./100 ft.	Actual Summer Infil.:	4 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14E-10-8b 8 X 9	63.2	0.079	4.2	264	0.8	0	52
S -Wall-14E-10-8b 8 X 9	72	0.079	4.2	301	0.8	0	59
N -Gls-1D-cv-o shgc-0.56 100%S	8.8	0.570	30.2	267	18.9	0	167
Subtotals for Structure:				832		0	278
Infil.: Win.: 8.6, Sum.: 4.2	144		3.479	501	0.444	141	64
AED Excursion:							9
Lighting:	48						164
Room Totals:				1,333		141	514

Detailed Room Loads - Room 9 - 1st Flr Kitchen (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	11.8 ft.	System Number:	1
Room Width:	13.0 ft.	Zone Number:	1
Area:	152.8 sq.ft.	Supply Air:	235 CFM
Ceiling Height:	9.0 ft.	Supply Air Changes:	10.3 AC/hr
Volume:	1,375 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	3	Actual Winter Vent.:	4 CFM
Runout Air:	78 CFM	Percent of Supply.:	2 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	6 CFM
Runout Air Velocity:	575 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	575 ft./min.	Actual Winter Infil.:	20 CFM
Actual Loss:	0.272 in.wg./100 ft.	Actual Summer Infil.:	10 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14E-10-8b 13 X 9	104.5	0.079	4.2	438	0.8	0	86
S -Wall-14E-10-8b 13 X 9	117	0.079	4.2	490	0.8	0	96
E -Wall-14E-10-8b 11.8 X 9	75.5	0.079	4.2	316	0.8	0	62
E -Door-11D 2.7 X 6.7	17.8	0.390	20.7	368	9.8	0	173
N -Gls-1D-cv-o shgc-0.56 100%S	12.5	0.570	30.2	378	18.9	0	236
E -Gls-1D-cv-o shgc-0.56 0%S	12.5	0.570	30.2	378	61.0	0	762
Subtotals for Structure:				2,368		0	1,415
Infil.: Win.: 20.3, Sum.: 9.8	340		3.479	1,182	0.444	333	151
AED Excursion:							87
Equipment:						683	3,217
Lighting:	88						300
Room Totals:				3,550		1,016	5,170

Equipment Cooling Loads

Item Name	Cont. Output Sens. Btuh	Cont. Output Lat. Btuh	Avg. In-Use Output	Pct Used /Hour	Sens. Load Btuh	Lat. Load Btuh
Cooking range with hood - four burners on high heat	0	0	100	100	0	0
Dishwasher	4096	1433	100	25	1024	358
Microwave	4949	1732	75	25	928	325
Refrigerator or freezer - 22 cubic feet	1265	0	100	100	1265	0
Total					3217	683

Detailed Room Loads - Room 10 - 2nd Flr Master Bed Rm (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	14.0 ft.	System Number:	1
Room Width:	12.7 ft.	Zone Number:	1
Area:	177.3 sq.ft.	Supply Air:	246 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	10.4 AC/hr
Volume:	1,419 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	3	Actual Winter Vent.:	5 CFM
Runout Air:	82 CFM	Percent of Supply.:	2 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	6 CFM
Runout Air Velocity:	602 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	602 ft./min.	Actual Winter Infil.:	19 CFM
Actual Loss:	0.298 in.wg./100 ft.	Actual Summer Infil.:	9 CFM

Item Description	Area Quantity	-U-Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14E-10-8b 12.7 X 8	101.3	0.079	4.2	424	0.8	0	83
S -Wall-14E-10-8b 12.7 X 8	101.3	0.079	4.2	424	0.8	0	83
W -Wall-14E-10-8b 14 X 8	63.2	0.079	4.2	265	0.8	0	52
W -Gls-1D-cv-o shgc-0.56 0%S (3)	48.8	0.570	30.2	1,473	60.9	0	2,970
UP-Ceil-16B-50 14 X 12.7	177.3	0.020	1.1	188	1.0	0	174
Subtotals for Structure:				2,774		0	3,362
Infil.: Win.: 18.8, Sum.: 9.1	315		3.480	1,095	0.445	308	140
AED Excursion:							91
People: 200 lat/per, 230 sen/per:	2					400	460
Equipment:						0	1,218
Lighting:	42						143
Room Totals:				3,869		708	5,414

Equipment Cooling Loads

Item Name	Cont. Output Sens. Btuh	Cont. Output Lat. Btuh	Avg. In-Use Output	Pct Used /Hour	Sens. Load Btuh	Lat. Load Btuh
Color television LED 55"	1218	0	100	100	1218	0
Total					1218	0

Detailed Room Loads - Room 11 - 2nd Flr Hallway (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	30.4 ft.	System Number:	1
Room Width:	3.5 ft.	Zone Number:	1
Area:	106.5 sq.ft.	Supply Air:	23 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	1.6 AC/hr
Volume:	852 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	2 CFM
Runout Air:	23 CFM	Percent of Supply.:	10 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	1 CFM
Runout Air Velocity:	170 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	170 ft./min.	Actual Winter Infil.:	15 CFM
Actual Loss:	0.025 in.wg./100 ft.	Actual Summer Infil.:	7 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
S -Wall-14E-10-8b 30.5 X 8	244	0.079	4.2	1,022	0.8	0	200
UP-Ceil-16B-50 30.4 X 3.5	106.5	0.020	1.1	113	1.0	0	104
Subtotals for Structure:				1,135		0	304
Infil.: Win.: 14.6, Sum.: 7.1	244		3.480	849	0.447	239	109
AED Excursion:							9
Lighting:	26						89
Room Totals:				1,984		239	510

Detailed Room Loads - Room 12 - 2nd Flr Stairwell (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	6.0 ft.	System Number:	1
Room Width:	10.5 ft.	Zone Number:	1
Area:	63.0 sq.ft.	Supply Air:	8 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	1.0 AC/hr
Volume:	504 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	1 CFM
Runout Air:	8 CFM	Percent of Supply.:	6 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	0 CFM
Runout Air Velocity:	60 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	60 ft./min.	Actual Winter Infil.:	3 CFM
Actual Loss:	0.003 in.wg./100 ft.	Actual Summer Infil.:	1 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14E-10-8b 6 X 8	48	0.079	4.2	201	0.8	0	39
UP-Ceil-16B-50 6 X 10.5	63	0.020	1.1	67	1.0	0	62
Subtotals for Structure:				268		0	101
Infil.: Win.: 2.9, Sum.: 1.4	48		3.479	167	0.438	47	21
AED Excursion:							3
Lighting:	16						55
Room Totals:				435		47	180

Detailed Room Loads - Room 13 - 2nd Flr Bedroom Center (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	10.1 ft.	System Number:	1
Room Width:	12.3 ft.	Zone Number:	1
Area:	123.5 sq.ft.	Supply Air:	72 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	4.4 AC/hr
Volume:	988 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	2 CFM
Runout Air:	72 CFM	Percent of Supply.:	3 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	2 CFM
Runout Air Velocity:	531 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	531 ft./min.	Actual Winter Infil.:	8 CFM
Actual Loss:	0.233 in.wg./100 ft.	Actual Summer Infil.:	4 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14E-10-8b 12.2 X 8	98	0.079	4.2	410	0.8	0	81
N -Wall-14E-10-8b 4 X 8	12.5	0.079	4.2	52	0.8	0	10
N -Gls-1D-cv-o shgc-0.56 100%S	19.5	0.570	30.2	589	18.9	0	368
UP-Ceil-16B-50 10.1 X 12.2	123.5	0.020	1.1	131	1.0	0	121
Subtotals for Structure:				1,182		0	580
Infil.: Win.: 7.8, Sum.: 3.8	130		3.477	452	0.446	127	58
AED Excursion:							27
People: 200 lat/per, 230 sen/per:	1					200	230
Equipment:						0	615
Lighting:	24						82
Room Totals:				1,634		327	1,591

Equipment Cooling Loads

Item Name	Cont. Output Sens. Btuh	Cont. Output Lat. Btuh	Avg. In-Use Output	Pct Used /Hour	Sens. Load Btuh	Lat. Load Btuh
Color television LCD 45"	615	0	100	100	615	0
Total					615	0

Detailed Room Loads - Room 14 - 2nd Flr Bathroom (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	7.0 ft.	System Number:	1
Room Width:	5.0 ft.	Zone Number:	1
Area:	35.0 sq.ft.	Supply Air:	14 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	3.0 AC/hr
Volume:	280 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	1 CFM
Runout Air:	14 CFM	Percent of Supply.:	5 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	0 CFM
Runout Air Velocity:	104 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	104 ft./min.	Actual Winter Infil.:	2 CFM
Actual Loss:	0.010 in.wg./100 ft.	Actual Summer Infil.:	1 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14E-10-8b 5 X 8	31.2	0.079	4.2	130	0.8	0	26
N -Gls-1D-cv-o shgc-0.56 100%S	8.8	0.570	30.2	267	18.9	0	167
UP-Ceil-16B-50 7 X 5	35	0.020	1.1	37	1.0	0	34
Subtotals for Structure:				434		0	227
Infil.: Win.: 2.4, Sum.: 1.2	40		3.475	139	0.450	39	18
AED Excursion:							5
Lighting:	18						61
Room Totals:				573		39	312

Detailed Room Loads - Room 15 - 2nd Flr Kitchen (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	8.5 ft.	System Number:	1
Room Width:	7.0 ft.	Zone Number:	1
Area:	59.5 sq.ft.	Supply Air:	171 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	21.5 AC/hr
Volume:	476 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	2	Actual Winter Vent.:	1 CFM
Runout Air:	85 CFM	Percent of Supply.:	1 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	4 CFM
Runout Air Velocity:	626 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	626 ft./min.	Actual Winter Infil.:	3 CFM
Actual Loss:	0.322 in.wg./100 ft.	Actual Summer Infil.:	2 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14E-10-8b 7 X 8	43.5	0.079	4.2	182	0.8	0	36
N -Gls-1D-cv-o shgc-0.56 100%S	12.5	0.570	30.2	378	18.9	0	236
UP-Ceil-16B-50 8.5 X 7	59.5	0.020	1.1	63	1.0	0	58
Subtotals for Structure:				623		0	330
Infil.: Win.: 3.3, Sum.: 1.6	56		3.482	195	0.446	55	25
AED Excursion:							63
Equipment:						683	3,217
Lighting:	34						116
Room Totals:				818		738	3,751

Equipment Cooling Loads

Item Name	Cont. Output Sens. Btuh	Cont. Output Lat. Btuh	Avg. In-Use Output	Pct Used /Hour	Sens. Load Btuh	Lat. Load Btuh
Cooking range with hood - four burners on high heat	0	0	100	100	0	0
Microwave	4949	1732	75	25	928	325
Dishwasher	4096	1433	100	25	1024	358
Refrigerator or freezer - 22 cubic feet	1265	0	100	100	1265	0
Total					3217	683

Detailed Room Loads - Room 16 - 2nd Flr Bedroom Rear (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	9.0 ft.	System Number:	1
Room Width:	11.8 ft.	Zone Number:	1
Area:	105.8 sq.ft.	Supply Air:	123 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	8.7 AC/hr
Volume:	846 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	2	Actual Winter Vent.:	3 CFM
Runout Air:	61 CFM	Percent of Supply.:	2 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	3 CFM
Runout Air Velocity:	450 ft./min.	Percent of Supply:	2 %
Runout Air Velocity:	450 ft./min.	Actual Winter Infil.:	14 CFM
Actual Loss:	0.167 in.wg./100 ft.	Actual Summer Infil.:	7 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
N -Wall-14E-10-8b 9 X 8	72	0.079	4.2	301	0.8	0	59
S -Wall-14E-10-8b 9 X 8	72	0.079	4.2	301	0.8	0	59
E -Wall-14E-10-8b 11.8 X 8	71.9	0.079	4.2	301	0.8	0	59
E -Gls-1D-cv-o shgc-0.56 0%S (2)	22.1	0.570	30.2	668	60.9	0	1,346
UP-Ceil-16B-50 9 X 11.8	105.8	0.020	1.1	112	1.0	0	104
Subtotals for Structure:				1,683		0	1,627
Infil.: Win.: 14.2, Sum.: 6.9	238		3.479	828	0.445	233	106
AED Excursion:							45
People: 200 lat/per, 230 sen/per:	1					200	230
Equipment:						0	615
Lighting:	21						72
Room Totals:				2,511		433	2,695

Equipment Cooling Loads

Item Name	Cont. Output Sens. Btuh	Cont. Output Lat. Btuh	Avg. In-Use Output	Pct Used /Hour	Sens. Load Btuh	Lat. Load Btuh
Color television LCD 45"	615	0	100	100	615	0
Total					615	0

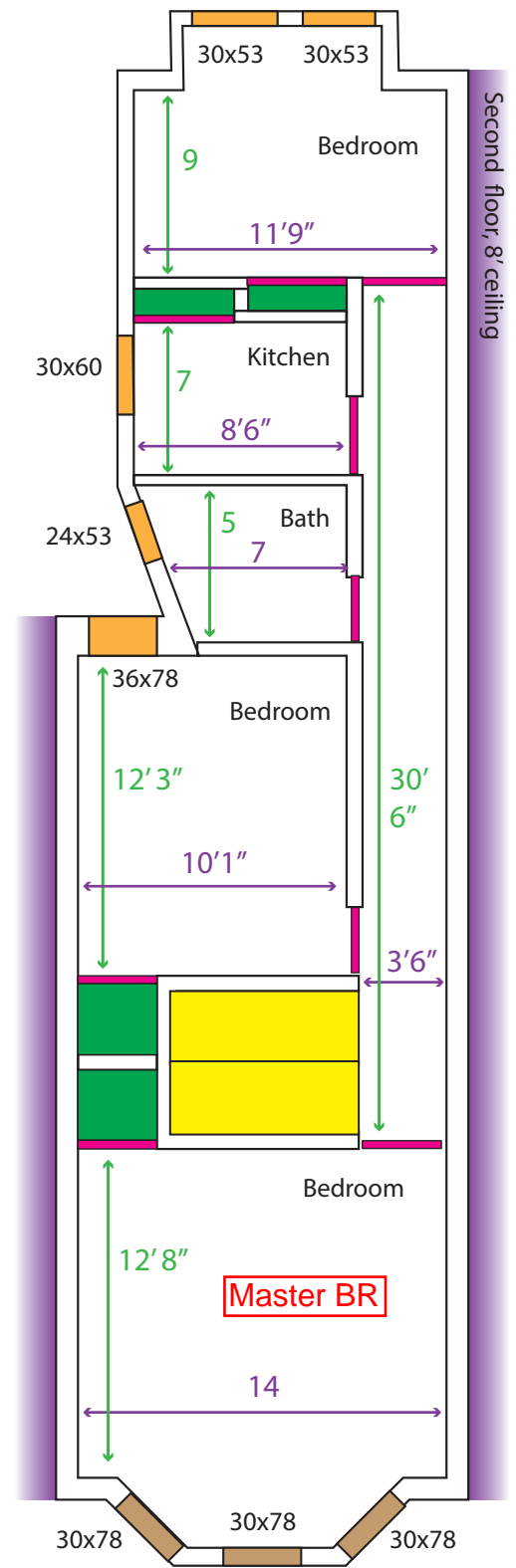
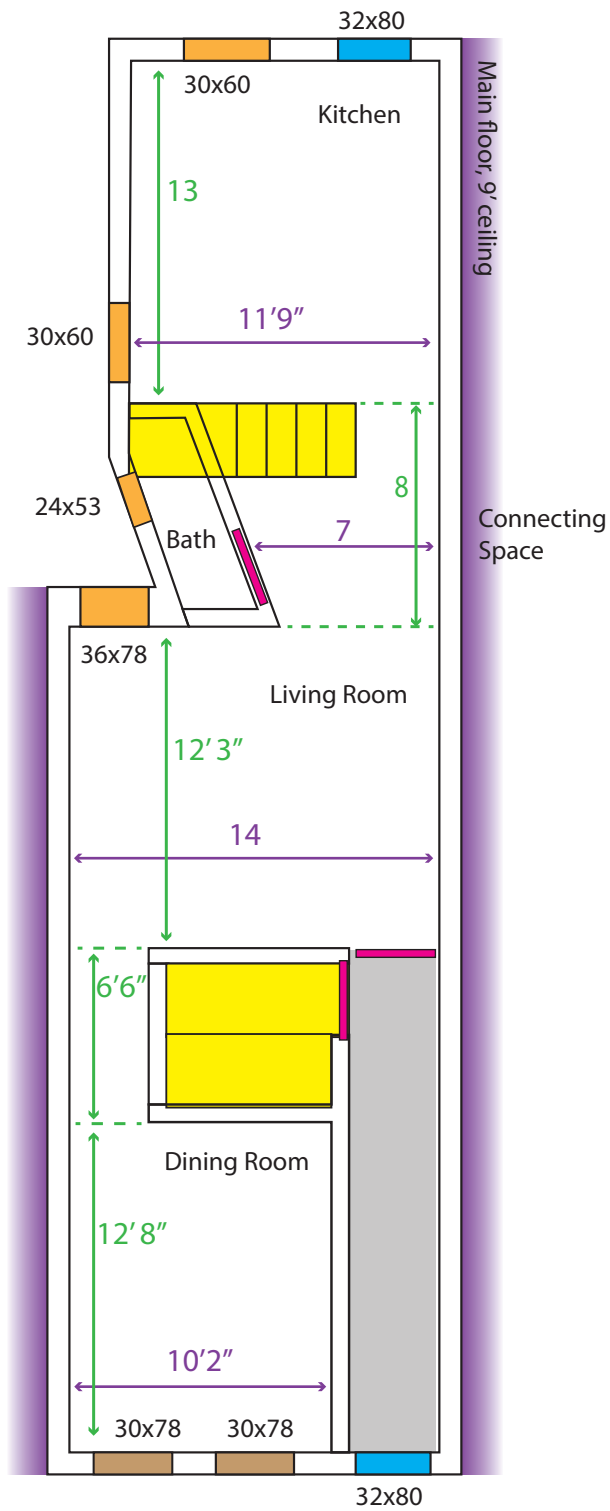
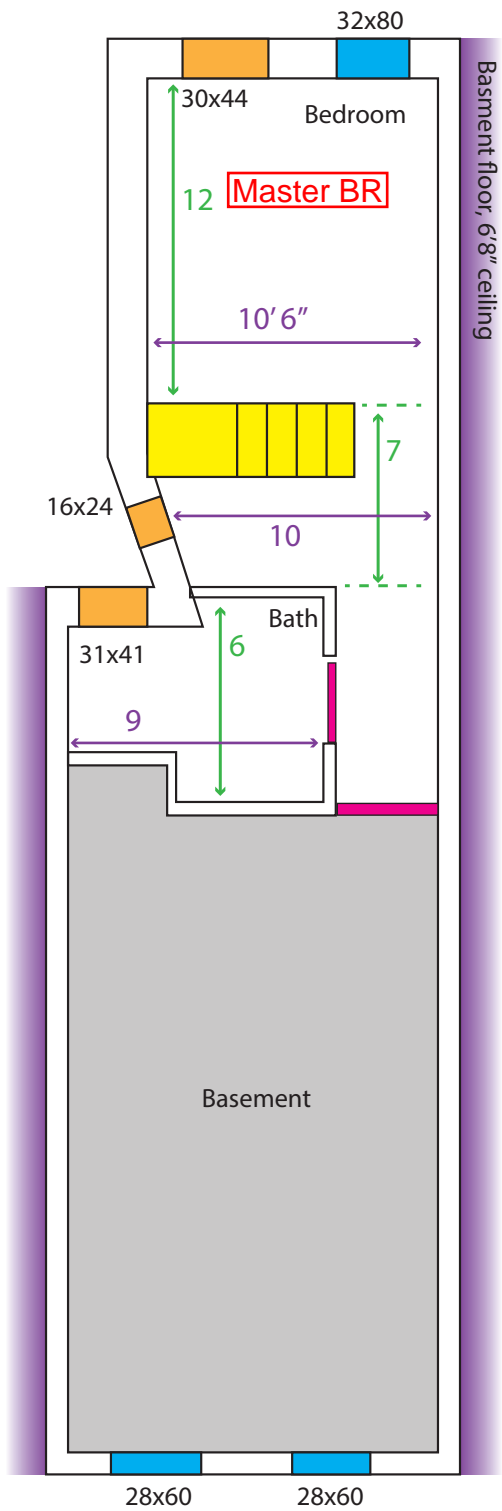
System 1 Room Load Summary

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---										
1	Basement Master Bedroom	126	1,414	20	2-5	428	2,568	427	117	117
2	Basement Stairs And Hallway	94	595	9	1-5	59	176	14	8	8
3	Basement Bathroom	54	485	7	1-5	199	595	14	27	27
4	1st Flr Foyer	19	1,894	27	1-5	167	500	205	23	23
5	1st Flr Dining Rm	129	2,421	35	1-6	557	2,403	201	109	109
6	1st Flr Hall To Dining Rm	26	449	6	1-5	37	110	57	5	5
7	1st Flr Living Room	172	1,691	24	1-5	178	534	216	24	24
8	1st Flr Bath & Stairs Hall	94	1,333	19	1-5	172	514	141	23	23
9	1st Flr Kitchen	153	3,550	51	3-5	575	5,170	1,016	235	235
10	2nd Flr Master Bed Rm	177	3,869	55	3-5	602	5,414	708	246	246
11	2nd Flr Hallway	106	1,984	28	1-5	170	510	239	23	23
12	2nd Flr Stairwell	63	435	6	1-5	60	180	47	8	8
13	2nd Flr Bedroom Center	124	1,634	23	1-5	531	1,591	327	72	72
14	2nd Flr Bathroom	35	573	8	1-5	104	312	39	14	14
15	2nd Flr Kitchen	60	818	12	2-5	626	3,751	738	171	171
16	2nd Flr Bedroom Rear	106	2,511	36	2-5	450	2,695	433	123	123
	Ventilation		1,771				468	1,031		
	Humidification		2,579							
	System 1 total	1,537	30,006	367			27,491	5,853	1,229	1,229

System 1 Main Trunk Size: 12x18 in.
 Velocity: 820 ft./min
 Loss per 100 ft.: 0.094 in.wg

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	2.78	82% / 18%	27,491	5,853	33,344
Recommended:	3.05	75% / 25%	27,491	9,164	36,655



HVAC System Design Disclaimer

General Notes

This report summarizes the load calculations, equipment selection, and duct design of a residence using ACCA/ASHRAE procedures (J, S, D, 62.2) and current codes (IRC, IECC). All calculations are based on information given to Correct Air Engineering, LLC. in the form of surveys, drawings, sketches, pictures, and meetings. In certain cases, Correct Air Engineering, LLC. may make reasonable assumptions about design conditions and construction materials that may or may not be accurate for the building of concern. It is the responsibility of the installing HVAC contractor to verify the design conditions, construction materials, and compatibility with existing equipment before equipment purchase and installation. All HVAC system design work provided in the following pages are based upon information provided by the particular party submitting a particular project to Correct Air Engineering, LLC. Correct Air Engineering, LLC. has not and does not independently verify that the data provided to us is correct or complete, and any design or load calculation made by Correct Air Engineering, LLC. are based upon the information provided by contracting parties. Correct Air Engineering, LLC. makes no claim that the information given to us is correct or complete. Correct Air Engineering, LLC. utilizes the latest load calculation software which is an ACCA Certified and ASHRAE recommended HVAC system design software. The mathematical model and design of the HVAC system, designed by Correct Air Engineering, LLC., is only as accurate as the data provided. Correct Air Engineering, LLC. makes every attempt possible to be as detailed and accurate as possible, however, there is no reasonable means to mathematically model an HVAC system that has not been properly installed, or has had after-the-fact building modifications or HVAC system component alterations or substitutions. If there is any construction modifications (floor plan, roofing material, window types/sizes, insulation characteristics, or any other change that will alter the load calculation results), HVAC equipment substitutions, duct sizing or layout changes, which is not noted in this report, and therefore not provided to Correct Air Engineering, LLC. for consideration for the HVAC system design, then Correct Air Engineering, LLC. may not guarantee the performance of the HVAC system design, and all design standards and procedures performed for this HVAC system design, including this report, may no longer be valid. Correct Air Engineering, LLC. will not guarantee the performance of the HVAC system design if the equipment selection and/or duct design has been performed by another party. Also, Correct Air Engineering, LLC. will not guarantee the performance of the HVAC system design that has not been properly installed or tested to verify performance has conformed to manufacturer specifications and design criteria provided in this report. It is up to the installing HVAC contractor to properly install, test, and verify all components of the HVAC system. All installing HVAC contractors are expected to follow ACCA Standards 5 and 9 for quality HVAC equipment installation. All information on any existing HVAC equipment (prior to design) to remain with an existing structure must be provided to Correct Air Engineering, LLC. prior to the design for appropriate selection of new and compatible equipment. It is up to the installing HVAC contractor to verify equipment compatibility between the newly installed equipment (per design) and any existing equipment remaining, via manufacture specifications and airflow/static pressure measurements. Correct Air Engineering, LLC. does not provide architectural or engineering plans or diagrams for the public or for use by contractors or construction companies as final "construction documents". Correct Air Engineering, LLC. works with architectural and engineering firms and with contractors in connection with their designs of HVAC systems. Copies of this report, including the completed balance report (and any other documents that need to be completed by the installing HVAC contractor verifying equipment performance meeting design requirements and manufacturer specifications), must be kept on file by the installing HVAC contractor, and also a copy given to the homeowner to remain attached to the HVAC equipment, and to any other party of specific interest (i.e., code official, county, builder/architect). All Correct Air Engineering, LLC., warranties are null and voided on unpaid accounts.

Note: block loads provide overall building required btu's for heating and cooling only and do not provide actual cfm and btu's required for each room. Btu's and cfm's for each room can vary due to exterior exposures of N, S, E, and W, by as much as 2.83 tons in some residential cases. Block loads are not able to use cathedral ceiling with flat ceilings, and will not combine basement walls with studded walls, or stone & brick walls in conjunction with studded walls. We discourage the use of block loads for any new construction job or major change of existing system. Block load are suitable when providing system change outs to compare existing system to replacement system.

Weekend Review Kit
Temporarily closed

Pleasant Place Park

Roland Ave

Pleasant Pl

Roland Ave

Pleasant Pl

Rectory Ln

Rectory Ln

Roland Ave

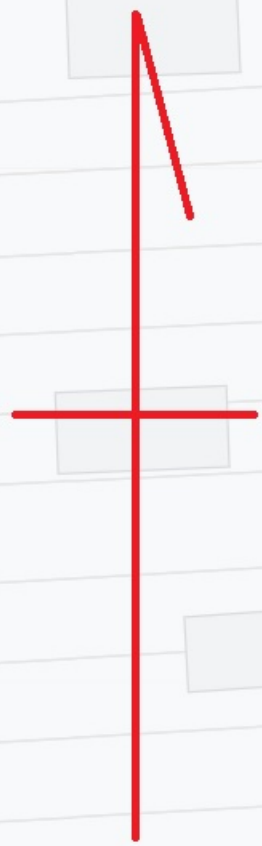
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