

***Antigo Public Library
HVAC Load Analysis***

for

City Of Antigo

Elite Software

**CHVAC COMMERCIAL
HVAC LOADS**

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Building Summary Loads

Building peaks in August at 5pm.

Bldg Load Descriptions	Area Quan	Sen Loss	%Tot Loss	Lat Gain	Sen Gain	Net Gain	%Net Gain
Roof	16,672	106,731	19.86	0	30,508	30,508	7.73
Wall	4,326	32,772	6.10	0	5,658	5,658	1.43
Glass	833	57,773	10.75	0	20,886	20,886	5.29
Floor Slab	448	27,725	5.16	0	0	0	0.00
Skin Loads		225,001	41.88	0	57,052	57,052	14.45
Lighting	20,608	0	0.00	0	70,318	70,318	17.82
Equipment	2,750	0	0.00	0	9,383	9,383	2.38
Pool Latent	0	0	0.00	0	0	0	0.00
People	206	0	0.00	30,690	48,510	79,200	20.07
Partition	0	0	0.00	0	0	0	0.00
Cool. Pret.	0	0	0.00	0	0	0	0.00
Heat. Pret.	0	0	0.00	0	0	0	0.00
Cool. Vent.	1,485	0	0.00	59,663	25,022	84,685	21.46
Heat. Vent.	1,485	148,935	27.72	0	0	0	0.00
Cool. Infil.	951	0	0.00	38,168	16,067	54,234	13.74
Heat. Infil.	992	109,451	20.37	0	0	0	0.00
Draw-Thru Fan	0	0	0.00	0	0	0	0.00
Blow-Thru Fan	0	0	0.00	0	0	0	0.00
Reserve Cap.	0	0	0.00	0	0	0	0.00
Reheat Cap.	0	0	0.00	0	3,365	3,365	0.85
Supply Duct	0	35,951	6.69	0	27,368	27,368	6.93
Return Duct	0	17,975	3.35	0	9,090	9,090	2.30
Misc. Supply	0	0	0.00	0	0	0	0.00
Misc. Return	0	0	0.00	0	0	0	0.00
Building Totals		537,313	100.00	128,521	266,175	394,696	100.00

Building Summary	Sen Loss	%Tot Loss	Lat Gain	Sen Gain	Net Gain	%Net Gain
Ventilation	148,935	27.72	59,663	25,022	84,685	21.46
Infiltration	109,451	20.37	38,168	16,067	54,234	13.74
Pretreated Air	0	0.00	0	0	0	0.00
Room Loads	225,001	41.88	30,690	188,629	219,319	55.57
Plenum Loads	0	0.00	0	0	0	0.00
Fan/Duct/Misc Loads	53,926	10.04	0	36,458	36,458	9.24
Building Totals	537,313	100.00	128,521	266,175	394,696	100.00

Check Figures

Total Building Supply Air (based on a 17° TD):	12,994 CFM
Total Building Vent. Air (11.43% of Supply):	1,485 CFM
Total Conditioned Air Space:	16,672 Sq.ft
Supply Air Per Unit Area:	0.7794 CFM/Sq.ft
Area Per Cooling Capacity:	506.9 Sq.ft/Ton
Cooling Capacity Per Area:	0.0020 Tons/Sq.ft
Heating Capacity Per Area:	32.23 Btuh/Sq.ft
Total Heating Required With Outside Air:	537,313 Btuh
Total Cooling Required With Outside Air:	32.89 Tons



Air Handler #1 - AHU-1 - Summary Loads

Rm No	Description Room Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM
1	Library North 129-B 4pm August	680 2 7,480	24,784 705 1.04	7,655 485 0.71	1,887 0 0	7.5/P 15 120	7.5/P 15 55
2	Library NE 129-A 3pm August	2,538 18 27,918	33,048 940 0.37	23,363 1,479 0.58	8,582 0 0	7.5/P 135 161	7.5/P 135 169
3	Library NW 132-A 5pm August	400 3 4,400	25,844 735 1.84	12,503 792 1.98	1,428 0 0	7.5/P 23 126	7.5/P 23 90
4	Library 132-B 3pm August	2,184 16 24,024	28,439 809 0.37	20,229 1,281 0.59	7,464 0 0	7.5/P 120 138	7.5/P 120 146
5	Library 132-C 3pm August	2,548 18 28,028	33,178 944 0.37	23,438 1,484 0.58	8,605 0 0	7.5/P 135 161	7.5/P 135 170
6	Library W 132-D 5pm August	655 5 7,205	24,837 707 1.08	12,877 815 1.24	2,352 0 0	7.5/P 38 121	7.5/P 38 93
7	Library Desk 115 3pm August	672 5 7,392	8,750 249 0.37	6,926 438 0.65	2,309 0 0	7.5/P 38 43	7.5/P 38 50
8	Conf 130 5pm August	114 4 1,254	3,808 108 0.95	1,965 124 1.09	894 0 0	7.5/P 30 19	7.5/P 30 14
9	Conf 131 5pm August	114 4 1,254	3,808 108 0.95	2,015 128 1.12	894 0 0	7.5/P 30 19	7.5/P 30 15
10	Office Vav 113 3pm August	186 2 2,046	2,422 69 0.37	2,561 162 0.87	734 0 0	7.5/P 15 12	7.5/P 15 19
11	Toilet 118 Vav 113 3pm August	70 1 770	911 26 0.37	768 150 2.14	315 150 150	7.5/P 8 4	7.5/P 8 17
12	Copy Room Vav 113 3pm August	80 1 880	1,042 30 0.37	2,719 172 2.15	338 0 0	7.5/P 8 5	7.5/P 8 20
13	Workroom 113 Vav 113 3pm August	525 4 5,775	6,836 194 0.37	4,901 310 0.59	1,818 0 0	7.5/P 30 33	7.5/P 30 35



Air Handler #1 - AHU-1 - Summary Loads (cont'd)

Rm No	Description Room Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM
14	Workroom 114 Vav 113 3pm August	204 2 2,244	2,656 76 0.37	2,013 127 0.62	776 0 0	7.5/P 15 13	7.5/P 15 15
15	Office 122 3pm August	198 2 2,178	5,309 151 0.76	3,326 211 1.06	762 0 0	7.5/P 15 26	7.5/P 15 24
16	Office 121 3pm August	231 2 2,541	5,906 168 0.73	3,611 229 0.99	837 0 0	7.5/P 15 29	7.5/P 15 26
17	Room 123 3pm August	378 1 4,158	4,922 140 0.37	3,068 194 0.51	1,018 0 0	7.5/P 8 24	7.5/P 8 22
18	Office 120 3pm August	403 3 4,433	11,028 314 0.78	6,815 431 1.07	1,385 0 0	7.5/P 23 54	7.5/P 23 49
19	Mait Rm 125 4pm August	276 2 3,036	5,337 152 0.55	3,471 220 0.80	950 0 0	7.5/P 15 26	7.5/P 15 25
20	Storage 127 3pm August	84 1 924	1,094 31 0.37	872 55 0.66	347 0 0	7.5/P 8 5	7.5/P 8 6
23	Hall 110 VAV-113 3pm August	208 1 2,288	2,708 77 0.37	1,798 114 0.55	630 0 0	7.5/P 8 13	7.5/P 8 13
25	Lobby 102 3pm August	576 2 6,336	7,500 213 0.37	4,791 303 0.53	1,624 0 0	7.5/P 15 36	7.5/P 15 35
27	Conference Room Vav 104-A 3pm August	1,032 69 11,352	13,438 382 0.37	24,953 1,580 1.53	13,050 0 0	7.5/P 518 65	7.5/P 518 181
28	Conference Room Vav 104-B 2pm August	288 20 3,168	17,146 488 1.69	12,329 780 2.71	3,768 0 0	7.5/P 150 83	7.5/P 150 89
29	Storage 103 On Vav 104-B 5pm August	319 1 3,509	10,024 285 0.89	3,202 203 0.64	923 0 0	7.5/P 8 49	7.5/P 8 23
30	Lounge 105 4pm August	363 4 3,988	6,535 186 0.51	5,606 355 0.98	1,461 200 200	7.5/P 30 32	7.5/P 30 41



Air Handler #1 - AHU-1 - Summary Loads (cont'd)

Rm No	Description Room Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM
31	Men 108 4pm August	234 2 2,574	4,935 140 0.60	2,495 200 0.85	853 200 200	7.5/P 15 24	7.5/P 15 23
32	Womens 109 5pm August	225 2 2,475	7,286 207 0.92	2,742 200 0.89	852 200 200	7.5/P 15 35	7.5/P 15 23
33	Utility 107 5pm August	68 1 748	2,047 58 0.86	897 100 1.47	319 100 100	7.5/P 8 10	7.5/P 8 11
	Room Peak Totals:	15,853	305,580	203,910	67,174		
	Total Rooms: 29	198	8,693	13,122	850	1,485	1,485
	Unique Rooms: 29	174,378	0.55	0.83	850	1,485	1,500



Air Handler #1 - AHU-1 - Total Load Summary

Air Handler Description: AHU-1 Variable Air Volume
 Sensible Heat Ratio: 0.77 --- This system occurs 1 time(s) in the building. ---

Air System Peak Time: 5pm in August.
 Outdoor Conditions: Clg: 88° DB, 77° WB, 128.84 grains, Htg: -25° DB
 Indoor Conditions: Clg: 72° DB, 55% RH, Htg: 72° DB

Because of the diversity in room, plenum and ventilation loads, the room sensible peak time in August at 4pm is different from the total system peak time, hence the air system CFM was computed using a room sensible load of 201,895.

Summer: Ventilation controls outside air, ----- Winter: Ventilation controls outside air.

Room Space sensible loss:	200,647 Btuh	
Infiltration sensible loss:	104,933 Btuh	951 CFM
Outside Air sensible loss:	148,935 Btuh	1,485 CFM
Supply Duct sensible loss:	35,951 Btuh	
Return Duct sensible loss:	17,975 Btuh	
Return Plenum sensible loss:	0 Btuh	
Total System sensible loss:		508,441 Btuh

Heating Supply Air: $341,531 / (.957 \times 1.08 \times 38) =$	8,693 CFM
Winter Vent Outside Air (17.1% of supply) =	1,485 CFM

Room space sensible gain:	185,264 Btuh	
Infiltration sensible gain:	16,067 Btuh	
Draw-thru fan sensible gain:	0 Btuh	
Supply duct sensible gain:	27,368 Btuh	
Reheat sensible gain:	3,365 Btuh	
Total sensible gain on supply side of coil:		232,064 Btuh

Cooling Supply Air: $232,628 / (.957 \times 1.1 \times 17) =$	12,994 CFM
Summer Vent Outside Air (11.4% of supply) =	1,485 CFM

Return duct sensible gain:	9,090 Btuh	
Return plenum sensible gain:	0 Btuh	
Outside air sensible gain:	25,022 Btuh	1,485 CFM
Blow-thru fan sensible gain:	0 Btuh	
Total sensible gain on return side of coil:		34,112 Btuh
Total sensible gain on air handling system:		266,175 Btuh

Room space latent gain:	30,690 Btuh	
Infiltration latent gain:	38,168 Btuh	
Outside air latent gain:	59,663 Btuh	
Total latent gain on air handling system:		128,521 Btuh
Total system sensible and latent gain:		394,696 Btuh

Check Figures

Total Air Handler Supply Air (based on a 17° TD):	12,994 CFM
Total Air Handler Vent. Air (11.43% of Supply):	1,485 CFM
Total Conditioned Air Space:	15,853 Sq.ft
Supply Air Per Unit Area:	0.8197 CFM/Sq.ft
Area Per Cooling Capacity:	482.0 Sq.ft/Ton
Cooling Capacity Per Area:	0.0021 Tons/Sq.ft
Heating Capacity Per Area:	32.07 Btuh/Sq.ft
Total Heating Required With Outside Air:	508,441 Btuh
Total Cooling Required With Outside Air:	32.89 Tons



Air Handler #2 - Unit Heater - Summary Loads

Rm No	Description Room Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM
21	Garage 124	600	14,995	0	0	None	None
	-	5	439	0	0	0	0
		6,600	0.73	0.00	0	0	0
	Room Peak Totals:	600	14,995	0	0		
	Total Rooms: 1	5	439	0	0	0	0
	Unique Rooms: 1	6,600	0.73	0.00	0	0	0



Air Handler #2 - Unit Heater - Total Load Summary

Air Handler Description: Unit Heater Constant Volume - Sum of Peaks
 Outdoor Conditions: -25° DB (System is Heating Only)
 Indoor Conditions: 72° DB

Winter: Exhaust controls outside air.

Room Space sensible loss:	11,686 Btuh		
Infiltration sensible loss:	3,310 Btuh	30 CFM	
Outside Air sensible loss:	0 Btuh	0 CFM	
Supply Duct sensible loss:	0 Btuh		
Return Duct sensible loss:	0 Btuh		
Return Plenum sensible loss:	0 Btuh		
Total System sensible loss:			14,995 Btuh

Heating Supply Air: $14,995 / (.957 \times 1.08 \times 33) =$ 439 CFM
 Winter Vent Outside Air (0.0% of supply) = 0 CFM

Room space sensible gain:	0 Btuh		
Infiltration sensible gain:	0 Btuh		
Draw-thru fan sensible gain:	0 Btuh		
Supply duct sensible gain:	0 Btuh		
Reserve sensible gain:	0 Btuh		
Total sensible gain on supply side of coil:			0 Btuh

Cooling Supply Air: $0 / (.957 \times 1.1 \times 0) =$ 0 CFM
 Summer Vent Outside Air (0.0% of supply) = 0 CFM

Return duct sensible gain:	0 Btuh		
Return plenum sensible gain:	0 Btuh		
Outside air sensible gain:	0 Btuh	0 CFM	
Blow-thru fan sensible gain:	0 Btuh		
Total sensible gain on return side of coil:			0 Btuh
Total sensible gain on air handling system:			0 Btuh

Room space latent gain:	0 Btuh		
Infiltration latent gain:	0 Btuh		
Outside air latent gain:	0 Btuh		
Total latent gain on air handling system:			0 Btuh
Total system sensible and latent gain:			0 Btuh

Check Figures

Total Air Handler Supply Air (based on a 33° TD):	439 CFM
Total Air Handler Vent. Air (0.00% of Supply):	0 CFM
Total Conditioned Air Space:	600 Sq.ft
Supply Air Per Unit Area:	0.7325 CFM/Sq.ft
Area Per Cooling Capacity:	0.0 Sq.ft/Ton
Cooling Capacity Per Area:	0.0000 Tons/Sq.ft
Heating Capacity Per Area:	24.99 Btuh/Sq.ft
Total Heating Required With Outside Air:	14,995 Btuh
Total Cooling Required With Outside Air:	0.00 Tons



Air Handler #3 - Elec Heater Rm 128 - Summary Loads

Rm No	Description Room Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM
22	128 Exit	35	2,441	0	0	None	None
	-	1	72	0	0	0	0
		385	2.04	0.00	0	0	0
24	Vest 111	92	5,718	0	0	None	None
	-	1	168	0	0	0	0
		1,012	1.82	0.00	0	0	0
26	Entry 101	92	5,718	0	0	None	None
	-	1	168	0	0	0	0
		1,012	1.82	0.00	0	0	0
	Room Peak Totals:	219	13,876	0	0		
	Total Rooms: 3	3	407	0	0	0	0
	Unique Rooms: 3	2,409	1.86	0.00	0	0	0



Air Handler #3 - Elec Heater Rm 128 - Total Load Summary

Air Handler Description: Elec Heater Rm 128 Constant Volume - Sum of Peaks
 Outdoor Conditions: -25° DB (System is Heating Only)
 Indoor Conditions: 72° DB

Winter: Exhaust controls outside air.

Room Space sensible loss:	12,668 Btuh		
Infiltration sensible loss:	1,208 Btuh	11 CFM	
Outside Air sensible loss:	0 Btuh	0 CFM	
Supply Duct sensible loss:	0 Btuh		
Return Duct sensible loss:	0 Btuh		
Return Plenum sensible loss:	0 Btuh		
Total System sensible loss:			13,876 Btuh

Heating Supply Air: $13,876 / (.957 \times 1.08 \times 33) =$	407 CFM
Winter Vent Outside Air (0.0% of supply) =	0 CFM

Room space sensible gain:	0 Btuh		
Infiltration sensible gain:	0 Btuh		
Draw-thru fan sensible gain:	0 Btuh		
Supply duct sensible gain:	0 Btuh		
Reserve sensible gain:	0 Btuh		
Total sensible gain on supply side of coil:			0 Btuh

Cooling Supply Air: $0 / (.957 \times 1.1 \times 0) =$	0 CFM
Summer Vent Outside Air (0.0% of supply) =	0 CFM

Return duct sensible gain:	0 Btuh		
Return plenum sensible gain:	0 Btuh		
Outside air sensible gain:	0 Btuh	0 CFM	
Blow-thru fan sensible gain:	0 Btuh		
Total sensible gain on return side of coil:			0 Btuh
Total sensible gain on air handling system:			0 Btuh

Room space latent gain:	0 Btuh		
Infiltration latent gain:	0 Btuh		
Outside air latent gain:	0 Btuh		
Total latent gain on air handling system:			0 Btuh
Total system sensible and latent gain:			0 Btuh

Check Figures

Total Air Handler Supply Air (based on a 33° TD):	407 CFM
Total Air Handler Vent. Air (0.00% of Supply):	0 CFM
Total Conditioned Air Space:	219 Sq.ft
Supply Air Per Unit Area:	1.8570 CFM/Sq.ft
Area Per Cooling Capacity:	0.0 Sq.ft/Ton
Cooling Capacity Per Area:	0.0000 Tons/Sq.ft
Heating Capacity Per Area:	63.36 Btuh/Sq.ft
Total Heating Required With Outside Air:	13,876 Btuh
Total Cooling Required With Outside Air:	0.00 Tons



Room Detailed Loads (At Room Peak Times)

Load Description	Unit Quan	-SC- CFAC	CLTD SHGF	U.Fac -CLF-	Sen. Gain	Lat. Gain	Htg. Mult.	Htg. Loss
Room 1-Library North 129-B peaks (sensible) in August at 4pm, Air Handler 1 (AHU-1), Zone 0, 68.0 x 10.0, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	680	0.50	32.1	0.060	1,309		5.820	3,958
Wall-1-N-B-D	650	1	8.6	0.071	396		6.887	4,477
Gls-N-1-90-Tran	32.0	1.000	15	0.520	253		63.050	2,018
0%S-0-NS-Solar	32.0	0.350	34	0.790	301			
Gls-N-1-90-Tran	66.0	1.000	15	0.520	522		63.050	4,161
0%S-0-NS-Solar	66.0	0.350	34	0.790	620			
Lights-Prof=0	884	1.000			3,016			
People-Prof=0	2.0	1.000			490	310		
Floor slab	68						56.260	3,826
Cool. Infil.CFM/ft²	41				748	1,577		
Heat. Infil.CFM/sq.ft	41						100.293	4,092
Sub-total					7,655	1,887		22,531
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					7,655	1,887		24,784

Room 2-Library NE 129-A peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 54.0 x 47.0, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	2,538	0.50	31.6	0.060	4,808		5.820	14,771
Lights-Prof=0	3,299	1.000			11,258			
People-Prof=0	18.0	1.000			4,410	2,790		
Cool. Infil.CFM/ft²	152				2,887	5,792		
Heat. Infil.CFM/sq.ft	152						100.293	15,273
Sub-total					23,363	8,582		30,044
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					23,363	8,582		33,048

Room 3-Library NW 132-A peaks (sensible) in August at 5pm, Air Handler 1 (AHU-1), Zone 0, 20.0 x 20.0, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	400	0.50	32.1	0.060	770		5.820	2,328
Wall-1-N-B-D	100	1	9.6	0.071	68		6.887	689
Wall-2-W-B-D	100	1	17.6	0.071	125		6.887	689
Gls-N-1-90-Tran	120.0	1.000	14	0.520	886		63.050	7,566
0%S-0-NS-Solar	120.0	0.350	34	0.790	1,128			
Gls-W-1-90-Tran	120.0	1.000	14	0.520	886		63.050	7,566
0%S-0-NS-Solar	120.0	0.350	213	0.640	5,725			
Lights-Prof=0	520	1.000			1,774			
People-Prof=0	3.0	1.000			735	465		
Floor slab	40						56.260	2,250
Cool. Infil.CFM/ft²	24				405	963		
Heat. Infil.CFM/sq.ft	24						100.293	2,407
Sub-total					12,503	1,428		23,495
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					12,503	1,428		25,844



Room Detailed Loads (At Room Peak Times) (cont'd)

Load Description	Unit Quan	-SC- CFAC	CLTD SHGF	U.Fac -CLF-	Sen. Gain	Lat. Gain	Htg. Mult.	Htg. Loss
Room 4-Library 132-B peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 52.0 x 42.0, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	2,184	0.50	31.6	0.060	4,138		5.820	12,711
Lights-Prof=0	2,839	1.000			9,688			
People-Prof=0	16.0	1.000			3,920	2,480		
Cool. Infil.CFM/ft²	131				2,484	4,984		
Heat. Infil.CFM/sq.ft	131						100.293	13,142
Sub-total					20,229	7,464		25,853
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					20,229	7,464		28,439
Room 5-Library 132-C peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 52.0 x 49.0, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	2,548	0.50	31.6	0.060	4,827		5.820	14,829
Lights-Prof=0	3,312	1.000			11,302			
People-Prof=0	18.0	1.000			4,410	2,790		
Cool. Infil.CFM/ft²	153				2,898	5,815		
Heat. Infil.CFM/sq.ft	153						100.293	15,333
Sub-total					23,438	8,605		30,162
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					23,438	8,605		33,178
Room 6-Library W 132-D peaks (sensible) in August at 5pm, Air Handler 1 (AHU-1), Zone 0, 65.5 x 10.0, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	655	0.50	32.1	0.060	1,261		5.820	3,812
Wall-1-W-B-D	611	1	17.6	0.071	762		6.887	4,205
Gls-W-1-90-Tran	32.0	1.000	14	0.520	236		63.050	2,018
0%S-0-NS-Solar	32.0	0.350	213	0.640	1,527			
Gls-W-1-90-Tran	78.0	1.000	14	0.520	576		63.050	4,918
0%S-0-NS-Solar	78.0	0.350	213	0.640	3,722			
Lights-Prof=0	851	1.000			2,905			
People-Prof=0	5.0	1.000			1,225	775		
Floor slab	66						56.260	3,685
Cool. Infil.CFM/ft²	39				664	1,577		
Heat. Infil.CFM/sq.ft	39						100.293	3,942
Sub-total					12,877	2,352		22,579
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					12,877	2,352		24,837
Room 7-Library Desk 115 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 28.0 x 24.0, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	672	0.50	31.6	0.060	1,273		5.820	3,911
Lights-Prof=0	874	1.000			2,981			
Equipment-Prof=0	200	1.000			682	0		
People-Prof=0	5.0	1.000			1,225	775		



Room Detailed Loads (At Room Peak Times) (cont'd)

Load Description	Unit Quan	-SC- CFAC	CLTD SHGF	U.Fac -CLF-	Sen. Gain	Lat. Gain	Htg. Mult.	Htg. Loss
Cool. Infil.CFM/ft²	40				764	1,534		
Heat. Infil.CFM/sq.ft	40						100.293	4,044
Sub-total					6,926	2,309		7,955
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					6,926	2,309		8,750

Room 8-Conf 130 peaks (sensible) in August at 5pm, Air Handler 1 (AHU-1), Zone 0, 12.0 x 9.5, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	114	0.50	32.1	0.060	219		5.820	663
Wall-1-N-B-D	132	1	9.6	0.071	90		6.887	909
Wall-2-W-B-D	44	1	17.6	0.071	55		6.887	303
Lights-Prof=0	148	1.000			506			
People-Prof=0	4.0	1.000			980	620		
Floor slab	16						56.260	900
Cool. Infil.CFM/ft²	7				116	274		
Heat. Infil.CFM/sq.ft	7						100.293	686
Sub-total					1,965	894		3,462
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					1,965	894		3,808

Room 9-Conf 131 peaks (sensible) in August at 5pm, Air Handler 1 (AHU-1), Zone 0, 12.0 x 9.5, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	114	0.50	32.1	0.060	219		5.820	663
Wall-1-W-B-D	132	1	17.6	0.071	165		6.887	909
Wall-2-N-B-D	44	1	9.6	0.071	30		6.887	303
Lights-Prof=0	148	1.000			506			
People-Prof=0	4.0	1.000			980	620		
Floor slab	16						56.260	900
Cool. Infil.CFM/ft²	7				116	274		
Heat. Infil.CFM/sq.ft	7						100.293	686
Sub-total					2,015	894		3,462
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					2,015	894		3,808

Room 10-Office Vav 113 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 15.5 x 12.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	186	0.50	31.6	0.060	352		5.820	1,083
Lights-Prof=0	242	1.000			825			
Equipment-Prof=0	200	1.000			682	0		
People-Prof=0	2.0	1.000			490	310		
Cool. Infil.CFM/ft²	11				212	424		
Heat. Infil.CFM/sq.ft	11						100.293	1,119
Sub-total					2,561	734		2,202
Safety factors:					+0%	+0%		+10%



Room Detailed Loads (At Room Peak Times) (cont'd)

Load Description	Unit Quan	-SC- CFAC	CLTD SHGF	U.Fac -CLF-	Sen. Gain	Lat. Gain	Htg. Mult.	Htg. Loss
Total w/ safety factors:					2,561	734		2,422

Room 11-Toilet 118 Vav 113 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 10.0 x 7.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	70	0.50	31.6	0.060	133		5.820	407
Lights-Prof=0	91	1.000			311			
People-Prof=0	1.0	1.000			245	155		
Cool. Infil.CFM/ft²	4				80	160		
Heat. Infil.CFM/sq.ft	4						100.293	421
Sub-total					768	315		829
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					768	315		911

Room 12-Copy Room Vav 113 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 8.0 x 10.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	80	0.50	31.6	0.060	152		5.820	466
Lights-Prof=0	104	1.000			355			
Equipment-Prof=0	550	1.000			1,877	0		
People-Prof=0	1.0	1.000			245	155		
Cool. Infil.CFM/ft²	5				91	183		
Heat. Infil.CFM/sq.ft	5						100.293	481
Sub-total					2,719	338		947
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					2,719	338		1,042

Equipment Cooling Loads

Item Name	Nominal Output Sensible	Quantity Type Sensible	Nominal Output Latent	Quantity Type Latent	Sensible Load (Btuh)	Latent Load (Btuh)
Copy machine: Large, multiuser, office type (B)	550	watts	0	Btuh	1,877	0
Total					1,877	0

Room 13-Workroom 113 Vav 113 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 21.0 x 25.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	525	0.50	31.6	0.060	995		5.820	3,056
Lights-Prof=0	683	1.000			2,329			
People-Prof=0	4.0	1.000			980	620		
Cool. Infil.CFM/ft²	32				597	1,198		
Heat. Infil.CFM/sq.ft	32						100.293	3,159
Sub-total					4,901	1,818		6,215
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					4,901	1,818		6,836



Room Detailed Loads (At Room Peak Times) (cont'd)

Load Description	Unit Quan	-SC- CFAC	CLTD SHGF	U.Fac -CLF-	Sen. Gain	Lat. Gain	Htg. Mult.	Htg. Loss
Room 14-Workroom 114 Vav 113 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 17.0 x 12.0, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	204	0.50	31.6	0.060	386		5.820	1,187
Lights-Prof=0	265	1.000			905			
People-Prof=0	2.0	1.000			490	310		
Cool. Infil.CFM/ft ²	12				232	466		
Heat. Infil.CFM/sq.ft	12						100.293	1,228
Sub-total					2,013	776		2,415
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					2,013	776		2,656

Room 15-Office 122 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 12.0 x 16.5, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	198	0.50	31.6	0.060	375		5.820	1,152
Wall-1-E-B-D	116	1	24.6	0.071	202		6.887	799
Gls-E-1-90-Tran	16.0	1.000	15	0.520	126		63.050	1,009
0%S-0-NS-Solar	16.0	0.350	213	0.290	346			
Lights-Prof=0	257	1.000			878			
Equipment-Prof=0	200	1.000			682	0		
People-Prof=0	2.0	1.000			490	310		
Floor slab	12						56.260	675
Cool. Infil.CFM/ft ²	12				225	452		
Heat. Infil.CFM/sq.ft	12						100.293	1,191
Sub-total					3,326	762		4,827
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					3,326	762		5,309

Room 16-Office 121 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 14.0 x 16.5, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	231	0.50	31.6	0.060	438		5.820	1,344
Wall-1-E-B-D	138	1	24.6	0.071	241		6.887	950
Gls-E-1-90-Tran	16.0	1.000	15	0.520	126		63.050	1,009
0%S-0-NS-Solar	16.0	0.350	213	0.290	346			
Lights-Prof=0	300	1.000			1,025			
Equipment-Prof=0	200	1.000			682	0		
People-Prof=0	2.0	1.000			490	310		
Floor slab	12						56.260	675
Cool. Infil.CFM/ft ²	14				263	527		
Heat. Infil.CFM/sq.ft	14						100.293	1,390
Sub-total					3,611	837		5,369
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					3,611	837		5,906



Room Detailed Loads (At Room Peak Times) (cont'd)

Load Description	Unit Quan	-SC- CFAC	CLTD SHGF	U.Fac -CLF-	Sen. Gain	Lat. Gain	Htg. Mult.	Htg. Loss
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Room 17-Room 123 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 28.0 x 13.5, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	378	0.50	31.6	0.060	716		5.820	2,200
Lights-Prof=0	491	1.000			1,677			
People-Prof=0	1.0	1.000			245	155		
Cool. Infil.CFM/ft²	23				430	863		
Heat. Infil.CFM/sq.ft	23						100.293	2,275
Sub-total					3,068	1,018		4,475
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					3,068	1,018		4,922

Room 18-Office 120 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 31.0 x 13.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	403	0.50	31.6	0.060	763		5.820	2,345
Wall-1-E-B-D	127	1	24.6	0.071	222		6.887	875
Wall-2-S-B-D	220	1	21.1	0.071	329		6.887	1,515
Gls-E-1-90-Tran	16.0	1.000	15	0.520	126		63.050	1,009
0%S-0-NS-Solar	16.0	0.350	213	0.290	346			
Lights-Prof=0	524	1.000			1,788			
Equipment-Prof=0	600	1.000			2,047	0		
People-Prof=0	3.0	1.000			735	465		
Floor slab	33						56.260	1,857
Cool. Infil.CFM/ft²	24				458	920		
Heat. Infil.CFM/sq.ft	24						100.293	2,425
Sub-total					6,815	1,385		10,026
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					6,815	1,385		11,028

Room 19-Mait Rm 125 peaks (sensible) in August at 4pm, Air Handler 1 (AHU-1), Zone 0, 23.0 x 12.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	276	0.50	32.1	0.060	531		5.820	1,606
Wall-1-E-B-D	132	1	25.6	0.071	240		6.887	909
Lights-Prof=0	359	1.000			1,224			
Equipment-Prof=0	200	1.000			682	0		
People-Prof=0	2.0	1.000			490	310		
Floor slab	12						56.260	675
Cool. Infil.CFM/ft²	17				304	640		
Heat. Infil.CFM/sq.ft	17						100.293	1,661
Sub-total					3,471	950		4,851
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					3,471	950		5,337

Room 20-Storage 127 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 12.0 x 7.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	84	0.50	31.6	0.060	159		5.820	489
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Room Detailed Loads (At Room Peak Times) (cont'd)

Load Description	Unit Quan	-SC- CFAC	CLTD SHGF	U.Fac -CLF-	Sen. Gain	Lat. Gain	Htg. Mult.	Htg. Loss
Lights-Prof=0	109	1.000			373			
People-Prof=0	1.0	1.000			245	155		
Cool. Infil.CFM/ft²	5				96	192		
Heat. Infil.CFM/sq.ft	5						100.293	505
Sub-total					872	347		994
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					872	347		1,094

Room 21-Garage 124, Air Handler 2 (Unit Heater), Zone 0, 30.0 x 20.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	600	0.50	7.6	0.060	0		5.820	3,492
Wall-1-E-B-D	120	1	24.6	0.071	0		6.887	826
Gls-E-1-90-Tran	100.0	1.000	3	0.520	0		63.050	6,305
0%S-0-NS-Solar	100.0	0.350	213	0.050	0			
Cool. Infil.CFM/ft²	0				0	0		
Heat. Infil.CFM/sq.ft	30						100.293	3,009
Sub-total					0	0		13,632
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					0	0		14,995

Room 22-128 Exit, Air Handler 3 (Elec Heater Rm 128), Zone 0, 5.0 x 7.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	35	0.50	7.6	0.060	0		5.820	204
Wall-1-N-B-D	34	1	13.6	0.071	0		6.887	234
Gls-N-1-90-Tran	21.0	1.000	3	0.520	0		63.050	1,324
0%S-0-NS-Solar	21.0	0.350	34	0.200	0			
Floor slab	5						56.260	281
Cool. Infil.CFM/ft²	0				0	0		
Heat. Infil.CFM/sq.ft	2						100.293	176
Sub-total					0	0		2,219
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					0	0		2,441

Room 23-Hall 110 VAV-113 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 26.0 x 8.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	208	0.50	31.6	0.060	394		5.820	1,211
Lights-Prof=0	270	1.000			923			
People-Prof=0	1.0	1.000			245	155		
Cool. Infil.CFM/ft²	12				237	475		
Heat. Infil.CFM/sq.ft	12						100.293	1,252
Sub-total					1,798	630		2,462
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					1,798	630		2,708



Room Detailed Loads (At Room Peak Times) (cont'd)

Load Description	Unit Quan	-SC- CFAC	CLTD SHGF	U.Fac -CLF-	Sen. Gain	Lat. Gain	Htg. Mult.	Htg. Loss
Room 24-Vest 111, Air Handler 3 (Elec Heater Rm 128), Zone 0, 11.5 x 8.0, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	92	0.50	7.6	0.060	0		5.820	535
Wall-1-E-B-D	32	1	24.6	0.071	0		6.887	220
Gls-E-1-90-Tran	56.0	1.000	3	0.520	0		63.050	3,531
0%S-0-NS-Solar	56.0	0.350	213	0.050	0			
Floor slab	8						56.260	450
Cool. Infil.CFM/ft²	0				0	0		
Heat. Infil.CFM/sq.ft	5						100.293	461
Sub-total					0	0		5,198
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					0	0		5,718

Room 25-Lobby 102 peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 48.0 x 12.0, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	576	0.50	31.6	0.060	1,091		5.820	3,352
Lights-Prof=0	749	1.000			2,555			
People-Prof=0	2.0	1.000			490	310		
Cool. Infil.CFM/ft²	35				655	1,314		
Heat. Infil.CFM/sq.ft	35						100.293	3,466
Sub-total					4,791	1,624		6,818
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					4,791	1,624		7,500

Room 26-Entry 101, Air Handler 3 (Elec Heater Rm 128), Zone 0, 11.5 x 8.0, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	92	0.50	7.6	0.060	0		5.820	535
Wall-1-W-B-D	32	1	30.6	0.071	0		6.887	220
Gls-W-1-90-Tran	56.0	1.000	3	0.520	0		63.050	3,531
0%S-0-NS-Solar	56.0	0.350	213	0.140	0			
Floor slab	8						56.260	450
Cool. Infil.CFM/ft²	0				0	0		
Heat. Infil.CFM/sq.ft	5						100.293	461
Sub-total					0	0		5,198
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					0	0		5,718

Room 27-Conference Room Vav 104-A peaks (sensible) in August at 3pm, Air Handler 1 (AHU-1), Zone 0, 48.0 x 21.5, Construction Type: 1 (Light)								
Roof-1-4-No.Clg-L	1,032	0.50	31.6	0.060	1,955		5.820	6,006
Lights-Prof=0	1,342	1.000			4,578			
Equipment-Prof=0	100	1.000			341	0		
People-Prof=0	69.0	1.000			16,905	10,695		
Cool. Infil.CFM/ft²	62				1,174	2,355		
Heat. Infil.CFM/sq.ft	62						100.293	6,210
Sub-total					24,953	13,050		12,216



Room Detailed Loads (At Room Peak Times) (cont'd)

Load Description	Unit Quan	-SC- CFAC	CLTD SHGF	U.Fac -CLF-	Sen. Gain	Lat. Gain	Htg. Mult.	Htg. Loss
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					24,953	13,050		13,438

Room 28-Conference Room Vav 104-B peaks (sensible) in August at 2pm, Air Handler 1 (AHU-1), Zone 0, 48.0 x 6.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	288	0.50	28.6	0.060	494		5.820	1,676
Wall-1-S-B-D	424	1	19.1	0.071	574		6.887	2,920
Gls-S-1-90-Tran	32.0	1.000	14	0.520	236		63.050	2,018
0%S-0-NS-Solar	32.0	0.350	169	0.650	1,230			
Gls-S-1-90-Tran	72.0	1.000	14	0.520	532		63.050	4,540
0%S-0-NS-Solar	72.0	0.350	169	0.650	2,768			
Lights-Prof=0	374	1.000			1,278			
People-Prof=0	20.0	1.000			4,900	3,100		
Floor slab	48						56.260	2,700
Cool. Infil.CFM/ft²	17				317	668		
Heat. Infil.CFM/sq.ft	17						100.293	1,733
Sub-total					12,329	3,768		15,587
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					12,329	3,768		17,146

Room 29-Storage 103 On Vav 104-B peaks (sensible) in August at 5pm, Air Handler 1 (AHU-1), Zone 0, 29.0 x 11.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	319	0.50	32.1	0.060	614		5.820	1,857
Wall-1-W-B-D	319	1	17.6	0.071	398		6.887	2,197
Wall-2-S-B-D	121	1	24.1	0.071	207		6.887	833
Lights-Prof=0	415	1.000			1,415			
People-Prof=0	1.0	1.000			245	155		
Floor slab	41						56.260	2,307
Cool. Infil.CFM/ft²	19				323	768		
Heat. Infil.CFM/sq.ft	19						100.293	1,920
Sub-total					3,202	923		9,113
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					3,202	923		10,024

Room 30-Lounge 105 peaks (sensible) in August at 4pm, Air Handler 1 (AHU-1), Zone 0, 29.0 x 12.5, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	363	0.50	32.1	0.060	698		5.820	2,110
Wall-1-S-B-D	138	1	22.1	0.071	216		6.887	947
Lights-Prof=0	471	1.000			1,608			
Equipment-Prof=0	500	1.000			1,706	0		
People-Prof=0	4.0	1.000			980	620		
Floor slab	13						56.260	703
Cool. Infil.CFM/ft²	22				399	841		
Heat. Infil.CFM/sq.ft	22						100.293	2,181
Sub-total					5,606	1,461		5,941



Room Detailed Loads (At Room Peak Times) (cont'd)

Load Description	Unit Quan	-SC- CFAC	CLTD SHGF	U.Fac -CLF-	Sen. Gain	Lat. Gain	Htg. Mult.	Htg. Loss
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					5,606	1,461		6,535

Room 31-Men 108 peaks (sensible) in August at 4pm, Air Handler 1 (AHU-1), Zone 0, 18.0 x 13.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	234	0.50	32.1	0.060	450		5.820	1,362
Wall-1-E-B-D	143	1	25.6	0.071	260		6.887	985
Lights-Prof=0	304	1.000			1,038			
People-Prof=0	2.0	1.000			490	310		
Floor slab	13						56.260	731
Cool. Infil.CFM/ft²	14				257	543		
Heat. Infil.CFM/sq.ft	14						100.293	1,408
Sub-total					2,495	853		4,486
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					2,495	853		4,935

Room 32-Womens 109 peaks (sensible) in August at 5pm, Air Handler 1 (AHU-1), Zone 0, 15.0 x 15.0, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	225	0.50	32.1	0.060	433		5.820	1,310
Wall-1-E-B-D	165	1	26.6	0.071	311		6.887	1,136
Wall-2-S-B-D	165	1	24.1	0.071	282		6.887	1,136
Lights-Prof=0	293	1.000			998			
People-Prof=0	2.0	1.000			490	310		
Floor slab	30						56.260	1,688
Cool. Infil.CFM/ft²	14				228	542		
Heat. Infil.CFM/sq.ft	14						100.293	1,354
Sub-total					2,742	852		6,624
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					2,742	852		7,286

Room 33-Utility 107 peaks (sensible) in August at 5pm, Air Handler 1 (AHU-1), Zone 0, 8.0 x 8.5, Construction Type: 1 (Light)

Roof-1-4-No.Clg-L	68	0.50	32.1	0.060	131		5.820	396
Wall-1-S-B-D	88	1	24.1	0.071	150		6.887	606
Lights-Prof=0	88	1.000			302			
People-Prof=0	1.0	1.000			245	155		
Floor slab	8						56.260	450
Cool. Infil.CFM/ft²	4				69	164		
Heat. Infil.CFM/sq.ft	4						100.293	409
Sub-total					897	319		1,861
Safety factors:					+0%	+0%		+10%
Total w/ safety factors:					897	319		2,047