



Project Report

General Project Information

Project Title: Degan Residence
 Designed By: Gary/Ragsdale Inc.
 Project Date: June 18, 2004
 Client Name: Byron Degan
 Client City: Spring, TX
 Client Phone: (281) 353-7007
 Client E-Mail Address: ciainc@sbcglobal.net
 Company Name: Building Science Corporation
 Company Representative: Phil Kerrigan
 Company Address: 70 Main Street
 Company City: Westford, MA
 Company Phone: (978) 589-5100
 Company Fax: (978) 589-5103
 Company E-Mail Address: phil@building-science.com
 Company Website: www.buildingscience.com

Design Data

Reference City: Houston, Texas
 Daily Temperature Range: Medium
 Latitude: 29 Degrees
 Elevation: 96 ft.
 Altitude Factor: 0.997
 Elevation Sensible Adj. Factor: 1.000
 Elevation Total Adj. Factor: 1.000
 Elevation Heating Adj. Factor: 1.000
 Elevation Heating Adj. Factor: 1.000

	Outdoor Dry Bulb	Outdoor Wet Bulb	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	32	0	50	72	37
Summer:	94	77	50	75	48

Check Figures

Total Building Supply CFM:	1,438	CFM Per Square ft.:	0.393
Square ft. of Room Area:	3,654	Square ft. Per Ton:	1,026
Volume (ft ³) of Cond. Space:	56,329	Air Turnover Rate (per hour):	1.5

Building Loads

Total Heating Required With Outside Air:	44,625 Btuh	44.625 MBH
Total Sensible Gain:	32,907 Btuh	83 %
Total Latent Gain:	6,628 Btuh	17 %
Total Cooling Required With Outside Air:	39,536 Btuh	3.29 Tons (Based On Sensible + Latent)
		3.56 Tons (Based On 77% Sensible Capacity)

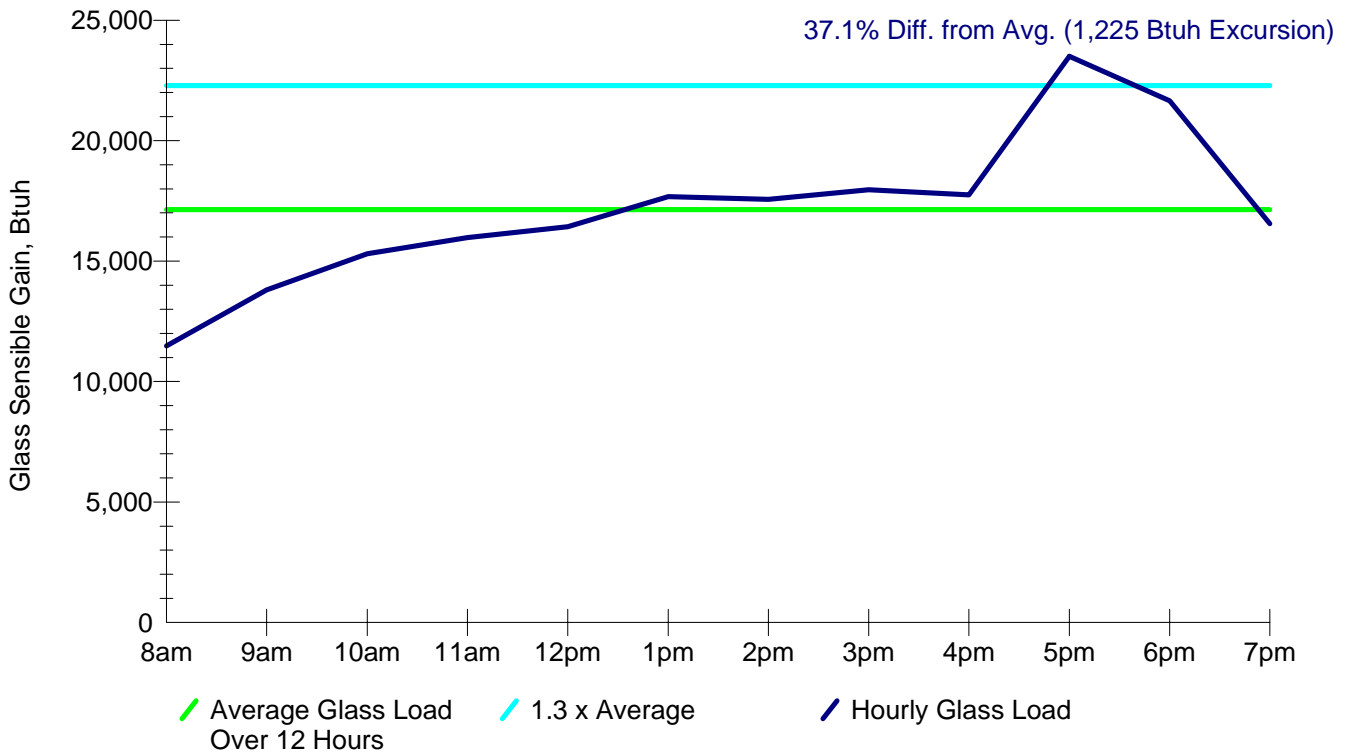
Notes

Calculations are based on 8th edition of ACCA Manual J.
 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.



System 1 - Main Floor - Adequate Exposure Diversity Test

Test For Adequate Exposure Diversity



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 37.1%.

AED Excursion (amount by which peak exceeds 1.3 x average): 1,225 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
LoE2 Spectrally Sel: Glazing-	629.6	9,275	0	13,722	13,722
7A-1: Glazing-Glass or plastic block, smooth or wide ribs or flutes, no screen, no coating	32	768	0	2,362	2,362
11P: Door-Polyurethane Core	38.2	406	0	311	311
12B-3bw: Wall-Frame, R-11 insulation in 2 x 4 stud cavity, R-3 board insulation, brick finish, wood studs	2274.5	7,188	0	2,769	2,769
12B-3bw: Part-Frame, R-11 insulation in 2 x 4 stud cavity, R-3 board insulation, brick finish, wood studs	452.9	1,180	0	929	929
18A-30: Roof/Ceiling-Below roof joists, Dark or Bold-Color Asphalt Shingle, Dark Metal, Dark Membrane, Dark Tar and Gravel, R-30 blanket or loose fill	4396.3	5,978	0	4,337	4,337
22A-pl: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, light dry soil	301	11,909	0	0	0
20P-19-c: Floor-Over open crawl space or garage, Passive, R-19 blanket insulation, carpet covering	443	886	0	310	310
Subtotals for structure:		37,590	0	24,740	24,740
People:	6		1,380	1,800	3,180
Equipment:			0	1,800	1,800
Lighting:	0			0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 94, Summer CFM: 94		4,115	3,070	1,955	5,025
Ventilation: Winter CFM: 67, Summer CFM: 67		2,920	2,178	1,387	3,565
AED Excursion:		0	0	1,225	1,225
Total Building Load Totals:		44,625	6,628	32,907	39,536

Check Figures

Total Building Supply CFM:	1,438	CFM Per Square ft.:	0.393
Square ft. of Room Area:	3,654	Square ft. Per Ton:	1,026
Volume (ft ³) of Cond. Space:	56,329	Air Turnover Rate (per hour):	1.5

Building Loads

Total Heating Required With Outside Air:	44,625 Btuh	44.625 MBH
Total Sensible Gain:	32,907 Btuh	83 %
Total Latent Gain:	6,628 Btuh	17 %
Total Cooling Required With Outside Air:	39,536 Btuh	3.29 Tons (Based On Sensible + Latent)
		3.56 Tons (Based On 77% Sensible Capacity)

Notes

Calculations are based on 8th edition of ACCA Manual J.
 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.



Detailed Room Loads - Room 1 - Family (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	197.2 ft.	Zone Number:	1
Area:	197.0 sq.ft.	Supply Air:	70 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	1.3 AC/hr
Volume:	3,333.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	3 CFM
Runout Air:	70 CFM	Percent of Supply.:	4 %
Runout Duct Size:	6 in.	Actual Summer Vent.:	3 CFM
Runout Air Velocity:	358 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	6 CFM
Actual Loss:	0.083 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
W -Wall-12B-3bw 13 X 14	158	0.079	3.2	499	1.2	0	192
W -Gls-LoE2 Spectrally Sel shgc-0.33 100%S	24	0.370	14.8	355	13.9	0	334
UP-Roof-18A-30 1 X 237	237	0.034	1.4	322	1.0	0	234
Floor-22A-pl 13 ft..Per.	13	0.989	39.6	514	0.0	0	0
Subtotals for Structure:				1,690		0	760
Infil.: Win.: 5.8, Sum.: 5.8	182		1.390	253	0.659	189	120
People: 230 lat/per, 300 sen/per:	2					460	600
Room Totals:				1,943		649	1,480



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

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	350.0 ft.	Zone Number:	1
Area:	350.0 sq.ft.	Supply Air:	59 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	0.6 AC/hr
Volume:	5,915.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	2 CFM
Runout Air:	59 CFM	Percent of Supply.:	4 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	3 CFM
Runout Air Velocity:	433 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	1 CFM
Actual Loss:	0.155 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
NW-Wall-12B-3bw 4.4 X 10	2	0.079	3.2	6	1.2	0	2
NW-Door-11P 3 X 6.7	20.1	0.290	11.6	233	8.7	0	175
NW-Gls-LoE2 Spectrally Sel shgc-0.32 0%S	12	0.360	14.4	173	28.5	0	342
NW-Gls-LoE2 Spectrally Sel shgc-0.32 0%S	9.9	0.360	14.4	142	28.5	0	281
UP-Roof-18A-30 1 X 420.7	420.7	0.034	1.4	572	1.0	0	415
Floor-22A-pl 4 ft..Per.	4	0.989	39.6	158	0.0	0	0
Subtotals for Structure:				1,284		0	1,215
Infil.: Win.: 1.4, Sum.: 1.4	44		1.386	61	0.659	46	29
Room Totals:				1,345		46	1,244



Detailed Room Loads - Room 3 - Powder (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	40.1 ft.	Zone Number:	1
Area:	40.0 sq.ft.	Supply Air:	4 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	0.4 AC/hr
Volume:	678.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
Runout Air:	4 CFM	Percent of Supply.:	7 %
Runout Duct Size:	4 in.	Actual Summer Vent.:	0 CFM
Runout Air Velocity:	48 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	0 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
E -Part-26°/33°-12B-3bw 2 X 10	20	0.079	2.6	52	2.1	0	41
UP-Roof-18A-30 1 X 48.2	48.2	0.034	1.4	66	1.0	0	48
Floor-22A-pl 2 ft..Per.	2	0.989	39.6	79	0.0	0	0
Subtotals for Structure:				197		0	89
Infil.: Win.: 0.0, Sum.: 0.0	0		0	0	0	0	0
Room Totals:				197		0	89



Detailed Room Loads - Room 4 - Bedroom 3 (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	242.1 ft.	Zone Number:	1
Area:	242.0 sq.ft.	Supply Air:	131 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	1.9 AC/hr
Volume:	4,091.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	9 CFM
Runout Air:	131 CFM	Percent of Supply.:	7 %
Runout Duct Size:	7 in.	Actual Summer Vent.:	6 CFM
Runout Air Velocity:	488 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	17 CFM
Actual Loss:	0.123 in.wg./100 ft.	Actual Summer Infil.:	17 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
S -Wall-12B-3bw 2 X 10	20	0.079	3.2	63	1.2	0	24
E -Wall-12B-3bw 12.3 X 10	95	0.079	3.2	300	1.2	0	116
N -Wall-12B-3bw 19.6 X 14	241.4	0.079	3.2	763	1.2	0	294
E -Wall-12B-3bw 12.3 X 10	123	0.079	3.2	389	1.2	0	150
E -Gls-LoE2 Spectrally Sel shgc-0.33 0%S	28	0.370	14.8	414	38.7	0	1,084
N -Gls-LoE2 Spectrally Sel shgc-0.3 100%S (3)	33	0.370	14.8	489	13.3	0	438
UP-Roof-18A-30 1 X 291	291	0.034	1.4	396	1.0	0	287
Floor-22A-pl 46 ft..Per.	46	0.989	39.6	1,820	0.0	0	0
Subtotals for Structure:				4,634		0	2,393
Infil.: Win.: 17.2, Sum.: 17.2	540		1.393	753	0.661	561	357
Room Totals:				5,387		561	2,750



Detailed Room Loads - Room 5 - Bath 3 (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	63.9 ft.	Zone Number:	1
Area:	64.0 sq.ft.	Supply Air:	13 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	0.7 AC/hr
Volume:	1,080.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	1 CFM
Runout Air:	13 CFM	Percent of Supply.:	9 %
Runout Duct Size:	4 in.	Actual Summer Vent.:	1 CFM
Runout Air Velocity:	152 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	0 CFM
Actual Loss:	0.028 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
E -Part-26°/33°-12B-3bw 9.9 X 10	99	0.079	2.6	258	2.1	0	203
UP-Roof-18A-30 1 X 76.8	76.8	0.034	1.4	104	1.0	0	76
Floor-22A-pl 10 ft..Per.	10	0.989	39.6	396	0.0	0	0
Subtotals for Structure:				758		0	279
Infil.: Win.: 0.0, Sum.: 0.0	0		0	0	0	0	0
Room Totals:				758		0	279



Detailed Room Loads - Room 6 - WIC (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	52.1 ft.	Zone Number:	1
Area:	52.0 sq.ft.	Supply Air:	13 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	0.9 AC/hr
Volume:	880.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	1 CFM
Runout Air:	13 CFM	Percent of Supply.:	9 %
Runout Duct Size:	4 in.	Actual Summer Vent.:	1 CFM
Runout Air Velocity:	147 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	0 CFM
Actual Loss:	0.026 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
E -Part-26°/33°-12B-3bw 8.2 X 10	82	0.079	2.6	214	2.1	0	168
S -Part-26°/33°-12B-3bw 2 X 10	20	0.079	2.6	52	2.1	0	41
UP-Roof-18A-30 1 X 62.6	62.6	0.034	1.4	85	1.0	0	62
Floor-22A-pl 10 ft..Per.	10	0.989	39.6	396	0.0	0	0
Subtotals for Structure:				747		0	271
Infil.: Win.: 0.0, Sum.: 0.0	0		0	0	0	0	0
Room Totals:				747		0	271



Detailed Room Loads - Room 7 - Utility (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	67.0 ft.	Zone Number:	1
Area:	67.0 sq.ft.	Supply Air:	48 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	2.6 AC/hr
Volume:	1,132.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	2 CFM
Runout Air:	48 CFM	Percent of Supply.:	3 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	2 CFM
Runout Air Velocity:	354 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	0 CFM
Actual Loss:	0.104 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 -Part-26°/33°-12B-3bw 8.3 X 10	64.9	0.079	2.6	169	2.1	0	133
E -Part-26°/33°-12B-3bw 3.3 X 10	33	0.079	2.6	86	2.1	0	68
N -Door-11P 2.7 X 6.7	18.1	0.290	9.6	173	7.5	0	136
UP-Roof-18A-30 1 X 80.5	80.5	0.034	1.4	109	1.0	0	79
Floor-22A-pl 12 ft..Per.	12	0.989	39.6	475	0.0	0	0
Subtotals for Structure:				1,012		0	416
Infil.: Win.: 0.0, Sum.: 0.0	0		0	0	0	0	0
Equipment:						0	600
Room Totals:				1,012		0	1,016



Detailed Room Loads - Room 8 - Study (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	235.1 ft.	Zone Number:	1
Area:	235.0 sq.ft.	Supply Air:	83 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	1.2 AC/hr
Volume:	3,973.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	5 CFM
Runout Air:	83 CFM	Percent of Supply.:	7 %
Runout Duct Size:	6 in.	Actual Summer Vent.:	4 CFM
Runout Air Velocity:	421 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	7 CFM
Actual Loss:	0.114 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 -Part-26°/33°-12B-3bw 13.4 X 10	134	0.079	2.6	349	2.1	0	275
E -Wall-12B-3bw 16 X 10	146.5	0.079	3.2	463	1.2	0	178
S -Wall-12B-3bw 5 X 11	36.9	0.079	3.2	117	1.2	0	45
E -Gls-LoE2 Spectrally Sel shgc-0.34 0%S (3)	13.5	0.360	14.4	195	39.6	0	534
S -Gls-LoE2 Spectrally Sel shgc-0.34 0%S	18.1	0.360	14.4	260	15.9	0	287
UP-Roof-18A-30 1 X 282.6	282.6	0.034	1.4	384	1.0	0	279
Floor-22A-pl 34 ft..Per.	34	0.989	39.6	1,345	0.0	0	0
Subtotals for Structure:				3,113		0	1,598
Infil.: Win.: 6.8, Sum.: 6.8	215		1.391	299	0.660	223	142
Room Totals:				3,412		223	1,740



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

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	188.2 ft.	Zone Number:	1
Area:	188.0 sq.ft.	Supply Air:	103 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	1.9 AC/hr
Volume:	3,181.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	3 CFM
Runout Air:	103 CFM	Percent of Supply.:	3 %
Runout Duct Size:	7 in.	Actual Summer Vent.:	5 CFM
Runout Air Velocity:	386 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	4 CFM
Actual Loss:	0.077 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
E -Wall-12B-3bw 9.9 X 12	72.8	0.079	3.2	230	1.2	0	89
E -Gls-LoE2 Spectrally Sel shgc-0.33 0%S (2)	18	0.370	14.8	266	38.7	0	696
E -Gls-LoE2 Spectrally Sel shgc-0.33 0%S	28	0.370	14.8	414	38.7	0	1,084
UP-Roof-18A-30 1 X 226.2	226.2	0.034	1.4	308	1.0	0	223
Floor-22A-pl 10 ft..Per.	10	0.989	39.6	396	0.0	0	0
Subtotals for Structure: Infil.: Win.: 3.8, Sum.: 3.8	119		1.389	1,614 165	0.665	0 123	2,092 79
Room Totals:				1,779		123	2,171



Detailed Room Loads - Room 10 - Master Bath (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	199.8 ft.	Zone Number:	1
Area:	200.0 sq.ft.	Supply Air:	140 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	2.5 AC/hr
Volume:	3,377.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	4 CFM
Runout Air:	140 CFM	Percent of Supply.:	3 %
Runout Duct Size:	8 in.	Actual Summer Vent.:	6 CFM
Runout Air Velocity:	402 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	7 CFM
Actual Loss:	0.070 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-12B-3bw 5 X 11	55	0.079	3.2	174	1.2	0	67
E -Wall-12B-3bw 15.5 X 10	123	0.079	3.2	389	1.2	0	150
E -Gls-7A-1 shgc-0.65 0%S (2)	32	0.600	24.0	768	73.8	0	2,362
UP-Roof-18A-30 1 X 240.2	240.2	0.034	1.4	327	1.0	0	237
Floor-22A-pl 21 ft..Per.	21	0.989	39.6	831	0.0	0	0
Subtotals for Structure:				2,489		0	2,816
Infil.: Win.: 6.7, Sum.: 6.7	210		1.390	292	0.662	218	139
Room Totals:				2,781		218	2,955



Detailed Room Loads - Room 11 - Master Bedroom (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	317.7 ft.	Zone Number:	1
Area:	318.0 sq.ft.	Supply Air:	137 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	1.5 AC/hr
Volume:	5,369.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	7 CFM
Runout Air:	137 CFM	Percent of Supply.:	5 %
Runout Duct Size:	8 in.	Actual Summer Vent.:	6 CFM
Runout Air Velocity:	393 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	12 CFM
Actual Loss:	0.067 in.wg./100 ft.	Actual Summer Infil.:	12 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
E -Wall-12B-3bw 15.2 X 10	152	0.079	3.2	480	1.2	0	185
S -Wall-12B-3bw 20.7 X 10	123	0.079	3.2	389	1.2	0	150
W -Wall-12B-3bw 1 X 10	10	0.079	3.2	32	1.2	0	12
S -Gls-LoE2 Spectrally Sel shgc-0.33 0%S (4)	84	0.370	14.8	1,244	15.8	0	1,324
UP-Roof-18A-30 1 X 381.9	381.9	0.034	1.4	519	1.0	0	377
Floor-22A-pl 37 ft..Per.	37	0.989	39.6	1,464	0.0	0	0
Subtotals for Structure:				4,128		0	2,048
Infil.: Win.: 11.7, Sum.: 11.7	369		1.393	514	0.661	383	244
People: 230 lat/per, 300 sen/per:	2					460	600
Room Totals:				4,642		843	2,892



Detailed Room Loads - Room 12 - Family Room (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	514.2 ft.	Zone Number:	1
Area:	514.0 sq.ft.	Supply Air:	267 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	1.8 AC/hr
Volume:	8,690.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	2	Actual Winter Vent.:	14 CFM
Runout Air:	133 CFM	Percent of Supply.:	5 %
Runout Duct Size:	7 in.	Actual Summer Vent.:	12 CFM
Runout Air Velocity:	499 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	25 CFM
Actual Loss:	0.129 in.wg./100 ft.	Actual Summer Infil.:	25 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
S -Wall-12B-3bw 29.3 X 15	333.4	0.079	3.2	1,053	1.2	0	406
W -Wall-12B-3bw 22.3 X 15	222.5	0.079	3.2	703	1.2	0	271
S -Gls-LoE2 Spectrally Sel shgc-0.33 100%S (3)	84	0.370	14.8	1,242	13.9	0	1,170
W -Gls-LoE2 Spectrally Sel shgc-0.33 93%S (4)	112	0.370	14.8	1,656	15.5	0	1,740
S -Gls-LoE2 Spectrally Sel shgc-0.34 100%S	4.1	0.360	14.4	58	13.8	0	56
S -Gls-LoE2 Spectrally Sel shgc-0.34 100%S	18.1	0.360	14.4	260	13.9	0	252
UP-Roof-18A-30 1 X 618.1	618.1	0.034	1.4	841	1.0	0	609
Floor-22A-pl 52 ft..Per.	52	0.989	39.6	2,057	0.0	0	0
Subtotals for Structure:				7,870		0	4,504
Infil.: Win.: 24.6, Sum.: 24.6	774		1.393	1,078	0.661	804	512
People: 230 lat/per, 300 sen/per:	2					460	600
Room Totals:				8,948		1,264	5,616



Detailed Room Loads - Room 13 - Master WIC (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	111.4 ft.	Zone Number:	1
Area:	111.0 sq.ft.	Supply Air:	6 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	0.2 AC/hr
Volume:	1,883.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
Runout Air:	6 CFM	Percent of Supply.:	5 %
Runout Duct Size:	4 in.	Actual Summer Vent.:	0 CFM
Runout Air Velocity:	72 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	0 CFM
Actual Loss:	0.007 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
UP-Roof-18A-30 1 X 133.9	133.9	0.034	1.4	182	1.0	0	132
Subtotals for Structure:				182		0	132
Infil.: Win.: 0.0, Sum.: 0.0	0		0	0	0	0	0
Room Totals:				182		0	132



Detailed Room Loads - Room 14 - Kitchen (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	197.9 ft.	Zone Number:	1
Area:	198.0 sq.ft.	Supply Air:	68 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	1.2 AC/hr
Volume:	3,345.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	1 CFM
Runout Air:	68 CFM	Percent of Supply.:	1 %
Runout Duct Size:	5 in.	Actual Summer Vent.:	3 CFM
Runout Air Velocity:	499 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	0 CFM
Actual Loss:	0.206 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
UP-Roof-18A-30 1 X 237.9	237.9	0.034	1.4	324	1.0	0	235
Subtotals for Structure:				324		0	235
Infil.: Win.: 0.0, Sum.: 0.0	0		0	0	0	0	0
Equipment:						0	1,200
Room Totals:				324		0	1,435



Detailed Room Loads - Room 15 - Bath 2 (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	87.2 ft.	Zone Number:	1
Area:	87.0 sq.ft.	Supply Air:	5 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	0.2 AC/hr
Volume:	1,474.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	0 CFM
Runout Air:	5 CFM	Percent of Supply.:	5 %
Runout Duct Size:	4 in.	Actual Summer Vent.:	0 CFM
Runout Air Velocity:	58 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	0 CFM
Actual Loss:	0.005 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
UP-Roof-18A-30 1 X 108.4	108.4	0.034	1.4	147	1.0	0	107
Subtotals for Structure:				147		0	107
Infil.: Win.: 0.0, Sum.: 0.0	0		0	0	0	0	0
Room Totals:				147		0	107



Detailed Room Loads - Room 16 - Breakfast (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	109.2 ft.	Zone Number:	1
Area:	109.0 sq.ft.	Supply Air:	169 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	5.5 AC/hr
Volume:	1,845.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	2	Actual Winter Vent.:	5 CFM
Runout Air:	85 CFM	Percent of Supply.:	3 %
Runout Duct Size:	6 in.	Actual Summer Vent.:	8 CFM
Runout Air Velocity:	431 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	6 CFM
Actual Loss:	0.119 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-12B-3bw 8 X 10	39	0.079	3.2	123	1.2	0	47
W -Wall-12B-3bw 12.4 X 10	56.5	0.079	3.2	179	1.2	0	69
S -Gls-LoE2 Spectrally Sel shgc-0.34 100%S	4.1	0.360	14.4	58	13.8	0	56
S -Gls-LoE2 Spectrally Sel shgc-0.34 100%S	18.1	0.360	14.4	260	13.9	0	252
S -Gls-LoE2 Spectrally Sel shgc-0.33 100%S	18.9	0.370	14.8	280	13.9	0	263
W -Gls-LoE2 Spectrally Sel shgc-0.33 0%S (2)	42	0.370	14.8	622	38.7	0	1,626
W -Gls-LoE2 Spectrally Sel shgc-0.33 0%S	25.5	0.370	14.8	377	38.7	0	987
UP-Roof-18A-30 1 X 131.3	131.3	0.034	1.4	179	1.0	0	129
Floor-22A-pl 20 ft..Per.	20	0.989	39.6	791	0.0	0	0
Subtotals for Structure:				2,869		0	3,429
Infil.: Win.: 6.5, Sum.: 6.5	204		1.392	284	0.662	212	135
Room Totals:				3,153		212	3,564



Detailed Room Loads - Room 17 - Pantry (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	34.5 ft.	Zone Number:	1
Area:	35.0 sq.ft.	Supply Air:	6 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	0.6 AC/hr
Volume:	583.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	1 CFM
Runout Air:	6 CFM	Percent of Supply.:	11 %
Runout Duct Size:	4 in.	Actual Summer Vent.:	0 CFM
Runout Air Velocity:	65 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	1 CFM
Actual Loss:	0.006 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
S -Wall-12B-3bw 4.2 X 10	42	0.079	3.2	133	1.2	0	51
UP-Roof-18A-30 1 X 41.5	41.5	0.034	1.4	56	1.0	0	41
Floor-22A-pl 4 ft..Per.	4	0.989	39.6	158	0.0	0	0
Subtotals for Structure:				347		0	92
Infil.: Win.: 1.3, Sum.: 1.3	42		1.381	58	0.667	44	28
Room Totals:				405		44	120



Detailed Room Loads - Room 18 - Bedroom 2 (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	203.8 ft.	Zone Number:	1
Area:	204.0 sq.ft.	Supply Air:	76 CFM
Ceiling Height:	16.9 ft.	Supply Air Changes:	1.3 AC/hr
Volume:	3,444.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	5 CFM
Runout Air:	76 CFM	Percent of Supply.:	6 %
Runout Duct Size:	6 in.	Actual Summer Vent.:	4 CFM
Runout Air Velocity:	386 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	8 CFM
Actual Loss:	0.096 in.wg./100 ft.	Actual Summer Infil.:	8 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
W -Wall-12B-3bw 18.3 X 10	165	0.079	3.2	521	1.2	0	201
N -Wall-12B-3bw 6.3 X 10	46.5	0.079	3.2	147	1.2	0	57
NW-Wall-12B-3bw 1.1 X 10	11	0.079	3.2	35	1.2	0	13
W -Gls-LoE2 Spectrally Sel shgc-0.33 0%S	18	0.370	14.8	266	38.7	0	697
N -Gls-LoE2 Spectrally Sel shgc-0.3 100%S	16.5	0.370	14.8	244	13.3	0	219
UP-Roof-18A-30 1 X 245	245	0.034	1.4	333	1.0	0	242
Floor-22A-pl 26 ft..Per.	26	0.989	39.6	1,029	0.0	0	0
Subtotals for Structure:				2,575		0	1,429
Infil.: Win.: 8.2, Sum.: 8.2	257		1.393	358	0.661	267	170
Room Totals:				2,933		267	1,599



Detailed Room Loads - Room 19 - Over Garage (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	1.0 ft.	System Number:	1
Room Width:	443.0 ft.	Zone Number:	1
Area:	443.0 sq.ft.	Supply Air:	40 CFM
Ceiling Height:	4.6 ft.	Supply Air Changes:	1.2 AC/hr
Volume:	2,056.0 cu.ft.	Required Vent.:	0 CFM
Number of Registers:	1	Actual Winter Vent.:	3 CFM
Runout Air:	40 CFM	Percent of Supply.:	6 %
Runout Duct Size:	4 in.	Actual Summer Vent.:	2 CFM
Runout Air Velocity:	454 ft./min.	Percent of Supply:	5 %
Design Loss:	0.100 in.wg./100 ft.	Actual Winter Infil.:	0 CFM
Actual Loss:	0.233 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
UP-Roof-18A-30 1 X 532.5	532.5	0.034	1.4	724	1.0	0	525
Floor-20P-19 443 X 1	443	0.050	2.0	886	0.7	0	310
Subtotals for Structure:				1,610		0	835
Infil.: Win.: 0.0, Sum.: 0.0	0		0	0	0	0	0
Room Totals:				1,610		0	835



System 1 Room Load Summary

Room No	Room Name	Area SF	Htg Sens Btuh	Htg Nom CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Clg Nom CFM	Air Sys CFM
---Zone 1---										
1	Family	197	1,943	25	1-6	358	1,480	649	70	70
2	Entry	350	1,345	18	1-5	433	1,244	46	59	59
3	Powder	40	197	3	1-4	48	89	0	4	4
4	Bedroom 3	242	5,387	70	1-7	488	2,750	561	131	131
5	Bath 3	64	758	10	1-4	152	279	0	13	13
6	WIC	52	747	10	1-4	147	271	0	13	13
7	Utility	67	1,012	13	1-5	354	1,016	0	48	48
8	Study	235	3,412	44	1-6	421	1,740	223	83	83
9	Dining Room	188	1,779	23	1-7	386	2,171	123	103	103
10	Master Bath	200	2,781	36	1-8	402	2,955	218	140	140
11	Master Bedroom	318	4,642	60	1-8	393	2,892	843	137	137
12	Family Room	514	8,948	117	2-7	499	5,616	1,264	267	267
13	Master WIC	111	182	2	1-4	72	132	0	6	6
14	Kitchen	198	324	4	1-5	499	1,435	0	68	68
15	Bath 2	87	147	2	1-4	58	107	0	5	5
16	Breakfast	109	3,153	41	2-6	431	3,564	212	169	169
17	Pantry	35	405	5	1-4	65	120	44	6	6
18	Bedroom 2	204	2,933	38	1-6	386	1,599	267	76	76
19	Over Garage	443	1,610	21	1-4	454	835	0	40	40
Ventilation			2,920				1,387	2,178		
AED Excursion							1,225			
System 1 total		3,654	44,625	544			32,907	6,628	1,438	1,438

System 1 Main Trunk Size: 18x17 in.
 Velocity: 730 ft./min
 Loss per 100 ft.: 0.053 in.wg

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	3.29	83% / 17%	32,907	6,628	39,536
Recommended:	3.56	77% / 23%	32,907	9,829	42,737

Equipment Data

	Heating System	Cooling System
Type:		
Model:		
Brand:		
Efficiency:		
Sound:		
Capacity:		
Sensible Capacity:	n/a	0 Btuh
Latent Capacity:	n/a	0 Btuh