

EMORY MEDICAL OFFICE HVAC LOAD ANALYSIS

for

ADAM'S FRAMING AND CONSTRUCTION

Prepared By

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01-02-1997

Project File Name: ADAM, EMORY MEDICAL

---System 1---	Outdoor Dry Bulb	Outdoor Wet Bulb	Indoor Rel.Hum.	Indoor Dry Bulb	Grains Difference
Winter:	27	N/A	N/A	72	N/A
Summer:	96	78	50%	75	51
---System 2---					
Winter:	27	N/A	N/A	72	N/A
Summer:	96	78	50%	75	51

No.	Projection	Offset	No.	Projection	Offset
1	3	1	6	0	0
2	5	0	7	0	0
3	4	0.5	8	0	0
4	0	0	9	0	0
5	0	0	10	0	0

	<u>Runouts</u>		<u>Main Trunk</u>
Duct Material:	Flexible Duct		Galvanized Steel
Roughness Factor:	0.010000		0.000300
Pressure Drop:	0.1000 In.wg/100 Ft.		0.1000 In.wg/100 Ft
Minimum Velocity:	450.0 Ft /Minute		650.0 Ft /Minute
Maximum Velocity:	750.0 Ft./Minute		900.0 Ft./Minute
Minimum Height:	0 Inches		0 Inches
Maximum Height:	0 Inches		0 Inches

	<u>Winter</u>		<u>Summer</u>
Infiltration:	0.900 AC/Hr		0.400 AC/Hr
Volume of Conditioned Space:	X 46590 Cu.Ft.		X 46590 Cu.Ft.
	41,931 Cu.Ft./Hr		18,636 Cu.Ft./Hr
	X 0.0167		X 0.0167
Total Building Infiltration	698.85 CFM		310.6 CFM
Total Building Ventilation:	0 CFM		0 CFM
---System 1---			
Infiltration & Ventilation Sensible Gain Multiplier:	23.10 = (1.10 X 21.00 Summer Temp. Difference)		
Infiltration & Ventilation Latent Gain Multiplier:	34.86 = (0.68 X 51.27 Grains Difference)		
Infiltration & Ventilation Sensible Loss Multiplier:	49.50 = (1.10 X 45.00 Winter Temp. Difference)		
---System 2---			
Infiltration & Ventilation Sensible Gain Multiplier:	23.10 = (1.10 X 21.00 Summer Temp. Difference)		
Infiltration & Ventilation Latent Gain Multiplier:	34.86 = (0.68 X 51.27 Grains Difference)		
Infiltration & Ventilation Sensible Loss Multiplier:	49.50 = (1.10 X 45.00 Winter Temp. Difference)		

Component Description	Area Quan	Sen. Loss	Lat. Gain	Sen. Gain	Total Gain
3C Window Double Pane Clear Glass Metal Frame	218	7,108	0	8,552	8,552
8O Glass Door Double Clear Glass Metal Frame	63	2,055	0	1,789	1,789
12C Wall R-11 + 1/2" Gypsum(R-0.5)	2,414	9,777	0	5,340	5,340
16G Ceiling R-30 Insulation	4,660	6,920	0	6,920	6,920
22A Slab on Grade No Edge Insulation	282	10,281	0	0	0
Subtotals for structure:	7,637	36,141	0	22,601	22,601
Active People:	66	0	15,180	19,800	34,980
Inactive People:	0	0	0	0	0
Appliances:	0	0	2,400	2,400	4,800
Lighting:	0	0		25,234	
Ductwork:	0	3,517	0	7,727	7,727
Infiltration: Winter CFM: 698.8, Summer CFM: 310.6	281	34,594	10,829	7,177	18,006
Ventilation: Winter CFM: 0.0, Summer CFM: 0.0	0	0	0	0	0
Sensible Gain Total:				84,939	
Temperature Swing Multiplier:				X1.00	
Building Load Totals:		74,252	28,409	84,939	113,348

Total Building Supply CFM:	3861	CFM per square foot:	0.829
Square feet of room area:	4,660	Square feet per ton:	452.73

Total heating required with outside air:	74,252 Btuh	74.252 MBH
Total sensible gain:	84,939 Btuh	75 %
Total latent gain:	28,409 Btuh	25 %
Total cooling required with outside air:	113,348 Btuh	9.446 Tons (based on sensible + latent)
		10.293 Tons (based on 77% sensible capacity)

Calculations are based on 7th 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

Component Description	Area Quan	Sen. Loss	Lat. Gain	Sen. Gain	Total Gain
3C Window Double Pane Clear Glass Metal Frame	150	4,890	0	5,940	5,940
8O Glass Door Double Clear Glass Metal Frame	63	2,055	0	1,789	1,789
12C Wall R-11 + 1/2" Gypsum(R-0 5)	1,731	7,011	0	3,828	3,828
16G Ceiling R-30 Insulation	2,379	3,535	0	3,535	3,535
22A Slab on Grade No Edge Insulation	199	7,257	0	0	0
Subtotals for structure:	4,522	24,748	0	15,092	15,092
Active People:	38	0	8,740	11,400	20,140
Inactive People:	0	0	0	0	0
Appliances:	0	0	1,200	1,200	2,400
Lighting:	0	0		13,640	
Ductwork:	0	2,117	0	4,502	4,502
Infiltration: Winter CFM: 356.7, Summer CFM: 158.5	213	17,657	5,527	3,663	9,190
Ventilation: Winter CFM: 0.0, Summer CFM: 0.0	0	0	0	0	0
Sensible Gain Total				49,497	
Temperature Swing Multiplier:				X1.00	
System Load Totals:		44,522	15,467	49,497	64,964

Supply CFM:	2,250	CFM per square foot:	0.946
Square feet of room area:	2,379	Square feet per ton:	424.519

Total heating required with outside air:	44,522 Btuh	44.522 MBH
Total sensible gain:	49,497 Btuh	76 %
Total latent gain:	15,467 Btuh	24 %
Total cooling required with outside air:	64,964 Btuh	5.414 Tons (based on sensible + latent)
		5.604 Tons (based on 77% sensible capacity)

Calculations are based on 7th 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.



Component Description	Area Quan	Sen. Loss	Lat. Gain	Sen. Gain	Total Gain
3C Window Double Pane Clear Glass Metal Frame	68	2,218	0	2,612	2,612
12C Wall R-11 + 1/2" Gypsum(R-0.5)	683	2,766	0	1,512	1,512
16G Ceiling R-30 Insulation	2,281	3,385	0	3,385	3,385
22A Slab on Grade No Edge Insulation	83	3,024	0	0	0
Subtotals for structure:	3,115	11,393	0	7,509	7,509
Active People:	28	0	6,440	8,400	14,840
Inactive People:	0	0	0	0	0
Appliances:	0	0	1,200	1,200	2,400
Lighting:	0	0		11,594	
Ductwork:	0	1,400	0	3,225	3,225
Infiltration: Winter CFM: 342 1, Summer CFM: 152.1	68	16,937	5,302	3,514	8,816
Ventilation: Winter CFM: 0.0, Summer CFM: 0.0	0	0	0	0	0
Sensible Gain Total:				35,442	
Temperature Swing Multiplier:				X1.00	
System Load Totals:		29,730	12,942	35,442	48,384

Supply CFM:	1,611	CFM per square foot:	0.706
Square feet of room area:	2,281	Square feet per ton:	486.444

Total heating required with outside air:	29,730 Btuh	29 730 MBH
Total sensible gain:	35,442 Btuh	73 %
Total latent gain:	12,942 Btuh	27 %
Total cooling required with outside air:	48,384 Btuh	4.032 Tons (based on sensible + latent)
		4.689 Tons (based on 77% sensible capacity)

Calculations are based on 7th 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.



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	Zone Adj Fact	Clg Adj CFM	Air Sys CFM
---Zone 1---												
1	Waiting Room	195	15,460	201	3-9	457	13,318	7,247	605	1.00	605	605
2	Bath#1	111	807	10	1-5	483	1,449	230	66	1.00	66	66
3	I T Room	47	478	6	1-6	525	2,269	1,200	103	1.00	103	103
4	Exam #1	111	807	10	1-5	483	1,449	230	66	1.00	66	66
5	Exam #2	111	807	10	1-5	483	1,449	230	66	1.00	66	66
6	Exam #3	111	807	10	1-5	483	1,449	230	66	1.00	66	66
7	Bath #2	111	807	10	1-5	483	1,449	230	66	1.00	66	66
8	Exam #4	111	807	10	1-5	483	1,449	230	66	1.00	66	66
9	Exam #5	111	807	10	1-5	483	1,449	230	66	1.00	66	66
10	Exam #6	111	807	10	1-5	483	1,449	230	66	1.00	66	66
11	Exam #7	111	807	10	1-5	483	1,449	230	66	1.00	66	66
12	Procedure Room	202	1,454	19	1-7	482	2,836	460	129	1.00	129	129
13	Office #1	161	5,850	76	1-8	470	3,611	1,008	164	1.00	164	164
14	Office #2	158	2,810	36	1-8	553	3,399	619	155	1.25	193	155
15	Office #3	237	10,577	137	1-11	617	7,582	1,943	345	1.18	407	345
29	Hall #1	380	630	8	2-5	574	3,441	920	156	1.00	156	156
System 1 Totals		2379	44,522	578			49,497	15,467	2,250		2,351	2,250

*Main Trunk Size: 20x16 in.

*Main Trunk velocity constraints were not met due to duct schedule limitations.

Main Trunk Air Velocity = 1082 Feet/Minute

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	5.414	76%/24%	49,497	15,467	64,964
Recommended:	5.604	77%/23%	51,781	15,467	67,248

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	Zone Adj Fact	Clg Adj CFM	Air Sys CFM
---Zone 1---												
16	Procedure Room #2	225	5,645	73	1-8	461	3,541	1,321	161	1.00	161	161
17	Exam #8	111	1,974	26	1-5	612	1,837	542	84	1.00	84	84
18	Exam #9	111	3,722	48	1-7	485	2,416	1,010	110	1.18	130	110
19	Bath #3	111	3,722	48	1-7	485	2,416	1,010	110	1.18	130	110
20	Laser Room	225	4,478	58	2-6	556	4,805	2,440	218	1.00	218	218
21	Stock Room	147	267	3	1-4	516	990	0	45	1.00	45	45
22	Ultrasound	104	200	3	1-5	527	1,580	460	72	1.00	72	72
23	Non-stress Test	104	200	3	1-5	527	1,580	460	72	1.00	72	72
24	Office #4	104	200	3	1-5	527	1,580	460	72	1.00	72	72
25	Office #5	104	200	3	1-5	527	1,580	460	72	1.00	72	72
26	Lab	104	200	3	1-5	527	1,580	460	72	1.00	72	72
27	Office #6	541	8,450	110	2-8	537	8,242	3,399	375	1.00	375	375
28	Hall #2	290	472	6	2-5	549	3,295	920	150	1.00	150	150
System 2 Totals		2281	29,730	386			35,442	12,942	1,611		1,651	1,611
Main Trunk Size: 20x14 in.												

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required.	4.032	73%/27%	35,442	12,942	48,384
Recommended:	4.689	77%/23%	43,328	12,942	56,270

Troy Crews

From: David Boozer
Sent: Friday, August 09, 2013 8 06 AM
To: Troy Crews
Subject: RE emory medical 90 west

Good Morning,

I am fine with it.

I'll get the information and send a letter.

From: Troy Crews
Sent: Thursday, August 08, 2013 8:22 AM
To: David Boozer
Subject: emory medical 90 west

Are we a go with this one for Adam Papka ?

Troy Crews
Assistant Building and Zoning Coordinator C.B.O.
386-758-1040 phone
386-758-2160 fax

