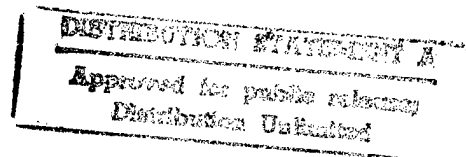


Dec 94

APPENDIX F

**SYSTEM SIMULATION
COMPUTER RUNS**

Volume III



933702

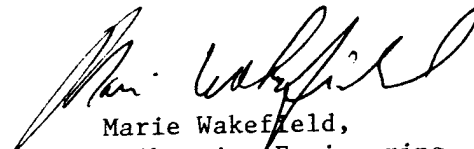


DEPARTMENT OF THE ARMY
CONSTRUCTION ENGINEERING RESEARCH LABORATORIES, CORPS OF ENGINEERS
P.O. BOX 9005
CHAMPAIGN, ILLINOIS 61826-9005

REPLY TO
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17 Sep 1997

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Marie Wakefield,
Librarian Engineering

Building 201
(Typical for 202, 203, and 204)

Trace Input File

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933702

19971017 205

CONTENTS OF : E:\CB201.TM

LINE # -----

1 JOB - 1

2 01/ENERGY SAVINGS OPPORTUNITY STUDY

3 01/CARLISLE BARRACKS, PA

4 01/DEPARTMENT OF THE ARMY

5 01/BENATEC ASSOCIATES

6 01/BUILDING 201

7 08/CARLISLE

8 09/MAY/SEP////APR/OCT

9 10/CLTD-CLF

10 11///ZONE

11 LOAD - 1

12 19/1/BASE BUILDING

13 20/01/1/1ST FLOOR/864/1/2/1/.36/9

14 20/02/1/2ND FLOOR/864/1/1/0//8

15 21/M////CBLQTX//CBLQTX

16 22/02/1/YES////154

17 24/01/1/329/1//157/0

18 24/01/2/25/2//157/90

19 24/01/3/25/7//156/90

20 24/01/4/36.5/6//156/180

21 24/01/5/36.5/2//157/180

22 24/01/6/25/2//157/270

23 24/01/7/25/7//156/270

24 24/02/1/292/1//157/0

25 24/02/2/272/1//157/90

26 24/02/3/292/1//157/180

27 24/02/4/272/1//157/270

28 25/01/1/66.3/1/1/.55/.57

29 25/01/3/36/1/1/.55/.57

30 25/01/4/18/1/1/.55/.57

31 25/01/6/16/1/1/.55/.57

32 25/02/1/73/1/1/.55/.57

33 25/02/2/86/1/1/.55/.57

34 25/02/3/40/1/1/.55/.57

35 25/02/4/24/1/1/.55/.57

36 26/M/CBLQP/CBLQL/OFF//OFF/CBLQHTG/CBLQHTG/OFF/OFF

37 27/M/345/SF-PERS/230/190/.5/WATT-SF/INCAND

38 29/M////////.38/CFM-SF

39 30/M///760/CFM

40 SYSTEM - 1

41 39/1/BASE BUILDING

42 40/1/SZ

43 41/1/1/1

44 42/1/.2/.2

45 45/1/OFF////CBLQHTG

46 EQUIPMENT - 1

47 59/1/CARLISLE///BASE BUILDING

48 60/1/1/BLKPLANT/1/1

49 62/1/EQ1000/1

50 65/1/1//1/1

51 67/1/EQ2454/1

52 69/1

53 LOAD - 2

54 19/2/WALL & ROOF INSULATION

55 20/01/1/1ST FLOOR/864/1/2/1/.36/9

56 20/02/1/2ND FLOOR/864/1/1/0//8

57 21/M////CBLQTX//CBLQTX

58 22/02/1/YES////191

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LINE #	-----
59	24/01/1/329/1//157/0
60	24/01/2/25/2//157/90
61	24/01/3/25/7//145/90
62	24/01/4/36.5/6//145/180
63	24/01/5/36.6/2//157/180
64	24/01/6/25/2//157/270
65	24/01/7/25/7//145/270
66	24/02/1/292/1//157/0
67	24/02/2/272/1//157/90
68	24/02/3/292/1//157/180
69	24/02/4/272/1//157/270
70	25/01/1/66.3/1/1/.55/.57
71	25/01/3/36/1/1/.55/.57
72	25/01/4/18/1/1/.55/.57
73	25/01/6/16/1/1/.55/.57
74	25/02/1/73/1/1/.55/.57
75	25/02/2/86/1/1/.55/.57
76	25/02/3/40/1/1/.55/.57
77	25/02/4/24/1/1/.55/.57
78	26/M/CBLQP/CBLQL/OFF//OFF/CBLQHTG/CBLQHTG/OFF/OFF
79	27/M/345/SF-PERS/230/190/.5/WATT-SF/INCAND
80	29/M////////.33/CFM-SF
81	30/M///760/CFM
82	SYSTEM - 2
83	39/2/WALL & ROOF INSULATION
84	40/1/SZ
85	41/1/1/1
86	42/1/.2/.2
87	45/1/OFF/////CBLQHTG
88	EQUIPMENT - 2
89	59/2/CARLISLE///WALL & ROOF INSULATION
90	60/1/1/BLKPLANT/1/1
91	62/1/EQ1000/1
92	65/1/1//1/1
93	67/1/EQ2454/1
94	69/1
95	LOAD - 3
96	19/3/WEATHERSTRIP & CAULKING
97	20/01/1/1ST FLOOR/864/1/2/1/.36/9
98	20/02/1/2ND FLOOR/864/1/1/0//8
99	21/M////CBLQTX///CBLQTX
100	22/02/1/YES////154
101	24/01/1/329/1//157/0
102	24/01/2/25/2//157/90
103	24/01/3/25/7//156/90
104	24/01/4/36.5/6//156/180
105	24/01/5/36.5/2//157/180
106	24/01/6/25/2//157/270
107	24/01/7/25/7//156/270
108	24/02/1/292/1//157/0
109	24/02/2/272/1//157/90
110	24/02/3/292/1//157/180
111	24/02/4/272/1//157/270
112	25/01/1/66.3/1/1/.55/.57
113	25/01/3/36/1/1/.55/.57
114	25/01/4/18/1/1/.55/.57
115	25/01/6/16/1/1/.55/.57
116	25/02/1/73/1/1/.55/.57

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LINE #	
117	25/02/2/86/1/1/.55/.57
118	25/02/3/40/1/1/.55/.57
119	25/02/4/24/1/1/.55/.57
120	26/M/CBLQP/CBLQL/OFF//OFF/CBLQHTG/CBLQHTG/OFF/OFF
121	27/M/345/SF-PERS/230/190/.5/WATT-SF/INCAND
122	29/M////////.30/CFM-SF
123	30/M///760/CFM
124	SYSTEM - 3
125	39/3/WEATHERSTRIP & CAULKING
126	40/1/SZ
127	41/1/1/1
128	42/1/.2/.2
129	45/1/OFF/////CBLQHTG
130	EQUIPMENT - 3
131	59/3/CARLISLE///WEATHERSTRIP & CAULKING
132	60/1/1/BLKPLANT/1/1
133	62/1/EQ1000/1
134	65/1/1/1/1
135	67/1/EQ2454/1
136	69/1
137	LOAD - 4
138	19/4/COMPINED ECOS
139	20/01/1/1ST FLOOR/864/1/2/1/.36/9
140	20/02/1/2ND FLOOR/864/1/1/0//8
141	21/M///CBLQTX///CBLQTX
142	22/02/1/YES////191
143	24/01/1/329/1//157/0
144	24/01/2/25/2//157/90
145	24/01/3/25/7//145/90
146	24/01/4/36.5/6//145/180
147	24/01/5/36.5/2//157/180
148	24/01/6/25/2//157/270
149	24/01/7/25/7//145/270
150	24/02/1/292/1//157/0
151	24/02/2/272/1//157/90
152	24/02/3/292/1//157/180
153	24/02/4/272/1//157/270
154	25/01/1/66.3/1/1/.55/.57
155	25/01/3/36/1/1/.55/.57
156	25/01/4/18/1/1/.55/.57
157	25/01/6/16/1/1/.55/.57
158	25/02/1/73/1/1/.55/.57
159	25/02/2/86/1/1/.55/.57
160	25/02/3/40/1/1/.55/.57
161	25/02/4/24/1/1/.55/.57
162	26/M/CBLQP/CBLQL/OFF//OFF/CBLQHTG/CBLQHTG/OFF/OFF
163	27/M/345/SF-PERS/230/190/.5/WATT-SF/INCAND
164	29/M////////.28/CFM-SF
165	30/M///760/CFM
166	SYSTEM - 4
167	39/4/COMBINED ECOS
168	40/1/SZ
169	41/1/1/1
170	42/1/.2/.2
171	45/1/OFF/////CBLQHTG
172	EQUIPMENT - 4
173	59/4/CARLISLE///COMBINED ECOS
174	60/1/1/BLKPLANT/1/1

CONTENTS OF : E:\CB201.TM

LINE #	-----
175	62/1/EQ1000/1
176	65/1/1//1/1
177	67/1/EQ2454/1
178	69/1

Building 201
(Typical for 202, 203, and 204)

Trace Output File

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*****
*****
**
**          T R A C E   6 0 0   A N A L Y S I S          **
**
**          by          **
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 201

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 13: 0:39 1/12/94
Dataset Name: CB201 .TM

AIRFLOW - ALTERNATIVE 1
BASE BUILDING

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	Main					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1	SZ	0	1,933	1,520	2,769	836	0	0
Totals		0	1,933	1,520	2,769	836	0	0

CAPACITY - ALTERNATIVE 1
BASE BUILDING

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	Cooling					Heating					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	2.3	0.0	0.0	2.3	-90,533	0	0	0	0	0	-90,533
Totals		2.3	0.0	0.0	2.3	-90,533	0	0	0	0	0	-90,533

The building peaked at hour 17 month 7 with a capacity of 2.3 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BASE BUILDING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	0.00	1.12	830.3	742.1	16.17	0.88	-52.39	1,728

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/17 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 89/ 72/ 91.0 * OADB: 89 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,865	0		3,865	13.83	*	3,865	14.12	*	-3,167	-3,167	3.55
Glass Solar	10,729	0		10,729	38.40	*	10,729	39.20	*	0	0	0.00
Glass Cond	2,699	0		2,699	9.66	*	2,699	9.86	*	-12,944	-12,944	14.49
Wall Cond	5,871	520		6,390	22.87	*	5,871	21.45	*	-11,510	-12,649	14.17
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-58,197	-58,197	65.17
Sub Total==>	23,164	520		23,684	84.76	*	23,164	84.63	*	-85,818	-86,957	97.38
Internal Loads						*			*			
Lights	2,374	0		2,374	8.50	*	2,374	8.67	*	0	0	0.00
People	1,885			1,885	6.75	*	933	3.41	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	4,259	0	0	4,259	15.24	*	3,307	12.08	*	0	0	0.00
Ceiling Load	916	-916		0	0.00	*	900	3.29	*	-894	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	-2,342	-2,342	2.62
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	28,339	-396	0	27,942	100.00	*	27,371	100.00	*	-89,053	-89,299	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
				Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf)	(%)
Main Clg	2.3	27.9	1,933	75.7	62.7	66.5	61.9	57.9	67.5	Floor	1,728	
Aux Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0	
Opt Vent	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Totals	2.3	27.9								Roof	864	0 0
										Wall	2,199	359 16

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)--		
								Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-90.5	1,520	67.1	121.8	Vent	0	0	Clg Cfm/Sqft	1.12	SADB	62.0	121.8	
Aux Htg	0.0	0	0.0	0.0	Infil	0	836	Clg Cfm/Ton	830.27	Plenum	76.8	66.2	
Preheat	-0.0	1,933	67.1	61.9	Supply	1,933	1,520	Clg Sqft/Ton	742.10	Return	75.7	67.1	
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	16.17	Ret/OA	75.7	67.1	
Humidif	0.0	0	0.0	0.0	Return	1,933	1,520	No. People	5	Runarnd	75.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	-90.5				Rm Exh	0	0	Htg Cfm/Sqft	0.88	Fn BldTD	0.0	0.0	
					Auxil	0	0	Htg Btuh/Sqft	-52.39	Fn Frict	0.1	0.1	

BUILDING U-VALUES - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G U - V A L U E S -----

		----- Room U-Values -----									Room	Room
		(Btu/hr/sqft/F)									Mass	Capac.
Room				Summr	Wintr		Summr	Wintr			(lb/	(Btu/
Number	Description	Part.	ExFlr	Skylt	Skylt	Roof	Windo	Windo	Wall	Ceil.	sqft)	sqft/F)
1	1ST FLOOR	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.154	0.578	51.4	10.97
2	2ND FLOOR	0.000	0.000	0.000	0.000	0.057	0.550	0.563	0.060	0.000	22.0	8.05
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.057	0.550	0.563	0.108	0.578	36.7	9.51
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.057	0.550	0.563	0.108	0.578	36.7	9.51
Building		0.000	0.000	0.000	0.000	0.057	0.550	0.563	0.108	0.578	36.7	9.51

BUILDING AREAS - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed		Skylight Area (sqft)	Skyl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
		Flr	Rm				Floor Area (sqft)	Partition Area (sqft)						
1	1ST FLOOR	1	1	864	864	0	0	0	0	0	0	136	13	935
2	2ND FLOOR	1	1	864	864	0	0	0	0	0	864	223	20	905
Zone	1 Total/Ave.				1,728	0	0	0	0	0	864	359	16	1,840
System	1 Total/Ave.				1,728	0	0	0	0	0	864	359	16	1,840
Building					1,728	0	0	0	0	0	864	359	16	1,840

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BASE BUILDING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.057 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.180 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.145 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 3.49 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 16.91 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BASE BUILDING

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.1	0	0	-4,527	5	222	96.7	0	0	0.0	0	0
5 - 10	0.2	0	0	-9,053	7	309	193.3	0	0	0.0	0	0
10 - 15	0.3	0	0	-13,580	5	238	290.0	0	0	0.0	0	0
15 - 20	0.5	0	0	-18,107	11	527	386.7	42	2,120	0.0	0	0
20 - 25	0.6	0	0	-22,633	40	1,874	483.3	0	0	0.0	0	0
25 - 30	0.7	0	0	-27,160	5	257	580.0	0	0	0.0	0	0
30 - 35	0.8	0	0	-31,687	6	271	676.7	0	0	0.0	0	0
35 - 40	0.9	0	0	-36,213	4	212	773.3	20	1,043	0.0	0	0
40 - 45	1.0	0	0	-40,740	3	142	870.0	0	0	0.0	0	0
45 - 50	1.2	0	0	-45,267	1	59	966.6	0	17	0.0	0	0
50 - 55	1.3	0	0	-49,793	8	362	1,063.3	0	0	0.0	0	0
55 - 60	1.4	0	0	-54,320	0	22	1,160.0	0	0	0.0	0	0
60 - 65	1.5	0	0	-58,847	2	71	1,256.6	0	0	0.0	0	0
65 - 70	1.6	0	0	-63,373	0	0	1,353.3	0	0	0.0	0	0
70 - 75	1.7	0	0	-67,900	0	19	1,450.0	0	0	0.0	0	0
75 - 80	1.9	0	0	-72,427	0	9	1,546.6	32	1,631	0.0	0	0
80 - 85	2.0	0	0	-76,953	0	0	1,643.3	0	0	0.0	0	0
85 - 90	2.1	0	0	-81,480	0	0	1,740.0	0	0	0.0	0	0
90 - 95	2.2	0	0	-86,007	0	0	1,836.6	0	0	0.0	0	0
95 - 100	2.3	0	0	-90,533	3	118	1,933.3	5	277	0.0	0	0
Hours Off	0.0	0	8,760	0	0	4,048	0.0	0	3,672	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature ----- Zone Number -----
Range 1
(F)

Max. Temp. 102.9
Mo./Hr. 7 22
Day Type 1

..... Number of Hours
Above 100 312
95 - 100 1,198
90 - 95 1,097
85 - 90 507
80 - 85 558
75 - 80 0
70 - 75 0
65 - 70 4,446
60 - 65 642
55 - 60 0
50 - 55 0
Below 50 0

Min. Temp. 60.2
Mo./Hr. 2 15
Day Type 2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BASE BUILDING

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	1,710	3	306	1
Feb	1,545	3	300	1
March	1,716	3	207	1
April	1,415	3	97	0
May	231	1	0	0
June	226	1	0	0
July	226	1	0	0
Aug	234	1	0	0
Sept	220	1	0	0
Oct	1,080	3	66	0
Nov	1,654	3	143	0
Dec	1,708	3	258	1
Total	11,967	3	1,378	1

Building Energy Consumption = 103,364 (Btu/Sq Ft/Year)
Source Energy Consumption = 154,839 (Btu/Sq Ft/Year)

Floor Area = 1,728 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BASE BUILDING

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	229	207	234	220	231	226	226	234	220	231	220	226	2,705
	PK	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTW20	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1000													
	PREVENTS COOLING ENERGY													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5001													
	CHILLED WATER PUMP C.V.													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5010													
	CONDENSER WATER PUMP C.V.													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ2454													
	RESIDENT GAS FURNACE W-FAN													
	GAS	306	300	207	97	0	0	0	0	0	66	143	258	1,378
	PK	1.1	1.1	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.4	1.1	1.1
1	EQ5254													
	RESIDENTIAL FURNACE FAN													
	ELEC	1482	1338	1482	1195	0	0	0	0	0	848	1434	1482	9,262
	PK	2.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0	2.0

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BASE BUILDING

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 2.9 (kW)
Yearly Time of Peak 6 (hr) 1 (mo)

Hour 6 Month 1

Sub Total	0.0	0.00

Heating Equipment

1	EQ2454	RESIDENT GAS FURNACE W-FAN	2.0	69.75

Sub Total	2.0	69.75

Sub Total	0.0	0.00

Sub Total	0.0	0.00

Miscellaneous

Lights	0.9	30.25

Base Utilities	0.0	0.00

Misc Equipment	0.0	0.00

Sub Total	0.9	30.25

Grand Total	2.9	100.00

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*****
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**                                     **
**          T R A C E    6 0 0    A N A L Y S I S          **
**                                     **
**          by                **
**                                     **
*****
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 201

Weather File Code:	CARLISLE
Location:	ENERGY SAVINGS OPPORTUNITY STUDY
Latitude:	40.2 (deg)
Longitude:	77.2 (deg)
Time Zone:	5
Elevation:	475 (ft)
Barometric Pressure:	29.2 (in. Hg)
Summer Clearness Number:	1.00
Winter Clearness Number:	1.00
Summer Design Dry Bulb:	92 (F)
Summer Design Wet Bulb:	72 (F)
Winter Design Dry Bulb:	4 (F)
Summer Ground Reflectance:	0.20
Winter Ground Reflectance:	0.20
Air Density:	0.0742 (Lbm/cuft)
Air Specific Heat:	0.2444 (Btu/lbm/F)
Density-Specific Heat Prod:	1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor:	4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor:	4.4519 (Lb-min./hr/cuft)
Design Simulation Period:	May To September
System Simulation Period:	January To December
Cooling Load Methodology:	CLTD/CLF (Transfer Function Method)
Time/Date Program was Run:	13: 3:28 1/12/94
Dataset Name:	CB201 .TM

AIRFLOW - ALTERNATIVE 2
WALL & ROOF INSULATION

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	Main					Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)		
1 SZ		0	1,715	1,520	2,441	726	0	0
Totals		0	1,715	1,520	2,441	726	0	0

CAPACITY - ALTERNATIVE 2
WALL & ROOF INSULATION

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

		Cooling				Heating						
		Main Sys.	Aux. Sys.	Opt. Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
System Number	System Type	Capacity (Tons)	Capacity (Tons)	Capacity (Tons)	Totals (Tons)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Totals (Btuh)
1	SZ	2.1	0.0	0.0	2.1	-78,543	0	0	0	0	0	-78,543
Totals		2.1	0.0	0.0	2.1	-78,543	0	0	0	0	0	-78,543

The building peaked at hour 17 month 7 with a capacity of 2.1 tons

ENGINEERING CHECKS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	0.00	0.99	802.7	808.7	14.84	0.88	-45.45	1,728

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==>		Mo/Hr: 7/17		*	Mo/Hr: 7/17		*	Mo/Hr: 13/ 1		
Outside Air ==>		OADB/WB/HR: 89/ 72/ 91.0		*	OADB: 89		*	OADB: 4		
				*			*			
	Space	Ret. Air	Ret. Air	Net	Percnt	Space	Percnt	Space Peak	Coil Peak	Percnt
	Sens.+Lat.	Sensible	Latent	Total	Of Tot	Sensible	Of Tot	Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)	(Btuh)	(%)	(Btuh)	(Btuh)	(%)
Envelope Loads										
Skylite Solr	0	0		0	0.00	0	0.00	0	0	0.00
Skylite Cond	0	0		0	0.00	0	0.00	0	0	0.00
Roof Cond	1,651	0		1,651	6.44	1,651	6.63	-1,476	-1,476	1.90
Glass Solar	10,506	0		10,506	40.98	10,506	42.15	0	0	0.00
Glass Cond	2,626	0		2,626	10.24	2,626	10.53	-12,944	-12,944	16.64
Wall Cond	3,464	180		3,644	14.21	3,464	13.90	-6,420	-6,844	8.80
Partition	0			0	0.00	0	0.00	0	0	0.00
Exposed Floor	0			0	0.00	0	0.00	0	0	0.00
Infiltration	0			0	0.00	0	0.00	-50,544	-50,544	64.97
Sub Total==>	18,247	180		18,427	71.87	18,247	73.21	-71,384	-71,808	92.30
Internal Loads										
Lights	2,418	0		2,418	9.43	2,418	9.70	0	0	0.00
People	1,919			1,919	7.49	968	3.88	0	0	0.00
Misc	0	0	0	0	0.00	0	0.00	0	0	0.00
Sub Total==>	4,337	0	0	4,337	16.92	3,386	13.58	0	0	0.00
Ceiling Load	379	-379		0	0.00	417	1.67	-439	0	0.00
Outside Air	0	0	0	0	0.00	0	0.00	0	0	0.00
Sup. Fan Heat				0	0.00		0.00		0	0.00
Ret. Fan Heat		0		0	0.00		0.00		0	0.00
Duct Heat Pkup		0		0	0.00		0.00		0	0.00
OV/UNDR Sizing	2,876			2,876	11.22	2,876	11.54	-5,993	-5,993	7.70
Exhaust Heat		0	0	0	0.00		0.00		0	0.00
Terminal Bypass		0	0	0	0.00		0.00		0	0.00
Grand Total==>	25,840	-200	0	25,640	100.00	24,926	100.00	-77,816	-77,801	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor	1,728	
Main Clg	2.1	25.6	24.7	1,715 75.3 62.6 66.5	61.5 57.6 66.6	Part	0	
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	864	0 0
Totals	2.1	25.6				Wall	2,199	359 16

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	0	0	Clg Cfm/Sqft	0.99	SADB	61.6	115.0
Main Htg	-78.5	1,520	67.6	115.0	Infil	0	726	Clg Cfm/Ton	802.73	Plenum	75.8	67.1
Aux Htg	0.0	0	0.0	0.0	Supply	1,715	1,520	Clg Sqft/Ton	808.72	Return	75.3	67.6
Preheat	-0.0	1,715	67.6	61.5	Mincfm	0	0	Clg Btuh/Sqft	14.84	Ret/OA	75.3	67.6
Reheat	0.0	0	0.0	0.0	Return	1,715	1,520	No. People	5	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	0.88	Fn BldTD	0.0	0.0
Total	-78.5				Auxil	0	0	Htg Btuh/Sqft	-45.45	Fn Frict	0.1	0.1

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

BUILDING U-VALUES - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G U - V A L U E S -----

		Room U-Values (Btu/hr/sqft/F)									Room	Room
Room				Summr	Wintr		Summr	Wintr			Mass	Capac.
Number	Description	Part.	ExFlr	Skylt	Skylt	Roof	Windo	Windo	Wall	Ceil.	(lb/ sqft)	(Btu/ sqft/F)
1	1ST FLOOR	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.056	0.578	52.8	11.26
2	2ND FLOOR	0.000	0.000	0.000	0.000	0.027	0.550	0.563	0.060	0.000	23.0	8.25
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.578	37.9	9.75
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.578	37.9	9.75
Building		0.000	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.578	37.9	9.75

BUILDING AREAS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
		Flr	Rm										
1	1ST FLOOR	1	1	864	864	0	0	0	0	0	136	13	935
2	2ND FLOOR	1	1	864	864	0	0	0	0	864	223	20	905
Zone	1 Total/Ave.				1,728	0	0	0	0	864	359	16	1,840
System	1 Total/Ave.				1,728	0	0	0	0	864	359	16	1,840
Building					1,728	0	0	0	0	864	359	16	1,840

ASHRAE 90 ANALYSIS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.027 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.139 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.107 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 1.33 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 15.38 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2
WALL & ROOF INSULATION

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.1	0	0	-3,927	6	259	85.8	0	0	0.0	0	0
5 - 10	0.2	0	0	-7,854	6	285	171.5	0	0	0.0	0	0
10 - 15	0.3	0	0	-11,781	7	319	257.3	0	0	0.0	0	0
15 - 20	0.4	0	0	-15,709	11	509	343.0	42	2,120	0.0	0	0
20 - 25	0.5	0	0	-19,636	39	1,785	428.8	0	0	0.0	0	0
25 - 30	0.6	0	0	-23,563	6	266	514.6	0	0	0.0	0	0
30 - 35	0.7	0	0	-27,490	7	317	600.3	0	0	0.0	0	0
35 - 40	0.9	0	0	-31,417	4	195	686.1	0	0	0.0	0	0
40 - 45	1.0	0	0	-35,344	1	31	771.8	20	1,009	0.0	0	0
45 - 50	1.1	0	0	-39,272	3	155	857.6	1	51	0.0	0	0
50 - 55	1.2	0	0	-43,199	8	359	943.4	0	0	0.0	0	0
55 - 60	1.3	0	0	-47,126	0	0	1,029.1	0	0	0.0	0	0
60 - 65	1.4	0	0	-51,053	0	19	1,114.9	0	0	0.0	0	0
65 - 70	1.5	0	0	-54,980	0	9	1,200.6	0	0	0.0	0	0
70 - 75	1.6	0	0	-58,907	0	0	1,286.4	0	0	0.0	0	0
75 - 80	1.7	0	0	-62,834	0	0	1,372.2	0	0	0.0	0	0
80 - 85	1.8	0	0	-66,762	0	0	1,457.9	0	0	0.0	0	0
85 - 90	1.9	0	0	-70,689	0	11	1,543.7	31	1,591	0.0	0	0
90 - 95	2.0	0	0	-74,616	1	48	1,629.4	0	0	0.0	0	0
95 - 100	2.1	0	0	-78,543	1	59	1,715.2	6	317	0.0	0	0
Hours Off	0.0	0	8,760	0	0	4,134	0.0	0	3,672	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature ----- Zone Number -----
Range 1
(F)

Max. Temp. 105.2
Mo./Hr. 8 21
Day Type 1

..... Number of Hours

Above 100	1,153
95 - 100	1,181
90 - 95	485
85 - 90	380
80 - 85	473
75 - 80	0
70 - 75	17
65 - 70	4,635
60 - 65	436
55 - 60	0
50 - 55	0
Below 50	0

Min. Temp. 61.8
Mo./Hr. 2 15
Day Type 2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 2
WALL & ROOF INSULATION

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	1,514	3	253	1
Feb	1,368	3	250	1
March	1,520	3	171	0
April	1,240	3	77	0
May	231	1	0	0
June	226	1	0	0
July	226	1	0	0
Aug	234	1	0	0
Sept	220	1	0	0
Oct	871	3	44	0
Nov	1,464	3	115	0
Dec	1,511	3	211	1
Total	10,626	3	1,120	1

Building Energy Consumption = 85,784 (8tu/Sq Ft/Year)
Source Energy Consumption = 131,176 (8tu/Sq Ft/Year)

Floor Area = 1,728 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2
 WALL & ROOF INSULATION

----- EQUIPMENT ENERGY CONSUMPTION -----															
Ref Num	Equip Code	----- Monthly Consumption -----												Total	
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec		
0	LIGHTS														
	ELEC	229	207	234	220	231	226	226	234	220	231	220	226	2,705	
	PK	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
1	MISC LD														
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	MISC LD														
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	MISC LD														
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	MISC LD														
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	MISC LD														
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	MISC LD														
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ1000		PREVENTS COOLING ENERGY												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ5001		CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ5010		CONDENSER WATER PUMP C.V.												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ2454		RESIDENT GAS FURNACE W-FAN												
	GAS	253	250	171	77	0	0	0	0	0	44	115	211	1,120	
	PK	0.9	0.9	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.9	0.9	
1	EQ5254		RESIDENTIAL FURNACE FAN												
	ELEC	1286	1161	1286	1019	0	0	0	0	0	639	1244	1286	7,921	
	PK	1.7	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	

UTILITY PEAK CHECKSUMS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 2.6 (kW)
Yearly Time of Peak 6 (hr) 1 (mo)

Hour 6 Month 1

Sub Total	0.0	0.00

Heating Equipment

1	EQ2454	RESIDENT GAS FURNACE W-FAN	1.7	66.67

Sub Total	1.7	66.67

Sub Total	0.0	0.00

Sub Total	0.0	0.00

Miscellaneous

Lights	0.9	33.33

Base Utilities	0.0	0.00

Misc Equipment	0.0	0.00

Sub Total	0.9	33.33

Grand Total	2.6	100.00

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**          T R A C E    6 0 0    A N A L Y S I S          **  
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 201

Weather File Code:	CARLISLE
Location:	ENERGY SAVINGS OPPORTUNITY STUDY
Latitude:	40.2 (deg)
Longitude:	77.2 (deg)
Time Zone:	5
Elevation:	475 (ft)
Barometric Pressure:	29.2 (in. Hg)
Summer Clearness Number:	1.00
Winter Clearness Number:	1.00
Summer Design Dry Bulb:	92 (F)
Summer Design Wet Bulb:	72 (F)
Winter Design Dry Bulb:	4 (F)
Summer Ground Relectance:	0.20
Winter Ground Relectance:	0.20
Air Density:	0.0742 (Lbm/cuft)
Air Specific Heat:	0.2444 (Btu/lbm/F)
Density-Specific Heat Prod:	1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor:	4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor:	4.4519 (Lb-min./hr/cuft)
Design Simulation Period:	May To September
System Simulation Period:	January To December
Cooling Load Methodology:	CLTD/CLF (Transfer Function Method)
Time/Date Program was Run:	13: 6:23 1/12/94
Dataset Name:	CB201 .TM

AIRFLOW - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1	SZ	0	1,933	1,520	2,593	660	0	0
Totals		0	1,933	1,520	2,593	660	0	0

CAPACITY - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

		----- Cooling -----				----- Heating -----						
		Main Sys.	Aux. Sys.	Opt. Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
System	System	Capacity	Capacity	Capacity	Totals	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Totals
Number	Type	(Tons)	(Tons)	(Tons)	(Tons)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)
1	SZ	2.3	0.0	0.0	2.3	-77,964	0	0	0	0	0	-77,964
Totals		2.3	0.0	0.0	2.3	-77,964	0	0	0	0	0	-77,964

The building peaked at hour 17 month 7 with a capacity of 2.3 tons

ENGINEERING CHECKS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				--- Heating ---		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	0.00	1.12	830.3	742.1	16.17	0.88	-45.12	1,728

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/17 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 89/ 72/ 91.0 * OADB: 89 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)		Space Sensible (Btuh)	Perct Of Tot (%)		Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,865	0		3,865	13.83	*	3,865	14.12	*	-3,167	-3,167	4.13
Glass Solar	10,729	0		10,729	38.40	*	10,729	39.20	*	0	0	0.00
Glass Cond	2,699	0		2,699	9.66	*	2,699	9.86	*	-12,944	-12,944	16.87
Wall Cond	5,871	520		6,390	22.87	*	5,871	21.45	*	-11,510	-12,649	16.49
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-45,945	-45,945	59.88
Sub Total==>	23,164	520		23,684	84.76	*	23,164	84.63	*	-73,566	-74,705	97.36
Internal Loads												
Lights	2,374	0		2,374	8.50	*	2,374	8.67	*	0	0	0.00
People	1,885			1,885	6.75	*	933	3.41	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	4,259	0	0	4,259	15.24	*	3,307	12.08	*	0	0	0.00
Ceiling Load	916	-916		0	0.00	*	900	3.29	*	-894	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	-2,024	-2,024	2.64
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	28,339	-396	0	27,942	100.00	*	27,371	100.00	*	-76,484	-76,730	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
				Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	1,728	
Main Clg	2.3	27.9	27.0	75.7	62.7	66.5	61.9	57.9	67.5	Part	0	
Aux Clg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	864	0 0
Totals	2.3	27.9								Wall	2,199	359 16

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)--		
								Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-78.0	1,520	67.1	114.2	Vent	0	0	Clg Cfm/Sqft	1.12	SADB	62.0	114.2	
Aux Htg	0.0	0	0.0	0.0	Infil	0	660	Clg Cfm/Ton	830.27	Plenum	76.8	66.2	
Preheat	-0.0	1,933	67.1	61.9	Supply	1,933	1,520	Clg Sqft/Ton	742.10	Return	75.7	67.1	
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	16.17	Ret/OA	75.7	67.1	
Humidif	0.0	0	0.0	0.0	Return	1,933	1,520	No. People	5	Runarnd	75.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	-78.0				Rm Exh	0	0	Htg Cfm/Sqft	0.88	Fn BldTD	0.0	0.0	
					Auxil	0	0	Htg Btuh/Sqft	-45.12	Fn Frict	0.1	0.1	

BUILDING U-VALUES - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G U - V A L U E S -----

		----- Room U-Values ----- (Btu/hr/sqft/F)									Room	Room
Room				Summr	Wintr		Summr	Wintr			Mass	Capac.
Number	Description	Part.	ExFlr	Skylt	Skylt	Roof	Windo	Windo	Wall	Ceil.	(lb/ sqft)	(Btu/ sqft/F)
1	1ST FLOOR	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.154	0.578	51.4	10.97
2	2ND FLOOR	0.000	0.000	0.000	0.000	0.057	0.550	0.563	0.060	0.000	22.0	8.05
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.057	0.550	0.563	0.108	0.578	36.7	9.51
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.057	0.550	0.563	0.108	0.578	36.7	9.51
Building		0.000	0.000	0.000	0.000	0.057	0.550	0.563	0.108	0.578	36.7	9.51

BUILDING AREAS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed		Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
		Flr	Rm				Floor Area (sqft)	Skylight Area (sqft)					
1	1ST FLOOR	1	1	864	864	0	0	0	0	0	136	13	935
2	2ND FLOOR	1	1	864	864	0	0	0	0	864	223	20	905
Zone	1 Total/Ave.				1,728	0	0	0	0	864	359	16	1,840
System	1 Total/Ave.				1,728	0	0	0	0	864	359	16	1,840
Building					1,728	0	0	0	0	864	359	16	1,840

ASHRAE 90 ANALYSIS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.057 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.180 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.145 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 3.49 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 16.91 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.1	0	0	-3,898	5	217	96.7	0	0	0.0	0	0
5 - 10	0.2	0	0	-7,796	5	221	193.3	0	0	0.0	0	0
10 - 15	0.3	0	0	-11,695	6	281	290.0	0	0	0.0	0	0
15 - 20	0.5	0	0	-15,593	9	422	386.7	42	2,120	0.0	0	0
20 - 25	0.6	0	0	-19,491	41	1,857	483.3	0	0	0.0	0	0
25 - 30	0.7	0	0	-23,389	6	272	580.0	0	0	0.0	0	0
30 - 35	0.8	0	0	-27,287	6	292	676.7	0	0	0.0	0	0
35 - 40	0.9	0	0	-31,185	4	159	773.3	19	971	0.0	0	0
40 - 45	1.0	0	0	-35,084	4	167	870.0	0	0	0.0	0	0
45 - 50	1.2	0	0	-38,982	1	48	966.6	2	89	0.0	0	0
50 - 55	1.3	0	0	-42,880	9	385	1,063.3	0	0	0.0	0	0
55 - 60	1.4	0	0	-46,778	1	24	1,160.0	0	0	0.0	0	0
60 - 65	1.5	0	0	-50,676	1	38	1,256.6	0	0	0.0	0	0
65 - 70	1.6	0	0	-54,575	0	0	1,353.3	0	0	0.0	0	0
70 - 75	1.7	0	0	-58,473	0	19	1,450.0	0	0	0.0	0	0
75 - 80	1.9	0	0	-62,371	0	9	1,546.6	30	1,541	0.0	0	0
80 - 85	2.0	0	0	-66,269	0	0	1,643.3	0	0	0.0	0	0
85 - 90	2.1	0	0	-70,167	0	0	1,740.0	0	0	0.0	0	0
90 - 95	2.2	0	0	-74,066	0	0	1,836.6	0	0	0.0	0	0
95 - 100	2.3	0	0	-77,964	3	118	1,933.3	7	367	0.0	0	0
Hours Off	0.0	0	8,760	0	0	4,231	0.0	0	3,672	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature ----- Zone Number -----
Range 1
(F)

Max. Temp. 102.9
Mo./Hr. 7 22
Day Type 1

..... Number of Hours
Above 100 312
95 - 100 1,198
90 - 95 1,097
85 - 90 507
80 - 85 558
75 - 80 0
70 - 75 17
65 - 70 4,534
60 - 65 537
55 - 60 0
50 - 55 0
Below 50 0

Min. Temp. 61.4
Mo./Hr. 2 15
Day Type 2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	1,505	3	262	1
Feb	1,359	3	256	1
March	1,510	3	173	1
April	1,085	3	72	0
May	231	1	0	0
June	226	1	0	0
July	226	1	0	0
Aug	234	1	0	0
Sept	220	1	0	0
Oct	851	3	47	0
Nov	1,455	3	120	0
Dec	1,502	3	222	1
Total	10,405	3	1,152	1

Building Energy Consumption = 87,207 (Btu/Sq Ft/Year)
Source Energy Consumption = 131,822 (Btu/Sq Ft/Year)

Floor Area = 1,728 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	229	207	234	220	231	226	226	234	220	231	220	226	2,705
	PK	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTW20	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1000													
	PREVENTS COOLING ENERGY													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5001													
	CHILLED WATER PUMP C.V.													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5010													
	CONDENSER WATER PUMP C.V.													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ2454													
	RESIDENT GAS FURNACE W-FAN													
	GAS	262	256	173	72	0	0	0	0	0	47	120	222	1,152
	PK	0.9	0.9	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.9	0.9
1	EQ5254													
	RESIDENTIAL FURNACE FAN													
	ELEC	1276	1153	1276	864	0	0	0	0	0	619	1235	1276	7,700
	PK	1.7	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7

UTILITY PEAK CHECKSUMS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 2.6 (kW)
Yearly Time of Peak 6 (hr) 1 (mo)

Hour 6 Month 1

Sub Total	0.0	0.00

Heating Equipment

1	EQ2454	RESIDENT GAS FURNACE W-FAN	1.7	66.50

Sub Total	1.7	66.50

Sub Total	0.0	0.00

Sub Total	0.0	0.00

Miscellaneous

Lights	0.9	33.50

Base Utilities	0.0	0.00

Misc Equipment	0.0	0.00

Sub Total	0.9	33.50

Grand Total	2.6	100.00

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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 201

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 13: 9:15 1/12/94
Dataset Name: CB201 .TM

AIRFLOW - ALTERNATIVE 4
COMPINED ECOS

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1 SZ		0	1,715	1,520	2,331	616	0	0
Totals		0	1,715	1,520	2,331	616	0	0

CAPACITY - ALTERNATIVE 4
COMPINED ECOS

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

		----- Cooling -----				----- Heating -----						
		Main Sys.	Aux. Sys.	Opt. Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
System	System	Capacity	Capacity	Capacity	Totals	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Totals
Number	Type	(Tons)	(Tons)	(Tons)	(Tons)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)
1	SZ	2.1	0.0	0.0	2.1	-70,687	0	0	0	0	0	-70,687
Totals		2.1	0.0	0.0	2.1	-70,687	0	0	0	0	0	-70,687

The building peaked at hour 17 month 7 with a capacity of 2.1 tons

ENGINEERING CHECKS - ALTERNATIVE 4
COMPINED ECOS

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				----- Heating -----		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	0.00	0.99	802.7	808.7	14.84	0.88	-40.91	1,728

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/17 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 89/ 72/ 91.0 * OADB: 89 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	1,651	0	0	1,651	6.44	*	1,651	6.63	*	-1,476	-1,476	2.11
Glass Solar	10,506	0	0	10,506	40.98	*	10,506	42.15	*	0	0	0.00
Glass Cond	2,626	0	0	2,626	10.24	*	2,626	10.53	*	-12,944	-12,944	18.51
Wall Cond	3,464	180	0	3,643	14.21	*	3,464	13.90	*	-6,419	-6,843	9.78
Partition	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0	0	0	0	0.00	*	0	0.00	*	-42,882	-42,882	61.31
Sub Total==>	18,247	180	0	18,427	71.87	*	18,247	73.20	*	-63,721	-64,145	91.71
Internal Loads						*			*			
Lights	2,418	0	0	2,418	9.43	*	2,418	9.70	*	0	0	0.00
People	1,919	0	0	1,919	7.49	*	968	3.88	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	4,337	0	0	4,337	16.92	*	3,386	13.58	*	0	0	0.00
Ceiling Load	379	-379	0	0	0.00	*	417	1.67	*	-439	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ret. Fan Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Duct Heat Pkup	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
OV/UNDR Sizing	2,876	0	0	2,876	11.22	*	2,876	11.54	*	-5,799	-5,799	8.29
Exhaust Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Terminal Bypass	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Grand Total==>	25,840	-200	0	25,640	100.00	*	24,926	100.00	*	-69,960	-69,944	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf) (%)
Main Clg	2.1	25.6	1,715	75.3 62.6 66.5	61.5 57.6 66.6	1,728	
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0	
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0	
Totals	2.1	25.6				864	0 0
						2,199	359 16

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-70.7	1,520	67.6	110.3	Vent	0	0	Clg Cfm/Sqft	0.99	SADB	61.6	110.3
Aux Htg	0.0	0	0.0	0.0	Infil	0	616	Clg Cfm/Ton	802.73	Plenum	75.8	67.1
Preheat	-0.0	1,715	67.6	61.5	Supply	1,715	1,520	Clg Sqft/Ton	808.72	Return	75.3	67.6
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	14.84	Ret/OA	75.3	67.6
Humidif	0.0	0	0.0	0.0	Return	1,715	1,520	No. People	5	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-70.7				Rm Exh	0	0	Htg Cfm/Sqft	0.88	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/SqFt	-40.91	Fn Frict	0.1	0.1

BUILDING U-VALUES - ALTERNATIVE 4
COMPINED ECOS

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass	Room Capac.
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Summr Roof	Wintr Windo	Windo	Wall	Ceil.	(lb/ sqft)	(Btu/ sqft/F)
1	1ST FLOOR	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.056	0.578	52.8	11.26
2	2ND FLOOR	0.000	0.000	0.000	0.000	0.027	0.550	0.563	0.060	0.000	23.0	8.25
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.578	37.9	9.75
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.578	37.9	9.75
Building		0.000	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.578	37.9	9.75

BUILDING AREAS - ALTERNATIVE 4
COMPINED ECOS

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
		Flr	Rm										
1	1ST FLOOR	1	1	864	864	0	0	0	0	0	136	13	935
2	2ND FLOOR	1	1	864	864	0	0	0	0	864	223	20	905
Zone	1 Total/Ave.				1,728	0	0	0	0	864	359	16	1,840
System	1 Total/Ave.				1,728	0	0	0	0	864	359	16	1,840
Building					1,728	0	0	0	0	864	359	16	1,840

ASHRAE 90 ANALYSIS - ALTERNATIVE 4
COMPINED ECOS

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.027 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.139 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.107 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 1.33 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 15.38 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 4
COMBINED ECOS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.1	0	0	-3,534	5	220	85.8	0	0	0.0	0	0
5 - 10	0.2	0	0	-7,069	6	272	171.5	0	0	0.0	0	0
10 - 15	0.3	0	0	-10,603	7	314	257.3	0	0	0.0	0	0
15 - 20	0.4	0	0	-14,137	11	490	343.0	42	2,120	0.0	0	0
20 - 25	0.5	0	0	-17,672	39	1,724	428.8	0	0	0.0	0	0
25 - 30	0.6	0	0	-21,206	7	299	514.6	0	0	0.0	0	0
30 - 35	0.7	0	0	-24,740	6	263	600.3	0	0	0.0	0	0
35 - 40	0.9	0	0	-28,275	5	203	686.1	0	0	0.0	0	0
40 - 45	1.0	0	0	-31,809	2	83	771.8	19	954	0.0	0	0
45 - 50	1.1	0	0	-35,343	3	156	857.6	2	106	0.0	0	0
50 - 55	1.2	0	0	-38,878	7	298	943.4	0	0	0.0	0	0
55 - 60	1.3	0	0	-42,412	0	16	1,029.1	0	0	0.0	0	0
60 - 65	1.4	0	0	-45,947	0	12	1,114.9	0	0	0.0	0	0
65 - 70	1.5	0	0	-49,481	0	0	1,200.6	0	0	0.0	0	0
70 - 75	1.6	0	0	-53,015	0	0	1,286.4	0	0	0.0	0	0
75 - 80	1.7	0	0	-56,550	0	0	1,372.2	0	0	0.0	0	0
80 - 85	1.8	0	0	-60,084	0	0	1,457.9	0	0	0.0	0	0
85 - 90	1.9	0	0	-63,618	1	39	1,543.7	29	1,497	0.0	0	0
90 - 95	2.0	0	0	-67,153	0	20	1,629.4	0	0	0.0	0	0
95 - 100	2.1	0	0	-70,687	1	59	1,715.2	8	411	0.0	0	0
Hours Off	0.0	0	8,760	0	0	4,292	0.0	0	3,672	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 4
COMBINED ECOS

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature ----- Zone Number -----
Range. 1
(F)

Max. Temp. 105.2
Mo./Hr. 8 21
Day Type 1

..... Number of Hours
Above 100 1,153
95 - 100 1,181
90 - 95 485
85 - 90 380
80 - 85 473
75 - 80 0
70 - 75 51
65 - 70 4,742
60 - 65 295
55 - 60 0
50 - 55 0
Below 50 0

Min. Temp. 62.6
Mo./Hr. 2 15
Day Type 2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 4
COMBINED ECOS

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	GAS	GAS DMND
	Off Peak (kWh)	On Peak (kW)	On Peak (Therm)	On Peak (Thrm/hr)
Jan	1,386	2	225	1
Feb	1,252	2	221	1
March	1,391	2	149	0
April	1,004	2	61	0
May	231	1	0	0
June	226	1	0	0
July	226	1	0	0
Aug	234	1	0	0
Sept	220	1	0	0
Oct	700	2	32	0
Nov	1,309	2	100	0
Dec	1,383	2	188	1
Total	9,562	2	976	1

Building Energy Consumption = 75,356 (Btu/Sq Ft/Year)
Source Energy Consumption = 116,105 (Btu/Sq Ft/Year)

Floor Area = 1,728 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4
COMBINED ECOS

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	229	207	234	220	231	226	226	234	220	231	220	226	2,705
	PK	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTW20	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1000	PREVENTS COOLING ENERGY												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5010	CONDENSER WATER PUMP C.V.												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ2454	RESIDENT GAS FURNACE W-FAN												
	GAS	225	221	149	61	0	0	0	0	0	32	100	188	976
	PK	0.8	0.8	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.8	0.8
1	EQ5254	RESIDENTIAL FURNACE FAN												
	ELEC	1157	1045	1157	784	0	0	0	0	0	468	1089	1157	6,856
	PK	1.6	1.6	1.6	1.6	0.0	0.0	0.0	0.0	0.0	1.6	1.6	1.6	1.6

UTILITY PEAK CHECKSUMS - ALTERNATIVE 4
COMBINED ECOS

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 2.4 (kW)

Yearly Time of Peak 6 (hr) 1 (mo)

Hour 6 Month 1

Sub Total	0.0	0.00

Heating Equipment

1	EQ2454	RESIDENT GAS FURNACE W-FAN	1.6	64.28

Sub Total	1.6	64.28

Sub Total	0.0	0.00

Sub Total	0.0	0.00

Miscellaneous

Lights	0.9	35.72

Base Utilities	0.0	0.00

Misc Equipment	0.0	0.00

Sub Total	0.9	35.72

Grand Total	2.4	100.00

Building 205
(Typical for 206, 207, 208, 209, 210,
211, 212, 213, 214, 215, 216, 217,
218, 219, and 220)

Trace Input File

CONTENTS OF : E:\CB205.TM

LINE # -----

1 JOB - 1

2 01/ENERGY SAVINGS OPPORTUNITY STUDY

3 01/CARLISLE BARRACKS, PA

4 01/DEPARTMENT OF THE ARMY

5 01/BENATEC ASSOCIATES

6 01/BUILDING 205

7 08/CARLISLE

8 09/MAY/SEP////APR/OCT

9 10/CLTD-CLF

10 11///ZONE

11 LOAD - 1

12 19/1/BASE BUILDING

13 20/1/1/1ST FLOOR/840/1/2/.8/.45/9//2

14 20/2/1/2ND FLOOR/920/1/1/0//9//2

15 21/M////CBLQTX///CBLQTX

16 22/2/1/YES////154

17 24/1/1/27/5//156/0

18 24/1/2/22/7//156/90

19 24/1/3/5/8//157/270

20 24/1/4/7.5/8//157/0

21 24/1/5/6/8//157/90

22 24/1/6/30.5/8//157/180

23 24/2/1/27.5/8//157/0

24 24/2/2/24/8//157/90

25 24/2/3/35.5/8//157/180

26 25/1/1/2.75/1.3/8/.55/.57

27 25/1/5/38/1/1/.55/.57

28 25/1/6/69/1/1/.55/.57

29 25/2/1/3.75/1.3/8/.55/.57

30 25/2/2/2.8/2/4/.55/.57

31 25/2/3/59/1/1/.55/.57

32 26/M/CBLQP/CBLQL/OFF//OFF/CBLQHTG/CBLQHTG/OFF/OFF/OFF

33 27/M/440/SF-PERS/230/190/.5/WATT-SF/INCAND

34 29/M////////.41/CFM-SF

35 30/M///855/CFM

36 31/1/1/50/3//158/SINE-FIT/80/50

37 SYSTEM - 1

38 39/1/BASE BUILDING

39 40/1/SZ

40 41/1/1/1

41 42/1//.2

42 45/1/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF

43 EQUIPMENT - 1

44 59/1/CARLISLE///BASE BUILDING

45 60/1/1/BLKPLANT/1/1

46 62/1/EQ1000/1

47 65/1/1//1/1

48 67/1/EQ2454/2

49 69/1

50 LOAD - 2

51 19/2/WALL & ROOF INSULATION

52 20/1/1/1ST FLOOR/840/1/2/.8/.45/9//2

53 20/2/1/2ND FLOOR/920/1/1/0//9//2

54 21/M////CBLQTX///CBLQTX

55 22/2/1/YES////191

56 24/1/1/27/5//145/0

57 24/1/2/22/7//145/90

58 24/1/3/5/8//157/270

CONTENTS OF : E:\CB205.TM

LINE #	
59	24/1/4/7.5/8//157/0
60	24/1/5/6/8//157/90
61	24/1/6/30.5/8//157/180
62	24/2/1/27.5/8//157/0
63	24/2/2/24/8//157/90
64	24/2/3/35.5/8//157/180
65	25/1/1/2.75/1.3/8/.55/.57
66	25/1/5/38/1/1/.55/.57
67	25/1/6/69/1/1/.55/.57
68	25/2/1/3.75/1.3/8/.55/.57
69	25/2/2/2.8/2/4/.55/.57
70	25/2/3/59/1/1/.55/.57
71	26/M/CBLQP/CBLQL/OFF//OFF/CBLQHTG/CBLQHTG/OFF/OFF/OFF
72	27/M/440/SF-PERS/230/190/.5/WATT-SF/INCAND
73	29/M////////.39/CFM-SF
74	30/M///855/CFM
75	31/1/1/50/3//158/SINE-FIT/80/50
76	SYSTEM - 2
77	39/2/WALL & ROOF INSULATION
78	40/1/SZ
79	41/1/1/1
80	42/1//.2
81	45/1/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF
82	EQUIPMENT - 2
83	59/2/CARLISLE///WALL & ROOF INSULATION
84	60/1/1/BLKPLANT/1/1
85	62/1/EQ1000/1
86	65/1/1//1/1
87	67/1/EQ2454/2
88	69/1
89	LOAD - 3
90	19/3/WEATHERSTRIP & CAULKING
91	20/1/1/1ST FLOOR/840/1/2/.8/.45/9//2
92	20/2/1/2ND FLOOR/920/1/1/0//9//2
93	21/M////CBLQTX///CBLQTX
94	22/2/1/YES////154
95	24/1/1/27/5//156/0
96	24/1/2/22/7//156/90
97	24/1/3/5/8//157/270
98	24/1/4/7.5/8//157/0
99	24/1/5/6/8//157/90
100	24/1/6/30.5/8//157/180
101	24/2/1/27.5/8//157/0
102	24/2/2/24/8//157/90
103	24/2/3/35.5/8//157/180
104	25/1/1/2.75/1.3/8/.55/.57
105	25/1/5/38/1/1/.55/.57
106	25/1/6/69/1/1/.55/.57
107	25/2/1/3.75/1.3/8/.55/.57
108	25/2/2/2.8/2/4/.55/.57
109	25/2/3/59/1/1/.55/.57
110	26/M/CBLQP/CBLQL/OFF//OFF/CBLQHTG/CBLQHTG/OFF/OFF/OFF
111	27/M/440/SF-PERS/230/190/.5/WATT-SF/INCAND
112	29/M////////.32/CFM-SF
113	30/M///855/CFM
114	31/1/1/50/3//158/SINE-FIT/80/50
115	SYSTEM - 3
116	39/3/WEATHERSTRIP & CAULKING

CONTENTS OF : E:\CB205.TM

LINE #	-----
117	40/1/SZ
118	41/1/1/1
119	42/1//.2
120	45/1/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF
121	EQUIPMENT - 3
122	59/3/CARLISLE///WEATHERSTRIP & CAULKING
123	60/1/1/BLKPLANT/1/1
124	62/1/EQ1000/1
125	65/1/1//1/1
126	67/1/EQ2454/2
127	69/1
128	LOAD - 4
129	19/4/COMBINED ECOS
130	20/1/1/1ST FLOOR/840/1/2/.8/.45/9//2
131	20/2/1/2ND FLOOR/920/1/1/0//9//2
132	21/M///CBLQTX///CBLQTX
133	22/2/1/YES///191
134	24/1/1/27/5//145/0
135	24/1/2/22/7//145/90
136	24/1/3/5/8//157/270
137	24/1/4/7.5/8//157/0
138	24/1/5/6/8//157/90
139	24/1/6/30.5/8//157/180
140	24/2/1/27.5/8//157/0
141	24/2/2/24/8//157/90
142	24/2/3/35.5/8//157/180
143	25/1/1/2.75/1.3/8/.55/.57
144	25/1/5/38/1/1/.55/.57
145	25/1/6/69/1/1/.55/.57
146	25/2/1/3.75/1.3/8/.55/.57
147	25/2/2/2.8/2/4/.55/.57
148	25/2/3/59/1/1/.55/.57
149	26/M/CBLQP/CBLQL/OFF//OFF/CBLQHTG/CBLQHTG/OFF/OFF/OFF
150	27/M/440/SF-PERS/230/190/.5/WATT-SF/INCAND
151	29/M////////.29/CFM-SF
152	30/M///855/CFM
153	31/1/1/50/3//158/SINE-FIT/80/50
154	SYSTEM - 4
155	39/4/COMBINED ECOS
156	40/1/SZ
157	41/1/1/1
158	42/1//.2
159	45/1/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF
160	EQUIPMENT - 4
161	59/4/CARLISLE///COMBINED ECOS
162	60/1/1/BLKPLANT/1/1
163	62/1/EQ1000/1
164	65/1/1//1/1
165	67/1/EQ2454/2
166	69/1

Building 205
(Typical for 206, 207, 208, 209, 210,
211, 212, 213, 214, 215, 216,
217, 218, 219, and 220)

Trace Output File

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**          T R A C E    6 0 0    A N A L Y S I S          **
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 205

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Reflectance: 0.20
Winter Ground Reflectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 14:28:18 1/12/94
Dataset Name: CB205 .TM

AIRFLOW - ALTERNATIVE 1
BASE BUILDING

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1 SZ		0	3,420	3,420	4,549	1,129	0	0
Totals		0	3,420	3,420	4,549	1,129	0	0

CAPACITY - ALTERNATIVE 1
BASE BUILDING

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	----- Cooling -----					----- Heating -----					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1 SZ		4.1	0.0	0.0	4.1	-122,100	0	0	0	0	0	-122,100
Totals		4.1	0.0	0.0	4.1	-122,100	0	0	0	0	0	-122,100

The building peaked at hour 16 month 9 with a capacity of 4.1 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BASE BUILDING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				--- Heating ---		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	0.00	0.97	836.2	860.6	13.94	0.97	-34.69	3,520

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 9/16 * Mo/Hr: 9/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 83/ 64/ 63.0 * OADB: 83 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	8,241	0		8,241	16.79	*	8,241	16.75	*	-6,744	-6,744	5.68
Glass Solar	18,374	0		18,374	37.44	*	18,374	37.36	*	0	0	0.00
Glass Cond	2,704	0		2,704	5.51	*	2,704	5.50	*	-18,445	-18,445	15.53
Wall Cond	5,255	310		5,565	11.34	*	5,255	10.68	*	-13,194	-14,263	12.01
Partition	-93			-93	-0.19	*	-93	-0.19	*	-671	-671	0.56
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-78,640	-78,640	66.20
Sub Total==>	34,481	310		34,791	70.89	*	34,481	70.11	*	-117,694	-118,762	99.98
Internal Loads						*			*			
Lights	4,803	0		4,803	9.79	*	4,803	9.77	*	0	0	0.00
People	2,974			2,974	6.06	*	1,454	2.96	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	7,776	0	0	7,776	15.84	*	6,256	12.72	*	0	0	0.00
Ceiling Load	1,737	-1,737		0	0.00	*	1,933	3.93	*	-1,453	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	6,513			6,513	13.27	*	6,513	13.24	*	-24	-24	0.02
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	50,506	-1,427	0	49,081	100.00	*	49,184	100.00	*	-119,171	-118,787	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
				Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor		
Main Clg	4.1	49.1	3,420	75.9	62.8	66.5	61.8	58.0	68.0	Part	300	
Aux Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Exflr	0	
Opt Vent	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	1,840	0 0
Totals	4.1	49.1								Wall	2,754	512 19

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)--		
					Vent			Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-122.1	3,420	67.2	100.0	Infil	0	1,129	Clg Cfm/Sqft	0.97	SADB	61.8	100.0	
Aux Htg	0.0	0	0.0	0.0	Supply	3,420	3,420	Clg Cfm/Ton	836.18	Plenum	76.9	66.4	
Preheat	-0.0	3,420	67.2	61.8	Mincfm	0	0	Clg Sqft/Ton	860.63	Return	75.9	67.2	
Reheat	0.0	C	0.0	0.0	Return	3,420	3,420	Clg Btuh/Sqft	13.94	Ret/DA	75.9	67.2	
Humidif	0.0	C	0.0	0.0	Exhaust	0	0	No. People	8	Runarnd	75.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	-122.1				Auxil	0	0	Htg Cfm/SqFt	0.97	Fn BldTD	0.0	0.0	
								Htg Btuh/SqFt	-34.69	Fn Frict	0.0	0.1	

BUILDING U-VALUES - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G U - V A L U E S -----

		Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
Room Number	Description	Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	1ST FLOOR	0.124	0.000	0.000	0.000	0.000	0.550	0.563	0.141	0.549	74.3	17.05
2	2ND FLOOR	0.000	0.000	0.000	0.000	0.057	0.550	0.563	0.060	0.000	19.1	7.29
Zone	1 Total/Ave.	0.124	0.000	0.000	0.000	0.057	0.550	0.563	0.100	0.549	45.4	11.95
System	1 Total/Ave.	0.124	0.000	0.000	0.000	0.057	0.550	0.563	0.100	0.549	45.4	11.95
Building		0.124	0.000	0.000	0.000	0.057	0.550	0.563	0.100	0.549	45.4	11.95

BUILDING AREAS - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of		Floor	Total	Exposed	Skylight	Skl	Net Roof	Window	Win	Net Wall
		Duplicate	Room	Area/Dupl	Floor							
		Flr	Rm	(sqft)	Area	Floor	Area	/Rf	Area	Area	/Wl	Area
					(sqft)	(sqft)	(sqft)	(%)	(sqft)	(sqft)	(%)	(sqft)
1	1ST FLOOR	1	2	340	1,680	300	0	0	0	271	20	1,091
2	2ND FLOOR	1	2	920	1,840	0	0	0	1,840	241	17	1,151
Zone	1 Total/Ave.				3,520	300	0	0	1,840	512	19	2,242
System	1 Total/Ave.				3,520	300	0	0	1,840	512	19	2,242
Building					3,520	300	0	0	1,840	512	19	2,242

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BASE BUILDING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.057 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.183 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.133 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 3.49 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 18.49 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BASE BUILDING

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.2	0	0	-6,105	5	224	171.0	0	0	0.0	0	0
5 - 10	0.4	0	0	-12,210	3	124	342.0	0	0	0.0	0	0
10 - 15	0.6	0	0	-18,315	5	225	513.0	0	0	0.0	0	0
15 - 20	0.8	0	0	-24,420	8	352	684.0	42	2,120	0.0	0	0
20 - 25	1.0	0	0	-30,525	43	1,802	855.0	0	0	0.0	0	0
25 - 30	1.2	0	0	-36,630	6	265	1,026.0	0	0	0.0	0	0
30 - 35	1.4	0	0	-42,735	6	269	1,197.0	0	0	0.0	0	0
35 - 40	1.6	0	0	-48,840	5	195	1,368.0	0	0	0.0	0	0
40 - 45	1.8	0	0	-54,945	3	130	1,539.0	0	0	0.0	0	0
45 - 50	2.0	0	0	-61,050	3	113	1,710.0	21	1,060	0.0	0	0
50 - 55	2.2	0	0	-67,155	9	362	1,881.0	0	0	0.0	0	0
55 - 60	2.5	0	0	-73,260	0	4	2,052.0	0	0	0.0	0	0
60 - 65	2.7	0	0	-79,365	1	27	2,223.0	0	0	0.0	0	0
65 - 70	2.9	0	0	-85,470	0	0	2,394.0	0	0	0.0	0	0
70 - 75	3.1	0	0	-91,575	0	0	2,565.0	0	0	0.0	0	0
75 - 80	3.3	0	0	-97,680	0	19	2,736.0	0	0	0.0	0	0
80 - 85	3.5	0	0	-103,785	0	20	2,907.0	0	0	0.0	0	0
85 - 90	3.7	0	0	-109,890	0	20	3,078.0	0	0	0.0	0	0
90 - 95	3.9	0	0	-115,995	0	0	3,249.0	0	0	0.0	0	0
95 - 100	4.1	0	0	-122,100	2	87	3,420.0	38	1,908	0.0	0	0
Hours Off	0.0	0	8,760	0	0	4,522	0.0	0	3,672	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
BASE BUILDING

----- BUILDING TEMPERATURE PROFILES -----

Temperature ----- Zone Number -----
Range 1
(F)

Max. Temp. 100.9
Mo./Hr. 8 21
Day Type 1

----- Number of Hours -----
Above 100 19
95 - 100 1,633
90 - 95 1,114
85 - 90 162
80 - 85 366
75 - 80 395
70 - 75 238
65 - 70 4,679
60 - 65 154
55 - 60 0
50 - 55 0
Below 50 0

Min. Temp. 63.9
Mo./Hr. 2 15
Day Type 2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BASE BUILDING

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	GAS	GAS DMND
	Off Peak (kWh)	On Peak (kW)	On Peak (Therm)	On Peak (Thrm/hr)
Jan	2,464	4	407	1
Feb	2,226	4	404	1
March	2,476	4	271	1
April	1,706	4	112	0
May	472	2	0	0
June	460	2	0	0
July	460	2	0	0
Aug	477	2	0	0
Sept	449	2	0	0
Oct	864	4	32	0
Nov	2,222	4	173	1
Dec	2,458	4	337	1
Total	16,734	4	1,737	1

Building Energy Consumption = 65,560 (Btu/Sq Ft/Year)
Source Energy Consumption = 100,611 (Btu/Sq Ft/Year)

Floor Area = 3,520 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BASE BUILDING

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	466	421	477	449	472	460	460	477	449	472	449	460	5,511
	PK	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTW20	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1000													
	PREVENTS COOLING ENERGY													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5001													
	CHILLED WATER PUMP C.V.													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5010													
	CONDENSER WATER PUMP C.V.													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ2454													
	RESIDENT GAS FURNACE W-FAN													
	GAS	407	404	271	112	0	0	0	0	0	32	173	337	1,737
	PK	1.5	1.5	0.8	0.5	0.0	0.0	0.0	0.0	0.0	0.3	0.5	1.3	1.5
1	EQ5254													
	RESIDENTIAL FURNACE FAN													
	ELEC	1999	1805	1999	1257	0	0	0	0	0	392	1773	1999	11,223
	PK	2.7	2.7	2.7	2.7	0.0	0.0	0.0	0.0	0.0	2.7	2.7	2.7	2.7

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BASE BUILDING

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 4.4 (kW)
Yearly Time of Peak 6 (hr) 1 (mo)

Hour 6 Month 1

Sub Total	0.0	0.00

Heating Equipment

1	EQ2454	RESIDENT GAS FURNACE W-FAN	2.7	60.42

Sub Total	2.7	60.42

Sub Total	0.0	0.00

Sub Total	0.0	0.00

Miscellaneous

Lights	1.8	39.58

Base Utilities	0.0	0.00

Misc Equipment	0.0	0.00

Sub Total	1.8	39.58

Grand Total	4.4	100.00

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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 205

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Reflectance: 0.20
Winter Ground Reflectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 14:31: 7 1/12/94
Dataset Name: CB205 .TM

AIRFLOW - ALTERNATIVE 2
WALL & ROOF INSULATION

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	Main					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1	SZ	0	3,420	3,420	4,494	1,074	0	0
Totals		0	3,420	3,420	4,494	1,074	0	0

CAPACITY - ALTERNATIVE 2
WALL & ROOF INSULATION

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	Cooling				Heating						
		Main Sys.	Aux. Sys.	Opt. Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
		Capacity (Tons)	Capacity (Tons)	Capacity (Tons)	Totals (Tons)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Totals (Btuh)
1	SZ	4.3	0.0	0.0	4.3	-109,516	0	0	0	0	0	-109,516
Totals		4.3	0.0	0.0	4.3	-109,516	0	0	0	0	0	-109,516

The building peaked at hour 16 month 9 with a capacity of 4.3 tons

ENGINEERING CHECKS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	0.00	0.97	798.9	822.3	14.59	0.97	-31.11	3,520

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 9/16 * Mo/Hr: 9/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 83/ 64/ 63.0 * OADB: 83 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	2,117	0		2,117	4.12	*	2,117	4.21	*	-3,144	-3,144	2.92
Glass Solar	21,474	0		21,474	41.80	*	21,474	42.74	*	0	0	0.00
Glass Cond	1,671	0		1,671	3.25	*	1,671	3.33	*	-18,445	-18,445	17.11
Wall Cond	3,921	192		4,113	8.01	*	3,921	7.80	*	-7,950	-8,385	7.78
Partition	-93			-93	-0.18	*	-93	-0.19	*	-671	-671	0.62
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-74,804	-74,804	69.38
Sub Total==>	29,090	192		29,282	57.00	*	29,090	57.90	*	-105,013	-105,448	97.80
Internal Loads												
Lights	4,803	0		4,803	9.35	*	4,803	9.56	*	0	0	0.00
People	2,974			2,974	5.79	*	1,454	2.89	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	7,776	0	0	7,776	15.14	*	6,256	12.45	*	0	0	0.00
Ceiling Load	451	-451		0	0.00	*	583	1.16	*	-706	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	14,312			14,312	27.86	*	14,312	28.49	*	-2,373	-2,373	2.20
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	51,629	-259	0	51,370	100.00	*	50,241	100.00	*	-108,092	-107,821	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor		
Main Clg	4.3	51.4	3,420	75.2	62.5	66.5	61.5	57.6	66.4	Part	300	
Aux Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	1,840	0 0
Totals	4.3	51.4								Wall	2,754	512 19

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	ENGINEERING CHECKS--			TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-109.5	3,420	67.6	97.0	Infil	0	1,074	Clg Cfm/Sqft	0.97	SADB	61.5	97.0	
Aux Htg	0.0	0	0.0	0.0	Supply	3,420	3,420	Clg Cfm/Ton	798.90	Plenum	75.5	67.2	
Preheat	-0.0	3,420	67.6	61.5	Mincfm	0	0	Clg Sqft/Ton	822.26	Return	75.2	67.6	
Reheat	0.0	0	0.0	0.0	Return	3,420	3,420	Clg Btuh/Sqft	14.59	Ret/OA	75.2	67.6	
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	8	Runarnd	75.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	-109.5				Auxil	0	0	Htg Cfm/Sqft	0.97	Fn BldTD	0.0	0.0	
								Htg Btuh/Sqft	-31.11	Fn Frict	0.0	0.1	

BUILDING U-VALUES - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G U - V A L U E S -----

		----- Room U-Values -----									Room	Room
		(Btu/hr/sqft/F)									Mass	Capac.
Room				Summr	Wintr		Summr	Wintr			(lb/	(Btu/
Number	Description	Part.	ExFlr	Skylt	Skylt	Roof	Windo	Windo	Wall	Ceil.	sqft)	sqft/F)
1	1ST FLOOR	0.124	0.000	0.000	0.000	0.000	0.550	0.563	0.057	0.549	75.1	17.20
2	2ND FLOOR	0.000	0.000	0.000	0.000	0.027	0.550	0.563	0.060	0.000	20.1	7.49
Zone	1 Total/Ave.	0.124	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.549	46.3	12.13
System	1 Total/Ave.	0.124	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.549	46.3	12.13
Building		0.124	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.549	46.3	12.13

BUILDING AREAS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skf /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
		Flr	Rm										
1	1ST FLOOR	1	2	840	1,680	300	0	0	0	0	271	20	1,091
2	2ND FLOOR	1	2	920	1,840	0	0	0	0	1,840	241	17	1,151
Zone	1 Total/Ave.				3,520	300	0	0	0	1,840	512	19	2,242
System	1 Total/Ave.				3,520	300	0	0	0	1,840	512	19	2,242
Building					3,520	300	0	0	0	1,840	512	19	2,242

ASHRAE 90 ANALYSIS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.027 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.150 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.101 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTvr) = 1.33 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTvw) = 17.21 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2
WALL & ROOF INSULATION

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.2	0	0	-5,476	5	204	171.0	0	0	0.0	0	0
5 - 10	0.4	0	0	-10,952	3	134	342.0	0	0	0.0	0	0
10 - 15	0.6	0	0	-16,427	6	247	513.0	0	0	0.0	0	0
15 - 20	0.9	0	0	-21,903	10	398	684.0	42	2,120	0.0	0	0
20 - 25	1.1	0	0	-27,379	42	1,729	855.0	0	0	0.0	0	0
25 - 30	1.3	0	0	-32,855	7	292	1,026.0	0	0	0.0	0	0
30 - 35	1.5	0	0	-38,330	6	238	1,197.0	0	0	0.0	0	0
35 - 40	1.7	0	0	-43,806	4	164	1,368.0	0	0	0.0	0	0
40 - 45	1.9	0	0	-49,282	3	140	1,539.0	0	0	0.0	0	0
45 - 50	2.1	0	0	-54,758	2	73	1,710.0	21	1,060	0.0	0	0
50 - 55	2.4	0	0	-60,234	8	352	1,881.0	0	0	0.0	0	0
55 - 60	2.6	0	0	-65,709	0	10	2,052.0	0	0	0.0	0	0
60 - 65	2.8	0	0	-71,185	0	17	2,223.0	0	0	0.0	0	0
65 - 70	3.0	0	0	-76,661	0	0	2,394.0	0	0	0.0	0	0
70 - 75	3.2	0	0	-82,137	1	30	2,565.0	0	0	0.0	0	0
75 - 80	3.4	0	0	-87,613	1	29	2,736.0	0	0	0.0	0	0
80 - 85	3.6	0	0	-93,088	0	0	2,907.0	0	0	0.0	0	0
85 - 90	3.9	0	0	-98,564	0	0	3,078.0	0	0	0.0	0	0
90 - 95	4.1	0	0	-104,040	0	9	3,249.0	0	0	0.0	0	0
95 - 100	4.3	0	0	-109,516	2	78	3,420.0	38	1,908	0.0	0	0
Hours Off	0.0	0	8,760	0	0	4,616	0.0	0	3,672	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature ----- Zone Number -----
Range 1
(F)

Max. Temp. 102.6
Mo./Hr. 8 21
Day Type 1

..... Number of Hours
Above 100 566
95 - 100 1,583
90 - 95 707
85 - 90 92
80 - 85 240
75 - 80 586
70 - 75 322
65 - 70 4,580
60 - 65 84
55 - 60 0
50 - 55 0
Below 50 0

Min. Temp. 64.5
Mo./Hr. 2 15
Day Type 2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 2
WALL & ROOF INSULATION

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	GAS On Peak (Therm)	GAS DMND On Peak (Thrm/hr)
Jan	2,258	4	351	1
Feb	2,040	4	353	1
March	2,270	4	235	1
April	1,576	4	97	0
May	472	2	0	0
June	460	2	0	0
July	460	2	0	0
Aug	477	2	0	0
Sept	449	2	0	0
Oct	744	4	20	0
Nov	1,870	4	141	0
Dec	2,252	4	287	1
Total	15,329	4	1,482	1

Building Energy Consumption = 56,966 (Btu/Sq Ft/Year)
Source Energy Consumption = 88,913 (Btu/Sq Ft/Year)

Floor Area = 3,520 (Sq Ft)

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	466	421	477	449	472	460	460	477	449	472	449	460	5,511
	PK	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTW20	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1000		PREVENTS COOLING ENERGY											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5001		CHILLED WATER PUMP C.V.											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5010		CONDENSER WATER PUMP C.V.											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ2454		RESIDENT GAS FURNACE W-FAN											
	GAS	351	353	235	97	0	0	0	0	0	20	141	287	1,482
	PK	1.3	1.3	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.3	0.5	1.0	1.3
1	EQ5254		RESIDENTIAL FURNACE FAN											
	ELEC	1793	1619	1793	1128	0	0	0	0	0	272	1422	1793	9,818
	PK	2.4	2.4	2.4	2.4	0.0	0.0	0.0	0.0	0.0	2.4	2.4	2.4	2.4

UTILITY PEAK CHECKSUMS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 4.2 (kW)
Yearly Time of Peak 6 (hr) 1 (mo)

Hour 6 Month 1

Sub Total	0.0	0.00

Heating Equipment

1	EQ2454	RESIDENT GAS FURNACE W-FAN	2.4	57.79

Sub Total	2.4	57.79

Sub Total	0.0	0.00

Sub Total	0.0	0.00

Miscellaneous

Lights	1.8	42.21

Base Utilities	0.0	0.00

Misc Equipment	0.0	0.00

Sub Total	1.8	42.21

Grand Total	4.2	100.00

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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 205

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Reflectance: 0.20
Winter Ground Reflectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 14:33:53 1/12/94
Dataset Name: CB205 .TM

AIRFLOW - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1 SZ		0	3,420	3,420	4,301	981	0	0
Totals		0	3,420	3,420	4,301	981	0	0

CAPACITY - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	----- Cooling -----					----- Heating -----					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1 SZ		4.1	0.0	0.0	4.1	-104,977	0	0	0	0	0	-104,977
Totals		4.1	0.0	0.0	4.1	-104,977	0	0	0	0	0	-104,977

The building peaked at hour 16 month 9 with a capacity of 4.1 tons

ENGINEERING CHECKS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				--- Heating ---		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	0.00	0.97	836.2	860.6	13.94	0.97	-29.82	3,520

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 9/16 * Mo/Hr: 9/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 83/ 64/ 63.0 * OADB: 83 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	8,241	0	0	8,241	16.79	*	8,241	16.75	*	-6,744	-6,744	6.63
Glass Solar	18,374	0	0	18,374	37.44	*	18,374	37.36	*	0	0	0.00
Glass Cond	2,704	0	0	2,704	5.51	*	2,704	5.50	*	-18,445	-18,445	18.14
Wall Cond	5,255	310	0	5,565	11.34	*	5,255	10.68	*	-13,194	-14,263	14.03
Partition	-93	0	0	-93	-0.19	*	-93	-0.19	*	-671	-671	0.66
Exposed Floor	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0	0	0	0	0.00	*	0	0.00	*	-61,377	-61,377	60.37
Sub Total==>	34,481	310	0	34,791	70.89	*	34,481	70.11	*	-100,431	-101,500	99.84
Internal Loads												
Lights	4,803	0	0	4,803	9.79	*	4,803	9.77	*	0	0	0.00
People	2,974	0	0	2,974	6.06	*	1,454	2.96	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	7,776	0	0	7,776	15.84	*	6,256	12.72	*	0	0	0.00
Ceiling Load	1,737	-1,737	0	0	0.00	*	1,933	3.93	*	-1,453	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ret. Fan Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Duct Heat Pkup	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
OV/UNDR Sizing	6,513	0	0	6,513	13.27	*	6,513	13.24	*	-164	-164	0.16
Exhaust Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Terminal Bypass	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Grand Total==>	50,508	-1,427	0	49,081	100.00	*	49,184	100.00	*	-102,048	-101,664	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf)	(%)
Main Clg	4.1	49.1	3,420	75.9 62.8 66.5	61.8 58.0 68.0	3,520		
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	300		
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	4.1	49.1				1,840	0	0
						2,754	512	19

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-105.0	3,420	67.2	95.4	Vent	0	0	Clg Cfm/Sqft	0.97	SADB	61.8	95.4
Aux Htg	0.0	0	0.0	0.0	Infil	0	881	Clg Cfm/Ton	836.18	Plenum	76.9	66.4
Preheat	-0.0	3,420	67.2	61.8	Supply	3,420	3,420	Clg Sqft/Ton	860.63	Return	75.9	67.1
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	13.94	Ret/OA	75.9	67.1
Humidif	0.0	0	0.0	0.0	Return	3,420	3,420	No. People	8	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-105.0				Rm Exh	0	0	Htg Cfm/SqFt	0.97	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/SqFt	-29.82	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

BUILDING U-VALUES - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G U - V A L U E S -----

		----- Room U-Values -----									Room	Room
		(Btu/hr/sqft/F)									Mass	Capac.
Room				Summr	Wintr	Summr	Wintr				(lb/	(Btu/
Number	Description	Part.	ExFlr	Skylt	Skylt	Roof	Windo	Windo	Wall	Ceil.	sqft)	sqft/F)
1	1ST FLOOR	0.124	0.000	0.000	0.000	0.000	0.550	0.563	0.141	0.549	74.3	17.05
2	2ND FLOOR	0.000	0.000	0.000	0.000	0.057	0.550	0.563	0.060	0.000	19.1	7.29
Zone	1 Total/Ave.	0.124	0.000	0.000	0.000	0.057	0.550	0.563	0.100	0.549	45.4	11.95
System	1 Total/Ave.	0.124	0.000	0.000	0.000	0.057	0.550	0.563	0.100	0.549	45.4	11.95
Building		0.124	0.000	0.000	0.000	0.057	0.550	0.563	0.100	0.549	45.4	11.95

BUILDING AREAS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of		Floor	Total	Partition	Exposed	Skylight	Skl	Net Roof	Window	Win	Net Wall
		Duplicate	Room	Area/Dupl	Floor		Floor						
		Flr	Rm	(sqft)	Area	Area	Area	Area	/Rf	Area	Area	/Wl	Area
					(sqft)	(sqft)	(sqft)	(sqft)	(%)	(sqft)	(sqft)	(%)	(sqft)
1	1ST FLOOR	1	2	840	1,680	300	0	0	0	0	271	20	1,091
2	2ND FLOOR	1	2	920	1,840	0	0	0	0	1,840	241	17	1,151
Zone	1 Total/Ave.				3,520	300	0	0	0	1,840	512	19	2,242
System	1 Total/Ave.				3,520	300	0	0	0	1,840	512	19	2,242
Building					3,520	300	0	0	0	1,840	512	19	2,242

ASHRAE 90 ANALYSIS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.057 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.183 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.133 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 3.49 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 18.49 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.2	0	0	-5,249	3	111	171.0	0	0	0.0	0	0
5 - 10	0.4	0	0	-10,498	3	121	342.0	0	0	0.0	0	0
10 - 15	0.6	0	0	-15,747	6	239	513.0	0	0	0.0	0	0
15 - 20	0.8	0	0	-20,995	9	343	684.0	42	2,120	0.0	0	0
20 - 25	1.0	0	0	-26,244	44	1,740	855.0	0	0	0.0	0	0
25 - 30	1.2	0	0	-31,493	7	262	1,026.0	0	0	0.0	0	0
30 - 35	1.4	0	0	-36,742	7	274	1,197.0	0	0	0.0	0	0
35 - 40	1.6	0	0	-41,991	5	207	1,368.0	0	0	0.0	0	0
40 - 45	1.8	0	0	-47,240	3	121	1,539.0	0	0	0.0	0	0
45 - 50	2.0	0	0	-52,488	1	40	1,710.0	21	1,060	0.0	0	0
50 - 55	2.2	0	0	-57,737	9	366	1,881.0	0	0	0.0	0	0
55 - 60	2.5	0	0	-62,986	0	4	2,052.0	0	0	0.0	0	0
60 - 65	2.7	0	0	-68,235	1	23	2,223.0	0	0	0.0	0	0
65 - 70	2.9	0	0	-73,484	0	0	2,394.0	0	0	0.0	0	0
70 - 75	3.1	0	0	-78,733	1	30	2,565.0	0	0	0.0	0	0
75 - 80	3.3	0	0	-83,982	1	38	2,736.0	0	0	0.0	0	0
80 - 85	3.5	0	0	-89,230	0	19	2,907.0	0	0	0.0	0	0
85 - 90	3.7	0	0	-94,479	0	0	3,078.0	0	0	0.0	0	0
90 - 95	3.9	0	0	-99,728	0	0	3,249.0	0	0	0.0	0	0
95 - 100	4.1	0	0	-104,977	1	59	3,420.0	38	1,908	0.0	0	0
Hours Off	0.0	0	8,760	0	0	4,763	0.0	0	3,672	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature ----- Zone Number -----
Range 1
(F)

Max. Temp. 100.9
Mo./Hr. 8 21
Day Type 1

..... Number of Hours

Above 100	19
95 - 100	1,633
90 - 95	1,114
85 - 90	162
80 - 85	366
75 - 80	463
70 - 75	335
65 - 70	4,612
60 - 65	56
55 - 60	0
50 - 55	0
Below 50	0

Min. Temp. 64.8
Mo./Hr. 2 15
Day Type 2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	GAS	GAS DMND
	Off Peak (kWh)	On Peak (kW)	On Peak (Therm)	On Peak (Thrm/hr)
Jan	2,184	4	342	1
Feb	1,973	4	337	1
March	2,196	4	221	1
April	1,285	4	77	0
May	472	2	0	0
June	460	2	0	0
July	460	2	0	0
Aug	477	2	0	0
Sept	449	2	0	0
Oct	716	4	20	0
Nov	1,788	4	139	0
Dec	2,178	4	284	1
Total	14,638	4	1,420	1

Building Energy Consumption = 54,541 (Btu/Sq Ft/Year)
Source Energy Consumption = 85,054 (Btu/Sq Ft/Year)

Floor Area = 3,520 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	466	421	477	449	472	460	460	477	449	472	449	460	5,511
	PK	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTW20	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1000													
	PREVENTS COOLING ENERGY													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5001													
	CHILLED WATER PUMP C.V.													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5010													
	CONDENSER WATER PUMP C.V.													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ2454													
	RESIDENT GAS FURNACE W-FAN													
	GAS	342	337	221	77	0	0	0	0	0	20	139	284	1,420
	PK	1.3	1.3	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.3	0.4	1.0	1.3
1	EQ5254													
	RESIDENTIAL FURNACE FAN													
	ELEC	1718	1552	1718	836	0	0	0	0	0	245	1340	1718	9,127
	PK	2.3	2.3	2.3	2.3	0.0	0.0	0.0	0.0	0.0	2.3	2.3	2.3	2.3

UTILITY PEAK CHECKSUMS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 4.1 (kW)
Yearly Time of Peak 6 (hr) 1 (mo)

Hour 6 Month 1

Sub Total	0.0	0.00

Heating Equipment

1	EQ2454	RESIDENT GAS FURNACE W-FAN	2.3	56.75

Sub Total	2.3	56.75

Sub Total	0.0	0.00

Sub Total	0.0	0.00

Miscellaneous

Lights	1.8	43.25
Base Utilities	0.0	0.00
Misc Equipment	0.0	0.00
Sub Total	1.8	43.25

Grand Total	4.1	100.00


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**          T R A C E    6 0 0    A N A L Y S I S          **
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 205

Weather File Code:	CARLISLE
Location:	ENERGY SAVINGS OPPORTUNITY STUDY
Latitude:	40.2 (deg)
Longitude:	77.2 (deg)
Time Zone:	5
Elevation:	475 (ft)
Barometric Pressure:	29.2 (in. Hg)
Summer Clearness Number:	1.00
Winter Clearness Number:	1.00
Summer Design Dry Bulb:	92 (F)
Summer Design Wet Bulb:	72 (F)
Winter Design Dry Bulb:	4 (F)
Summer Ground Relectance:	0.20
Winter Ground Relectance:	0.20
Air Density:	0.0742 (Lbm/cuft)
Air Specific Heat:	0.2444 (Btu/lbm/F)
Density-Specific Heat Prod:	1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor:	4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor:	4.4519 (Lb-min./hr/cuft)
Design Simulation Period:	May To September
System Simulation Period:	January To December
Cooling Load Methodology:	CLTD/CLF (Transfer Function Method)
Time/Date Program was Run:	14:36:51 1/12/94
Dataset Name:	C8205 .TM

AIRFLOW - ALTERNATIVE 4
COMBINED ECOS

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1	SZ	0	3,420	3,420	4,219	799	0	0
Totals		0	3,420	3,420	4,219	799	0	0

CAPACITY - ALTERNATIVE 4
COMBINED ECOS

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

		----- Cooling -----				----- Heating -----						
		Main Sys.	Aux. Sys.	Opt. Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
System	System	Capacity	Capacity	Capacity	Totals	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Totals
Number	Type	(Tons)	(Tons)	(Tons)	(Tons)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)
1	SZ	4.3	0.0	0.0	4.3	-90,126	0	0	0	0	0	-90,126
Totals		4.3	0.0	0.0	4.3	-90,126	0	0	0	0	0	-90,126

The building peaked at hour 16 month 9 with a capacity of 4.3 tons

ENGINEERING CHECKS - ALTERNATIVE 4
COMBINED ECOS

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				----- Heating -----		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	0.00	0.97	798.9	822.3	14.59	0.97	-25.60	3,520

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 9/16 * Mo/Hr: 9/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 83/ 64/ 63.0 * OADB: 83 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	2,117	0		2,117	4.12	*	2,117	4.21	*	-3,144	-3,144	3.55
Glass Solar	21,474	0		21,474	41.80	*	21,474	42.74	*	0	0	0.00
Glass Cond	1,671	0		1,671	3.25	*	1,671	3.33	*	-18,445	-18,445	20.86
Wall Cond	3,921	192		4,113	8.01	*	3,921	7.80	*	-7,950	-8,385	9.48
Partition	-93			-93	-0.18	*	-93	-0.19	*	-671	-671	0.76
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-55,623	-55,623	62.90
Sub Total==>	29,090	192		29,282	57.00	*	29,090	57.90	*	-85,832	-86,268	97.55
Internal Loads												
Lights	4,803	0		4,803	9.35	*	4,803	9.56	*	0	0	0.00
People	2,974			2,974	5.79	*	1,454	2.89	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	7,776	0	0	7,776	15.14	*	6,256	12.45	*	0	0	0.00
Ceiling Load	451	-451		0	0.00	*	583	1.16	*	-706	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	14,312			14,312	27.86	*	14,312	28.49	*	-2,164	-2,164	2.45
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	51,629	-259	0	51,370	100.00	*	50,241	100.00	*	-88,702	-88,432	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS-----		
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf) (%)
Main Clg	4.3	51.4	49.9	3,420	75.2	62.5	66.5	61.5	57.6	66.4	Floor	3,520
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	300
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	4.3	51.4									Roof	1,840
											Wall	2,754
												512 19

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-90.1	3,420	67.6	91.8	Vent	0	0	Clg Cfm/Sqft	0.97	SADB	61.5	91.8	
Aux Htg	0.0	0	0.0	0.0	Infil	0	799	Clg Cfm/Ton	798.90	Plenum	75.5	67.2	
Preheat	-0.0	3,420	67.6	61.5	Supply	3,420	3,420	Clg Sqft/Ton	822.26	Return	75.2	67.6	
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	14.59	Ret/OA	75.2	67.6	
Humidif	0.0	0	0.0	0.0	Return	3,420	3,420	No. People	8	Runarnd	75.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	-90.1				Rm Exh	0	0	Htg Cfm/Sqft	0.97	Fn BldTD	0.0	0.0	
					Auxil	0	0	Htg Btuh/Sqft	-25.60	Fn Frict	0.0	0.1	

BUILDING U-VALUES - ALTERNATIVE 4
COMBINED ECOS

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	1ST FLOOR	0.124	0.000	0.000	0.000	0.000	0.550	0.563	0.057	0.549	75.1	17.20
2	2ND FLOOR	0.000	0.000	0.000	0.000	0.027	0.550	0.563	0.060	0.000	20.1	7.49
Zone	1 Total/Ave.	0.124	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.549	46.3	12.13
System	1 Total/Ave.	0.124	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.549	46.3	12.13
Building		0.124	0.000	0.000	0.000	0.027	0.550	0.563	0.058	0.549	46.3	12.13

BUILDING AREAS - ALTERNATIVE 4
COMBINED ECOS

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of		Floor	Total	Partition	Exposed	Skylight	Skl	Net Roof	Window	Win	Net Wall
		Duplicate	Room	Area/Dupl	Floor		Floor						
		Flr	Rm	(sqft)	Area	Area	Area	Area	/Rf	Area	Area	/Wl	Area
				(sqft)	(sqft)	(sqft)	(sqft)	(sqft)	(%)	(sqft)	(sqft)	(%)	(sqft)
1	1ST FLOOR	1	2	840	1,680	300	0	0	0	0	271	20	1,091
2	2ND FLOOR	1	2	920	1,840	0	0	0	0	1,840	241	17	1,151
Zone	1 Total/Ave.				3,520	300	0	0	0	1,840	512	19	2,242
System	1 Total/Ave.				3,520	300	0	0	0	1,840	512	19	2,242
Building					3,520	300	0	0	0	1,840	512	19	2,242

ASHRAE 90 ANALYSIS - ALTERNATIVE 4
COMBINED ECOS

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.027 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.150 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.101 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTvr) = 1.33 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTvw) = 17.21 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 4
COMBINED ECOS

----- SYSTEM LOAD PROFILE -----

System Total:

Percent Design Load	----- Cooling Load -----			----- Heating Load -----			----- Cooling Airflow -----			----- Heating Airflow -----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.2	0	0	-4,506	3	100	171.0	0	0	0.0	0	0
5 - 10	0.4	0	0	-9,013	5	181	342.0	0	0	0.0	0	0
10 - 15	0.6	0	0	-13,519	5	178	513.0	0	0	0.0	0	0
15 - 20	0.9	0	0	-18,025	8	304	684.0	42	2,120	0.0	0	0
20 - 25	1.1	0	0	-22,532	46	1,738	855.0	0	0	0.0	0	0
25 - 30	1.3	0	0	-27,038	8	291	1,026.0	0	0	0.0	0	0
30 - 35	1.5	0	0	-31,544	5	195	1,197.0	0	0	0.0	0	0
35 - 40	1.7	0	0	-36,051	4	149	1,368.0	0	0	0.0	0	0
40 - 45	1.9	0	0	-40,557	2	84	1,539.0	0	0	0.0	0	0
45 - 50	2.1	0	0	-45,063	2	75	1,710.0	21	1,060	0.0	0	0
50 - 55	2.4	0	0	-49,569	9	335	1,881.0	0	0	0.0	0	0
55 - 60	2.6	0	0	-54,076	1	34	2,052.0	0	0	0.0	0	0
60 - 65	2.8	0	0	-58,582	0	0	2,223.0	0	0	0.0	0	0
65 - 70	3.0	0	0	-63,088	1	48	2,394.0	0	0	0.0	0	0
70 - 75	3.2	0	0	-67,595	1	19	2,565.0	0	0	0.0	0	0
75 - 80	3.4	0	0	-72,101	0	9	2,736.0	0	0	0.0	0	0
80 - 85	3.6	0	0	-76,607	0	0	2,907.0	0	0	0.0	0	0
85 - 90	3.9	0	0	-81,114	0	0	3,078.0	0	0	0.0	0	0
90 - 95	4.1	0	0	-85,620	0	10	3,249.0	0	0	0.0	0	0
95 - 100	4.3	0	0	-90,126	1	49	3,420.0	38	1,908	0.0	0	0
Hours Off	0.0	0	8,760	0	0	4,961	0.0	0	3,672	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 4
COMBINED ECOS

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature ----- Zone Number -----
Range 1
(F)

Max. Temp. 102.6
Mo./Hr. 8 21
Day Type 1

..... Number of Hours

Above 100	566
95 - 100	1,583
90 - 95	707
85 - 90	92
80 - 85	291
75 - 80	845
70 - 75	107
65 - 70	4,569
60 - 65	0
55 - 60	0
50 - 55	0
Below 50	0

Min. Temp. 65.4
Mo./Hr. 2 15
Day Type 2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 4
COMBINED ECOS

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	GAS	GAS DMND
	Off Peak (kWh)	On Peak (kW)	On Peak (Therm)	On Peak (Thrm/hr)
Jan	1,941	4	278	1
Feb	1,753	4	278	1
March	1,952	4	178	1
April	1,115	4	57	0
May	472	2	0	0
June	460	2	0	0
July	460	2	0	0
Aug	477	2	0	0
Sept	449	2	0	0
Oct	581	4	7	0
Nov	1,389	4	99	0
Dec	1,935	4	227	1
Total	12,984	4	1,124	1

Building Energy Consumption = 44,517 (Btu/Sq Ft/Year)
Source Energy Consumption = 71,380 (Btu/Sq Ft/Year)

Floor Area = 3,520 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4
COMBINED ECOS

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	466	421	477	449	472	460	460	477	449	472	449	460	5,511
	PK	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1000													
	PREVENTS COOLING ENERGY													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5001													
	CHILLED WATER PUMP C.V.													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5010													
	CONDENSER WATER PUMP C.V.													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ2454													
	RESIDENT GAS FURNACE W-FAN													
	GAS	278	278	178	57	0	0	0	0	0	7	99	227	1,124
	PK	1.1	1.1	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.7	1.1
1	EQ5254													
	RESIDENTIAL FURNACE FAN													
	ELEC	1475	1332	1475	666	0	0	0	0	0	109	940	1475	7,473
	PK	2.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0	2.0

UTILITY PEAK CHECKSUMS - ALTERNATIVE 4
COMBINED ECOS

----- UTILITY PEAK CHECKSUMS -----

Utility ELECTRIC DEMAND

Peak Value 3.7 (kW)
Yearly Time of Peak 6 (hr) 1 (mo)

Hour 6 Month 1

Sub Total	0.0	0.00

Heating Equipment

1	EQ2454	RESIDENT GAS FURNACE W-FAN	2.0	52.98

Sub Total	2.0	52.98

Sub Total	0.0	0.00

Sub Total	0.0	0.00

Miscellaneous

Lights	1.8	47.02

Base Utilities	0.0	0.00

Misc Equipment	0.0	0.00

Sub Total	1.8	47.02

Grand Total	3.7	100.00

Building 253
Trace Input File

933702

CONTENTS OF : E:\CB253.TM

LINE # -----

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1  JOB - 1
2  01/ENERGY SAVINGS OPPORTUNITY STUDY
3  01/CARLISLE BARRACKS, PA
4  01/DEPARTMENT OF THE ARMY
5  01/BENATEC ASSOCIATES
6  01/BUILDING 253
7  08/CARLISLE
8  09/MAY/SEP////APR/OCT
9  10/CLTD-CLF
10 11///ZONE
11 LOAD - 1
12 19/1/BASE BUILDING
13 20/1/1/BASEMENT/3927/1//0//10
14 20/2/1/RECEIVING/951/1//2//14
15 20/3/1/STORE/2067/1//2.75//14
16 20/4/1/LOBBY/768/1//2.75//14
17 20/5/2/BATH ROOMS/169/1//5.75//14
18 20/6/3/MED. WAREHOUSE/4828/1/4/0//17.3
19 21/M///CBADCTX///CBADHTX
20 22/2/1/YES////11
21 22/3/1/YES////11
22 22/4/1/YES////11
23 22/5/1/YES////11
24 22/6/1/YES////146
25 24/1/1/310/1//139/135
26 24/1/2/107/1//139/225
27 24/1/3/407/1//139/45
28 24/2/1/660/1//140/135
29 24/2/2/275/1//140/225
30 24/2/3/275/1//140/45
31 24/3/1/275/1//140/45
32 24/4/1/660/1//141/315
33 24/4/2/220/1//140/45
34 24/5/1/371/1//140/45
35 24/6/1/1207/1//142/135
36 24/6/2/1156/1//142/225
37 24/6/3/1207/1//142/315
38 25/2/1/5.25/3/5/1.04/.95
39 25/2/2/5.25/3/2/1.04/.95
40 25/4/1/5.5/5/10/1.04/.95
41 25/5/1/3/1.5/4/1.04/.95
42 26/M/CBADP&L/CBADP&L/CBADP&L//OFF/CBADCLG/CBADHTG/OFF/CBADP&L/OFF
43 26/6/CBADP&L/CBADP&L/CBADP&L//OFF/OFF/CBADHTG/OFF/CBADP&L/OFF
44 27/1/6/PEOPLE/255/255/1.14/WATT-SF/ASHRAE2
45 27/2/2/PEOPLE/255/255/1.09/WATT-SF/ASHRAE2
46 27/3/5/PEOPLE/255/255/2.24/WATT-SF/ASHRAE2
47 27/4/4/PEOPLE/255/255/.84/WATT-SF/ASHRAE2
48 27/6/3/PEOPLE/345/435/.80/WATT-SF/ASHRAE2
49 29/1/15/PCT-MCLG/0//612/CFM/612/CFM
50 29/2/15/PCT-MCLG/0//1193/CFM/1193/CFM
51 29/3/15/PCT-MCLG/0//85/CFM/85/CFM
52 29/4/15/PCT-MCLG/0//469/CFM/469/CFM
53 29/5/15/PCT-MCLG/0//170/CFM/170/CFM
54 29/6/0/PCT-MCLG/0//850/CFM/850/CFM
55 30/1/4315/CFM/0/CFM///1500/CFM/635/CFM
56 30/2/1200/CFM/0/CFM///3300/CFM/200/CFM
57 30/3/2850/CFM/0/CFM///2400/CFM/200/CFM
58 30/4/1800/CFM/0/CFM///4400/CFM/200/CFM

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59 30/5/150/CFM/0/CFM///0/CFM/0/CFM

60 30/6/0/CFM/2525/CFM///0/CFM/23520/CFM

61 31/1/1/1853/1//147/SINE-FIT/80/50

62 SYSTEM - 1

63 39/1/BASE BUILDING

64 40/1/SZ

65 41/1/1/2

66 42/1/1.5/0/1///.2

67 44/1/DRY-BULB/65/15

68 45/1/CBADCLG/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF

69 40/2/UH

70 41/2/1/1/3/3

71 42/2///.25///.25

72 45/2/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF

73 40/3/RAD

74 41/3/2/2

75 45/3/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF

76 EQUIPMENT - 1

77 59/1/CARLISLE///BASE BUILDING

78 60/1/1/BLKPLANT/1/1

79 62/1/EQ1160S/1/25/TONS/87.9/KW

80 65/1/1//2/3

81 67/1/EQ2006/1/.33/HP/141.7/MBH/41.5/KW

82 69/1/EQ4003/EQ4003

83 69/2//EQ4003

84 LOAD - 2

85 19/2/WALL & ROOF INSULATION

86 20/1/1/BASEMENT/3927/1//0//10

87 20/2/1/RECEIVING/951/1//2//14

88 20/3/1/STORE/2067/1//2.75//14

89 20/4/1/LOBBY/768/1//2.75//14

90 20/5/2/BATH ROOMS/169/1//5.75//14

91 20/6/3/MED. WAREHOUSE/4828/1/4/0//17.3

92 21/M///CBADCTX///CBADHTX

93 22/2/1/YES///180

94 22/3/1/YES///180

95 22/4/1/YES///180

96 22/5/1/YES///180

97 22/6/1/YES///146

98 24/1/1/310/1//139/135

99 24/1/2/107/1//139/225

100 24/1/3/407/1//139/45

101 24/2/1/660/1//181/135

102 24/2/2/275/1//181/225

103 24/2/3/275/1//181/45

104 24/3/1/275/1//181/45

105 24/4/1/660/1//181/315

106 24/4/2/220/1//181/45

107 24/5/1/371/1//181/45

108 24/6/1/1207/1//142/135

109 24/6/2/1156/1//142/225

110 24/6/3/1207/1//142/315

111 25/2/1/5.25/3/5/1.04/.95

112 25/2/2/5.25/3/2/1.04/.95

113 25/4/1/5.5/5/10/1.04/.95

114 25/5/1/3/1.5/4/1.04/.95

115 26/M/CBADP&L/CBADP&L/CBADP&L//OFF/CBADCLG/CBADHTG/OFF/CBADP&L/OFF

116 26/6/CBADP&L/CBADP&L/CBADP&L//OFF/OFF/CBADHTG/OFF/CBADP&L/OFF

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LINE #	-----
117	27/1/6/PEOPLE/255/255/1.14/WATT-SF/ASHRAE2
118	27/2/2/PEOPLE/255/255/1.09/WATT-SF/ASHRAE2
119	27/3/5/PEOPLE/255/255/2.24/WATT-SF/ASHRAE2
120	27/4/4/PEOPLE/255/255/.84/WATT-SF/ASHRAE2
121	27/6/3/PEOPLE/345/435/.80/WATT-SF/ASHRAE2
122	29/1/15/PCT-MCLG/0//612/CFM/612/CFM
123	29/2/15/PCT-MCLG/0//907/CFM/907/CFM
124	29/3/15/PCT-MCLG/0//67/CFM/67/CFM
125	29/4/15/PCT-MCLG/0//358/CFM/358/CFM
126	29/5/15/PCT-MCLG/0//128/CFM/128/CFM
127	29/6/0/PCT-MCLG/0//850/CFM/850/CFM
128	30/1/4315/CFM/0/CFM///1500/CFM/635/CFM
129	30/2/1200/CFM/0/CFM///3300/CFM/200/CFM
130	30/3/2850/CFM/0/CFM///2400/CFM/200/CFM
131	30/4/1800/CFM/0/CFM///4400/CFM/200/CFM
132	30/5/150/CFM/0/CFM///0/CFM/0/CFM
133	30/6/0/CFM/2525/CFM///0/CFM/23520/CFM
134	31/1/1/1853/1//147/SINE-FIT/80/50
135	SYSTEM - 2
136	39/2/WALL & ROOF INSULATION
137	40/1/SZ
138	41/1/1/2
139	42/1/1.5/0/1///.2
140	44/1/DRY-BULB/65/15
141	45/1/CBADCLG/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
142	40/2/UH
143	41/2/1/1/3/3
144	42/2//.25///.25
145	45/2/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
146	40/3/RAD
147	41/3/2/2
148	45/3/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
149	EQUIPMENT - 2
150	59/2/CARLISLE///WALL & ROOF INSULATION
151	60/1/1/BLKPLANT/1/1
152	62/1/EQ1160S/1/25/TONS/87.9/KW
153	65/1/1//2/3
154	67/1/EQ2006/1/.33/HP/141.7/MBH/41.5/KW
155	69/1/EQ4003/EQ4003
156	69/2//EQ4003
157	LOAD - 3
158	19/3/REPLACE FLUORESCENT LAMPS
159	20/1/1/BASEMENT/3927/1//0//10
160	20/2/1/RECEIVING/951/1//2//14
161	20/3/1/STORE/2067/1//2.75//14
162	20/4/1/LOBBY/768/1//2.75//14
163	20/5/2/BATH ROOMS/169/1//5.75//14
164	20/6/3/MED. WAREHOUSE/4828/1/4/0//17.3
165	21/M////CBADCTX///CBADHTX
166	22/2/1/YES////11
167	22/3/1/YES////11
168	22/4/1/YES////11
169	22/5/1/YES////11
170	22/6/1/YES////146
171	24/1/1/310/1//139/135
172	24/1/2/107/1//139/225
173	24/1/3/407/1//139/45
174	24/2/1/660/1//140/135

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LINE #	
175	24/2/2/275/1//140/225
176	24/2/3/275/1//140/45
177	24/3/1/275/1//140/45
178	24/4/1/660/1//141/315
179	24/4/2/220/1//140/45
180	24/5/1/371/1//140/45
181	24/6/1/1207/1//142/135
182	24/6/2/1156/1//142/225
183	24/6/3/1207/1//142/315
184	25/2/1/5.25/3/5/1.04/.95
185	25/2/2/5.25/3/2/1.04/.95
186	25/4/1/5.5/5/10/1.04/.95
187	25/5/1/3/1.5/4/1.04/.95
188	26/M/CBADP&L/CBADP&L/CBADP&L//OFF/CBADCLG/CBADHTG/OFF/CBADP&L/OFF
189	26/6/CBADP&L/CBADP&L/CBADP&L//OFF/OFF/CBADHTG/OFF/CBADP&L/OFF
190	27/1/6/PEOPLE/255/255/.97/WATT-SF/ASHRAE2
191	27/2/2/PEOPLE/255/255/.91/WATT-SF/ASHRAE2
192	27/3/5/PEOPLE/255/255/1.9/WATT-SF/ASHRAE2
193	27/4/4/PEOPLE/255/255/.64/WATT-SF/ASHRAE2
194	27/6/3/PEOPLE/345/435/.69/WATT-SF/ASHRAE2
195	29/1/15/PCT-MCLG/0//612/CFM/612/CFM
196	29/2/15/PCT-MCLG/0//1193/CFM/1193/CFM
197	29/3/15/PCT-MCLG/0//85/CFM/85/CFM
198	29/4/15/PCT-MCLG/0//469/CFM/469/CFM
199	29/5/15/PCT-MCLG/0//170/CFM/170/CFM
200	29/6/0/PCT-MCLG/0//850/CFM/850/CFM
201	30/1/4315/CFM/0/CFM///1500/CFM/635/CFM
202	30/2/1200/CFM/0/CFM///3300/CFM/200/CFM
203	30/3/2850/CFM/0/CFM///2400/CFM/200/CFM
204	30/4/1800/CFM/0/CFM///4400/CFM/200/CFM
205	30/5/150/CFM/0/CFM///0/CFM/0/CFM
206	30/6/0/CFM/2525/CFM///0/CFM/23520/CFM
207	31/1/1/1853/1//147/SINE-FIT/80/50
208	SYSTEM - 3
209	39/3/REPLACE FLUORESCENT LAMPS
210	40/1/SZ
211	41/1/1/2
212	42/1/1.5/0/1///.2
213	44/1/DRY-BULB/65/15
214	45/1/CBADCLG/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
215	40/2/UH
216	41/2/1/1/3/3
217	42/2//.25///.25
218	45/2/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
219	40/3/RAD
220	41/3/2/2
221	45/3/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
222	EQUIPMENT - 3
223	59/3/CARLISLE///REPLACE FLUORESCENT LAMPS
224	60/1/1/BLKPLANT/1/1
225	62/1/EQ1160S/1/25/TONS/87.9/KW
226	65/1/1//2/3
227	67/1/EQ2006/1/.33/HP/141.7/MBH/41.5/KW
228	69/1/EQ4003/EQ4003
229	69/2//EQ4003
230	LOAD - 4
231	19/4/REPLACE FLUORESCENT BALLASTS
232	20/1/1/BASEMENT/3927/1//0//10

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LINE #	
233	20/2/1/RECEIVING/951/1//2//14
234	20/3/1/STORE/2067/1//2.75//14
235	20/4/1/LOBBY/768/1//2.75//14
236	20/5/2/BATH ROOMS/169/1//5.75//14
237	20/6/3/MED. WAREHOUSE/4828/1/4/0//17.3
238	21/M////CBADCTX///CBADHTX
239	22/2/1/YES////11
240	22/3/1/YES////11
241	22/4/1/YES////11
242	22/5/1/YES////11
243	22/6/1/YES////146
244	24/1/1/310/1//139/135
245	24/1/2/107/1//139/225
246	24/1/3/407/1//139/45
247	24/2/1/660/1//140/135
248	24/2/2/275/1//140/225
249	24/2/3/275/1//140/45
250	24/3/1/275/1//140/45
251	24/4/1/660/1//141/315
252	24/4/2/220/1//140/45
253	24/5/1/371/1//140/45
254	24/6/1/1207/1//142/135
255	24/6/2/1156/1//142/225
256	24/6/3/1207/1//142/315
257	25/2/1/5.25/3/5/1.04/.95
258	25/2/2/5.25/3/2/1.04/.95
259	25/4/1/5.5/5/10/1.04/.95
260	25/5/1/3/1.5/4/1.04/.95
261	26/M/CBADP&L/CBADP&L/CBADP&L//OFF/CBADCLG/CBADHTG/OFF/CBADP&L/OFF
262	26/6/CBADP&L/CBADP&L/CBADP&L//OFF/OFF/CBADHTG/OFF/CBADP&L/OFF
263	27/1/6/PEOPLE/255/255/.84/WATT-SF/ASHRAE2
264	27/2/2/PEOPLE/255/255/.78/WATT-SF/ASHRAE2
265	27/3/5/PEOPLE/255/255/1.7/WATT-SF/ASHRAE2
266	27/4/4/PEOPLE/255/255/.55/WATT-SF/ASHRAE2
267	27/6/3/PEOPLE/345/435/.60/WATT-SF/ASHRAE2
268	29/1/15/PCT-MCLG/0//612/CFM/612/CFM
269	29/2/15/PCT-MCLG/0//1193/CFM/1193/CFM
270	29/3/15/PCT-MCLG/0//85/CFM/85/CFM
271	29/4/15/PCT-MCLG/0//469/CFM/469/CFM
272	29/5/15/PCT-MCLG/0//170/CFM/170/CFM
273	29/6/0/PCT-MCLG/0//850/CFM/850/CFM
274	30/1/4315/CFM/0/CFM//1500/CFM/635/CFM
275	30/2/1200/CFM/0/CFM//3300/CFM/200/CFM
276	30/3/2850/CFM/0/CFM//2400/CFM/200/CFM
277	30/4/1800/CFM/0/CFM//4400/CFM/200/CFM
278	30/5/150/CFM/0/CFM//0/CFM/0/CFM
279	30/6/0/CFM/2525/CFM//0/CFM/23520/CFM
280	31/1/1/1853/1//147/SINE-FIT/80/50
281	SYSTEM - 4
282	39/4/REPLACE FLUORESCENT BALLASTS
283	40/1/SZ
284	41/1/1/2
285	42/1/1.5/0/1///.2
286	44/1/DRY-BULB/65/15
287	45/1/CBADCLG/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
288	40/2/UH
289	41/2/1/1/3/3
290	42/2//.25///.25

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LINE #	
291	45/2/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
292	40/3/RAD
293	41/3/2/2
294	45/3/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
295	EQUIPMENT - 4
296	59/4/CARLISLE///REPLACE FLUORESCENT BALLASTS
297	60/1/1/BLKPLANT/1/1
298	62/1/EQ1160S/1/25/TONS/87.9/KW
299	65/1/1//2/3
300	67/1/EQ2006/1/.33/HP/141.7/MBH/41.5/KW
301	69/1/EQ4003/EQ4003
302	69/2//EQ4003

CONTENTS OF : E:\CB253B.TM

LINE #	-----
1	JOB - 1
2	01/ENERGY SAVINGS OPPORTUNITY STUDY
3	01/CARLISLE BARRACKS, PA
4	01/DEPARTMENT OF THE ARMY
5	01/BENATEC ASSOCIATES
6	01/BUILDING 253
7	08/CARLISLE
8	09/MAY/SEP////APR/OCT
9	10/CLTD-CLF
10	11///ZONE
11	LOAD - 1
12	19/1/REPLACE FLUORESCENT FIXTURES
13	20/1/1/BASEMENT/3927/1//0//10
14	20/2/1/RECEIVING/951/1//2//14
15	20/3/1/STORE/2067/1//2.75//14
16	20/4/1/LOBBY/768/1//2.75//14
17	20/5/2/BATH ROOMS/169/1//5.75//14
18	20/6/3/MED. WAREHOUSE/4828/1/4/0//17.3
19	21/M////CBADCTX///CBADHTX
20	22/2/1/YES////11
21	22/3/1/YES////11
22	22/4/1/YES////11
23	22/5/1/YES////11
24	22/6/1/YES////146
25	24/1/1/310/1//139/135
26	24/1/2/107/1//139/225
27	24/1/3/407/1//139/45
28	24/2/1/660/1//140/135
29	24/2/2/275/1//140/225
30	24/2/3/275/1//140/45
31	24/3/1/275/1//140/45
32	24/4/1/660/1//141/315
33	24/4/2/220/1//140/45
34	24/5/1/371/1//140/45
35	24/6/1/1207/1//142/135
36	24/6/2/1156/1//142/225
37	24/6/3/1207/1//142/315
38	25/2/1/5.25/3/5/1.04/.95
39	25/2/2/5.25/3/2/1.04/.95
40	25/4/1/5.5/5/10/1.04/.95
41	25/5/1/3/1.5/4/1.04/.95
42	26/M/CBAPD&L/CBAPD&L/CBAPD&L//OFF/CBADCLG/CBADHTG/OFF/CBAPD&L/OFF
43	26/6/CBAPD&L/CBAPD&L/CBAPD&L//OFF/OFF/CBADHTG/OFF/CBAPD&L/OFF
44	27/1/6/PEOPLE/255/255/.70/WATT-SF/ASHRAE2
45	27/2/2/PEOPLE/255/255/.65/WATT-SF/ASHRAE2
46	27/3/5/PEOPLE/255/255/1.4/WATT-SF/ASHRAE2
47	27/4/4/PEOPLE/255/255/.46/WATT-SF/ASHRAE2
48	27/6/3/PEOPLE/345/435/.50/WATT-SF/ASHRAE2
49	29/1/15/PCT-MCLG/0//612/CFM/612/CFM
50	29/2/15/PCT-MCLG/0//1193/CFM/1193/CFM
51	29/3/15/PCT-MCLG/0//85/CFM/85/CFM
52	29/4/15/PCT-MCLG/0//469/CFM/469/CFM
53	29/5/15/PCT-MCLG/0//170/CFM/170/CFM
54	29/6/0/PCT-MCLG/0//850/CFM/850/CFM
55	30/1/4315/CFM/0/CFM///1500/CFM/635/CFM
56	30/2/1200/CFM/0/CFM///3300/CFM/200/CFM
57	30/3/2850/CFM/0/CFM///2400/CFM/200/CFM
58	30/4/1800/CFM/0/CFM///4400/CFM/200/CFM

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LINE #	-----
59	30/5/150/CFM/0/CFM///0/CFM/0/CFM
60	30/6/0/CFM/2525/CFM///0/CFM/23520/CFM
61	31/1/1/1853/1//147/SINE-FIT/80/50
62	SYSTEM - 1
63	39/1/REPLACE FLUORESCENT FIXTURES
64	40/1/SZ
65	41/1/1/2
66	42/1/1.5/0/1///.2
67	44/1/DRY-BULB/65/15
68	45/1/CBADCLG/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
69	40/2/UH
70	41/2/1/1/3/3
71	42/2//.25///.25
72	45/2/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
73	40/3/RAD
74	41/3/2/2
75	45/3/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
76	EQUIPMENT - 1
77	59/1/CARLISLE///REPLACE FLUORESCENT FIXTURES
78	60/1/1/BLKPLANT/1/1
79	62/1/EQ1160S/1/25/TONS/87.9/KW
80	65/1/1//2/3
81	67/1/EQ2006/1/.33/HP/141.7/MBH/41.5/KW
82	69/1/EQ4003/EQ4003
83	69/2//EQ4003
84	LOAD - 2
85	19/2/INFRARED HEATERS
86	20/1/1/BASEMENT/3927/1//0//10
87	20/2/1/RECEIVING/951/1//2//14
88	20/3/1/STORE/2067/1//2.75//14
89	20/4/1/LOBBY/768/1//2.75//14
90	20/5/2/BATH ROOMS/169/1//5.75//14
91	20/6/3/MED. WAREHOUSE/4828/1/4/0//17.3
92	21/M///CBADCTX///CBADHTX
93	21/6////////IR55
94	22/2/1/YES////11
95	22/3/1/YES////11
96	22/4/1/YES////11
97	22/5/1/YES////11
98	22/6/1/YES////146
99	24/1/1/310/1//139/135
100	24/1/2/107/1//139/225
101	24/1/3/407/1//139/45
102	24/2/1/660/1//140/135
103	24/2/2/275/1//140/225
104	24/2/3/275/1//140/45
105	24/3/1/275/1//140/45
106	24/4/1/660/1//141/315
107	24/4/2/220/1//140/45
108	24/5/1/371/1//140/45
109	24/6/1/1207/1//142/135
110	24/6/2/1156/1//142/225
111	24/6/3/1207/1//142/315
112	25/2/1/5.25/3/5/1.04/.95
113	25/2/2/5.25/3/2/1.04/.95
114	25/4/1/5.5/5/10/1.04/.95
115	25/5/1/3/1.5/4/1.04/.95
116	26/M/CBADP&L/CBADP&L/CBADP&L//OFF/CBADCLG/CBADHTG/OFF/CBADP&L/OFF

CONTENTS OF : E:\CB253B.TM

LINE #	-----
117	26/6/CBADP&L/CBADP&L/CBADP&L//OFF/OFF/CBADHTG/OFF/CBADP&L/OFF
118	27/1/6/PEOPLE/255/255/1.14/WATT-SF/ASHRAE2
119	27/2/2/PEOPLE/255/255/1.09/WATT-SF/ASHRAE2
120	27/3/5/PEOPLE/255/255/2.24/WATT-SF/ASHRAE2
121	27/4/4/PEOPLE/255/255/.84/WATT-SF/ASHRAE2
122	27/6/3/PEOPLE/345/435/.80/WATT-SF/ASHRAE2
123	29/1/15/PCT-MCLG/0//612/CFM/612/CFM
124	29/2/15/PCT-MCLG/0//1193/CFM/1193/CFM
125	29/3/15/PCT-MCLG/0//85/CFM/85/CFM
126	29/4/15/PCT-MCLG/0//469/CFM/469/CFM
127	29/5/15/PCT-MCLG/0//170/CFM/170/CFM
128	29/6/0/PCT-MCLG/0//676/CFM/676/CFM
129	30/1/4315/CFM/0/CFM///1500/CFM/635/CFM
130	30/2/1200/CFM/0/CFM///3300/CFM/200/CFM
131	30/3/2850/CFM/0/CFM///2400/CFM/200/CFM
132	30/4/1800/CFM/0/CFM///4400/CFM/200/CFM
133	30/5/150/CFM/0/CFM///0/CFM/0/CFM
134	30/6/0/CFM/2525/CFM///0/CFM/23520/CFM
135	31/1/1/1853/1//147/SINE-FIT/80/50
136	SYSTEM - 2
137	39/2/INFRERED HEATERS
138	40/1/SZ
139	41/1/1/2
140	42/1/1.5/0/1///.2
141	44/1/DRY-BULB/65/15
142	45/1/CBADCLG/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
143	40/2/UH
144	41/2/1/1/3/3
145	42/2//.25//.25
146	45/2/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
147	40/3/RAD
148	41/3/2/2
149	45/3/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
150	EQUIPMENT - 2
151	59/2/CARLISLE///INRARED HEATERS
152	60/1/1/BLKPLANT/1/1
153	62/1/EQ1160S/1/25/TONS/87.9/KW
154	65/1/1//2/3
155	67/1/EQ2006/1/.33/HP/141.7/MBH/41.5/KW
156	69/1/EQ4003/EQ4003
157	69/2//EQ4003
158	LOAD - 3
159	19/3/COMBINED ECOS
160	20/1/1/BASEMENT/3927/1//0//10
161	20/2/1/RECEIVING/951/1//2//14
162	20/3/1/STORE/2067/1//2.75//14
163	20/4/1/LOBBY/768/1//2.75//14
164	20/5/2/BATH ROOMS/169/1//5.75//14
165	20/6/3/MED. WAREHOUSE/4828/1/4/0//17.3
166	21/M///CBADCTX///CBADHTX
167	21/6////////IR55
168	22/2/1/YES////180
169	22/3/1/YES////180
170	22/4/1/YES////180
171	22/5/1/YES////180
172	22/6/1/YES////146
173	24/1/1/310/1//139/135
174	24/1/2/107/1//139/225

CONTENTS OF : E:\CB253B.TM

LINE #	
175	24/1/3/407/1//139/45
176	24/2/1/660/1//181/135
177	24/2/2/275/1//181/225
178	24/2/3/275/1//181/45
179	24/3/1/275/1//181/45
180	24/4/1/660/1//181/315
181	24/4/2/220/1//181/45
182	24/5/1/371/1//181/45
183	24/6/1/1207/1//142/135
184	24/6/2/1156/1//142/225
185	24/6/3/1207/1//142/315
186	25/2/1/5.25/3/5/1.04/.95
187	25/2/2/5.25/3/2/1.04/.95
188	25/4/1/5.5/5/10/1.04/.95
189	25/5/1/3/1.5/4/1.04/.95
190	26/M/CBADP&L/CBADP&L/CBADP&L//OFF/CBADCLG/CBADHTG/OFF/CBADP&L/OFF
191	26/6/CBADP&L/CBADP&L/CBADP&L//OFF/OFF/CBADHTG/OFF/CBADP&L/OFF
192	27/1/6/PEOPLE/255/255/.70/WATT-SF/ASHRAE2
193	27/2/2/PEOPLE/255/255/.65/WATT-SF/ASHRAE2
194	27/3/5/PEOPLE/255/255/1.4/WATT-SF/ASHRAE2
195	27/4/4/PEOPLE/255/255/.46/WATT-SF/ASHRAE2
196	27/6/3/PEOPLE/345/435/.50/WATT-SF/ASHRAE2
197	29/1/15/PCT-MCLG/0//612/CFM/612/CFM
198	29/2/15/PCT-MCLG/0//907/CFM/907/CFM
199	29/3/15/PCT-MCLG/0//67/CFM/67/CFM
200	29/4/15/PCT-MCLG/0//358/CFM/358/CFM
201	29/5/15/PCT-MCLG/0//128/CFM/128/CFM
202	29/6/0/PCT-MCLG/0//676/CFM/676/CFM
203	30/1/4315/CFM/0/CFM///1500/CFM/635/CFM
204	30/2/1200/CFM/0/CFM///3300/CFM/200/CFM
205	30/3/2850/CFM/0/CFM///2400/CFM/200/CFM
206	30/4/1800/CFM/0/CFM///4400/CFM/200/CFM
207	30/5/150/CFM/0/CFM///0/CFM/0/CFM
208	30/6/0/CFM/2525/CFM///0/CFM/23520/CFM
209	31/1/1/1853/1//147/SINE-FIT/80/50
210	SYSTEM - 3
211	39/3/COMBINED ECOS
212	40/1/SZ
213	41/1/1/2
214	42/1/1.5/0/1///.2
215	44/1/DRY-BULB/65/15
216	45/1/CBADCLG/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
217	40/2/UH
218	41/2/1/1/3/3
219	42/2//.25///.25
220	45/2/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
221	40/3/RAD
222	41/3/2/2
223	45/3/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF
224	EQUIPMENT - 3
225	59/3/CARLISLE///COMBINED ECOS
226	60/1/1/BLKPLANT/1/1
227	62/1/EQ1160S/1/25/TONS/87.9/KW
228	65/1/1//2/3
229	67/1/EQ2006/1/.33/HP/141.7/MBH/41.5/KW
230	69/1/EQ4003/EQ4003
231	69/2//EQ4003

CONTENTS OF : C:\JOBS\CB253C.TM

LINE #

- 1 JOB - 1
- 2 01/ENERGY SAVINGS OPPORTUNITY STUDY
- 3 01/CARLISLE BARRACKS, PA
- 4 01/DEPARTMENT OF THE ARMY
- 5 01/BENATEC ASSOCIATES
- 6 01/BUILDING 253
- 7 08/CARLISLE
- 8 09/MAY/SEP///APR/OCT
- 9 10/CLTD-CLF
- 10 11///ZONE
- 11 LOAD - 1
- 12 19/1/BASE BUILDING
- 13 20/1/1/BASEMENT/3927/1//0//10
- 14 20/2/1/RECEIVING/951/1//2//14
- 15 20/3/1/STORE/2067/1//2.75//14
- 16 20/4/1/LOBBY/768/1//2.75//14
- 17 20/5/2/BATH ROOMS/169/1//5.75//14
- 18 20/6/3/MED. WAREHOUSE/4828/1/4/0//17.3
- 19 21/M///CBADCTX///CBADHTX
- 20 21/6///CBADSTX///CBADSTX
- 21 22/2/1/YES///11
- 22 22/3/1/YES///11
- 23 22/4/1/YES///11
- 24 22/5/1/YES///11
- 25 22/6/1/YES///.08/146
- 26 24/1/1/310/1//139/135
- 27 24/1/2/107/1//139/225
- 28 24/1/3/407/1//139/45
- 29 24/2/1/660/1//140/135
- 30 24/2/2/275/1//140/225
- 31 24/2/3/275/1//140/45
- 32 24/3/1/275/1//140/45
- 33 24/4/1/660/1//141/315
- 34 24/4/2/220/1//140/45
- 35 24/5/1/371/1//140/45
- 36 24/6/1/1207/1//142/135
- 37 24/6/2/1156/1//142/225
- 38 24/6/3/1207/1//142/315
- 39 25/2/1/5.25/3/5/1.04/.95
- 40 25/2/2/5.25/3/2/1.04/.95
- 41 25/4/1/5.5/5/10/1.04/.95
- 42 25/5/1/3/1.5/4/1.04/.95
- 43 26/M/CBAP&L/CBAP&L/CBAP&L//OFF/CBAP&L/CBAP&L//OFF/CBAP&L//OFF
- 44 26/6/CBAP&L/CBAP&L/CBAP&L//OFF/OFF/CBAP&L//OFF/CBAP&L//OFF
- 45 27/1/6/PEOPLE/255/255/1.14/WATT-SF/ASHRAE2
- 46 27/2/2/PEOPLE/255/255/1.09/WATT-SF/ASHRAE2
- 47 27/3/5/PEOPLE/255/255/2.24/WATT-SF/ASHRAE2
- 48 27/4/4/PEOPLE/255/255/.84/WATT-SF/ASHRAE2
- 49 27/6/3/PEOPLE/345/435/.80/WATT-SF/ASHRAE2
- 50 29/1/15/PCT-MCLG/0//612/CFM/612/CFM
- 51 29/2/15/PCT-MCLG/0//1193/CFM/1193/CFM
- 52 29/3/15/PCT-MCLG/0//85/CFM/85/CFM
- 53 29/4/15/PCT-MCLG/0//469/CFM/469/CFM
- 54 29/5/15/PCT-MCLG/0//170/CFM/170/CFM
- 55 29/6/0/PCT-MCLG/0//850/CFM/850/CFM
- 56 30/1/4315/CFM/0/CFM///1500/CFM/635/CFM
- 57 30/2/1200/CFM/0/CFM///3300/CFM/200/CFM
- 58 30/3/2850/CFM/0/CFM///2400/CFM/200/CFM

CONTENTS OF : C:\JOBS\CB253C.TM

LINE # -----

59 30/4/1800/CFM/0/CFM///4400/CFM/200/CFM

60 30/5/150/CFM/0/CFM///0/CFM/0/CFM

61 30/6/0/CFM/2525/CFM///0/CFM/23520/CFM

62 31/1/1/1853/1//147/SINE-FIT/80/50

63 SYSTEM - 1

64 39/1/AIR STRATIFICATION

65 40/1/SZ

66 41/1/1/2

67 42/1/1.5/0/1///.2

68 44/1/DRY-BULB/65/15

69 45/1/CBADCLG/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF

70 40/2/UH

71 41/2/1/1/3/3

72 42/2//.25///.25

73 45/2/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF

74 40/3/RAD

75 41/3/2/2

76 45/3/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF

77 EQUIPMENT - 1

78 59/1/CARLISLE///AIR STRATIFICATION

79 60/1/1/BLKPLANT/1/1

80 62/1/EQ1160S/1/25/TONS/87.9/KW

81 65/1/1//2/3

82 67/1/EQ2006/1/.33/HP/141.7/MBH/41.5/KW

83 69/1/EQ4003/EQ4003

84 69/2//EQ4003

85 LOAD - 2

86 19/1/BASE BUILDING

87 20/1/1/BASEMENT/3927/1//0//10

88 20/2/1/RECEIVING/951/1//2//14

89 20/3/1/STORE/2067/1//2.75//14

90 20/4/1/LOBBY/768/1//2.75//14

91 20/5/2/BATH ROOMS/169/1//5.75//14

92 20/6/3/MED. WAREHOUSE/4828/1/4/0//17.3

93 21/M///CBADCTX///CBADHTX

94 22/2/1/YES///11

95 22/3/1/YES///11

96 22/4/1/YES///11

97 22/5/1/YES///11

98 22/6/1/YES///146

99 24/1/1/310/1//139/135

100 24/1/2/107/1//139/225

101 24/1/3/407/1//139/45

102 24/2/1/660/1//140/135

103 24/2/2/275/1//140/225

104 24/2/3/275/1//140/45

105 24/3/1/275/1//140/45

106 24/4/1/660/1//141/315

107 24/4/2/220/1//140/45

108 24/5/1/371/1//140/45

109 24/6/1/1207/1//142/135

110 24/6/2/1156/1//142/225

111 24/6/3/1207/1//142/315

112 25/2/1/5.25/3/5/1.04/.95

113 25/2/2/5.25/3/2/1.04/.95

114 25/4/1/5.5/5/10/1.04/.95

115 25/5/1/3/1.5/4/1.04/.95

116 26/M/CBAP&L/CBAP&L/CBAP&L//OFF/CBADCLG/CBADHTG/OFF/CBAP&L/OFF

CONTENTS OF : C:\JOBS\CB253C.TM

LINE # -----

117 26/6/CBAP&L/CBAP&L/CBAP&L//OFF/OFF/CBADHTG/OFF/CBAP&L/OFF

118 27/1/6/PEOPLE/255/255/1.14/WATT-SF/ASHRAE2

119 27/2/2/PEOPLE/255/255/1.09/WATT-SF/ASHRAE2

120 27/3/5/PEOPLE/255/255/2.24/WATT-SF/ASHRAE2

121 27/4/4/PEOPLE/255/255/.84/WATT-SF/ASHRAE2

122 27/6/3/PEOPLE/345/435/.80/WATT-SF/ASHRAE2

123 28/6/1/CEILING FANS/384/WATTS/CBAP&L/ELEC

124 29/1/15/PCT-MCLG/0//612/CFM/612/CFM

125 29/2/15/PCT-MCLG/0//1193/CFM/1193/CFM

126 29/3/15/PCT-MCLG/0//85/CFM/85/CFM

127 29/4/15/PCT-MCLG/0//469/CFM/469/CFM

128 29/5/15/PCT-MCLG/0//170/CFM/170/CFM

129 29/6/0/PCT-MCLG/0//850/CFM/850/CFM

130 30/1/4315/CFM/0/CFM///1500/CFM/635/CFM

131 30/2/1200/CFM/0/CFM///3300/CFM/200/CFM

132 30/3/2850/CFM/0/CFM///2400/CFM/200/CFM

133 30/4/1800/CFM/0/CFM///4400/CFM/200/CFM

134 30/5/150/CFM/0/CFM///0/CFM/0/CFM

135 30/6/0/CFM/2525/CFM///0/CFM/23520/CFM

136 31/1/1/1853/1//147/SINE-FIT/80/50

137 SYSTEM - 2

138 39/2/CEILING FANS

139 40/1/SZ

140 41/1/1/2

141 42/1/1.5/0/1///.2

142 44/1/DRY-BULB/65/15

143 45/1/CBADCLG/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF

144 40/2/UH

145 41/2/1/1/3/3

146 42/2//.25///.25

147 45/2/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF

148 40/3/RAD

149 41/3/2/2

150 45/3/OFF/OFF/OFF/OFF/OFF/CBADHTG/OFF/OFF/OFF/OFF

151 EQUIPMENT - 2

152 59/2/CARLISLE///CEILING FANS

153 60/1/1/BLKPLANT/1/1

154 62/1/EQ1160S/1/25/TONS/87.9/KW

155 65/1/1//2/3

156 67/1/EQ2006/1/.33/HP/141.7/MBH/41.5/KW

157 69/1/EQ4003/EQ4003

158 69/2/EQ4003

Building 253
Trace Output File

933702


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**          T R A C E    6 0 0    A N A L Y S I S          **  
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ENERGY SAVINGS OPPORTUNITY STUDY

CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 253

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 11:37:42 1/19/94
Dataset Name: CB253 .TM

AIRFLOW - ALTERNATIVE 1
BASE BUILDING

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	Main					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1	SZ	1,547	10,315	4,331	12,844	1,547	0	1,035
2	UH	0	0	7,035	0	3,209	0	0
3	RAD	0	0	0	0	170	0	0
Totals		1,547	10,315	11,366	12,844	4,926	0	1,035

CAPACITY - ALTERNATIVE 1
BASE BUILDING

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	Cooling					Heating					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	22.7	0.0	0.0	22.7	-400,260	0	-247,741	0	0	0	-400,260
2	UH	0.0	0.0	0.0	0.0	-386,318	0	0	0	0	0	-386,318
3	RAD	0.0	0.0	0.0	0.0	-18,830	0	0	0	0	0	-18,830
Totals		22.7	0.0	0.0	22.7	-805,408	0	-247,741	0	0	0	-805,408

The building peaked at hour 14 month 7 with a capacity of 21.3 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BASE BUILDING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	15.00	1.31	454.6	347.4	34.54	0.55	-50.78	7,882
2	Main	UH	0.00	0.00	0.0	0.0	0.00	0.56	-30.80	12,541
3	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-111.42	169

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	52,876		52,876	19.42	*	0	0.00	*	0	-30,241	10.34
Glass Solar	21,378	0		21,378	7.85	*	29,188	21.86	*	0	0	0.00
Glass Cond	5,608	0		5,608	2.06	*	5,130	3.84	*	-28,015	-28,015	9.58
Wall Cond	19,751	2,412		22,162	8.14	*	21,311	15.96	*	-48,296	-53,384	18.25
Partition	1,333			1,333	0.49	*	1,333	1.00	*	-4,797	-4,797	1.64
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	77,699			77,699	28.54	*	42,048	31.49	*	-176,134	-176,134	60.20
Sub Total==>	125,768	55,288		181,056	66.50	*	99,010	74.16	*	-257,241	-292,571	100.00
Internal Loads						*			*			
Lights	28,943	0		28,943	10.63	*	27,921	20.91	*	0	0	0.00
People	7,913			7,913	2.91	*	3,088	2.31	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	36,856	0	0	36,856	13.54	*	31,009	23.23	*	0	0	0.00
Ceiling Load	9,390	-9,390		0	0.00	*	5,981	4.48	*	-11,398	0	0.00
Outside Air	0	0	0	45,625	16.76	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				11,003	4.04	*		0.00	*		0	0.00
Ret. Fan Heat		7,237		7,237	2.66	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	-2,489			-2,489	-0.91	*	-2,489	-1.86	*	0	0	0.00
Exhaust Heat		-7,027	0	-7,027	-2.58	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	169,525	46,107	0	272,260	100.00	*	133,510	100.00	*	-268,639	-292,571	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	7,882	
Main Clg	22.7	272.3	213.4	10,315	81.4	68.4	86.2	62.1	60.5	78.5	Part	1,853
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	3,955
Totals	22.7	272.3									Wall	3,560
												403 11

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	ENGINEERING CHECKS--		TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F	Vent	1,547	0	Clg % OA	15.0	Type	Clg	Htg
Main Htg	-400.3	4,331	40.1	125.0	Infil	2,529	2,529	Clg Cfm/Sqft	1.31	SADB	63.1	125.0
Aux Htg	0.0	0	0.0	0.0	Supply	10,315	4,331	Clg Cfm/Ton	454.64	Plenum	82.5	39.8
Preheat	-247.7	10,315	40.1	62.1	Mincfm	0	0	Clg Sqft/Ton	347.40	Return	79.8	45.2
Reheat	0.0	0	0.0	0.0	Return	10,177	4,331	Clg Btuh/Sqft	34.54	Ret/OA	81.4	45.2
Humidif	0.0	0	0.0	0.0	Exhaust	1,409	0	No. People	17	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	1,035	0	Htg % OA	0.0	Fn MtrTD	0.2	0.0
Total	-400.3				Auxil	0	0	Htg Cfm/Sqft	0.55	Fn BltdTD	0.2	0.0
								Htg Btuh/Sqft	-50.78	Fn Frict	0.6	0.0

System 2 Block UH - UNIT HEATERS

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-23,735	-53,053	13.73
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-26,764	-26,764	6.93
Wall Cond	0	0		0	0.00	*	0	0.00	*	-74,257	-78,211	20.25
Partition	0			0	0.00	*	0	0.00	*	-4,797	-4,797	1.24
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-223,493	-223,493	57.85
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-353,046	-386,318	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-39,267	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-392,313	-386,318	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
				Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	12,541	
Main Clg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Part	1,853	
Aux Clg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	8,614	0 0
Totals	0.0	0.0								Wall	6,759	385 6

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	AIRFLOWS (cfm)		--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
						Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-386.3	7,035	68.8	119.2	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	119.2
Aux Htg	0.0	0	0.0	0.0	Infil	0	3,209	Clg Cfm/Ton	0.00	Plenum	0.0	40.3
Preheat	0.0	0	0.0	0.0	Supply	0	7,035	Clg Sqft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Return	0	7,035	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-386.3				Rm Exh	0	0	Htg Cfm/Sqft	0.56	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	-30.80	Fn Frict	0.0	0.1

System 3 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-923	4.90
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-1,250	-1,250	6.64
Wall Cond	0	0		0	0.00	*	0	0.00	*	-3,682	-4,816	25.58
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-11,840	-11,840	62.88
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-16,772	-18,830	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-2,058	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-18,830	-18,830	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	Part	
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	169	0	
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0		
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0		
Totals	0.0	0.0								169	0	0
										371	18	5

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	ENGINEERING CHECKS--		TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA	0.0	Type	Clg	Mtg
Main Htg	-18.8	0	0.0	0.0	Infil	0	170	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Cfm/Ton	0.00	Plenum	0.0	29.6
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Sqft/Ton	0.00	Return	0.0	29.6
Reheat	0.0	0	0.0	0.0	Return	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	29.6
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-18.8				Auxil	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
								Htg Btuh/Sqft	-111.42	Fn Frict	0.0	0.0

BUILDING U-VALUES - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	101.9	23.44
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
6	MED. WAREHOUSE	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
Zone 3	Total/Ave.	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
System 2	Total/Ave.	0.144	0.000	0.000	0.000	0.137	1.040	1.086	0.200	0.317	93.8	20.92
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System 3	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Building		0.144	0.000	0.000	0.000	0.162	1.040	1.086	0.231	0.317	97.6	22.02

BUILDING AREAS - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G A R E A S -----													
Room Number	Description	Number of Duplicate Flr	Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	1 Total/Ave.				7,882	1,853	0	0	0	3,955	403	11	3,157
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
6	MED. WAREHOUSE	1	1	4,828	4,828	0	0	0	0	4,828	0	0	3,570
Zone	3 Total/Ave.				4,828	0	0	0	0	4,828	0	0	3,570
System	2 Total/Ave.				12,541	1,853	0	0	0	8,614	385	6	6,374
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	3 Total/Ave.				169	0	0	0	0	169	18	5	353
Building					20,592	3,706	0	0	0	12,738	807	8	9,883

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BASE BUILDING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.162 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.292 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.221 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 12.27 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 16.56 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BASE BUILDING

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	1.1	4	19	-52,657	41	1,104	867.5	0	0	0.0	0	0
5 - 10	2.3	4	18	-105,315	16	424	1,735.0	0	0	0.0	0	0
10 - 15	3.4	4	19	-157,972	13	341	2,602.5	0	0	0.0	0	0
15 - 20	4.5	4	22	-210,630	1	37	3,470.0	0	0	0.0	0	0
20 - 25	5.7	1	4	-263,287	1	33	4,337.5	9	571	0.0	0	0
25 - 30	6.8	11	56	-315,945	1	35	5,204.9	0	0	0.0	0	0
30 - 35	7.9	1	4	-368,602	0	8	6,072.4	0	0	0.0	0	0
35 - 40	9.1	8	41	-421,260	27	735	6,939.9	0	0	0.0	0	0
40 - 45	10.2	12	61	-473,917	0	0	7,807.4	83	5,088	0.0	0	0
45 - 50	11.3	14	68	-526,574	0	0	8,674.9	0	0	0.0	0	0
50 - 55	12.5	1	5	-579,232	0	0	9,542.4	0	0	0.0	0	0
55 - 60	13.6	4	19	-631,889	0	0	10,409.9	5	295	0.0	0	0
60 - 65	14.7	11	53	-684,547	0	0	11,277.4	3	204	0.0	0	0
65 - 70	15.9	12	60	-737,204	0	0	12,144.9	0	0	0.0	0	0
70 - 75	17.0	0	0	-789,862	0	0	13,012.4	0	0	0.0	0	0
75 - 80	18.2	4	20	-842,519	0	0	13,879.9	0	0	0.0	0	0
80 - 85	19.3	4	20	-895,177	0	0	14,747.4	0	0	0.0	0	0
85 - 90	20.4	2	10	-947,834	0	0	15,614.8	0	0	0.0	0	0
90 - 95	21.6	0	0	-1,000,492	0	0	16,482.3	0	0	0.0	0	0
95 - 100	22.7	0	0	-1,053,149	0	0	17,349.8	0	0	0.0	0	0
Hours Off	0.0	0	8,261	0	0	6,043	0.0	0	2,602	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
 BASE BUILDING

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature	----- Zone Number -----				
Range (F)	1	2	1	3	2
Max. Temp.	82.8	82.8	96.1	93.9	89.7
Mo./Hr.	7 22	7 20	8 22	8 19	8 21
Day Type	4	4	1	1	1
	 Number of Hours				
Above 100	0	0	0	0	0
95 - 100	0	0	270	0	0
90 - 95	0	0	1,498	1,320	0
85 - 90	0	0	999	833	1,292
80 - 85	355	301	173	775	1,044
75 - 80	2,322	1,955	550	524	848
70 - 75	903	1,049	602	648	488
65 - 70	536	367	1,997	2,022	1,685
60 - 65	300	119	1,451	1,533	1,147
55 - 60	1,194	641	552	509	986
50 - 55	637	832	668	596	1,270
Below 50	2,513	3,496	0	0	0
Min. Temp.	35.1	29.9	54.9	54.9	54.9
Mo./Hr.	2 8	2 10	1 3	1 6	2 4
Day Type	5	5	5	5	3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BASE BUILDING

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	OIL	WATER
	Off Peak (kWh)	On Peak (kW)		
			(Therm)	(1000 G1)
Jan	5,633	27	747	0
Feb	5,095	27	691	0
March	5,953	27	562	0
April	4,883	27	198	0
May	5,733	28	0	0
June	11,752	97	0	0
July	16,987	110	0	0
Aug	12,060	96	0	0
Sept	5,212	81	0	0
Oct	5,349	27	100	0
Nov	5,069	27	371	0
Dec	5,345	27	644	0
Total	89,071	110	3,312	2

Building Energy Consumption = 30,846 (Btu/Sq Ft/Year)
Source Energy Consumption = 61,223 (Btu/Sq Ft/Year)

Floor Area = 20,592 (Sq Ft)

----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BASE BUILDING

ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ2006	OIL FIRE TUBE STEAM												
OIL	747	691	562	198	0	0	0	0	0	100	371	644	3,312
PK	1.4	1.4	1.4	1.4	0.1	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4
1 EQ5020	HEAT WATER CIRC. PUMP C.V.												
ELEC	215	194	173	66	0	0	0	0	0	66	119	199	1,033
PK	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	93	84	75	28	0	0	0	0	0	28	52	86	446
PK	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	328	296	264	100	0	0	0	0	0	100	182	303	1,574
PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
1 EQ5061	CONDENSATE RETURN PUMP												
ELEC	4	4	4	1	0	0	0	0	0	1	2	4	21
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5406	MAKE-UP WATER												
WATER	0	0	0	0	0	0	0	0	0	0	0	0	2
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	104	94	84	32	0	0	0	0	0	32	58	97	501
PK	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BASE BUILDING

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 109.6 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1160S	AIR-CLD COND COMP 25-35 TONS	77.5	70.75
Sub Total			77.5	70.75
Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	6.6	6.04
Sub Total			6.6	6.04
Sub Total			0.0	0.00

Miscellaneous

Lights			25.4	23.21
Base Utilities			0.0	0.00
Misc Equipment			0.0	0.00
Sub Total			25.4	23.21

Grand Total			109.6	100.00

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**                                     **
**          T R A C E   6 0 0   A N A L Y S I S          **
**                                     **
**          by                **
**                                     **
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 253

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Reflectance: 0.20
Winter Ground Reflectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 11:52:11 1/19/94
Dataset Name: CB253 .TM

AIRFLOW - ALTERNATIVE 2
WALL & ROOF INSULATION

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1	SZ	1,547	10,315	3,276	12,387	1,547	0	1,035
2	UH	0	0	5,970	0	2,794	0	0
3	RAD	0	0	0	0	128	0	0
Totals		1,547	10,315	9,245	12,387	4,469	0	1,035

CAPACITY - ALTERNATIVE 2
WALL & ROOF INSULATION

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	----- Cooling -----					----- Heating -----						
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Sys. Opt. Capacity (Tons)	Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	16.4	0.0	0.0	0.0	16.4	-232,997	0	-109,532	0	0	0	-232,997
2	UH	0.0	0.0	0.0	0.0	0.0	-311,059	0	0	0	0	0	-311,059
3	RAD	0.0	0.0	0.0	0.0	0.0	-11,650	0	0	0	0	0	-11,650
Totals		16.4	0.0	0.0	0.0	16.4	-555,706	0	-109,532	0	0	0	-555,706

The building peaked at hour 14 month 7 with a capacity of 16.1 tons

ENGINEERING CHECKS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				--- Heating ---		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	15.00	1.31	627.9	479.8	25.01	0.42	-29.56	7,882
2	Main	UH	0.00	0.00	0.0	0.0	0.00	0.48	-24.80	12,541
3	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-68.94	169

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct	Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot	Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)	(Btuh)	(Btuh)	(%)
Envelope Loads											
Skylite Solr	0	0		0	0.00	*	0	0.00	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	0	0	0.00
Roof Cond	0	5,437		5,437	2.76	*	0	0.00	0	-8,902	4.24
Glass Solar	21,103	0		21,103	10.70	*	28,638	26.02	0	0	0.00
Glass Cond	5,608	0		5,608	2.84	*	5,101	4.63	-28,015	-28,015	13.33
Wall Cond	9,746	534		10,279	5.21	*	10,158	9.23	-22,432	-24,112	11.47
Partition	1,333			1,333	0.68	*	1,333	1.21	-4,797	-4,797	2.28
Exposed Floor	0			0	0.00	*	0	0.00	0	0	0.00
Infiltration	58,332			58,332	29.59	*	34,560	31.39	-144,306	-144,306	68.67
Sub Total==>	96,121	5,970		102,091	51.78	*	79,789	72.48	-199,550	-210,132	100.00
Internal Loads						*					
Lights	28,131	0		28,131	14.27	*	27,741	25.20	0	0	0.00
People	7,829			7,829	3.97	*	3,078	2.80	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Sub Total==>	35,960	0	0	35,960	18.24	*	30,818	28.00	0	0	0.00
Ceiling Load	1,001	-1,001		0	0.00	*	538	0.49	-3,633	0	0.00
Outside Air	0	0	0	43,580	22.11	*	0	0.00	0	0	0.00
Sup. Fan Heat				11,003	5.58	*		0.00		0	0.00
Ret. Fan Heat		7,224		7,224	3.66	*		0.00		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00		0	0.00
OV/UNDR Sizing	-1,065			-1,065	-0.54	*	-1,065	-0.97	0	0	0.00
Exhaust Heat		-1,646	0	-1,646	-0.83	*		0.00		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00		0	0.00
Grand Total==>	132,016	10,548	0	197,147	100.00	*	110,080	100.00	-203,183	-210,132	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor		
Main Clg	16.4	197.1	151.9	78.3	68.1	89.7	64.2	62.5	84.3	Part	1,853	
Aux Clg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	3,955	0 0
Totals	16.4	197.1								Wall	3,560	403 11

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	ENGINEERING CHECKS--		TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA	15.0	Type	Clg	Htg
Main Htg	-233.0	3,276	59.6	125.0	Infil	1,547	0	Clg Cfm/Sqft	1.31	SAOB	65.2	125.0
Aux Htg	0.0	0	0.0	0.0	Supply	2,072	2,072	Clg Cfm/Ton	627.86	Plenum	75.8	59.6
Preheat	-109.5	10,315	54.5	64.2	Mincfm	0	0	Clg Sqft/Ton	479.76	Return	76.1	61.6
Reheat	0.0	0	0.0	0.0	Return	10,159	3,276	Clg Btuh/Sqft	25.01	Ret/OA	78.3	61.6
Humidif	0.0	0	0.0	0.0	Exhaust	1,391	0	No. People	17	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	1,035	0	Htg % OA	0.0	Fn MtrTD	0.2	0.0
Total	-233.0				Auxil	0	0	Htg Cfm/Sqft	0.42	Fn BldTD	0.2	0.0
								Htg Btuh/Sqft	-29.56	Fn Frict	0.6	0.0

System 2 Block UH - UNIT HEATERS

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percent Of Tot (%)	*	Space Sensible (Btuh)	Percent Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percent Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-23,735	-32,297	10.38
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-26,764	-26,764	8.60
Wall Cond	0	0		0	0.00	*	0	0.00	*	-51,359	-52,610	16.91
Partition	0			0	0.00	*	0	0.00	*	-4,797	-4,797	1.54
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-194,590	-194,590	62.56
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-301,245	-311,059	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-25,001	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-326,246	-311,059	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total	Glass (sf)	(%)
Main Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Floor	12,541	
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Part	1,853	
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Totals	0.0	0.0	0			Roof	8,614	0 0
						Wall	6,759	385 6

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-311.1	5,970	70.3	118.2	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	118.2
Aux Htg	0.0	0	0.0	0.0	Infil	0	2,794	Clg Cfm/Ton	0.00	Plenum	0.0	59.8
Preheat	0.0	0	0.0	0.0	Supply	0	5,970	Clg Sqft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Return	0	5,970	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-311.1				Rm Exh	0	0	Htg Cfm/SqFt	0.48	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/SqFt	-24.80	Fn Frict	0.0	0.1

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 3 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct	Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot	Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)	(Btuh)	(Btuh)	(%)
Envelope Loads											
Skylite Solr	0	0		0	0.00	*	0	0.00	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	0	-340	2.92
Glass Solar	0	0		0	0.00	*	0	0.00	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	-1,250	-1,250	10.73
Wall Cond	0	0		0	0.00	*	0	0.00	-716	-1,145	9.83
Partition	0			0	0.00	*	0	0.00	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	-8,915	-8,915	76.52
Sub Total==>	0	0		0	0.00	*	0	0.00	-10,882	-11,650	100.00
Internal Loads											
Lights	0	0		0	0.00	*	0	0.00	0	0	0.00
People	0			0	0.00	*	0	0.00	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	-769	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	-11,650	-11,650	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	169
Totals	0.0	0.0									Wall	371

-----AREAS-----

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	ENGINEERING CHECKS--			TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-11.7	0	0.0	0.0	Infil	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1	
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Cfm/Ton	0.00	Plenum	0.0	53.6	
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Sqft/Ton	0.00	Return	0.0	53.6	
Reheat	0.0	0	0.0	0.0	Return	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	53.6	
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	0	Runarnd	0.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	-11.7				Auxil	0	0	Htg Cfm/SqFt	0.00	Fn BldTD	0.0	0.0	
								Htg Btuh/SqFt	-68.94	Fn Frict	0.0	0.0	

BUILDING U-VALUES - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	----- Room U-Values ----- (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Summr Roof	Wintr Windo	Summr Windo	Wall	Ceil.		
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	114.3	24.77
3	STORE	0.000	0.000	0.000	0.000	0.041	0.000	0.000	0.056	0.317	41.6	9.33
4	LOBBY	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	88.1	19.21
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.041	1.040	1.086	0.129	0.317	102.1	23.47
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	180.6	38.83
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	180.6	38.83
System 1	Total/Ave.	0.144	0.000	0.000	0.000	0.041	1.040	1.086	0.121	0.317	103.7	23.80
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	114.3	24.77
3	STORE	0.000	0.000	0.000	0.000	0.041	0.000	0.000	0.056	0.317	41.6	9.33
4	LOBBY	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	88.1	19.21
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.041	1.040	1.086	0.129	0.317	102.1	23.47
6	MED. WAREHOUSE	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
Zone 3	Total/Ave.	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
System 2	Total/Ave.	0.144	0.000	0.000	0.000	0.061	1.040	1.086	0.129	0.317	94.9	21.14
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	180.6	38.83
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	180.6	38.83
System 3	Total/Ave.	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	180.6	38.83
Building		0.144	0.000	0.000	0.000	0.054	1.040	1.086	0.124	0.317	99.0	22.30

BUILDING AREAS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G A R E A S -----													
Room Number	Description	Number of Duplicate Flr	Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	1 Total/Ave.				7,882	1,853	0	0	0	3,955	403	11	3,157
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
6	MED. WAREHOUSE	1	1	4,828	4,828	0	0	0	0	4,828	0	0	3,570
Zone	3 Total/Ave.				4,828	0	0	0	0	4,828	0	0	3,570
System	2 Total/Ave.				12,541	1,853	0	0	0	8,614	385	6	6,374
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	3 Total/Ave.				169	0	0	0	0	169	18	5	353
Building					20,592	3,706	0	0	0	12,738	807	8	9,883

ASHRAE 90 ANALYSIS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.054 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.193 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.118 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 3.33 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 13.88 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2
WALL & ROOF INSULATION

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.8	0	0	-33,262	33	756	814.2	0	0	0.0	0	0
5 - 10	1.6	5	23	-66,524	13	295	1,628.5	0	0	0.0	0	0
10 - 15	2.5	5	27	-99,786	11	255	2,442.7	0	0	0.0	0	0
15 - 20	3.3	5	23	-133,048	7	156	3,256.9	0	0	0.0	0	0
20 - 25	4.1	0	0	-166,309	2	35	4,071.2	9	530	0.0	0	0
25 - 30	4.9	5	26	-199,571	1	17	4,885.4	0	0	0.0	0	0
30 - 35	5.8	12	60	-232,833	2	35	5,699.7	0	0	0.0	0	0
35 - 40	6.6	5	23	-266,095	1	16	6,513.9	83	5,088	0.0	0	0
40 - 45	7.4	5	27	-299,357	1	21	7,328.1	0	0	0.0	0	0
45 - 50	8.2	21	103	-332,619	31	711	8,142.4	0	0	0.0	0	0
50 - 55	9.0	0	0	-365,881	0	0	8,956.6	0	0	0.0	0	0
55 - 60	9.9	3	15	-399,143	0	0	9,770.8	0	0	0.0	0	0
60 - 65	10.7	0	0	-432,405	0	0	10,585.1	9	540	0.0	0	0
65 - 70	11.5	16	80	-465,667	0	0	11,399.3	0	0	0.0	0	0
70 - 75	12.3	7	37	-498,929	0	0	12,213.5	0	0	0.0	0	0
75 - 80	13.1	0	0	-532,190	0	0	13,027.8	0	0	0.0	0	0
80 - 85	14.0	0	0	-565,452	0	0	13,842.0	0	0	0.0	0	0
85 - 90	14.8	0	0	-598,714	0	0	14,656.2	0	0	0.0	0	0
90 - 95	15.6	3	15	-631,976	0	0	15,470.5	0	0	0.0	0	0
95 - 100	16.4	7	35	-665,238	0	0	16,284.7	0	0	0.0	0	0
Hours Off	0.0	0	8,266	0	0	6,463	0.0	0	2,602	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature	----- Zone Number -----				
Range	1	2	1	3	2
(F)					

Max. Temp.	81.3	80.9	96.5	93.9	89.5
Mo./Hr.	7 22	7 21	8 19	8 19	8 21
Day Type	4	4	2	1	1

	 Number of Hours				
Above 100	0	0	0	0	0
95 - 100	0	0	500	0	0
90 - 95	0	0	1,557	1,320	0
85 - 90	0	0	583	833	1,632
80 - 85	197	100	356	775	954
75 - 80	2,546	2,156	802	524	370
70 - 75	931	686	413	648	716
65 - 70	542	514	2,191	2,022	1,827
60 - 65	590	644	1,370	1,533	1,504
55 - 60	1,112	316	556	509	884
50 - 55	803	1,190	432	596	873
Below 50	2,039	3,154	0	0	0

Min. Temp.	37.1	30.5	54.9	54.9	54.9
Mo./Hr.	2 8	2 10	1 3	1 6	1 12
Day Type	5	5	4	5	3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 2
WALL & ROOF INSULATION

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	OIL	WATER
	Off Peak (kWh)	On Peak (kW)		
			(Therm)	(1000 G1)
Jan	5,530	27	664	0
Feb	5,018	27	616	0
March	5,811	27	444	0
April	4,851	27	155	0
May	5,584	28	0	0
June	10,131	74	0	0
July	15,620	95	0	0
Aug	12,312	85	0	0
Sept	5,076	75	0	0
Oct	5,263	27	44	0
Nov	4,936	27	296	0
Dec	5,239	27	571	0
Total	85,369	95	2,789	2

Building Energy Consumption = 27,694 (Btu/Sq Ft/Year)
Source Energy Consumption = 56,710 (Btu/Sq Ft/Year)

Floor Area = 20,592 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2
WALL & ROOF INSULATION

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	4888	4423	5354	4655	5121	5121	4655	5354	4655	5121	4655	4655	58,659
	PK	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1160S	AIR-CLD COND COMP 25-35 TONS												
	ELEC	0	0	0	0	0	3879	9190	5202	0	0	0	0	18,272
	PK	0.0	0.0	0.0	0.0	0.0	45.0	59.5	49.9	41.3	0.0	0.0	0.0	59.5
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	0	159	430	214	0	0	0	0	803
	PK	0.0	0.0	0.0	0.0	0.0	1.8	3.0	2.4	1.8	0.0	0.0	0.0	3.0
1	EQ5302	CONTROLS												
	ELEC	0	0	0	0	0	11	20	18	0	0	0	0	49
	PK	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	463	960	1324	1523	421	0	0	0	4,691
	PK	0.0	0.0	0.0	0.0	2.1	6.6	6.6	6.6	6.6	0.0	0.0	0.0	6.6
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ4003	FC CENTRIF. FAN C.V.												

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2
WALL & ROOF INSULATION

ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ2006	OIL FIRE TUBE STEAM												
OIL	664	616	444	155	0	0	0	0	0	44	296	571	2,789
PK	1.4	1.4	1.4	1.4	0.1	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4
1 EQ5020	HEAT WATER CIRC. PUMP C.V.												
ELEC	185	172	132	56	0	0	0	0	0	41	81	169	837
PK	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	80	74	57	24	0	0	0	0	0	18	35	73	361
PK	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	283	262	201	86	0	0	0	0	0	63	124	257	1,275
PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
1 EQ5061	CONDENSATE RETURN PUMP												
ELEC	4	3	3	1	0	0	0	0	0	1	2	3	17
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5406	MAKE-UP WATER												
WATER	0	0	0	0	0	0	0	0	0	0	0	0	2
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	90	83	64	27	0	0	0	0	0	20	39	82	406
PK	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2

UTILITY PEAK CHECKSUMS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 94.7 (kW)
Yearly Time of Peak 14 (hr) 7 (mo)

Hour 14 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percent Of Tot (%)
Cooling Equipment				
1	EQ1160S	AIR-CLD COND COMP 25-35 TONS	62.7	66.16
Sub Total			62.7	66.16
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	6.6	6.99
Sub Total			6.6	6.99
Sub Total			0.0	0.00
Miscellaneous				
	Lights		25.4	26.85
	Base Utilities		0.0	0.00
	Misc Equipment		0.0	0.00
Sub Total			25.4	26.85
Grand Total			94.7	100.00

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**          T R A C E    6 0 0    A N A L Y S I S          **
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**          by          **
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 253

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Reflectance: 0.20
Winter Ground Reflectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 12: 7:28 1/19/94
Dataset Name: CB253 .TM

AIRFLOW - ALTERNATIVE 3
REPLACE FLUORESCENT LAMPS

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1	SZ	1,547	10,315	4,331	12,844	1,547	0	1,035
2	UH	0	0	7,035	0	3,209	0	0
3	RAD	0	0	0	0	170	0	0
Totals		1,547	10,315	11,366	12,844	4,926	0	1,035

CAPACITY - ALTERNATIVE 3
REPLACE FLUORESCENT LAMPS

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

		----- Cooling -----				----- Heating -----						
System	System	Main Sys.	Aux. Sys.	Opt. Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
Number	Type	Capacity	Capacity	Capacity	Totals	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Totals
		(Tons)	(Tons)	(Tons)	(Tons)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)
1	SZ	22.1	0.0	0.0	22.1	-400,260	0	-252,030	0	0	0	-400,260
2	UH	0.0	0.0	0.0	0.0	-386,318	0	0	0	0	0	-386,318
3	RAD	0.0	0.0	0.0	0.0	-18,830	0	0	0	0	0	-18,830
Totals		22.1	0.0	0.0	22.1	-805,408	0	-252,030	0	0	0	-805,408

The building peaked at hour 14 month 7 with a capacity of 20.7 tons

ENGINEERING CHECKS - ALTERNATIVE 3
REPLACE FLUORESCENT LAMPS

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				--- Heating ---		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	15.00	1.31	467.0	356.9	33.63	0.55	-50.78	7,882
2	Main	UH	0.00	0.00	0.0	0.0	0.00	0.56	-30.80	12,541
3	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-111.42	169

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	52,876		52,876	19.95	*	0	0.00	*	0	-30,241	10.34
Glass Solar	21,378	0		21,378	8.07	*	29,188	22.59	*	0	0	0.00
Glass Cond	5,608	0		5,608	2.12	*	5,130	3.97	*	-28,015	-28,015	9.58
Wall Cond	19,751	2,412		22,162	8.36	*	21,311	16.49	*	-48,296	-53,384	18.25
Partition	1,333			1,333	0.50	*	1,333	1.03	*	-4,797	-4,797	1.64
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	76,079			76,079	28.70	*	42,048	32.54	*	-176,134	-176,134	60.20
Sub Total==>	124,148	55,288		179,436	67.70	*	99,010	76.62	*	-257,241	-292,571	100.00
Internal Loads						*			*			
Lights	24,395	0		24,395	9.20	*	23,632	18.29	*	0	0	0.00
People	7,913			7,913	2.99	*	3,088	2.39	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	32,307	0	0	32,307	12.19	*	26,720	20.68	*	0	0	0.00
Ceiling Load	9,390	-9,390		0	0.00	*	5,981	4.63	*	-11,398	0	0.00
Outside Air	0	0	0	44,578	16.82	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				11,003	4.15	*		0.00	*		0	0.00
Ret. Fan Heat		7,237		7,237	2.73	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	-2,489			-2,489	-0.94	*	-2,489	-1.93	*	0	0	0.00
Exhaust Heat		-7,027	0	-7,027	-2.65	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	163,357	46,107	0	265,044	100.00	*	129,221	100.00	*	-268,639	-292,571	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf) (%) Part
Main Clg	22.1	265.0	10,315	81.4 68.6 87.0	62.5 60.9 79.8	7,882	1,853
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0	0
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0	0
Totals	22.1	265.0				3,955	403 11

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling Type	Heating Type	Clg % OA Clg Cfm/Sqft	15.0 1.31	---TEMPERATURES (F)--- Type Clg Htg
Main Htg	-400.3	4,331	40.1	125.0	Vent	1,547	0	Clg Cfm/Ton	467.02	SADB 63.5 125.0
Aux Htg	0.0	0	0.0	0.0	Infil	2,529	2,529	Clg Sqft/Ton	356.86	Plenum 82.5 39.8
Preheat	-252.0	10,315	40.1	62.5	Supply	10,315	4,331	Clg Btuh/Sqft	33.63	Return 79.8 45.2
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	No. People	17	Ret/OA 81.4 45.2
Humidif	0.0	0	0.0	0.0	Return	10,177	4,331	Htg % OA	0.0	Runarnd 75.0 68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	1,409	0	Htg Cfm/Sqft	0.55	Fn MtrTD 0.2 0.0
Total	-400.3				Rm Exh	1,035	0	Htg Btuh/Sqft	-50.78	Fn BldTD 0.2 0.0
					Auxil	0	0			Fn Frict 0.6 0.0

System 2 Block UH - UNIT HEATERS

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-23,735	-53,053	13.73
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-26,764	-26,764	6.93
Wall Cond	0	0		0	0.00	*	0	0.00	*	-74,257	-78,211	20.25
Partition	0			0	0.00	*	0	0.00	*	-4,797	-4,797	1.24
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-223,493	-223,493	57.85
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-353,046	-386,318	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-39,267	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-392,313	-386,318	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor 12,541 Part 1,853 ExFlr 0 Roof 8,614 Wall 6,759	Glass (sf) 0 0 385 6	(%)
Main Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0			
Aux Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0			
Opt Vent	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0			
Totals	0.0	0.0						

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-386.3	7,035	68.8	119.2	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	119.2
Aux Htg	0.0	0	0.0	0.0	Infil	0	3,209	Clg Cfm/Ton	0.00	Plenum	0.0	40.3
Preheat	0.0	0	0.0	0.0	Supply	0	7,035	Clg Sqft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Return	0	7,035	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrFD	0.0	0.0
Total	-386.3				Rm Exh	0	0	Htg Cfm/SqFt	0.56	Fn BldFD	0.0	0.0
					Auxil	0	0	Htg Btuh/SqFt	-30.80	Fn Frict	0.0	0.1

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 3 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-923	4.90
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-1,250	-1,250	6.64
Wall Cond	0	0		0	0.00	*	0	0.00	*	-3,682	-4,816	25.58
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-11,840	-11,840	62.88
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-16,772	-18,830	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-2,058	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-18,830	-18,830	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains		
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Floor	169
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	0.0	0.0									Roof	169
											Wall	371
												18
												5

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-18.8	0	0.0	0.0	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1	
Aux Htg	0.0	0	0.0	0.0	Infil	0	170	Clg Cfm/Ton	0.00	Plenum	0.0	29.6	
Preheat	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	29.6	
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	29.6	
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	-18.8				Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0	
					Auxil	0	0	Htg Btuh/Sqft	-111.42	Fn Frict	0.0	0.0	

BUILDING U-VALUES - ALTERNATIVE 3
REPLACE FLUORESCENT LAMPS

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Part.	ExFlr	Room U-Values (Btu/hr/sqft/F)							Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
				Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone	1 Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone	2 Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System	1 Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	101.9	23.44
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone	1 Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
6	MED. WAREHOUSE	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
Zone	3 Total/Ave.	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
System	2 Total/Ave.	0.144	0.000	0.000	0.000	0.137	1.040	1.086	0.200	0.317	93.8	20.92
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone	2 Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System	3 Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Building		0.144	0.000	0.000	0.000	0.162	1.040	1.086	0.231	0.317	97.6	22.02

BUILDING AREAS - ALTERNATIVE 3
REPLACE FLUORESCENT LAMPS

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate Flr	Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	1 Total/Ave.				7,882	1,853	0	0	0	3,955	403	11	3,157
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
6	MED. WAREHOUSE	1	1	4,828	4,828	0	0	0	0	4,828	0	0	3,570
Zone	3 Total/Ave.				4,828	0	0	0	0	4,828	0	0	3,570
System	2 Total/Ave.				12,541	1,853	0	0	0	8,614	385	6	6,374
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	3 Total/Ave.				169	0	0	0	0	169	18	5	353
Building					20,592	3,706	0	0	0	12,738	807	8	9,883

ASHRAE 90 ANALYSIS - ALTERNATIVE 3
REPLACE FLUORESCENT LAMPS

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.162 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.292 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.221 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 12.27 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 16.56 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 3
REPLACE FLUORESCENT LAMPS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	1.1	4	18	-52,872	39	1,069	867.5	0	0	0.0	0	0
5 - 10	2.2	0	0	-105,744	17	465	1,735.0	0	0	0.0	0	0
10 - 15	3.3	5	22	-158,616	12	326	2,602.5	0	0	0.0	0	0
15 - 20	4.4	2	8	-211,488	1	30	3,470.0	0	0	0.0	0	0
20 - 25	5.5	0	0	-264,359	1	16	4,337.5	10	590	0.0	0	0
25 - 30	6.6	11	52	-317,231	1	33	5,204.9	0	0	0.0	0	0
30 - 35	7.7	5	22	-370,103	1	35	6,072.4	0	0	0.0	0	0
35 - 40	8.8	8	38	-422,975	27	743	6,939.9	0	0	0.0	0	0
40 - 45	9.9	15	69	-475,847	0	0	7,807.4	83	5,088	0.0	0	0
45 - 50	11.0	10	45	-528,719	0	0	8,674.9	0	0	0.0	0	0
50 - 55	12.1	1	5	-581,591	0	0	9,542.4	0	0	0.0	0	0
55 - 60	13.3	7	34	-634,463	0	0	10,409.9	5	295	0.0	0	0
60 - 65	14.4	8	38	-687,335	0	0	11,277.4	3	185	0.0	0	0
65 - 70	15.5	13	60	-740,206	0	0	12,144.9	0	0	0.0	0	0
70 - 75	16.6	0	0	-793,078	0	0	13,012.4	0	0	0.0	0	0
75 - 80	17.7	4	20	-845,950	0	0	13,879.9	0	0	0.0	0	0
80 - 85	18.8	4	20	-898,822	0	0	14,747.4	0	0	0.0	0	0
85 - 90	19.9	2	10	-951,694	0	0	15,614.8	0	0	0.0	0	0
90 - 95	21.0	0	0	-1,004,566	0	0	16,482.3	0	0	0.0	0	0
95 - 100	22.1	0	0	-1,057,438	0	0	17,349.8	0	0	0.0	0	0
Hours Off	0.0	0	8,299	0	0	6,043	0.0	0	2,602	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 3
 REPLACE FLUORESCENT LAMPS

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature Range (F)	Zone Number				
	1	2	1	3	2

Max. Temp.	82.8	82.8	95.3	93.4	89.7
Mo./Hr.	7 22	7 20	8 21	8 20	8 21
Day Type	4	4	1	1	1

	Number of Hours				
Above 100	0	0	0	0	0
95 - 100	0	0	19	0	0
90 - 95	0	0	1,481	1,180	0
85 - 90	0	0	1,031	875	1,292
80 - 85	355	301	397	873	1,044
75 - 80	2,307	1,955	509	422	848
70 - 75	830	1,049	647	746	488
65 - 70	616	367	1,958	1,975	1,685
60 - 65	308	119	1,478	1,584	1,147
55 - 60	1,182	641	572	509	986
50 - 55	615	832	668	596	1,270
Below 50	2,547	3,496	0	0	0

Min. Temp.	34.9	29.9	55.0	55.0	54.9
Mo./Hr.	2 9	2 10	1 16	1 20	2 4
Day Type	5	5	3	3	3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 3
REPLACE FLUORESCENT LAMPS

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	OIL	WATER
	Off Peak (kWh)	On Peak (kW)		
			(Therm)	(1000 G1)
Jan	4,880	23	747	0
Feb	4,413	23	691	0
March	5,150	23	577	0
April	4,165	23	211	0
May	4,943	24	0	0
June	10,537	91	0	0
July	16,001	104	0	0
Aug	10,593	91	0	0
Sept	4,494	76	0	0
Oct	4,566	23	104	0
Nov	4,369	23	384	0
Dec	4,627	23	645	0
Total	78,737	104	3,359	2

Building Energy Consumption = 29,361 (Btu/Sq Ft/Year)
Source Energy Consumption = 56,324 (Btu/Sq Ft/Year)

Floor Area = 20,592 (Sq Ft)

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	4135	3741	4528	3938	4332	4332	3938	4528	3938	4332	3938	3938	49,617
	PK	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1160S	AIR-CLD COND COMP 25-35 TONS												
	ELEC	0	0	0	0	0	4813	10215	4693	0	0	0	0	19,722
	PK	0.0	0.0	0.0	0.0	0.0	59.4	72.1	59.2	45.9	0.0	0.0	0.0	72.1
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	0	205	503	205	0	0	0	0	913
	PK	0.0	0.0	0.0	0.0	0.0	3.1	3.9	3.1	2.2	0.0	0.0	0.0	3.9
1	EQ5302	CONTROLS												
	ELEC	0	0	0	0	0	15	20	11	0	0	0	0	46
	PK	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	612	1173	1324	1154	556	0	0	0	4,819
	PK	0.0	0.0	0.0	0.0	2.8	6.6	6.6	6.6	6.6	0.0	0.0	0.0	6.6
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ4003	FC CENTRIF. FAN C.V.												

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3
REPLACE FLUORESCENT LAMPS

ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ2006	OIL FIRE TUBE STEAM												
OIL	747	691	577	211	0	0	0	0	0	104	384	645	3,359
PK	1.4	1.4	1.4	1.4	0.1	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4
1 EQ5020	HEAT WATER CIRC. PUMP C.V.												
ELEC	215	194	179	66	0	0	0	0	0	68	125	199	1,046
PK	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	93	84	78	28	0	0	0	0	0	29	54	86	452
PK	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	328	296	274	100	0	0	0	0	0	103	190	303	1,594
PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
1 EQ5061	CONDENSATE RETURN PUMP												
ELEC	4	4	4	1	0	0	0	0	0	1	3	4	21
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5406	MAKE-UP WATER												
WATER	0	0	0	0	0	0	0	0	0	0	0	0	2
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	104	94	87	32	0	0	0	0	0	33	60	97	507
PK	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2

UTILITY PEAK CHECKSUMS - ALTERNATIVE 3
REPLACE FLUORESCENT LAMPS

----- UTILITY PEAK CHECKSUMS -----

Utility ELECTRIC DEMAND

Peak Value 104.2 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1160S	AIR-CLD COND COMP 25-35 TONS	76.1	73.01
Sub Total			76.1	73.01
Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	6.6	6.35
Sub Total			6.6	6.35
Sub Total			0.0	0.00

Miscellaneous

Lights	21.5	20.64
Base Utilities	0.0	0.00
Misc Equipment	0.0	0.00
Sub Total	21.5	20.64
Grand Total	104.2	100.00

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**
**          T R A C E    6 0 0    A N A L Y S I S          **
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**          by          **
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 253

Weather File Code:	CARLISLE
Location:	ENERGY SAVINGS OPPORTUNITY STUDY
Latitude:	40.2 (deg)
Longitude:	77.2 (deg)
Time Zone:	5
Elevation:	475 (ft)
Barometric Pressure:	29.2 (in. Hg)
Summer Clearness Number:	1.00
Winter Clearness Number:	1.00
Summer Design Dry Bulb:	92 (F)
Summer Design Wet Bulb:	72 (F)
Winter Design Dry Bulb:	4 (F)
Summer Ground Relectance:	0.20
Winter Ground Relectance:	0.20
Air Density:	0.0742 (Lbm/cuft)
Air Specific Heat:	0.2444 (Btu/lbm/F)
Density-Specific Heat Prod:	1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor:	4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor:	4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 12:22:28 1/19/94
Dataset Name: CB253.TM

AIRFLOW - ALTERNATIVE 4
REPLACE FLUORESCENT BALLASTS

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1	SZ	1,547	10,315	4,331	12,844	1,547	0	1,035
2	UH	0	0	7,035	0	3,209	0	0
3	RAD	0	0	0	0	170	0	0
Totals		1,547	10,315	11,366	12,844	4,926	0	1,035

CAPACITY - ALTERNATIVE 4
REPLACE FLUORESCENT BALLASTS

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	----- Cooling -----					----- Heating -----					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	21.7	0.0	0.0	21.7	-400,260	0	-254,892	0	0	0	-400,260
2	UH	0.0	0.0	0.0	0.0	-386,318	0	0	0	0	0	-386,318
3	RAD	0.0	0.0	0.0	0.0	-18,830	0	0	0	0	0	-18,830
Totals		21.7	0.0	0.0	21.7	-805,408	0	-254,892	0	0	0	-805,408

The building peaked at hour 14 month 7 with a capacity of 20.3 tons

ENGINEERING CHECKS - ALTERNATIVE 4
REPLACE FLUORESCENT BALLASTS

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				----- Heating -----		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	15.00	1.31	475.6	363.4	33.02	0.55	-50.78	7,882
2	Main	UH	0.00	0.00	0.0	0.0	0.00	0.56	-30.80	12,541
3	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-111.42	169

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percnt		Space	Percnt		Space Peak	Coil Peak	Percnt
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	52,876		52,876	20.32	*	0	0.00	*	0	-30,241	10.34
Glass Solar	21,378	0		21,378	8.21	*	29,188	23.10	*	0	0	0.00
Glass Cond	5,608	0		5,608	2.15	*	5,130	4.06	*	-28,015	-28,015	9.58
Wall Cond	19,751	2,412		22,162	8.52	*	21,311	16.87	*	-48,296	-53,384	18.25
Partition	1,333			1,333	0.51	*	1,333	1.05	*	-4,797	-4,797	1.64
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	74,974			74,974	28.81	*	42,048	33.28	*	-176,134	-176,134	60.20
Sub Total==>	123,043	55,288		178,330	68.52	*	99,010	78.36	*	-257,241	-292,571	100.00
Internal Loads												
Lights	21,425	0		21,425	8.23	*	20,770	16.44	*	0	0	0.00
People	7,913			7,913	3.04	*	3,088	2.44	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	29,338	0	0	29,338	11.27	*	23,858	18.88	*	0	0	0.00
Ceiling Load	9,390	-9,390		0	0.00	*	5,981	4.73	*	-11,398	0	0.00
Outside Air	0	0	0	43,863	16.85	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				11,003	4.23	*		0.00	*		0	0.00
Ret. Fan Heat		7,237		7,237	2.78	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	-2,489			-2,489	-0.96	*	-2,489	-1.97	*	0	0	0.00
Exhaust Heat		-7,027	0	-7,027	-2.70	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	159,281	46,107	0	260,254	100.00	*	126,359	100.00	*	-268,639	-292,571	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	21.7	260.3	205.8	10,315	81.4	68.7	87.6	62.8	61.2	80.6	Part	1,853
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	3,955
Totals	21.7	260.3									Wall	3,560

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % OA	15.0	Type	Clg	Htg	
Main Htg	-400.3	4,331	40.1	125.0	Vent	1,547	0	Clg Cfm/Sqft	1.31	SADB	63.7	125.0	
Aux Htg	0.0	0	0.0	0.0	Infil	2,529	2,529	Clg Cfm/Ton	475.61	Plenum	82.5	39.8	
Preheat	-254.9	10,315	40.1	62.8	Supply	10,315	4,331	Clg Sqft/Ton	363.43	Return	79.8	45.2	
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg 8tuh/Sqft	33.02	Ret/OA	81.4	45.2	
Humidif	0.0	0	0.0	0.0	Return	10,177	4,331	No. People	17	Runarnd	75.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Exhaust	1,409	0	Htg % OA	0.0	Fn MtrTD	0.2	0.0	
Total	-400.3				Rm Exh	1,035	0	Htg Cfm/Sqft	0.55	Fn 8ldTD	0.2	0.0	
					Auxil	0	0	Htg 8tuh/Sqft	-50.78	Fn Frict	0.6	0.0	

System 2 Block UH - UNIT HEATERS

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-23,735	-53,053	13.73
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-26,764	-26,764	6.93
Wall Cond	0	0		0	0.00	*	0	0.00	*	-74,257	-78,211	20.25
Partition	0			0	0.00	*	0	0.00	*	-4,797	-4,797	1.24
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-223,493	-223,493	57.85
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-353,046	-386,318	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-39,267	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-392,313	-386,318	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf)	(%)
Main Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	12,541		
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	1,853		
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	0.0	0.0				8,614	0	0
						6,759	385	6

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-386.3	7,035	68.8	119.2	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	119.2
Aux Htg	0.0	0	0.0	0.0	Infil	0	3,209	Clg Cfm/Ton	0.00	Plenum	0.0	40.3
Preheat	0.0	0	0.0	0.0	Supply	0	7,035	Clg Sqft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Return	0	7,035	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-386.3				Rm Exh	0	0	Htg Cfm/Sqft	0.56	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	-30.80	Fn Frict	0.0	0.1

System 3 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-923	4.90
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-1,250	-1,250	6.64
Wall Cond	0	0		0	0.00	*	0	0.00	*	-3,682	-4,816	25.58
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-11,840	-11,840	62.88
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-16,772	-18,830	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-2,058	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-18,830	-18,830	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor		
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	Part	0	
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	Roof	169	0 0
Totals	0.0	0.0								Wall	371	18 5

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA	0.0	Type	Clg	Htg
Main Htg	-18.8	0	0.0	0.0	Infil	0	170	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Cfm/Ton	0.00	Plenum	0.0	29.6
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Sqft/Ton	0.00	Return	0.0	29.6
Reheat	0.0	0	0.0	0.0	Return	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	29.6
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-18.8				Auxil	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
								Htg Btuh/Sqft	-111.42	Fn Frict	0.0	0.0

BUILDING U-VALUES - ALTERNATIVE 4
REPLACE FLUORESCENT BALLASTS

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	101.9	23.44
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
6	MED. WAREHOUSE	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
Zone 3	Total/Ave.	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
System 2	Total/Ave.	0.144	0.000	0.000	0.000	0.137	1.040	1.086	0.200	0.317	93.8	20.92
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System 3	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Building		0.144	0.000	0.000	0.000	0.162	1.040	1.086	0.231	0.317	97.6	22.02

BUILDING AREAS - ALTERNATIVE 4
REPLACE FLUORESCENT BALLASTS

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate Flr	Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	1 Total/Ave.				7,882	1,853	0	0	0	3,955	403	11	3,157
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
6	MED. WAREHOUSE	1	1	4,828	4,828	0	0	0	0	4,828	0	0	3,570
Zone	3 Total/Ave.				4,828	0	0	0	0	4,828	0	0	3,570
System	2 Total/Ave.				12,541	1,853	0	0	0	8,614	385	6	6,374
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	3 Total/Ave.				169	0	0	0	0	169	18	5	353
Building					20,592	3,706	0	0	0	12,738	807	8	9,883

ASHRAE 90 ANALYSIS - ALTERNATIVE 4
REPLACE FLUORESCENT BALLASTS

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.162 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.292 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.221 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 12.27 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 16.56 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 4
REPLACE FLUORESCENT BALLASTS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	1.1	0	0	-53,015	38	1,031	867.5	0	0	0.0	0	0
5 - 10	2.2	4	18	-106,030	17	467	1,735.0	0	0	0.0	0	0
10 - 15	3.3	2	8	-159,045	13	345	2,602.5	0	0	0.0	0	0
15 - 20	4.3	4	19	-212,060	2	42	3,470.0	0	0	0.0	0	0
20 - 25	5.4	8	33	-265,075	0	5	4,337.5	10	612	0.0	0	0
25 - 30	6.5	0	0	-318,090	1	16	5,204.9	0	0	0.0	0	0
30 - 35	7.6	5	22	-371,105	2	52	6,072.4	0	0	0.0	0	0
35 - 40	8.7	10	42	-424,120	28	759	6,939.9	0	0	0.0	0	0
40 - 45	9.8	15	65	-477,135	0	0	7,807.4	83	5,088	0.0	0	0
45 - 50	10.8	11	50	-530,150	0	0	8,674.9	0	0	0.0	0	0
50 - 55	11.9	0	0	-583,165	0	0	9,542.4	0	0	0.0	0	0
55 - 60	13.0	8	34	-636,180	0	0	10,409.9	5	295	0.0	0	0
60 - 65	14.1	9	38	-689,195	0	0	11,277.4	3	163	0.0	0	0
65 - 70	15.2	14	60	-742,210	0	0	12,144.9	0	0	0.0	0	0
70 - 75	16.3	0	0	-795,225	0	0	13,012.4	0	0	0.0	0	0
75 - 80	17.4	5	20	-848,240	0	0	13,879.9	0	0	0.0	0	0
80 - 85	18.4	5	20	-901,255	0	0	14,747.4	0	0	0.0	0	0
85 - 90	19.5	2	10	-954,270	0	0	15,614.8	0	0	0.0	0	0
90 - 95	20.6	0	0	-1,007,285	0	0	16,482.3	0	0	0.0	0	0
95 - 100	21.7	0	0	-1,060,300	0	0	17,349.8	0	0	0.0	0	0
Hours Off	0.0	0	8,321	0	0	6,043	0.0	0	2,602	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 4
REPLACE FLUORESCENT BALLASTS

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature	----- Zone Number -----				
Range	1	2	1	3	2
(F)					

Max. Temp.	82.7	82.8	94.8	92.9	89.7
Mo./Hr.	7 21	7 20	8 22	8 19	8 21
Day Type	4	4	1	1	1

	 Number of Hours				
Above 100	0	0	0	0	0
95 - 100	0	0	0	0	0
90 - 95	0	0	1,412	997	0
85 - 90	0	0	1,073	1,035	1,292
80 - 85	355	301	443	896	1,044
75 - 80	2,297	1,955	474	273	848
70 - 75	786	1,049	678	887	488
65 - 70	666	367	1,921	1,937	1,685
60 - 65	312	119	1,516	1,630	1,147
55 - 60	1,179	641	571	509	986
50 - 55	601	832	672	596	1,270
Below 50	2,564	3,496	0	0	0

Min. Temp.	34.8	29.9	54.9	55.0	54.9
Mo./Hr.	2 8	2 10	2 14	1 20	2 4
Day Type	5	5	3	3	3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 4
REPLACE FLUORESCENT BALLASTS

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	OIL	WATER
	Off Peak (kWh)	On Peak (kW)		
			(Therm)	(1000 G1)
Jan	4,367	20	747	0
Feb	3,949	20	691	0
March	4,588	20	587	0
April	3,695	20	222	0
May	4,406	22	0	0
June	9,489	89	0	0
July	15,336	101	0	0
Aug	9,723	87	0	0
Sept	4,006	73	0	0
Oct	4,029	20	107	0
Nov	3,881	20	393	0
Dec	4,139	20	645	0
Total	71,609	101	3,393	2

Building Energy Consumption = 28,345 (Btu/Sq Ft/Year)
Source Energy Consumption = 52,953 (Btu/Sq Ft/Year)

Floor Area = 20,592 (Sq Ft)

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total	
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec		
0	LIGHTS														
	ELEC	3622	3277	3967	3450	3795	3795	3450	3967	3450	3795	3450	3450	43,465	
	PK	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	
1	MISC LD														
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	MISC LD														
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	MISC LD														
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	MISC LD														
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	MISC LD														
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	MISC LD														
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ1160S		AIR-CLD COND COMP 25-35 TONS												
	ELEC	0	0	0	0	0	4407	10050	4399	0	0	0	0	18,856	
	PK	0.0	0.0	0.0	0.0	0.0	59.9	71.3	58.5	45.4	0.0	0.0	0.0	71.3	
1	EQ5200		CONDENSER FANS												
	ELEC	0	0	0	0	0	187	492	191	0	0	0	0	870	
	PK	0.0	0.0	0.0	0.0	0.0	3.1	3.8	3.0	2.2	0.0	0.0	0.0	3.8	
1	EQ5302		CONTROLS												
	ELEC	0	0	0	0	0	12	20	11	0	0	0	0	44	
	PK	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	
1	EQ4003		FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	612	1088	1324	1154	556	0	0	0	4,735	
	PK	0.0	0.0	0.0	0.0	2.8	6.6	6.6	6.6	6.6	0.0	0.0	0.0	6.6	
1	EQ4003		FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	EQ4003		FC CENTRIF. FAN C.V.												

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4
REPLACE FLUORESCENT BALLASTS

ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ2006	OIL FIRE TUBE STEAM												
OIL	747	691	587	222	0	0	0	0	0	107	393	645	3,393
PK	1.4	1.4	1.4	1.4	0.1	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4
1 EQ5020	HEAT WATER CIRC. PUMP C.V.												
ELEC	215	194	179	71	0	0	0	0	0	68	125	199	1,051
PK	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	93	84	78	31	0	0	0	0	0	29	54	86	454
PK	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	328	296	274	108	0	0	0	0	0	103	190	303	1,602
PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
1 EQ5061	CONDENSATE RETURN PUMP												
ELEC	4	4	4	1	0	0	0	0	0	1	3	4	21
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5406	MAKE-UP WATER												
WATER	0	0	0	0	0	0	0	0	0	0	0	0	2
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	104	94	87	34	0	0	0	0	0	33	60	97	510
PK	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2

UTILITY PEAK CHECKSUMS - ALTERNATIVE 4
REPLACE FLUORESCENT BALLASTS

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 100.6 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1160S	AIR-CLD COND COMP 25-35 TONS	75.2	74.69
Sub Total			75.2	74.69
Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	6.6	6.58
Sub Total			6.6	6.58
Sub Total			0.0	0.00

Miscellaneous

Lights			18.9	18.73
Base Utilities			0.0	0.00
Misc Equipment			0.0	0.00
Sub Total			18.9	18.73
Grand Total			100.6	100.00

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**          T R A C E    6 0 0    A N A L Y S I S          **  
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 253

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Reflectance: 0.20
Winter Ground Reflectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 13:57:39 12/27/93
Dataset Name: CB253B .TM

AIRFLOW - ALTERNATIVE 1
REPLACE FLUORESCENT FIXTURES

----- S Y S T E M S U M M A R Y -----

(Design Airflow Quantities)

System Number	System Type	Main					Auxil.	Room
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Supply Airflow (Cfm)	Exhaust Airflow (Cfm)
1	SZ	1,547	10,315	4,331	12,844	1,547	0	1,035
2	UH	0	0	7,035	0	3,209	0	0
3	RAD	0	0	0	0	170	0	0
Totals		1,547	10,315	11,366	12,844	4,926	0	1,035

CAPACITY - ALTERNATIVE 1
REPLACE FLUORESCENT FIXTURES

----- S Y S T E M S U M M A R Y -----

(Design Capacity Quantities)

System Number	System Type	Cooling					Heating					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	21.2	0.0	0.0	21.2	-400,260	0	-258,452	0	0	0	-400,260
2	UH	0.0	0.0	0.0	0.0	-386,318	0	0	0	0	0	-386,318
3	RAD	0.0	0.0	0.0	0.0	-18,830	0	0	0	0	0	-18,830
Totals		21.2	0.0	0.0	21.2	-805,408	0	-258,452	0	0	0	-805,408

The building peaked at hour 14 month 7 with a capacity of 19.8 tons

ENGINEERING CHECKS - ALTERNATIVE 1
REPLACE FLUORESCENT FIXTURES

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	15.00	1.31	486.8	372.0	32.26	0.55	-50.78	7,882
2	Main	UH	0.00	0.00	0.0	0.0	0.00	0.56	-30.80	12,541
3	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-111.42	169

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percnt		Space	Percnt		Space Peak	Coil Peak	Percnt
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	52,876		52,876	20.79	*	0	0.00	*	0	-30,241	10.34
Glass Solar	21,378	0		21,378	8.41	*	29,188	23.77	*	0	0	0.00
Glass Cond	5,608	0		5,608	2.21	*	5,130	4.18	*	-28,015	-28,015	9.58
Wall Cond	19,751	2,412		22,162	8.72	*	21,311	17.35	*	-48,296	-53,384	18.25
Partition	1,333			1,333	0.52	*	1,333	1.09	*	-4,797	-4,797	1.64
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	73,569			73,569	28.93	*	42,048	34.24	*	-176,134	-176,134	60.20
Sub Total==>	121,638	55,288		176,926	69.58	*	99,010	80.63	*	-257,241	-292,571	100.00
Internal Loads						*			*			
Lights	17,758	0		17,758	6.98	*	17,209	14.01	*	0	0	0.00
People	7,913			7,913	3.11	*	3,088	2.51	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	25,670	0	0	25,670	10.10	*	20,297	16.53	*	0	0	0.00
Ceiling Load	9,390	-9,390		0	0.00	*	5,981	4.87	*	-11,398	0	0.00
Outside Air	0	0	0	42,955	16.89	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				11,003	4.33	*		0.00	*		0	0.00
Ret. Fan Heat		7,237		7,237	2.85	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	-2,489			-2,489	-0.98	*	-2,489	-2.03	*	0	0	0.00
Exhaust Heat		-7,027	0	-7,027	-2.76	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	154,209	46,107	0	254,274	100.00	*	122,799	100.00	*	-268,639	-292,571	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	21.2	254.3	202.2	10,315	81.4	68.8	88.3	63.1	61.6	81.7	Part	1,853
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	3,955
Totals	21.2	254.3									Wall	3,560
												403
												11

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	ENGINEERING CHECKS--			TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA	15.0		Type	Clg	Htg
Main Htg	-400.3	4,331	40.1	125.0	Infil	1,547	0	Clg Cfm/Sqft	1.31		SADB	64.1	125.0
Aux Htg	0.0	0	0.0	0.0	Supply	2,529	2,529	Clg Cfm/Ton	486.80		Plenum	82.5	39.8
Preheat	-258.5	10,315	40.1	63.1	Mincfm	0	0	Clg Sqft/Ton	371.98		Return	79.8	45.2
Reheat	0.0	0	0.0	0.0	Return	10,177	4,331	Clg Btuh/Sqft	32.26		Ret/OA	81.4	45.2
Humidif	0.0	0	0.0	0.0	Exhaust	1,409	0	No. People	17		Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	1,035	0	Htg % OA	0.0		Fn MtrTD	0.2	0.0
Total	-400.3				Auxil	0	0	Htg Cfm/Sqft	0.55		Fn BldTD	0.2	0.0
								Htg Btuh/Sqft	-50.78		Fn Frict	0.6	0.0

System 2 Block UH - UNIT HEATERS

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-23,735	-53,053	13.73
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-26,764	-26,764	6.93
Wall Cond	0	0		0	0.00	*	0	0.00	*	-74,257	-78,211	20.25
Partition	0			0	0.00	*	0	0.00	*	-4,797	-4,797	1.24
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-223,493	-223,493	57.85
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-353,046	-386,318	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-39,267	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-392,313	-386,318	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total	Glass (sf) (%)
Main Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Floor 12,541	
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Part 1,853	
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr 0	
Totals	0.0	0.0				Roof 8,614	0 0
						Wall 6,759	385 6

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-386.3	7,035	68.8	119.2	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	119.2
Aux Htg	0.0	0	0.0	0.0	Infil	0	3,209	Clg Cfm/Ton	0.00	Plenum	0.0	40.3
Preheat	0.0	0	0.0	0.0	Supply	0	7,035	Clg Sqft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Return	0	7,035	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-386.3				Rm Exh	0	0	Htg Cfm/Sqft	0.56	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	-30.80	Fn Frict	0.0	0.1

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 3 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1

Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-923	4.90
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-1,250	-1,250	6.64
Wall Cond	0	0		0	0.00	*	0	0.00	*	-3,682	-4,816	25.58
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-11,840	-11,840	62.88
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-16,772	-18,830	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-2,058	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-18,830	-18,830	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	169	
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	
Totals	0.0	0.0									169	0 0
											371	18 5

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	ENGINEERING CHECKS			TEMPERATURES (F)		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-18.8	0	0.0	0.0	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1	
Aux Htg	0.0	0	0.0	0.0	Infil	0	170	Clg Cfm/Ton	0.00	Plenum	0.0	29.6	
Preheat	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	29.6	
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	29.6	
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	-18.8				Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0	
					Auxil	0	0	Htg Btuh/Sqft	-111.42	Fn Frict	0.0	0.0	

BUILDING U-VALUES - ALTERNATIVE 1
REPLACE FLUORESCENT FIXTURES

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Summr Roof	Wintr Windo	Windo	Wall	Ceil.		
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	101.9	23.44
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
6	MED. WAREHOUSE	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
Zone 3	Total/Ave.	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
System 2	Total/Ave.	0.144	0.000	0.000	0.000	0.137	1.040	1.086	0.200	0.317	93.8	20.92
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System 3	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Building		0.144	0.000	0.000	0.000	0.162	1.040	1.086	0.231	0.317	97.6	22.02

BUILDING AREAS - ALTERNATIVE 1
REPLACE FLUORESCENT FIXTURES

----- B U I L D I N G A R E A S -----													
Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	1 Total/Ave.				7,882	1,853	0	0	0	3,955	403	11	3,157
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
6	MED. WAREHOUSE	1	1	4,828	4,828	0	0	0	0	4,828	0	0	3,570
Zone	3 Total/Ave.				4,828	0	0	0	0	4,828	0	0	3,570
System	2 Total/Ave.				12,541	1,853	0	0	0	8,614	385	6	6,374
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	3 Total/Ave.				169	0	0	0	0	169	18	5	353
Building					20,592	3,706	0	0	0	12,738	807	8	9,883

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
REPLACE FLUORESCENT FIXTURES

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.162 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.292 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.221 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 12.27 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 16.56 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
REPLACE FLUORESCENT FIXTURES

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	1.1	4	18	-53,193	37	1,011	867.5	0	0	0.0	0	0
5 - 10	2.1	0	0	-106,386	17	475	1,735.0	0	0	0.0	0	0
10 - 15	3.2	5	22	-159,579	13	363	2,602.5	0	0	0.0	0	0
15 - 20	4.2	0	0	-212,772	1	15	3,470.0	0	0	0.0	0	0
20 - 25	5.3	5	19	-265,965	1	21	4,337.5	11	654	0.0	0	0
25 - 30	6.4	0	0	-319,158	0	0	5,204.9	0	0	0.0	0	0
30 - 35	7.4	10	41	-372,351	1	37	6,072.4	0	0	0.0	0	0
35 - 40	8.5	5	19	-425,544	29	795	6,939.9	0	0	0.0	0	0
40 - 45	9.5	16	65	-478,737	0	0	7,807.4	83	5,088	0.0	0	0
45 - 50	10.6	12	50	-531,930	0	0	8,674.9	0	0	0.0	0	0
50 - 55	11.7	4	15	-585,123	0	0	9,542.4	0	0	0.0	0	0
55 - 60	12.7	5	19	-638,316	0	0	10,409.9	5	295	0.0	0	0
60 - 65	13.8	9	38	-691,509	0	0	11,277.4	2	121	0.0	0	0
65 - 70	14.8	14	60	-744,702	0	0	12,144.9	0	0	0.0	0	0
70 - 75	15.9	0	0	-797,895	0	0	13,012.4	0	0	0.0	0	0
75 - 80	17.0	5	20	-851,088	0	0	13,879.9	0	0	0.0	0	0
80 - 85	18.0	5	20	-904,281	0	0	14,747.4	0	0	0.0	0	0
85 - 90	19.1	2	10	-957,474	0	0	15,614.8	0	0	0.0	0	0
90 - 95	20.1	0	0	-1,010,667	0	0	16,482.3	0	0	0.0	0	0
95 - 100	21.2	0	0	-1,063,860	0	0	17,349.8	0	0	0.0	0	0
Hours Off	0.0	0	8,344	0	0	6,043	0.0	0	2,602	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
REPLACE FLUORESCENT FIXTURES

----- BUILDING TEMPERATURE PROFILES -----

Temperature	Zone Number				
Range (F)	1	2	1	3	2
Max. Temp.	82.7	82.8	94.1	92.4	89.7
Mo./Hr.	7 21	7 20	8 21	8 19	8 21
Day Type	4	4	1	1	1
..... Number of Hours					
Above 100	0	0	0	0	0
95 - 100	0	0	0	0	0
90 - 95	0	0	1,320	831	0
85 - 90	0	0	1,048	1,167	1,292
80 - 85	337	301	560	930	1,044
75 - 80	2,300	1,955	438	213	848
70 - 75	783	1,049	663	943	488
65 - 70	680	367	1,934	1,909	1,685
60 - 65	291	119	1,554	1,638	1,147
55 - 60	1,101	641	571	529	986
50 - 55	670	832	672	600	1,270
Below 50	2,598	3,496	0	0	0
Min. Temp.	34.6	29.9	54.9	55.0	54.9
Mo./Hr.	2 10	2 10	1 16	1 20	2 4
Day Type	5	5	3	3	3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
REPLACE FLUORESCENT FIXTURES

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	OIL	WATER
	Off Peak (kWh)	On Peak (kW)		
			(Therm)	(1000 G1)
Jan	3,751	17	748	0
Feb	3,392	17	692	0
March	3,913	17	598	0
April	3,108	17	233	0
May	3,760	18	0	0
June	8,516	81	0	0
July	14,536	96	0	0
Aug	8,301	83	0	0
Sept	3,419	69	0	0
Oct	3,388	17	111	0
Nov	3,312	17	404	0
Dec	3,552	17	645	0
Total	62,948	96	3,431	2

Building Energy Consumption = 27,096 (Btu/Sq Ft/Year)
Source Energy Consumption = 48,842 (Btu/Sq Ft/Year)

Floor Area = 20,592 (Sq Ft)

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total	
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec		
0	LIGHTS														
	ELEC	3006	2719	3292	2863	3149	3149	2863	3292	2863	3149	2863	2863	36,068	
	PK	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	
1	MISC LD														
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	MISC LD														
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	MISC LD														
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	MISC LD														
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	MISC LD														
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	MISC LD														
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ1160S		AIR-CLD COND COMP 25-35 TONS												
	ELEC	0	0	0	0	0	4094	9850	3843	0	0	0	0	17,786	
	PK	0.0	0.0	0.0	0.0	0.0	56.1	70.2	57.6	44.8	0.0	0.0	0.0	70.2	
1	EQ5200		CONDENSER FANS												
	ELEC	0	0	0	0	0	173	479	165	0	0	0	0	817	
	PK	0.0	0.0	0.0	0.0	0.0	2.9	3.7	3.0	2.1	0.0	0.0	0.0	3.7	
1	EQ5302		CONTROLS												
	ELEC	0	0	0	0	0	12	20	9	0	0	0	0	42	
	PK	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	
1	EQ4003		FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	612	1088	1324	993	556	0	0	0	4,573	
	PK	0.0	0.0	0.0	0.0	2.8	6.6	6.6	6.6	6.6	0.0	0.0	0.0	6.6	
1	EQ4003		FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	EQ4003		FC CENTRIF. FAN C.V.												

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
REPLACE FLUORESCENT FIXTURES

ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ2006	OIL FIRE TUBE STEAM												
OIL	748	692	598	233	0	0	0	0	0	111	404	645	3,431
PK	1.4	1.4	1.4	1.4	0.1	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4
1 EQ5020	HEAT WATER CIRC. PUMP C.V.												
ELEC	215	194	179	71	0	0	0	0	0	69	130	199	1,058
PK	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	93	84	78	31	0	0	0	0	0	30	56	86	457
PK	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	328	296	274	108	0	0	0	0	0	106	198	303	1,612
PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
1 EQ5061	CONDENSATE RETURN PUMP												
ELEC	4	4	4	1	0	0	0	0	0	1	3	4	21
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5406	MAKE-UP WATER												
WATER	0	0	0	0	0	0	0	0	0	0	0	0	2
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	104	94	87	34	0	0	0	0	0	34	63	97	513
PK	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
REPLACE FLUORESCENT FIXTURES

----- UTILITY PEAK CHECKSUMS -----

Utility ELECTRIC DEMAND

Peak Value 96.3 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1160S	AIR-CLD COND COMP 25-35 TONS	74.0	76.88
Sub Total			74.0	76.88
Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	6.6	6.88
Sub Total			6.6	6.88
Sub Total			0.0	0.00

Miscellaneous

Lights	15.6	16.25
Base Utilities	0.0	0.00
Misc Equipment	0.0	0.00
Sub Total	15.6	16.25
Grand Total	96.3	100.00

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**          T R A C E    6 0 0    A N A L Y S I S          **
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 253

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 14: 9:19 12/27/93
Dataset Name: C82538 .TM

AIRFLOW - ALTERNATIVE 2
INFRARED HEATERS

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply	Room Exhaust
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Airflow (Cfm)	Airflow (Cfm)
1	SZ	1,547	10,315	4,331	12,844	1,547	0	1,035
2	UH	0	0	7,035	0	3,035	0	0
3	RAD	0	0	0	0	170	0	0
Totals		1,547	10,315	11,366	12,844	4,752	0	1,035

CAPACITY - ALTERNATIVE 2
INFRARED HEATERS

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

		----- Cooling -----				----- Heating -----						
		Main Sys.	Aux. Sys.	Opt. Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
System	System	Capacity	Capacity	Capacity	Totals	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Totals
Number	Type	(Tons)	(Tons)	(Tons)	(Tons)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)
1	SZ	22.7	0.0	0.0	22.7	-400,260	0	-247,741	0	0	0	-400,260
2	UH	0.0	0.0	0.0	0.0	-374,200	0	0	0	0	0	-374,200
3	RAD	0.0	0.0	0.0	0.0	-18,830	0	0	0	0	0	-18,830
Totals		22.7	0.0	0.0	22.7	-793,289	0	-247,741	0	0	0	-793,289

The building peaked at hour 14 month 7 with a capacity of 21.3 tons

ENGINEERING CHECKS - ALTERNATIVE 2
INFRARED HEATERS

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				----- Heating -----		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	15.00	1.31	454.6	347.4	34.54	0.55	-50.78	7,882
2	Main	UH	0.00	0.00	0.0	0.0	0.00	0.56	-29.84	12,541
3	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-111.42	169

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==>		Mo/Hr: 7/14		*		Mo/Hr: 7/16		*		Mo/Hr: 13/ 1		
Outside Air ==>		OADB/WB/HR: 91/ 74/105.0		*		OADB: 91		*		OADB: 4		
				*				*				
	Space	Ret. Air	Ret. Air	Net	Perct	*	Space	Perct	*	Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot	*	Sensible	Of Tot	*	Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)	*	(Btuh)	(%)	*	(Btuh)	(Btuh)	(%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	52,876		52,876	19.42	*	0	0.00	*	0	-30,241	10.34
Glass Solar	21,378	0		21,378	7.85	*	29,188	21.86	*	0	0	0.00
Glass Cond	5,608	0		5,608	2.06	*	5,130	3.84	*	-28,015	-28,015	9.58
Wall Cond	19,751	2,412		22,162	8.14	*	21,311	15.96	*	-48,296	-53,384	18.25
Partition	1,333			1,333	0.49	*	1,333	1.00	*	-4,797	-4,797	1.64
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	77,699			77,699	28.54	*	42,048	31.49	*	-176,134	-176,134	60.20
Sub Total==>	125,768	55,288		181,056	66.50	*	99,010	74.16	*	-257,241	-292,571	100.00
Internal Loads						*			*			
Lights	28,943	0		28,943	10.63	*	27,921	20.91	*	0	0	0.00
People	7,913			7,913	2.91	*	3,088	2.31	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	36,856	0	0	36,856	13.54	*	31,009	23.23	*	0	0	0.00
Ceiling Load	9,390	-9,390		0	0.00	*	5,981	4.48	*	-11,398	0	0.00
Outside Air	0	0	0	45,625	16.76	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				11,003	4.04	*		0.00	*		0	0.00
Ret. Fan Heat		7,237		7,237	2.66	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	-2,489			-2,489	-0.91	*	-2,489	-1.86	*	0	0	0.00
Exhaust Heat		-7,027	0	-7,027	-2.58	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
						*			*			
Grand Total==>	169,525	46,107	0	272,260	100.00	*	133,510	100.00	*	-268,639	-292,571	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf)	(%)
Main Clg	22.7	272.3	10,315	81.4	68.4	86.2	62.1	60.5	78.5	Floor	7,882	
Aux Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	1,853	
Opt Vent	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Totals	22.7	272.3								Roof	3,955	0 0
										Wall	3,560	403 11

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % OA	15.0	Type	Clg	Htg	
Main Htg	-400.3	4,331	40.1	125.0	Vent	1,547	0	Clg Cfm/Sqft	1.31	SADB	63.1	125.0	
Aux Htg	0.0	0	0.0	0.0	Infil	2,529	2,529	Clg Cfm/Ton	454.64	Plenum	82.5	39.8	
Preheat	-247.7	10,315	40.1	62.1	Supply	10,315	4,331	Clg Sqft/Ton	347.40	Return	79.8	45.2	
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	34.54	Ret/OA	81.4	45.2	
Humidif	0.0	0	0.0	0.0	Return	10,177	4,331	No. People	17	Runarnd	75.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Exhaust	1,409	0	Htg % OA	0.0	Fn MtrTD	0.2	0.0	
Total	-400.3				Rm Exh	1,035	0	Htg Cfm/Sqft	0.55	Fn BldTD	0.2	0.0	
					Auxil	0	0	Htg Btuh/Sqft	-50.78	Fn Frict	0.6	0.0	

System 2 Block UH - UNIT HEATERS

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-23,735	-53,053	14.18
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-26,764	-26,764	7.15
Wall Cond	0	0		0	0.00	*	0	0.00	*	-74,257	-78,211	20.90
Partition	0			0	0.00	*	0	0.00	*	-4,797	-4,797	1.28
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-211,374	-211,374	56.49
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-340,928	-374,200	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-39,267	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-380,195	-374,200	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor		
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	Part	1,853	
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	Roof	8,614	0 0
Totals	0.0	0.0								Wall	6,759	385 6

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	ENGINEERING CHECKS--			TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-374.2	7,035	68.8	117.7	Infil	0	3,035	Clg Cfm/Sqft	0.00	SADB	0.0	117.7	
Aux Htg	0.0	0	0.0	0.0	Supply	0	7,035	Clg Cfm/Ton	0.00	Plenum	0.0	40.3	
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Sqft/Ton	0.00	Return	0.0	68.0	
Reheat	0.0	0	0.0	0.0	Return	0	7,035	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0	
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	0	Runarnd	0.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	-374.2				Auxil	0	0	Htg Cfm/Sqft	0.56	Fn BldTD	0.0	0.0	
								Htg Btuh/Sqft	-29.84	Fn Frict	0.0	0.1	

System 3 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percent Of Tot (%)	*	Space Sensible (Btuh)	Percent Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percent Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-923	4.90
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-1,250	-1,250	6.64
Wall Cond	0	0		0	0.00	*	0	0.00	*	-3,682	-4,816	25.58
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-11,840	-11,840	62.88
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-16,772	-18,830	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-2,058	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-18,830	-18,830	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf)	(%)
Main Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	169		
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	0.0	0.0				169	0	0
						371	18	5

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-18.8	0	0.0	0.0	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	170	Clg Cfm/Ton	0.00	Plenum	0.0	29.6
Preheat	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	29.6
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	29.6
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-18.8				Rm Exh	0	0	Htg Cfm/SqFt	0.00	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/SqFt	-111.42	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

BUILDING U-VALUES - ALTERNATIVE 2
INFRARED HEATERS

----- B U I L D I N G U - V A L U E S -----												
Room Number	Description	----- Room U-Values ----- (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	101.9	23.44
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
6	MED. WAREHOUSE	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
Zone 3	Total/Ave.	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
System 2	Total/Ave.	0.144	0.000	0.000	0.000	0.137	1.040	1.086	0.200	0.317	93.8	20.92
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System 3	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Building		0.144	0.000	0.000	0.000	0.162	1.040	1.086	0.231	0.317	97.6	22.02

BUILDING AREAS - ALTERNATIVE 2
INFRARED HEATERS

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate Flr	Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	1 Total/Ave.				7,882	1,853	0	0	0	3,955	403	11	3,157
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
6	MED. WAREHOUSE	1	1	4,828	4,828	0	0	0	0	4,828	0	0	3,570
Zone	3 Total/Ave.				4,828	0	0	0	0	4,828	0	0	3,570
System	2 Total/Ave.				12,541	1,853	0	0	0	8,614	385	6	6,374
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	3 Total/Ave.				169	0	0	0	0	169	18	5	353
Building					20,592	3,706	0	0	0	12,738	807	8	9,883

ASHRAE 90 ANALYSIS - ALTERNATIVE 2
INFRARED HEATERS

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.162 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.292 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.221 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 12.27 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 16.56 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2
INFRERED HEATERS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	1.1	4	19	-52,052	53	1,771	867.5	0	0	0.0	0	0
5 - 10	2.3	4	18	-104,103	14	462	1,735.0	0	0	0.0	0	0
10 - 15	3.4	4	19	-156,155	9	310	2,602.5	0	0	0.0	0	0
15 - 20	4.5	4	22	-208,206	2	62	3,470.0	0	0	0.0	0	0
20 - 25	5.7	1	4	-260,258	1	24	4,337.5	9	571	0.0	0	0
25 - 30	6.8	11	56	-312,309	16	528	5,204.9	0	0	0.0	0	0
30 - 35	7.9	1	4	-364,361	6	207	6,072.4	0	0	0.0	0	0
35 - 40	9.1	8	41	-416,412	0	0	6,939.9	0	0	0.0	0	0
40 - 45	10.2	12	61	-468,464	0	0	7,807.4	83	5,088	0.0	0	0
45 - 50	11.3	14	68	-520,515	0	0	8,674.9	0	0	0.0	0	0
50 - 55	12.5	1	5	-572,567	0	0	9,542.4	0	0	0.0	0	0
55 - 60	13.6	4	19	-624,618	0	0	10,409.9	5	295	0.0	0	0
60 - 65	14.7	11	53	-676,670	0	0	11,277.4	3	204	0.0	0	0
65 - 70	15.9	12	60	-728,721	0	0	12,144.9	0	0	0.0	0	0
70 - 75	17.0	0	0	-780,773	0	0	13,012.4	0	0	0.0	0	0
75 - 80	18.2	4	20	-832,825	0	0	13,879.9	0	0	0.0	0	0
80 - 85	19.3	4	20	-884,876	0	0	14,747.4	0	0	0.0	0	0
85 - 90	20.4	2	10	-936,928	0	0	15,614.8	0	0	0.0	0	0
90 - 95	21.6	0	0	-988,979	0	0	16,482.3	0	0	0.0	0	0
95 - 100	22.7	0	0	-1,041,031	0	0	17,349.8	0	0	0.0	0	0
Hours Off	0.0	0	8,261	0	0	5,396	0.0	0	2,602	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 2
 INFRERED HEATERS

----- BUILDING TEMPERATURE PROFILES -----					
Temperature	----- Zone Number -----				
Range (F)	1	2	1	3	2
Max. Temp.	82.8	82.8	96.1	93.7	89.7
Mo./Hr.	7 22	7 20	8 22	8 19	8 21
Day Type	4	4	1	1	1
	 Number of Hours				
Above 100	0	0	0	0	0
95 - 100	0	0	270	0	0
90 - 95	0	0	1,498	1,200	0
85 - 90	0	0	999	857	1,292
80 - 85	355	301	173	871	1,044
75 - 80	2,322	1,955	550	155	848
70 - 75	903	1,049	602	727	488
65 - 70	536	367	1,997	491	1,685
60 - 65	300	119	1,451	360	1,147
55 - 60	1,194	641	552	1,517	986
50 - 55	637	832	668	2,582	1,270
Below 50	2,513	3,496	0	0	0
Min. Temp.	35.1	29.9	54.9	54.9	54.9
Mo./Hr.	2 8	2 10	1 3	1 9	2 4
Day Type	5	5	5	5	3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 2
INRARED HEATERS

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	OIL	WATER
	Off Peak (kWh)	On Peak (kW)		
Jan	5,656	27	765	0
Feb	5,186	27	746	0
March	5,926	27	472	0
April	4,860	27	144	0
May	5,733	28	0	0
June	11,752	97	0	0
July	16,987	110	0	0
Aug	12,060	96	0	0
Sept	5,212	81	0	0
Oct	5,332	27	76	0
Nov	5,057	27	303	0
Dec	5,500	27	703	1
Total	89,262	110	3,208	2

Building Energy Consumption = 30,374 (Btu/Sq Ft/Year)
Source Energy Consumption = 60,788 (Btu/Sq Ft/Year)

Floor Area = 20,592 (Sq Ft)

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	4888	4423	5354	4655	5121	5121	4655	5354	4655	5121	4655	4655	58,659
	PK	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-1	EQ1160S	AIR-CLD COND COMP 25-35 TONS												
	ELEC	0	0	0	0	0	5222	10468	5235	0	0	0	0	20,925
	PK	0.0	0.0	0.0	0.0	0.0	61.3	73.5	60.4	46.6	0.0	0.0	0.0	73.5
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	0	222	519	231	0	0	0	0	972
	PK	0.0	0.0	0.0	0.0	0.0	3.2	4.0	3.2	2.3	0.0	0.0	0.0	4.0
1	EQ5302	CONTROLS												
	ELEC	0	0	0	0	0	15	20	13	0	0	0	0	48
	PK	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	612	1173	1324	1227	556	0	0	0	4,892
	PK	0.0	0.0	0.0	0.0	2.8	6.6	6.6	6.6	6.6	0.0	0.0	0.0	6.6
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ4003	FC CENTRIF. FAN C.V.												

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2
INRARED HEATERS

ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ2006	OIL FIRE TUBE STEAM												
OIL	765	746	472	144	0	0	0	0	0	76	303	703	3,208
PK	1.4	1.4	1.4	1.4	0.1	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4
1 EQ5020	HEAT WATER CIRC. PUMP C.V.												
ELEC	222	220	165	59	0	0	0	0	0	61	116	244	1,088
PK	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	96	95	71	26	0	0	0	0	0	26	50	105	470
PK	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	338	336	252	90	0	0	0	0	0	93	177	372	1,658
PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
1 EQ5061	CONDENSATE RETURN PUMP												
ELEC	5	4	3	1	0	0	0	0	0	1	2	5	22
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5406	MAKE-UP WATER												
WATER	0	0	0	0	0	0	0	0	0	0	0	1	2
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	108	107	80	29	0	0	0	0	0	30	56	118	528
PK	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2

UTILITY PEAK CHECKSUMS - ALTERNATIVE 2
INRARED HEATERS

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 109.6 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1160S	AIR-CLD COND COMP 25-35 TONS	77.5	70.75
Sub Total			77.5	70.75
Sub Total			0.0	0.00

Air Moving Equipment

1	SUMMATION OF FAN ELECTRICAL DEMAND		6.6	6.04
Sub Total			6.6	6.04
Sub Total			0.0	0.00

Miscellaneous

Lights	25.4	23.21
Base Utilities	0.0	0.00
Misc Equipment	0.0	0.00
Sub Total	25.4	23.21
Grand Total	109.6	100.00

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**                                     **
**          T R A C E   6 0 0   A N A L Y S I S          **
**                                     **
**          by                **
**                                     **
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 253

Weather File Code:	CARLISLE
Location:	ENERGY SAVINGS OPPORTUNITY STUDY
Latitude:	40.2 (deg)
Longitude:	77.2 (deg)
Time Zone:	5
Elevation:	475 (ft)
Barometric Pressure:	29.2 (in. Hg)
Summer Clearness Number:	1.00
Winter Clearness Number:	1.00
Summer Design Dry Bulb:	92 (F)
Summer Design Wet Bulb:	72 (F)
Winter Design Dry Bulb:	4 (F)
Summer Ground Relectance:	0.20
Winter Ground Relectance:	0.20
Air Density:	0.0742 (Lbm/cuft)
Air Specific Heat:	0.2444 (Btu/lbm/F)
Density-Specific Heat Prod:	1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor:	4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor:	4.4519 (Lb-min./hr/cuft)
Design Simulation Period:	May To September
System Simulation Period:	January To December
Cooling Load Methodology:	CLTD/CLF (Transfer Function Method)
Time/Date Program was Run:	14:21:53 12/27/93
Dataset Name:	CB253B .TM

AIRFLOW - ALTERNATIVE 3
COMBINED ECOS

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	Main					Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)		
1	SZ	1,547	10,315	3,276	12,387	1,547	0	1,035
2	UH	0	0	5,970	0	2,620	0	0
3	RAD	0	0	0	0	128	0	0
Totals		1,547	10,315	9,245	12,387	4,295	0	1,035

CAPACITY - ALTERNATIVE 3
COMBINED ECOS

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	Cooling					Heating					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	15.0	0.0	0.0	15.0	-232,997	0	-120,174	0	0	0	-232,997
2	UH	0.0	0.0	0.0	0.0	-298,940	0	0	0	0	0	-298,940
3	RAD	0.0	0.0	0.0	0.0	-11,650	0	0	0	0	0	-11,650
Totals		15.0	0.0	0.0	15.0	-543,587	0	-120,174	0	0	0	-543,587

The building peaked at hour 14 month 7 with a capacity of 14.6 tons

ENGINEERING CHECKS - ALTERNATIVE 3
COMBINED ECOS

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	15.00	1.31	688.9	526.4	22.80	0.42	-29.56	7,882
2	Main	UH	0.00	0.00	0.0	0.0	0.00	0.48	-23.84	12,541
3	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-68.94	169

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	5,437		5,437	3.03	*	0	0.00	*	0	-8,902	4.24
Glass Solar	21,103	0		21,103	11.74	*	28,638	28.80	*	0	0	0.00
Glass Cond	5,608	0		5,608	3.12	*	5,101	5.13	*	-28,015	-28,015	13.33
Wall Cond	9,746	534		10,279	5.72	*	10,158	10.21	*	-22,432	-24,112	11.47
Partition	1,333			1,333	0.74	*	1,333	1.34	*	-4,797	-4,797	2.28
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	54,637			54,637	30.41	*	34,560	34.75	*	-144,306	-144,306	68.67
Sub Total==>	92,426	5,970		98,396	54.76	*	79,789	80.24	*	-199,550	-210,132	100.00
Internal Loads						*			*			
Lights	17,252	0		17,252	9.60	*	17,099	17.20	*	0	0	0.00
People	7,829			7,829	4.36	*	3,078	3.10	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	25,080	0	0	25,080	13.96	*	20,176	20.29	*	0	0	0.00
Ceiling Load	1,001	-1,001		0	0.00	*	538	0.54	*	-3,633	0	0.00
Outside Air	0	0	0	40,682	22.64	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				11,003	6.12	*		0.00	*		0	0.00
Ret. Fan Heat		7,224		7,224	4.02	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	-1,065			-1,065	-0.59	*	-1,065	-1.07	*	0	0	0.00
Exhaust Heat		-1,646	0	-1,646	-0.92	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	117,442	10,548	0	179,674	100.00	*	99,438	100.00	*	-203,183	-210,132	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf)	(%)
Main Clg	15.0	179.7	141.1	10,315 78.3 68.6 92.1	65.2 63.5 87.6	7,882		
Aux Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	1,853		
Opt Vent	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	15.0	179.7				3,955	0	0
						Wall	3,560	403 11

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling 1,547	Heating 0	Clg % OA 15.0	Type	Clg 66.1	Htg 125.0
Main Htg	-233.0	3,276	59.6	125.0	Vent	2,072	2,072	Clg Cfm/Sqft 1.31	SADB	75.8	59.6
Aux Htg	0.0	0	0.0	0.0	Infil	10,315	3,276	Clg Cfm/Ton 688.91	Plenum	76.1	61.6
Preheat	-120.2	10,315	54.5	65.2	Supply	0	0	Clg Sqft/Ton 526.42	Return	78.3	61.6
Reheat	0.0	0	0.0	0.0	Mincfm	10,159	3,276	Clg Btuh/Sqft 22.80	Ret/OA	75.0	68.0
Humidif	0.0	0	0.0	0.0	Return	1,391	0	No. People 17	Runarnd	0.2	0.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	1,035	0	Htg % OA 0.0	Fn MtrTD	0.2	0.0
Total	-233.0				Rm Exh	0	0	Htg Cfm/Sqft 0.42	Fn 8ldTD	0.6	0.0
					Auxil	0	0	Htg Btuh/Sqft -29.56	Fn Frict		

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 2 Block UH - UNIT HEATERS

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-23,735	-32,297	10.80
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-26,764	-26,764	8.95
Wall Cond	0	0		0	0.00	*	0	0.00	*	-51,359	-52,610	17.60
Partition	0			0	0.00	*	0	0.00	*	-4,797	-4,797	1.60
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-182,472	-182,472	61.04
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-289,127	-298,940	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-25,001	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-314,128	-298,940	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total	Glass (sf)	(%)
Main Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	Floor	12,541	
Aux Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	Part	1,853	
Opt Vent	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Totals	0.0	0.0				Roof	8,614	0 0
						Wall	6,759	385 6

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-298.9	5,970	70.3	116.4	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	116.4
Aux Htg	0.0	0	0.0	0.0	Infil	0	2,620	Clg Cfm/Ton	0.00	Plenum	0.0	59.8
Preheat	0.0	0	0.0	0.0	Supply	0	5,970	Clg Sqft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Return	0	5,970	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-298.9				Rm Exh	0	0	Htg Cfm/Sqft	0.48	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	-23.84	Fn Frict	0.0	0.1

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 3 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-340	2.92
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-1,250	-1,250	10.73
Wall Cond	0	0		0	0.00	*	0	0.00	*	-716	-1,145	9.83
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-8,915	-8,915	76.52
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-10,882	-11,650	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-769	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-11,650	-11,650	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
				Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	169	
Main Clg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0	
Aux Clg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	169	0 0
Totals	0.0	0.0								Wall	371	18 5

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	ENGINEERING CHECKS--		TEMPERATURES (F)---		
								Clg % OA	0.0	Type	Clg	Htg
Main Htg	-11.7	0	0.0	0.0	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	128	Clg Cfm/Ton	0.00	Plenum	0.0	53.6
Preheat	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	53.6
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	53.6
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-11.7				Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	-68.94	Fn Frict	0.0	0.0

BUILDING U-VALUES - ALTERNATIVE 3
COMBINED ECOS

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Summr Roof	Wintr Windo	Wintr Windo	Wall	Ceil.		
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	114.3	24.77
3	STORE	0.000	0.000	0.000	0.000	0.041	0.000	0.000	0.056	0.317	41.6	9.33
4	LOBBY	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	88.1	19.21
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.041	1.040	1.086	0.129	0.317	102.1	23.47
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	180.6	38.83
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	180.6	38.83
System 1	Total/Ave.	0.144	0.000	0.000	0.000	0.041	1.040	1.086	0.121	0.317	103.7	23.80
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	114.3	24.77
3	STORE	0.000	0.000	0.000	0.000	0.041	0.000	0.000	0.056	0.317	41.6	9.33
4	LOBBY	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	88.1	19.21
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.041	1.040	1.086	0.129	0.317	102.1	23.47
6	MED. WAREHOUSE	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
Zone 3	Total/Ave.	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
System 2	Total/Ave.	0.144	0.000	0.000	0.000	0.061	1.040	1.086	0.129	0.317	94.9	21.14
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	180.6	38.83
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	180.6	38.83
System 3	Total/Ave.	0.000	0.000	0.000	0.000	0.041	1.040	1.086	0.056	0.317	180.6	38.83
Building		0.144	0.000	0.000	0.000	0.054	1.040	1.086	0.124	0.317	99.0	22.30

BUILDING AREAS - ALTERNATIVE 3
COMBINED ECOS

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate Flr	Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	1 Total/Ave.				7,882	1,853	0	0	0	3,955	403	11	3,157
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
6	MED. WAREHOUSE	1	1	4,828	4,828	0	0	0	0	4,828	0	0	3,570
Zone	3 Total/Ave.				4,828	0	0	0	0	4,828	0	0	3,570
System	2 Total/Ave.				12,541	1,853	0	0	0	8,614	385	6	6,374
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	3 Total/Ave.				169	0	0	0	0	169	18	5	353
Building					20,592	3,706	0	0	0	12,738	807	8	9,883

ASHRAE 90 ANALYSIS - ALTERNATIVE 3
COMBINED ECOS

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.054 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.193 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.118 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 3.33 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 13.88 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 3
COMBINED ECOS

----- S Y S T E M L O A D P R O F I L E -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.7	1	4	-33,188	49	1,641	814.2	0	0	0.0	0	0
5 - 10	1.5	0	0	-66,376	14	463	1,628.5	0	0	0.0	0	0
10 - 15	2.2	7	27	-99,564	6	212	2,442.7	0	0	0.0	0	0
15 - 20	3.0	6	22	-132,752	5	177	3,256.9	0	0	0.0	0	0
20 - 25	3.7	0	0	-165,940	0	16	4,071.2	11	703	0.0	0	0
25 - 30	4.5	0	0	-199,128	0	0	4,885.4	0	0	0.0	0	0
30 - 35	5.2	4	15	-232,317	17	564	5,699.7	0	0	0.0	0	0
35 - 40	6.0	9	32	-265,505	7	245	6,513.9	83	5,088	0.0	0	0
40 - 45	6.7	20	75	-298,693	0	0	7,328.1	0	0	0.0	0	0
45 - 50	7.5	12	43	-331,881	0	0	8,142.4	0	0	0.0	0	0
50 - 55	8.2	0	0	-365,069	0	0	8,956.6	0	0	0.0	0	0
55 - 60	9.0	0	0	-398,257	0	0	9,770.8	0	0	0.0	0	0
60 - 65	9.7	11	39	-431,445	0	0	10,585.1	6	367	0.0	0	0
65 - 70	10.5	16	60	-464,633	0	0	11,399.3	0	0	0.0	0	0
70 - 75	11.2	0	0	-497,821	0	0	12,213.5	0	0	0.0	0	0
75 - 80	12.0	0	0	-531,009	0	0	13,027.8	0	0	0.0	0	0
80 - 85	12.7	0	0	-564,197	0	0	13,842.0	0	0	0.0	0	0
85 - 90	13.5	0	0	-597,385	0	0	14,656.2	0	0	0.0	0	0
90 - 95	14.2	5	20	-630,573	0	0	15,470.5	0	0	0.0	0	0
95 - 100	15.0	8	30	-663,761	0	0	16,284.7	0	0	0.0	0	0
Hours Off	0.0	0	8,393	0	0	5,442	0.0	0	2,602	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 3
 COMBINED ECOS

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature	----- Zone Number -----				
Range (F)	1	2	1	3	2
Max. Temp.	81.2	80.9	93.4	92.2	89.5
Mo./Hr.	7 21	7 21	8 19	8 19	8 21
Day Type	4	4	2	1	1
	 Number of Hours				
Above 100	0	0	0	0	0
95 - 100	0	0	0	0	0
90 - 95	0	0	1,618	546	0
85 - 90	0	0	626	1,401	1,632
80 - 85	150	100	684	801	954
75 - 80	2,537	2,156	498	231	370
70 - 75	496	686	750	641	716
65 - 70	1,008	514	2,107	606	1,827
60 - 65	289	644	1,472	254	1,504
55 - 60	995	316	559	1,546	884
50 - 55	923	1,190	446	2,734	873
Below 50	2,362	3,154	0	0	0
Min. Temp.	36.4	30.5	54.9	54.9	54.9
Mo./Hr.	2 9	2 10	12 10	2 7	1 12
Day Type	5	5	4	1	3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 3
COMBINED ECOS

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	OIL	WATER
	Off Peak (kWh)	On Peak (kW)		
			(Therm)	(1000 G1)
Jan	3,715	17	660	0
Feb	3,483	17	678	0
March	3,877	17	385	0
April	3,058	17	127	0
May	3,611	18	0	0
June	5,317	62	0	0
July	13,195	82	0	0
Aug	7,965	72	0	0
Sept	3,283	64	0	0
Oct	3,291	17	33	0
Nov	3,244	17	246	0
Dec	3,707	17	555	1
Total	57,746	82	2,694	2

Building Energy Consumption = 22,607 (Btu/Sq Ft/Year)
Source Energy Consumption = 42,439 (Btu/Sq Ft/Year)

Floor Area = 20,592 (Sq Ft)

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip Code	Monthly Consumption												Total	
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec		
0	LIGHTS														
	ELEC	3006	2719	3292	2863	3149	3149	2863	3292	2863	3149	2863	2863	36,068	
	PK	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	
1	MISC LD														
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	MISC LD														
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	MISC LD														
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	MISC LD														
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	MISC LD														
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	MISC LD														
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ1160S		AIR-CLD COND COMP 25-35 TONS												
	ELEC	0	0	0	0	0	1406	8598	3517	0	0	0	0	13,521	
	PK	0.0	0.0	0.0	0.0	0.0	38.4	56.6	47.5	39.7	0.0	0.0	0.0	56.6	
1	EQ5200		CONDENSER FANS												
	ELEC	0	0	0	0	0	60	390	141	0	0	0	0	591	
	PK	0.0	0.0	0.0	0.0	0.0	1.7	2.8	2.3	1.7	0.0	0.0	0.0	2.8	
1	EQ5302		CONTROLS												
	ELEC	0	0	0	0	0	5	20	11	0	0	0	0	36	
	PK	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	
1	EQ4003		FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	463	698	1324	1003	421	0	0	0	3,909	
	PK	0.0	0.0	0.0	0.0	2.1	6.6	6.6	6.6	6.6	0.0	0.0	0.0	6.6	
1	EQ4003		FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	EQ4003		FC CENTRIF. FAN C.V.												

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3
COMBINED ECOS

ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ2006	OIL FIRE TUBE STEAM												
OIL	660	678	385	127	0	0	0	0	0	33	246	555	2,684
PK	1.4	1.4	1.4	1.4	0.1	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4
1 EQ5020	HEAT WATER CIRC. PUMP C.V.												
ELEC	205	220	169	56	0	0	0	0	0	41	110	244	1,046
PK	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	89	95	73	24	0	0	0	0	0	18	48	105	452
PK	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	313	336	258	86	0	0	0	0	0	63	168	372	1,594
PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
1 EQ5061	CONDENSATE RETURN PUMP												
ELEC	4	4	3	1	0	0	0	0	0	1	2	5	21
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5406	MAKE-UP WATER												
WATER	0	0	0	0	0	0	0	0	0	0	0	1	2
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	99	107	82	27	0	0	0	0	0	20	53	118	507
PK	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2

UTILITY PEAK CHECKSUMS - ALTERNATIVE 3
COMBINED ECOS

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 81.8 (kW)
Yearly Time of Peak 14 (hr) 7 (mo)

Hour 14 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1160S	AIR-CLD COND COMP 25-35 TONS	59.5	72.77
Sub Total			59.5	72.77
Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	6.6	8.10
Sub Total			6.6	8.10
Sub Total			0.0	0.00

Miscellaneous

Lights			15.6	19.13
Base Utilities			0.0	0.00
Misc Equipment			0.0	0.00
Sub Total			15.6	19.13
Grand Total			81.8	100.00

Building 259
Trace Input File

933702

CONTENTS OF : E:\CB259.TM

LINE # -----

1 JOB - 1

2 01/ENERGY SAVINGS OPPORTUNITY STUDY

3 01/CARLISLE BARRACKS, PA

4 01/DEPARTMENT OF THE ARMY

5 01/BENATEC ASSOCIATES

6 01/BUILDING 259

7 08/CARLISLE

8 09/MAY/SEP////APR/OCT

9 10/CLTD-CLF

10 11///ZONE

11 LOAD - 1

12 19/1/BASE BUILDING

13 20/1/1/LIVING ROOM/483/1/1/.83/.39/10.5

14 20/2/1/MASTER BEDROOM/356/1/1/.83/.39/10.5

15 20/3/1/BEDROOM NO. 1/219/1/1/.83/.39/10.5

16 20/4/1/BEDROOM NO. 2/219/1/1/.83/.39/10.5

17 20/5/2/VESTIBULE/26/1/1/.83/.39/10.5

18 20/6/2/POWDER ROOM/26/1/1/.83/.39/10.5

19 20/7/2/KITCHEN, HALLWAY/140/1/1/.83/.39/10.5

20 20/8/2/DINING ROOM/241/1/1/.83/.39/10.5

21 20/9/2/MAIN HALLWAY/210/1/1/.83/.39/10.5

22 20/10/2/BATH NO. 2/53/1/1/.83/.39/10.5

23 20/11/2/BATH NO. 1/47/1/1/.83/.39/10.5

24 21/M////CBLQTX///CBLQTX

25 22/2/1/YES////186

26 22/3/1/YES////186

27 22/4/1/YES////186

28 22/10/1/YES////186

29 22/11/1/YES////186

30 24/1/1/16/9.7//172/330

31 24/1/2/30/9.7//172/60

32 24/1/3/16/9.7//172/150

33 24/2/1/9/9.5//172/150

34 24/2/2/19/9.5//172/240

35 24/2/3/18/9.5//172/330

36 24/3/1/15/9.5//172/330

37 24/3/2/14/9.5//172/60

38 24/4/1/14/9.5//172/60

39 24/4/2/15/9.5//172/150

40 24/5/1/5/9.5//172/150

41 24/5/2/5/9.5//172/240

42 24/6/1/5/9.5//172/60

43 24/6/2/5/9.5//172/150

44 24/7/1/7/9.5//172/150

45 24/7/2/10/9.5//172/240

46 24/8/1/13/9.5//172/240

47 24/8/2/18/9.5//172/330

48 24/9/1/6/9.7//172/240

49 24/9/2/7/9.7//172/330

50 24/9/3/7/9.7//172/150

51 24/10/1/6/9.5//172/240

52 24/10/2/7/9.5//172/330

53 24/11/1/6/9.5//172/150

54 25/1/1/5/2.5/2/.55/.57

55 25/1/2/4.25/2.3/2/.55/.57

56 25/1/3/5/2.5/2/.55/.57

57 25/2/1/4.5/2.5/1/.55/.57

58 25/2/2/4/2.5/2/.55/.57

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59	25/2/3/4.5/2.5/2/.55/.57
60	25/3/1/4/2.5/2/.55/.57
61	25/3/2/4.5/2.5/1/.55/.57
62	25/4/1/4.5/2.5/1/.55/.57
63	25/4/2/4/2.5/2/.55/.57
64	25/5/1/3/2/1/.55/.57
65	25/6/1/3/2/1/.55/.57
66	25/7/1/6/2.25/1/.55/.57
67	25/7/2/3.5/1.5/2/.55/.57
68	25/8/1/5/2.5/1/.55/.57
69	25/8/2/5/2.5/2/.55/.57
70	25/9/2/3.5/1/1/.55/.57
71	25/10/2/4/2.5/1/.55/.57
72	25/11/1/4.5/2.5/1/.55/.57
73	26/M/CBLQP/CBLQL/OFF//OFF/CBLQCLG/OFF/OFF/OFF/OFF
74	27/M/505/SF-PERS/230/190/.5/WATT-SF/INCAND
75	29/1////////.27/CFM-SF/.27/CFM-SF
76	29/2////////.27/CFM-SF/.27/CFM-SF
77	29/3////////.27/CFM-SF/.27/CFM-SF
78	29/4////////.27/CFM-SF/.27/CFM-SF
79	29/5////////.27/CFM-SF
80	29/6////////.27/CFM-SF
81	29/7////////.27/CFM-SF
82	29/8////////.27/CFM-SF
83	29/9////////.27/CFM-SF
84	29/10////////.27/CFM-SF
85	29/11////////.27/CFM-SF
86	SYSTEM - 1
87	39/1/BASE BUILDING
88	40/1/PTAC
89	41/1/1/1
90	42/1/.2
91	45/1/CBLQCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
92	40/2/RAD
93	41/2/1/2
94	45/2/OFF/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF
95	EQUIPMENT - 1
96	59/1/CARLISLE///BASE BUILDING
97	60/1/1/PKPLANT/1/1
98	62/1/EQ1161/4
99	65/1/1//2/2
100	67/1/EQ2005/1
101	69/1/EQ4003
102	LOAD - 2
103	19/2/WALL & ROOF INSULATION
104	20/1/1/LIVING ROOM/483/1/1/.83/.39/10.5
105	20/2/1/MASTER BEDROOM/356/1/1/.83/.39/10.5
106	20/3/1/BEDROOM NO. 1/219/1/1/.83/.39/10.5
107	20/4/1/BEDROOM NO. 2/219/1/1/.83/.39/10.5
108	20/5/2/VESTIBULE/26/1/1/.83/.39/10.5
109	20/6/2/POWDER ROOM/26/1/1/.83/.39/10.5
110	20/7/2/KITCHEN, HALLWAY/140/1/1/.83/.39/10.5
111	20/8/2/DINING ROOM/241/1/1/.83/.39/10.5
112	20/9/2/MAIN HALLWAY/210/1/1/.83/.39/10.5
113	20/10/2/BATH NO. 2/53/1/1/.83/.39/10.5
114	20/11/2/BATH NO. 1/47/1/1/.83/.39/10.5
115	21/M////CBLQTX///CBLQTX
116	22/2/1/YES////185

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LINE #	
117	22/3/1/YES////185
118	22/4/1/YES////185
119	22/10/1/YES////185
120	22/11/1/YES////185
121	24/1/1/16/9.7//179/330
122	24/1/2/30/9.7//179/60
123	24/1/3/16/9.7//179/150
124	24/2/1/9/9.5//179/150
125	24/2/2/19/9.5//179/240
126	24/2/3/18/9.5//179/330
127	24/3/1/15/9.5//179/330
128	24/3/2/14/9.5//179/60
129	24/4/1/14/9.5//179/60
130	24/4/2/15/9.5//179/150
131	24/5/1/5/9.5//179/150
132	24/5/2/5/9.5//179/240
133	24/6/1/5/9.5//179/60
134	24/6/2/5/9.5//179/150
135	24/7/1/7/9.5//179/150
136	24/7/2/10/9.5//179/240
137	24/8/1/13/9.5//179/240
138	24/8/2/18/9.5//179/330
139	24/9/1/6/9.7//179/240
140	24/9/2/7/9.7//179/330
141	24/9/3/7/9.7//179/150
142	24/10/1/6/9.5//179/240
143	24/10/2/7/9.5//179/330
144	24/11/1/6/9.5//179/150
145	25/1/1/5/2.5/2/.55/.57
146	25/1/2/4.25/2.3/2/.55/.57
147	25/1/3/5/2.5/2/.55/.57
148	25/2/1/4.5/2.5/1/.55/.57
149	25/2/2/4/2.5/2/.55/.57
150	25/2/3/4.5/2.5/2/.55/.57
151	25/3/1/4/2.5/2/.55/.57
152	25/3/2/4.5/2.5/1/.55/.57
153	25/4/1/4.5/2.5/1/.55/.57
154	25/4/2/4/2.5/2/.55/.57
155	25/5/1/3/2/1/.55/.57
156	25/6/1/3/2/1/.55/.57
157	25/7/1/6/2.25/1/.55/.57
158	25/7/2/3.5/1.5/2/.55/.57
159	25/8/1/5/2.5/1/.55/.57
160	25/8/2/5/2.5/2/.55/.57
161	25/9/2/3.5/1/1/.55/.57
162	25/10/2/4/2.5/1/.55/.57
163	25/11/1/4.5/2.5/1/.55/.57
164	26/M/CBLQP/CBLQL/OFF//OFF/CBLQCLG/OFF/OFF/OFF/OFF
165	27/M/505/SF-PERS/230/190/.5/WATT-SF/INCAND
166	29/1/////23/CFM-SF/.23/CFM-SF
167	29/2/////23/CFM-SF/.23/CFM-SF
168	29/3/////23/CFM-SF/.23/CFM-SF
169	29/4/////23/CFM-SF/.23/CFM-SF
170	29/5/////23/CFM-SF
171	29/6/////23/CFM-SF
172	29/7/////23/CFM-SF
173	29/8/////23/CFM-SF
174	29/9/////23/CFM-SF

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LINE #	-----
175	29/10////////.23/CFM-SF
176	29/11////////.23/CFM-SF
177	SYSTEM - 2
178	39/2/WALL & ROOF INSULATION
179	40/1/PTAC
180	41/1/1/1
181	42/1/.2
182	45/1/CBLQCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
183	40/2/RAD
184	41/2/1/2
185	45/2/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF
186	EQUIPMENT - 2
187	59/2/CARLISLE///WALL & ROOF INSULATION
188	60/1/1/PKPLANT/1/1
189	62/1/EQ1161/4
190	65/1/1//2/2
191	67/1/EQ2005/1
192	69/1/EQ4003
193	LOAD - 3
194	19/3/WEATHERSTRIP & CAULKING
195	20/1/1/LIVING ROOM/483/1/1/.83/.39/10.5
196	20/2/1/MASTER BEDROOM/356/1/1/.83/.39/10.5
197	20/3/1/BEDROOM NO. 1/219/1/1/.83/.39/10.5
198	20/4/1/BEDROOM NO. 2/219/1/1/.83/.39/10.5
199	20/5/2/VESTIBULE/26/1/1/.83/.39/10.5
200	20/6/2/POWDER ROOM/26/1/1/.83/.39/10.5
201	20/7/2/KITCHEN, HALLWAY/140/1/1/.83/.39/10.5
202	20/8/2/DINING ROOM/241/1/1/.83/.39/10.5
203	20/9/2/MAIN HALLWAY/210/1/1/.83/.39/10.5
204	20/10/2/BATH NO. 2/53/1/1/.83/.39/10.5
205	20/11/2/BATH NO. 1/47/1/1/.83/.39/10.5
206	21/M////CBLQTX///CBLQTX
207	22/2/1/YES////186
208	22/3/1/YES////186
209	22/4/1/YES////186
210	22/10/1/YES////186
211	22/11/1/YES////186
212	24/1/1/16/9.7//172/330
213	24/1/2/30/9.7//172/60
214	24/1/3/16/9.7//172/150
215	24/2/1/9/9.5//172/150
216	24/2/2/19/9.5//172/240
217	24/2/3/18/9.5//172/330
218	24/3/1/15/9.5//172/330
219	24/3/2/14/9.5//172/60
220	24/4/1/14/9.5//172/60
221	24/4/2/15/9.5//172/150
222	24/5/1/5/9.5//172/150
223	24/5/2/5/9.5//172/240
224	24/6/1/5/9.5//172/60
225	24/6/2/5/9.5//172/150
226	24/7/1/7/9.5//172/150
227	24/7/2/10/9.5//172/240
228	24/8/1/13/9.5//172/240
229	24/8/2/18/9.5//172/330
230	24/9/1/6/9.7//172/240
231	24/9/2/7/9.7//172/330
232	24/9/3/7/9.7//172/150

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LINE #	
233	24/10/1/6/9.5//172/240
234	24/10/2/7/9.5//172/330
235	24/11/1/6/9.5//172/150
236	25/1/1/5/2.5/2/.55/.57
237	25/1/2/4.25/2.3/2/.55/.57
238	25/1/3/5/2.5/2/.55/.57
239	25/2/1/4.5/2.5/1/.55/.57
240	25/2/2/4/2.5/2/.55/.57
241	25/2/3/4.5/2.5/2/.55/.57
242	25/3/1/4/2.5/2/.55/.57
243	25/3/2/4.5/2.5/1/.55/.57
244	25/4/1/4.5/2.5/1/.55/.57
245	25/4/2/4/2.5/2/.55/.57
246	25/5/1/3/2/1/.55/.57
247	25/6/1/3/2/1/.55/.57
248	25/7/1/6/2.25/1/.55/.57
249	25/7/2/3.5/1.5/2/.55/.57
250	25/8/1/5/2.5/1/.55/.57
251	25/8/2/5/2.5/2/.55/.57
252	25/9/2/3.5/1/1/.55/.57
253	25/10/2/4/2.5/1/.55/.57
254	25/11/1/4.5/2.5/1/.55/.57
255	26/M/CBLQP/CBLQL/OFF//OFF/CBLQCLG/OFF/OFF/OFF/OFF
256	27/M/505/SF-PERS/230/190/.5/WATT-SF/INCAND
257	29/1////////.22/CFM-SF/.22/CFM-SF
258	29/2////////.22/CFM-SF/.22/CFM-SF
259	29/3////////.22/CFM-SF/.22/CFM-SF
260	29/4////////.22/CFM-SF/.22/CFM-SF
261	29/5////////.22/CFM-SF
262	29/6////////.22/CFM-SF
263	29/7////////.22/CFM-SF
264	29/8////////.22/CFM-SF
265	29/9////////.22/CFM-SF
266	29/10////////.22/CFM-SF
267	29/11////////.22/CFM-SF
268	SYSTEM - 3
269	39/3/WEATHERSTRIP & CAULKING
270	40/1/PTAC
271	41/1/1/1
272	42/1/.2
273	45/1/CBLQCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
274	40/2/RAD
275	41/2/1/2
276	45/2/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF
277	EQUIPMENT - 3
278	59/3/CARLISLE///WEATHERSTRIP & CAULKING
279	60/1/1/PKPLANT/1/1
280	62/1/EQ1161/4
281	65/1/1//2/2
282	67/1/EQ2005/1
283	69/1/EQ4003
284	LOAD - 4
285	19/4/COMBINED ECOS
286	20/1/1/LIVING ROOM/483/1/1/.83/.39/10.5
287	20/2/1/MASTER BEDROOM/356/1/1/.83/.39/10.5
288	20/3/1/BEDROOM NO. 1/219/1/1/.83/.39/10.5
289	20/4/1/BEDROOM NO. 2/219/1/1/.83/.39/10.5
290	20/5/2/VESTIBULE/26/1/1/.83/.39/10.5

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LINE #	-----
291	20/6/2/POWDER ROOM/26/1/1/.83/.39/10.5
292	20/7/2/KITCHEN, HALLWAY/140/1/1/.83/.39/10.5
293	20/8/2/DINING ROOM/241/1/1/.83/.39/10.5
294	20/9/2/MAIN HALLWAY/210/1/1/.83/.39/10.5
295	20/10/2/BATH NO. 2/53/1/1/.83/.39/10.5
296	20/11/2/BATH NO. 1/47/1/1/.83/.39/10.5
297	21/M////CBLQTX///CBLQTX
298	22/2/1/YES////185
299	22/3/1/YES////185
300	22/4/1/YES////185
301	22/10/1/YES////185
302	22/11/1/YES////185
303	24/1/1/16/9.7//179/330
304	24/1/2/30/9.7//179/60
305	24/1/3/16/9.7//179/150
306	24/2/1/9/9.5//179/150
307	24/2/2/19/9.5//179/240
308	24/2/3/18/9.5//179/330
309	24/3/1/15/9.5//179/330
310	24/3/2/14/9.5//179/60
311	24/4/1/14/9.5//179/60
312	24/4/2/15/9.5//179/150
313	24/5/1/5/9.5//179/150
314	24/5/2/5/9.5//179/240
315	24/6/1/5/9.5//179/60
316	24/6/2/5/9.5//179/150
317	24/7/1/7/9.5//179/150
318	24/7/2/10/9.5//179/240
319	24/8/1/13/9.5//179/240
320	24/8/2/18/9.5//179/330
321	24/9/1/6/9.7//179/240
322	24/9/2/7/9.7//179/330
323	24/9/3/7/9.7//179/150
324	24/10/1/6/9.5//179/240
325	24/10/2/7/9.5//179/330
326	24/11/1/6/9.5//179/150
327	25/1/1/5/2.5/2/.55/.57
328	25/1/2/4.25/2.3/2/.55/.57
329	25/1/3/5/2.5/2/.55/.57
330	25/2/1/4.5/2.5/1/.55/.57
331	25/2/2/4/2.5/2/.55/.57
332	25/2/3/4.5/2.5/2/.55/.57
333	25/3/1/4/2.5/2/.55/.57
334	25/3/2/4.5/2.5/1/.55/.57
335	25/4/1/4.5/2.5/1/.55/.57
336	25/4/2/4/2.5/2/.55/.57
337	25/5/1/3/2/1/.55/.57
338	25/6/1/3/2/1/.55/.57
339	25/7/1/6/2.25/1/.55/.57
340	25/7/2/3.5/1.5/2/.55/.57
341	25/8/1/5/2.5/1/.55/.57
342	25/8/2/5/2.5/2/.55/.57
343	25/9/2/3.5/1/1/.55/.57
344	25/10/2/4/2.5/1/.55/.57
345	25/11/1/4.5/2.5/1/.55/.57
346	26/M/CBLQP/CBLQL/OFF//OFF/CBLQCLG/OFF/OFF/OFF/OFF
347	27/M/505/SF-PERS/230/190/.5/WATT-SF/INCAND
348	29/1/////18/CFM-SF/.18/CFM-SF

CONTENTS OF : E:\CB259.TM

LINE #	-----
349	29/2////////.18/CFM-SF/.18/CFM-SF
350	29/3////////.18/CFM-SF/.18/CFM-SF
351	29/4////////.18/CFM-SF/.18/CFM-SF
352	29/5////////.18/CFM-SF
353	29/6////////.18/CFM-SF
354	29/7////////.18/CFM-SF
355	29/8////////.18/CFM-SF
356	29/9////////.18/CFM-SF
357	29/10////////.18/CFM-SF
358	29/11////////.18/CFM-SF
359	SYSTEM - 4
360	39/4/COMBINED ECOS
361	40/1/PTAC
362	41/1/1/1
363	42/1/.2
364	45/1/CBLQCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
365	40/2/RAD
366	41/2/1/2
367	45/2/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF
368	EQUIPMENT - 4
369	59/4/CARLISLE///COMBINED ECOS
370	60/1/1/PKPLANT/1/1
371	62/1/EQ1161/4
372	65/1/1//2/2
373	67/1/EQ2005/1
374	69/1/EQ4003

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**
**          TRACE 600 ANALYSIS          **
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**          by          **
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 253

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Reflectance: 0.20
Winter Ground Reflectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 10:38:53 2/ 3/94
Dataset Name: CB253C .TM

AIRFLOW - ALTERNATIVE 1
BASE BUILDING

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)		
1	SZ	1,547	10,315	4,331	12,844	1,547	0	1,035
2	UH	0	0	7,039	0	3,209	0	0
3	RAD	0	0	0	0	170	0	0
Totals		1,547	10,315	11,370	12,844	4,926	0	1,035

CAPACITY - ALTERNATIVE 1
BASE BUILDING

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	----- Cooling -----				----- Heating -----						
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	22.7	0.0	0.0	22.7	-400,260	0	-247,741	0	0	0	-400,260
2	UH	0.0	0.0	0.0	0.0	-387,302	0	0	0	0	0	-387,302
3	RAD	0.0	0.0	0.0	0.0	-18,830	0	0	0	0	0	-18,830
Totals		22.7	0.0	0.0	22.7	-806,392	0	-247,741	0	0	0	-806,392

The building peaked at hour 14 month 7 with a capacity of 21.3 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BASE BUILDING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				--- Heating ---		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	15.00	1.31	454.6	347.4	34.54	0.55	-50.78	7,882
2	Main	UH	0.00	0.00	0.0	0.0	0.00	0.56	-30.88	12,541
3	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-111.42	169

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	52,876		52,876	19.42	*	0	0.00	*	0	-30,241	10.34
Glass Solar	21,378	0		21,378	7.85	*	29,188	21.86	*	0	0	0.00
Glass Cond	5,608	0		5,608	2.06	*	5,130	3.84	*	-28,015	-28,015	9.58
Wall Cond	19,751	2,412		22,162	8.14	*	21,311	15.96	*	-48,296	-53,384	18.25
Partition	1,333			1,333	0.49	*	1,333	1.00	*	-4,797	-4,797	1.64
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	77,699			77,699	28.54	*	42,048	31.49	*	-176,134	-176,134	60.20
Sub Total==>	125,768	55,288		181,056	66.50	*	99,010	74.16	*	-257,241	-292,571	100.00
Internal Loads						*			*			
Lights	28,943	0		28,943	10.63	*	27,921	20.91	*	0	0	0.00
People	7,913			7,913	2.91	*	3,088	2.31	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	36,856	0	0	36,856	13.54	*	31,009	23.23	*	0	0	0.00
Ceiling Load	9,390	-9,390		0	0.00	*	5,981	4.48	*	-11,398	0	0.00
Outside Air	0	0	0	45,625	16.76	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				11,003	4.04	*		0.00	*		0	0.00
Ret. Fan Heat		7,237		7,237	2.66	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	-2,489			-2,489	-0.91	*	-2,489	-1.86	*	0	0	0.00
Exhaust Heat		-7,027	0	-7,027	-2.58	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	169,525	46,107	0	272,260	100.00	*	133,510	100.00	*	-268,639	-292,571	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total	Glass (sf)	(%)
Main Clg	22.7	272.3	10,315	81.4 68.4 86.2	62.1 60.5 78.5	Floor	7,882	
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Part	1,853	
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Totals	22.7	272.3				Roof	3,955	0 0
						Wall	3,560	403 11

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	15.0	Type	Clg	Htg
Main Htg	-400.3	4,331	40.1	125.0	Vent	1,547	0	Clg Cfm/Sqft	1.31	SADB	63.1	125.0
Aux Htg	0.0	0	0.0	0.0	Infil	2,529	2,529	Clg Cfm/Ton	454.64	Plenum	82.5	39.8
Preheat	-247.7	10,315	40.1	62.1	Supply	10,315	4,331	Clg Sqft/Ton	347.40	Return	79.8	45.2
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	34.54	Ret/OA	81.4	45.2
Humidif	0.0	0	0.0	0.0	Return	10,177	4,331	No. People	17	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	1,409	0	Htg % OA	0.0	Fn MtrTD	0.2	0.0
Total	-400.3				Rm Exh	1,035	0	Htg Cfm/Sqft	0.55	Fn BldTD	0.2	0.0
					Auxil	0	0	Htg Btuh/Sqft	-50.78	Fn Frict	0.6	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 2 Block UH - UNIT HEATERS

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percent Of Tot (%)	*	Space Sensible (Btuh)	Percent Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percent Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-24,719	-54,037	13.95
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-26,764	-26,764	6.91
Wall Cond	0	0		0	0.00	*	0	0.00	*	-74,257	-78,211	20.19
Partition	0			0	0.00	*	0	0.00	*	-4,797	-4,797	1.24
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-223,493	-223,493	57.71
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-354,030	-387,302	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-39,500	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-393,530	-387,302	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf)	(%)
Main Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	12,541		
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	1,853		
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	0.0	0.0				8,614	0	0
						6,759	385	6

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-387.3	7,039	68.8	119.4	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	119.4
Aux Htg	0.0	0	0.0	0.0	Infil	0	3,209	Clg Cfm/Ton	0.00	Plenum	0.0	40.3
Preheat	0.0	0	0.0	0.0	Supply	0	7,039	Clg Sqft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Return	0	7,039	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-387.3				Rm Exh	0	0	Htg Cfm/Sqft	0.56	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	-30.88	Fn Frict	0.0	0.1

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 3 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****
Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-923	4.90
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-1,250	-1,250	6.64
Wall Cond	0	0		0	0.00	*	0	0.00	*	-3,682	-4,816	25.58
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-11,840	-11,840	62.88
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-16,772	-18,830	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-2,058	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-18,830	-18,830	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf)	(%)
Main Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	169		
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	0.0	0.0				169	0	0
						371	18	5

-----AREAS-----

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-18.8	0	0.0	0.0	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	170	Clg Cfm/Ton	0.00	Plenum	0.0	29.6
Preheat	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	29.6
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	29.6
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-18.8				Rm Exh	0	0	Htg Cfm/SqFt	0.00	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/SqFt	-111.42	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

BUILDING U-VALUES - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Part.	ExFlr	Room U-Values (Btu/hr/sqft/F)							Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
				Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	101.9	23.44
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone 1	Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
6	MED. WAREHOUSE	0.000	0.000	0.000	0.000	0.080	0.000	0.000	0.130	0.000	83.4	17.40
Zone 3	Total/Ave.	0.000	0.000	0.000	0.000	0.080	0.000	0.000	0.130	0.000	83.4	17.40
System 2	Total/Ave.	0.144	0.000	0.000	0.000	0.139	1.040	1.086	0.200	0.317	93.8	20.92
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System 3	Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Building		0.144	0.000	0.000	0.000	0.163	1.040	1.086	0.231	0.317	97.6	22.02

BUILDING AREAS - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G A R E A S -----													
Room Number	Description	Number of Duplicate Flr	Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /W1 (%)	Net Wall Area (sqft)
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	1 Total/Ave.				7,882	1,853	0	0	0	3,955	403	11	3,157
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
6	MED. WAREHOUSE	1	1	4,828	4,828	0	0	0	0	4,828	0	0	3,570
Zone	3 Total/Ave.				4,828	0	0	0	0	4,828	0	0	3,570
System	2 Total/Ave.				12,541	1,853	0	0	0	8,614	385	6	6,374
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	3 Total/Ave.				169	0	0	0	0	169	18	5	353
Building					20,592	3,706	0	0	0	12,738	807	8	9,883

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BASE BUILDING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.163 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.292 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.222 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTvr) = 12.37 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTvw) = 16.56 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
AIR STRATIFICATION

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	1.1	4	19	-52,707	36	969	867.7	0	0	0.0	0	0
5 - 10	2.3	4	18	-105,413	14	371	1,735.4	0	0	0.0	0	0
10 - 15	3.4	4	19	-158,120	15	396	2,603.0	0	0	0.0	0	0
15 - 20	4.5	4	22	-210,827	6	154	3,470.7	0	0	0.0	0	0
20 - 25	5.7	1	4	-263,533	1	16	4,338.4	9	571	0.0	0	0
25 - 30	6.8	11	56	-316,240	3	68	5,206.1	0	0	0.0	0	0
30 - 35	7.9	1	4	-368,946	0	8	6,073.8	0	0	0.0	0	0
35 - 40	9.1	8	41	-421,653	27	735	6,941.4	0	0	0.0	0	0
40 - 45	10.2	12	61	-474,360	0	0	7,809.1	83	5,088	0.0	0	0
45 - 50	11.3	14	68	-527,066	0	0	8,676.8	0	0	0.0	0	0
50 - 55	12.5	1	5	-579,773	0	0	9,544.5	0	0	0.0	0	0
55 - 60	13.6	4	19	-632,480	0	0	10,412.2	5	295	0.0	0	0
60 - 65	14.7	11	53	-685,186	0	0	11,279.8	3	204	0.0	0	0
65 - 70	15.9	12	60	-737,893	0	0	12,147.5	0	0	0.0	0	0
70 - 75	17.0	0	0	-790,600	0	0	13,015.2	0	0	0.0	0	0
75 - 80	18.2	4	20	-843,306	0	0	13,882.9	0	0	0.0	0	0
80 - 85	19.3	4	20	-896,013	0	0	14,750.6	0	0	0.0	0	0
85 - 90	20.4	2	10	-948,720	0	0	15,618.2	0	0	0.0	0	0
90 - 95	21.6	0	0	-1,001,426	0	0	16,485.9	0	0	0.0	0	0
95 - 100	22.7	0	0	-1,054,133	0	0	17,353.6	0	0	0.0	0	0
Hours Off	0.0	0	8,261	0	0	6,043	0.0	0	2,602	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
AIR STRATIFICATION

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature Range (F)	Zone Number				
	1	2	1	3	2

Max. Temp.	82.8	82.8	96.1	94.1	89.7
Mo./Hr.	7 22	7 20	8 22	8 19	8 21
Day Type	4	4	1	1	1

	Number of Hours				
Above 100	0	0	0	0	0
95 - 100	0	0	270	0	0
90 - 95	0	0	1,498	1,320	0
85 - 90	0	0	999	1,183	1,292
80 - 85	355	301	173	425	1,044
75 - 80	2,322	1,955	550	795	848
70 - 75	903	1,049	602	1,832	488
65 - 70	536	367	1,997	1,451	1,685
60 - 65	300	119	1,451	917	1,147
55 - 60	1,194	641	552	385	986
50 - 55	637	832	668	452	1,270
Below 50	2,513	3,496	0	0	0

Min. Temp.	35.1	29.9	54.9	55.0	54.9
Mo./Hr.	2 8	2 10	1 16	1 2	2 4
Day Type	5	5	3	4	3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
AIR STRATIFICATION

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	OIL (Therm)	WATER (1000 G1)
Jan	5,633	27	739	0
Feb	5,095	27	690	0
March	5,975	27	589	0
April	4,919	27	252	0
May	5,733	28	0	0
June	11,752	97	0	0
July	16,987	110	0	0
Aug	12,060	96	0	0
Sept	5,212	81	0	0
Oct	5,391	27	165	0
Nov	5,105	27	410	0
Dec	5,345	27	630	0
Total	89,207	110	3,475	2

Building Energy Consumption = 31,662 (Btu/Sq Ft/Year)
Source Energy Consumption = 62,126 (Btu/Sq Ft/Year)

Floor Area = 20,592 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption												Total	
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec		
0	LIGHTS														
	ELEC	4888	4423	5354	4655	5121	5121	4655	5354	4655	5121	4655	4655	58,659	
	PK	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	
1	MISC LD														
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	MISC LD														
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	MISC LD														
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	MISC LD														
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	MISC LD														
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	MISC LD														
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ1160S		AIR-CLD COND COMP 25-35 TONS												
	ELEC	0	0	0	0	0	5222	10468	5235	0	0	0	0	20,925	
	PK	0.0	0.0	0.0	0.0	0.0	61.3	73.5	60.4	46.6	0.0	0.0	0.0	73.5	
1	EQ5200		CONDENSER FANS												
	ELEC	0	0	0	0	0	222	519	231	0	0	0	0	972	
	PK	0.0	0.0	0.0	0.0	0.0	3.2	4.0	3.2	2.3	0.0	0.0	0.0	4.0	
1	EQ5302		CONTROLS												
	ELEC	0	0	0	0	0	15	20	13	0	0	0	0	48	
	PK	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	
1	EQ4003		FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	612	1173	1324	1227	556	0	0	0	4,892	
	PK	0.0	0.0	0.0	0.0	2.8	6.6	6.6	6.6	6.6	0.0	0.0	0.0	6.6	
1	EQ4003		FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	EQ4003		FC CENTRIF. FAN C.V.												

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
AIR STRATIFICATION

ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ2006	OIL FIRE TUBE STEAM												
OIL	739	690	589	252	0	0	0	0	0	165	410	630	3,475
PK	1.4	1.4	1.4	1.4	0.1	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4
1 EQ5020	HEAT WATER CIRC. PUMP C.V.												
ELEC	215	194	179	76	0	0	0	0	0	78	130	199	1,072
PK	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	93	84	78	33	0	0	0	0	0	34	56	86	463
PK	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	328	296	274	116	0	0	0	0	0	119	198	303	1,634
PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
1 EQ5061	CONDENSATE RETURN PUMP												
ELEC	4	4	4	2	0	0	0	0	0	2	3	4	22
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5406	MAKE-UP WATER												
WATER	0	0	0	0	0	0	0	0	0	0	0	0	2
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	104	94	87	37	0	0	0	0	0	38	63	97	520
PK	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
AIR STRATIFICATION

----- UTILITY PEAK CHECKSUMS -----

Utility ELECTRIC DEMAND

Peak Value 109.6 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)
Cooling Equipment				
1	EQ1160S	AIR-CLD COND COMP 25-35 TONS	77.5	70.75
Sub Total			77.5	70.75
Sub Total			0.0	0.00
Air Moving Equipment				
1		SUMMATION OF FAN ELECTRICAL DEMAND	6.6	6.04
Sub Total			6.6	6.04
Sub Total			0.0	0.00
Miscellaneous				
Lights			25.4	23.21
Base Utilities			0.0	0.00
Misc Equipment			0.0	0.00
Sub Total			25.4	23.21
Grand Total			109.6	100.00


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*****  
*****  
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**          TRACE    600  ANALYSIS          **  
**  
**          by          **  
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 253

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 10:55:15 2/ 3/94
Dataset Name: CB253C .TM

AIRFLOW - ALTERNATIVE 2
BASE BUILDING

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)		
1	SZ	1,547	10,315	4,331	12,844	1,547	0	1,035
2	UH	0	0	7,035	0	3,209	0	0
3	RAD	0	0	0	0	170	0	0
Totals		1,547	10,315	11,366	12,844	4,926	0	1,035

CAPACITY - ALTERNATIVE 2
BASE BUILDING

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	----- Cooling -----				----- Heating -----						
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	SZ	22.7	0.0	0.0	22.7	-400,260	0	-247,741	0	0	0	-400,260
2	UH	0.0	0.0	0.0	0.0	-386,318	0	0	0	0	0	-386,318
3	RAD	0.0	0.0	0.0	0.0	-18,830	0	0	0	0	0	-18,830
Totals		22.7	0.0	0.0	22.7	-805,408	0	-247,741	0	0	0	-805,408

The building peaked at hour 14 month 7 with a capacity of 21.3 tons

ENGINEERING CHECKS - ALTERNATIVE 2
BASE BUILDING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				----- Heating -----		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	SZ	15.00	1.31	454.6	347.4	34.54	0.55	-50.78	7,882
2	Main	UH	0.00	0.00	0.0	0.0	0.00	0.56	-30.80	12,541
3	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-111.42	169

System 1 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)		Space Sensible (Btuh)	Perct Of Tot (%)		Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	52,876		52,876	19.42	*	0	0.00	*	0	-30,241	10.34
Glass Solar	21,378	0		21,378	7.85	*	29,188	21.86	*	0	0	0.00
Glass Cond	5,608	0		5,608	2.06	*	5,130	3.84	*	-28,015	-28,015	9.58
Wall Cond	19,751	2,412		22,162	8.14	*	21,311	15.96	*	-48,296	-53,384	18.25
Partition	1,333			1,333	0.49	*	1,333	1.00	*	-4,797	-4,797	1.64
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	77,699			77,699	28.54	*	42,048	31.49	*	-176,134	-176,134	60.20
Sub Total==>	125,768	55,288		181,056	66.50	*	99,010	74.16	*	-257,241	-292,571	100.00
Internal Loads												
Lights	28,943	0		28,943	10.63	*	27,921	20.91	*	0	0	0.00
People	7,913			7,913	2.91	*	3,088	2.31	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	36,856	0	0	36,856	13.54	*	31,009	23.23	*	0	0	0.00
Ceiling Load	9,390	-9,390		0	0.00	*	5,981	4.48	*	-11,398	0	0.00
Outside Air	0	0	0	45,625	16.76	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				11,003	4.04	*		0.00	*		0	0.00
Ret. Fan Heat		7,237		7,237	2.66	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	-2,489			-2,489	-0.91	*	-2,489	-1.86	*	0	0	0.00
Exhaust Heat		-7,027	0	-7,027	-2.58	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	169,525	46,107	0	272,260	100.00	*	133,510	100.00	*	-268,639	-292,571	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf)	(%)
Main Clg	22.7	272.3	10,315	81.4 68.4 86.2	62.1 60.5 78.5	Part	1,853	
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	3,955	0 0
Totals	22.7	272.3				Wall	3,560	403 11

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	15.0	Type	Clg	Htg
Main Htg	-400.3	4,331	40.1	125.0	Vent	1,547	0	Clg Cfm/Sqft	1.31	SADB	63.1	125.0
Aux Htg	0.0	0	0.0	0.0	Infil	2,529	2,529	Clg Cfm/Ton	454.64	Plenum	82.5	39.8
Preheat	-247.7	10,315	40.1	62.1	Supply	10,315	4,331	Clg Sqft/Ton	347.40	Return	79.8	45.2
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	34.54	Ret/OA	81.4	45.2
Humidif	0.0	0	0.0	0.0	Return	10,177	4,331	No. People	17	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	1,409	0	Htg % OA	0.0	Fn MtrTD	0.2	0.0
Total	-400.3				Rm Exh	1,035	0	Htg Cfm/Sqft	0.55	Fn BldTD	0.2	0.0
					Auxil	0	0	Htg Btuh/Sqft	-50.78	Fn Frict	0.6	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 2 Block UH - UNIT HEATERS

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percent Of Tot (%)	*	Space Sensible (Btuh)	Percent Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percent Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-23,735	-53,053	13.73
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-26,764	-26,764	6.93
Wall Cond	0	0		0	0.00	*	0	0.00	*	-74,257	-78,211	20.25
Partition	0			0	0.00	*	0	0.00	*	-4,797	-4,797	1.24
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-223,493	-223,493	57.85
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-353,046	-386,318	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-39,267	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-392,313	-386,318	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf) (%) Part
Main Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	12,541	1,853
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0	0
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	8,614	0 0
Totals	0.0	0.0				6,759	385 6

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-386.3	7,035	68.8	119.2	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	119.2
Aux Htg	0.0	0	0.0	0.0	Infil	0	3,209	Clg Cfm/Ton	0.00	Plenum	0.0	40.3
Preheat	0.0	0	0.0	0.0	Supply	0	7,035	Clg Sqft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Return	0	7,035	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-386.3				Rm Exh	0	0	Htg Cfm/Sqft	0.56	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	-30.80	Fn Frict	0.0	0.1

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 3 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-923	4.90
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-1,250	-1,250	6.64
Wall Cond	0	0		0	0.00	*	0	0.00	*	-3,682	-4,816	25.58
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-11,840	-11,840	62.88
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-16,772	-18,830	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-2,058	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-18,830	-18,830	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total	Glass (sf)	(%)
Main Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Floor	169	
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Part	0	
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Totals	0.0	0.0				Roof	169	0 0
						Wall	371	18 5

-----AREAS-----

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-18.8	0	0.0	0.0	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	170	Clg Cfm/Ton	0.00	Plenum	0.0	29.6
Preheat	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	29.6
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	29.6
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-18.8				Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	-111.42	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

BUILDING U-VALUES - ALTERNATIVE 2
BASE BUILDING

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone	1 Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone	2 Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System	1 Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	101.9	23.44
1	BASEMENT	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	133.6	31.44
2	RECEIVING	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	110.6	24.01
3	STORE	0.000	0.000	0.000	0.000	0.214	0.000	0.000	0.289	0.317	40.3	9.07
4	LOBBY	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.269	0.317	78.9	17.36
Zone	1 Total/Ave.	0.144	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	100.3	23.13
6	MED. WAREHOUSE	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
Zone	3 Total/Ave.	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.130	0.000	83.4	17.40
System	2 Total/Ave.	0.144	0.000	0.000	0.000	0.137	1.040	1.086	0.200	0.317	93.8	20.92
5	BATH ROOMS	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Zone	2 Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
System	3 Total/Ave.	0.000	0.000	0.000	0.000	0.214	1.040	1.086	0.289	0.317	174.6	37.62
Building		0.144	0.000	0.000	0.000	0.162	1.040	1.086	0.231	0.317	97.6	22.02

BUILDING AREAS - ALTERNATIVE 2
BASE BUILDING

----- B U I L D I N G A R E A S -----													
Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	1 Total/Ave.				7,882	1,853	0	0	0	3,955	403	11	3,157
1	BASEMENT	1	1	3,927	3,927	1,853	0	0	0	0	0	0	824
2	RECEIVING	1	1	951	951	0	0	0	0	951	110	9	1,100
3	STORE	1	1	2,067	2,067	0	0	0	0	2,067	0	0	275
4	LOBBY	1	1	768	768	0	0	0	0	768	275	31	605
Zone	1 Total/Ave.				7,713	1,853	0	0	0	3,786	385	12	2,804
6	MED. WAREHOUSE	1	1	4,828	4,828	0	0	0	0	4,828	0	0	3,570
Zone	3 Total/Ave.				4,828	0	0	0	0	4,828	0	0	3,570
System	2 Total/Ave.				12,541	1,853	0	0	0	8,614	385	6	6,374
5	BATH ROOMS	1	1	169	169	0	0	0	0	169	18	5	353
Zone	2 Total/Ave.				169	0	0	0	0	169	18	5	353
System	3 Total/Ave.				169	0	0	0	0	169	18	5	353
Building					20,592	3,706	0	0	0	12,738	807	8	9,883

ASHRAE 90 ANALYSIS - ALTERNATIVE 2
BASE BUILDING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.162 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.292 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.221 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTvr) = 12.27 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTvw) = 16.56 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2
CEILING FANS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	1.1	4	19	-52,657	41	1,104	867.5	0	0	0.0	0	0
5 - 10	2.3	4	18	-105,315	16	446	1,735.0	0	0	0.0	0	0
10 - 15	3.4	4	19	-157,972	12	319	2,602.5	0	0	0.0	0	0
15 - 20	4.5	4	22	-210,630	1	37	3,470.0	0	0	0.0	0	0
20 - 25	5.7	1	4	-263,287	1	33	4,337.5	9	571	0.0	0	0
25 - 30	6.8	11	56	-315,945	1	35	5,204.9	0	0	0.0	0	0
30 - 35	7.9	1	4	-368,602	0	8	6,072.4	0	0	0.0	0	0
35 - 40	9.1	8	41	-421,260	27	735	6,939.9	0	0	0.0	0	0
40 - 45	10.2	12	61	-473,917	0	0	7,807.4	83	5,088	0.0	0	0
45 - 50	11.3	14	68	-526,574	0	0	8,674.9	0	0	0.0	0	0
50 - 55	12.5	1	5	-579,232	0	0	9,542.4	0	0	0.0	0	0
55 - 60	13.6	4	19	-631,889	0	0	10,409.9	5	295	0.0	0	0
60 - 65	14.7	11	53	-684,547	0	0	11,277.4	3	204	0.0	0	0
65 - 70	15.9	12	60	-737,204	0	0	12,144.9	0	0	0.0	0	0
70 - 75	17.0	0	0	-789,862	0	0	13,012.4	0	0	0.0	0	0
75 - 80	18.2	4	20	-842,519	0	0	13,879.9	0	0	0.0	0	0
80 - 85	19.3	4	20	-895,177	0	0	14,747.4	0	0	0.0	0	0
85 - 90	20.4	2	10	-947,834	0	0	15,614.8	0	0	0.0	0	0
90 - 95	21.6	0	0	-1,000,492	0	0	16,482.3	0	0	0.0	0	0
95 - 100	22.7	0	0	-1,053,149	0	0	17,349.8	0	0	0.0	0	0
Hours Off	0.0	0	8,261	0	0	6,043	0.0	0	2,602	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 2
 CEILING FANS

----- BUILDING TEMPERATURE PROFILES -----

Temperature Range (F)	----- Zone Number -----				
	1	2	1	3	2
Max. Temp.	82.8	82.8	96.1	94.3	89.7
Mo./Hr.	7 22	7 20	8 22	8 19	8 21
Day Type	4	4	1	1	1
	 Number of Hours				
Above 100	0	0	0	0	0
95 - 100	0	0	270	0	0
90 - 95	0	0	1,498	1,436	0
85 - 90	0	0	999	931	1,292
80 - 85	355	301	173	561	1,044
75 - 80	2,322	1,955	550	542	848
70 - 75	903	1,049	602	634	488
65 - 70	536	367	1,997	2,044	1,685
60 - 65	300	119	1,451	1,517	1,147
55 - 60	1,194	641	552	503	986
50 - 55	637	832	668	592	1,270
Below 50	2,513	3,496	0	0	0
Min. Temp.	35.1	29.9	54.9	55.0	54.9
Mo./Hr.	2 8	2 10	1 3	1 20	2 4
Day Type	5	5	5	3	3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 2
CEILING FANS

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	OIL	WATER
	Off Peak (kWh)	On Peak (kW)		
Jan	5,707	27	747	0
Feb	5,162	27	691	0
March	6,034	27	560	0
April	4,953	27	196	0
May	5,810	29	0	0
June	11,830	97	0	0
July	17,057	110	0	0
Aug	12,141	96	0	0
Sept	5,282	81	0	0
Oct	5,427	27	99	0
Nov	5,139	27	368	0
Dec	5,415	27	644	0
Total	89,956	110	3,304	2

Building Energy Consumption = 30,954 (Btu/Sq Ft/Year)
Source Energy Consumption = 61,622 (Btu/Sq Ft/Year)

Floor Area = 20,592 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2
CEILING FANS

ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ2006	OIL FIRE TUBE STEAM												
OIL	747	691	560	196	0	0	0	0	0	99	368	644	3,304
PK	1.4	1.4	1.4	1.4	0.1	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4
1 EQ5020	HEAT WATER CIRC. PUMP C.V.												
ELEC	215	194	173	66	0	0	0	0	0	66	119	199	1,033
PK	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	93	84	75	28	0	0	0	0	0	28	52	86	446
PK	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	328	296	264	100	0	0	0	0	0	100	182	303	1,574
PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
1 EQ5061	CONDENSATE RETURN PUMP												
ELEC	4	4	4	1	0	0	0	0	0	1	2	4	21
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5406	MAKE-UP WATER												
WATER	0	0	0	0	0	0	0	0	0	0	0	0	2
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	104	94	84	32	0	0	0	0	0	32	58	97	501
PK	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2

UTILITY PEAK CHECKSUMS - ALTERNATIVE 2
CEILING FANS

----- UTILITY PEAK CHECKSUMS -----

Utility ELECTRIC DEMAND

Peak Value 110.0 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1160S	AIR-CLD COND COMP 25-35 TONS	77.5	70.50

Sub Total			77.5	70.50

Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	6.6	6.02

Sub Total			6.6	6.02

Sub Total			0.0	0.00

Miscellaneous

Lights			25.4	23.13

Base Utilities			0.0	0.00

Misc Equipment			0.4	0.35

Sub Total			25.8	23.48

Grand Total			110.0	100.00

Building 259

Trace Output File

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*****  
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**                                     **  
**          T R A C E   6 0 0   A N A L Y S I S          **  
**                                     **  
**          by                **  
**                                     **  
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 259

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 16: 2: 4 1/18/94
Dataset Name: CB259 .TM

AIRFLOW - ALTERNATIVE 1
BASE BUILDING

----- S Y S T E M S U M M A R Y -----

(Design Airflow Quantities)

System Number	System Type	Main					Auxil.	Room
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Supply Airflow (Cfm)	Exhaust Airflow (Cfm)
1	PTAC	0	1,386	1,386	1,815	429	0	0
2	RAD	0	0	0	0	705	0	0
Totals		0	1,386	1,386	1,815	1,134	0	0

CAPACITY - ALTERNATIVE 1
BASE BUILDING

----- S Y S T E M S U M M A R Y -----

(Design Capacity Quantities)

System Number	System Type	Cooling				Heating						
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	PTAC	4.1	0.0	0.0	4.1	-87,194	0	0	0	0	0	-87,194
2	RAD	0.0	0.0	0.0	0.0	-126,732	0	0	0	0	0	-126,732
Totals		4.1	0.0	0.0	4.1	-213,926	0	0	0	0	0	-213,926

The building peaked at hour 16 month 7 with a capacity of 4.1 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BASE BUILDING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	PTAC	0.00	1.09	340.3	313.5	38.27	1.09	-68.28	1,277
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-62.74	2,020

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/16 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	12,456		12,456	25.49	*	0	0.00	*	0	-10,120	12.31
Glass Solar	5,337	0		5,337	10.92	*	5,622	18.48	*	0	0	0.00
Glass Cond	1,369	0		1,369	2.80	*	1,322	4.34	*	-6,693	-6,693	8.14
Wall Cond	9,756	550		10,306	21.09	*	10,104	33.21	*	-32,830	-35,544	43.22
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	16,462			16,462	33.68	*	6,842	22.49	*	-29,888	-29,888	36.34
Sub Total==>	32,924	13,006		45,931	93.97	*	23,890	78.51	*	-69,411	-82,245	100.00
Internal Loads						*			*			
Lights	1,809	0		1,809	3.70	*	1,823	5.99	*	0	0	0.00
People	940			940	1.92	*	475	1.56	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	2,749	0	0	2,749	5.62	*	2,298	7.55	*	0	0	0.00
Ceiling Load	5,555	-5,555		0	0.00	*	4,240	13.93	*	-4,376	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				197	0.40	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	41,228	7,451	0	48,676	100.00	*	30,427	100.00	*	-73,787	-82,245	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	4.1	48.9	39.2	82.7 65.0 66.6	54.8 53.2 59.5	1,277		
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	4.1	48.9				794	0	0
						1,589	186	12

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	0	0	Clg Cfm/Sqft	1.09	SADB	54.8	116.9
Main Htg	-87.2	1,386	59.1	116.9	Infil	429	429	Clg Cfm/Ton	340.32	Plenum	82.7	60.0
Aux Htg	0.0	0	0.0	0.0	Supply	1,386	1,386	Clg Sqft/Ton	313.53	Return	82.6	60.0
Preheat	-0.0	1,386	60.0	54.7	Mincfm	0	0	Clg Btuh/Sqft	38.27	Ret/OA	82.6	60.0
Reheat	0.0	0	0.0	0.0	Return	1,386	1,386	No. People	3	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	1.09	Fn BldTD	0.0	0.0
Total	-87.2				Auxil	0	0	Htg Btuh/Sqft	-68.28	Fn Frict	0.1	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1

Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-8,992	7.09
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-10,233	-10,233	8.07
Wall Cond	0	0		0	0.00	*	0	0.00	*	-54,448	-58,430	46.11
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-49,077	-49,077	38.73
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-113,758	-126,732	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0			0	0.00	*	0	0.00	*	-14,707	0	0.00
Outside Air	0		0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-128,466	-126,732	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	2,020		
Aux Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	0		
Opt Vent	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	0.0	0.0				894	0	0
						2,610	284	11

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Main Htg	-126.7	0	0.0	0.0	Infil	0	705	Clg Cfm/Ton	0.00	Plenum	0.0	54.4
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	47.4
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	47.4
Reheat	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
Total	-126.7				Auxil	0	0	Htg Btuh/Sqft	-62.74	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

BUILDING U-VALUES - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Part.	ExFlr	Room U-Values (Btu/hr/sqft/F)						Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)	
				Summr Skylt	Wintr Skylt	Summr Roof	Wintr Windo	Windo	Wall	Ceil.		
1	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	156.2	36.57
2	MASTER BEDROOM	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	160.0	38.17
3	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	165.3	39.33
4	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	165.3	39.33
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	160.4	37.96
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	160.4	37.96
1	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	156.2	36.57
2	MASTER BEDROOM	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	160.0	38.17
3	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	165.3	39.33
4	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	165.3	39.33
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	160.4	37.96
5	VESTIBULE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	472.6	105.88
6	POWDER ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	472.6	105.88
7	KITCHEN, HALLWAY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	140.0	33.02
8	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	151.5	35.53
9	MAIN HALLWAY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	129.8	30.78
10	BATH NO. 2	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	305.1	69.96
11	BATH NO. 1	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	146.0	35.10
Zone	2 Total/Ave.	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	176.3	41.07
System	2 Total/Ave.	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	166.2	39.11
Building		0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	164.0	38.66

BUILDING AREAS - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate Flr	Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	LIVING ROOM	1	1	483	483	0	0	0	0	0	70	12	532
2	MASTER BEDROOM	1	1	356	356	0	0	0	0	356	54	12	383
3	BEDROOM NO. 1	1	1	219	219	0	0	0	0	219	31	11	244
4	BEDROOM NO. 2	1	1	219	219	0	0	0	0	219	31	11	244
Zone	1 Total/Ave.				1,277	0	0	0	0	794	186	12	1,404
System	1 Total/Ave.				1,277	0	0	0	0	794	186	12	1,404
1	LIVING ROOM	1	1	483	483	0	0	0	0	0	70	12	532
2	MASTER BEDROOM	1	1	356	356	0	0	0	0	356	54	12	383
3	BEDROOM NO. 1	1	1	219	219	0	0	0	0	219	31	11	244
4	BEDROOM NO. 2	1	1	219	219	0	0	0	0	219	31	11	244
Zone	1 Total/Ave.				1,277	0	0	0	0	794	186	12	1,404
5	VESTIBULE	1	1	26	26	0	0	0	0	0	6	6	89
6	POWDER ROOM	1	1	26	26	0	0	0	0	0	6	6	89
7	KITCHEN, HALLWAY	1	1	140	140	0	0	0	0	0	24	15	138
8	DINING ROOM	1	1	241	241	0	0	0	0	0	38	13	257
9	MAIN HALLWAY	1	1	210	210	0	0	0	0	0	4	2	191
10	BATH NO. 2	1	1	53	53	0	0	0	0	53	10	8	114
11	BATH NO. 1	1	1	47	47	0	0	0	0	47	11	20	46
Zone	2 Total/Ave.				743	0	0	0	0	100	98	10	922
System	2 Total/Ave.				2,020	0	0	0	0	894	284	11	2,326
Building					3,297	0	0	0	0	1,688	470	11	3,729

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BASE BUILDING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.232 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.417 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.364 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTvr) = 18.58 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTvw) = 10.72 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BASE BUILDING

----- S Y S T E M L O A D P R O F I L E -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.2	9	137	-10,696	8	387	69.3	0	0	0.0	0	0
5 - 10	0.4	13	194	-21,393	13	597	138.6	0	0	0.0	0	0
10 - 15	0.6	7	96	-32,089	18	835	207.9	0	0	0.0	0	0
15 - 20	0.8	8	112	-42,785	14	664	277.2	42	1,530	0.0	0	0
20 - 25	1.0	13	185	-53,482	17	824	346.5	0	0	0.0	0	0
25 - 30	1.2	13	193	-64,178	22	1,014	415.8	0	0	0.0	0	0
30 - 35	1.4	4	64	-74,874	8	394	485.1	0	0	0.0	0	0
35 - 40	1.6	9	128	-85,571	0	0	554.4	0	0	0.0	0	0
40 - 45	1.8	14	204	-96,267	0	0	623.8	0	0	0.0	0	0
45 - 50	2.0	1	11	-106,963	0	0	693.1	21	765	0.0	0	0
50 - 55	2.2	2	31	-117,659	0	0	762.4	0	0	0.0	0	0
55 - 60	2.4	3	51	-128,356	0	0	831.7	0	0	0.0	0	0
60 - 65	2.6	0	0	-139,052	0	0	901.0	0	0	0.0	0	0
65 - 70	2.9	0	0	-149,748	0	0	970.3	0	0	0.0	0	0
70 - 75	3.1	0	0	-160,445	0	0	1,039.6	0	0	0.0	0	0
75 - 80	3.3	1	20	-171,141	0	0	1,108.9	0	0	0.0	0	0
80 - 85	3.5	1	11	-181,837	0	0	1,178.2	0	0	0.0	0	0
85 - 90	3.7	0	0	-192,534	0	0	1,247.5	0	0	0.0	0	0
90 - 95	3.9	0	0	-203,230	0	0	1,316.8	0	0	0.0	0	0
95 - 100	4.1	2	31	-213,926	0	0	1,386.1	38	1,377	0.0	0	0
Hours Off	0.0	0	7,292	0	0	4,045	0.0	0	5,088	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
 BASE BUILDING

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature	----- Zone Number -----		
Range (F)	1	1	2

Max. Temp.	79.6	92.4	91.5
Mo./Hr.	7 14	8 21	8 24
Day Type	1	1	1

	 Number of Hours		
Above 100	0	0	0
95 - 100	0	0	0
90 - 95	0	1,200	243
85 - 90	0	766	1,581
80 - 85	0	878	1,104
75 - 80	2,776	792	438
70 - 75	895	172	629
65 - 70	425	4,952	4,765
60 - 65	320	0	0
55 - 60	1,153	0	0
50 - 55	508	0	0
Below 50	2,683	0	0

Min. Temp.	35.1	67.9	67.9
Mo./Hr.	2 11	4 3	2 17
Day Type	5	2	3

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BASE BUILDING

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	OIL (Therm)
Jan	1,011	2	515
Feb	913	2	498
March	1,021	2	329
April	951	2	136
May	491	2	0
June	1,129	8	0
July	1,971	8	0
Aug	1,067	8	0
Sept	468	8	0
Oct	727	2	58
Nov	976	2	243
Dec	1,005	2	441
Total	11,732	8	2,220

Building Energy Consumption = 79,484 (Btu/Sq Ft/Year)
Source Energy Consumption = 107,321 (Btu/Sq Ft/Year)

Floor Area = 3,297 (Sq Ft)

ELEC	2	2	2	2	0	0	0	0	0	1	2	2	14
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EQ5240 BOILER FORCED DRAFT FAN													
ELEC	94	85	94	87	0	0	0	0	0	47	91	94	593
PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
EQ5307 BOILER CONTROLS													
ELEC	372	336	372	344	0	0	0	0	0	185	360	372	2,341
PK	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
EQ5040 FUEL OIL PUMP C.V.													
ELEC	106	96	106	98	0	0	0	0	0	53	102	106	666
PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BASE BUILDING

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 8.2 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1161	AIR-CLD COND COMP <15 TONS	6.5	78.51

Sub Total			6.5	78.51

Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	1.44

Sub Total			0.1	1.44

Sub Total			0.0	0.00

Miscellaneous

Lights			1.6	20.05

Base Utilities			0.0	0.00

Misc Equipment			0.0	0.00

Sub Total			1.6	20.05

Grand Total			8.2	100.00

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**          T R A C E    6 0 0    A N A L Y S I S          **  
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 259

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 16:14:25 1/18/94
Dataset Name: CB259 .TM

AIRFLOW - ALTERNATIVE 2
WALL & ROOF INSULATION

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	Main					Auxil.	Room
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Supply Airflow (Cfm)	Exhaust Airflow (Cfm)
1	PTAC	0	773	773	1,138	366	0	0
2	RAD	0	0	0	0	600	0	0
Totals		0	773	773	1,138	966	0	0

CAPACITY - ALTERNATIVE 2
WALL & ROOF INSULATION

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	Cooling					Heating					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	PTAC	2.3	0.0	0.0	2.3	-40,496	0	0	0	0	0	-40,496
2	RAD	0.0	0.0	0.0	0.0	-63,017	0	0	0	0	0	-63,017
Totals		2.3	0.0	0.0	2.3	-103,513	0	0	0	0	0	-103,513

The building peaked at hour 16 month 7 with a capacity of 2.3 tons

ENGINEERING CHECKS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	PTAC	0.00	0.60	335.8	555.2	21.62	0.60	-31.71	1,277
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-31.20	2,020

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/16 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	2,238		2,238	8.11	*	0	0.00	*	0	-2,006	5.08
Glass Solar	5,695	0		5,695	20.63	*	5,677	31.87	*	0	0	0.00
Glass Cond	1,336	0		1,336	4.84	*	1,337	7.50	*	-6,693	-6,693	16.95
Wall Cond	1,364	115		1,478	5.36	*	1,427	8.01	*	-4,874	-5,319	13.47
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	15,006			15,006	54.36	*	5,934	33.31	*	-25,460	-25,460	64.49
Sub Total==>	23,400	2,352		25,753	93.30	*	14,375	80.70	*	-37,028	-39,478	100.00
Internal Loads						*			*			
Lights	1,006	0		1,006	3.64	*	1,819	10.21	*	0	0	0.00
People	734			734	2.66	*	470	2.64	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	1,740	0	0	1,740	6.31	*	2,288	12.85	*	0	0	0.00
Ceiling Load	1,431	-1,431		0	0.00	*	1,150	6.46	*	-1,153	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				110	0.40	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	26,572	921	0	27,603	100.00	*	17,813	100.00	*	-38,180	-39,478	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	2.3	27.6	18.4	773 77.0 64.2 71.7	53.7 52.1 56.7	1,277		
Aux Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	0		
Opt Vent	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	2.3	27.6				794	0	0
						1,589	186	12

-----AREAS-----

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	0	0	Clg Cfm/Sqft	0.60	SADB	53.8	113.4
Main Htg	-40.5	773	65.2	113.4	Infil	366	366	Clg Cfm/Ton	335.85	Plenum	77.0	65.8
Aux Htg	0.0	0	0.0	0.0	Supply	773	773	Clg Sqft/Ton	555.16	Return	77.0	65.8
Preheat	-0.0	773	65.8	53.7	Mincfm	0	0	Clg Btuh/Sqft	21.62	Ret/OA	77.0	65.8
Reheat	0.0	0	0.0	0.0	Return	773	773	No. People	3	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/SqFt	0.60	Fn BldTD	0.0	0.0
Total	-40.5				Auxil	0	0	Htg Btuh/SqFt	-31.71	Fn Frict	0.1	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-2,174	3.45
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-10,233	-10,233	16.24
Wall Cond	0	0		0	0.00	*	0	0.00	*	-8,084	-8,803	13.97
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-41,807	-41,807	66.34
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-60,123	-63,017	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-2,984	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-63,107	-63,017	100.00

-----COOLING COIL SELECTION-----

-----AREAS-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	Part
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	2,020	0
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Totals	0.0	0.0									894	0 0
											2,610	284 11

-----HEATING COIL SELECTION-----

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA		Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent					SADB	0.0	68.1
Main Htg	-63.0	0	0.0	0.0	Infil	0	600	Clg Cfm/Sqft	0.00	Plenum	0.0	65.0
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Cfm/Ton	0.00	Return	0.0	63.1
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	63.1
Reheat	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
Total	-63.0				Auxil	0	0	Htg Btuh/Sqft	-31.20	Fn Frict	0.0	0.0

BUILDING U-VALUES - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	158.9	37.10
2	MASTER BEDROOM	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	163.6	38.90
3	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	169.0	40.07
4	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	169.0	40.07
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	163.7	38.62
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	163.7	38.62
1	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	158.9	37.10
2	MASTER BEDROOM	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	163.6	38.90
3	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	169.0	40.07
4	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	169.0	40.07
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	163.7	38.62
5	VESTIBULE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	480.8	107.53
6	POWDER ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	480.8	107.53
7	KITCHEN, HALLWAY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	142.4	33.49
8	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	154.0	36.05
9	MAIN HALLWAY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	132.0	31.22
10	BATH NO. 2	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	311.3	71.20
11	BATH NO. 1	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	149.3	35.77
Zone	2 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	179.4	41.69
System	2 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	169.5	39.75
Building		0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	167.2	39.31

BUILDING AREAS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate Flr Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	LIVING ROOM	1 1	483	483	0	0	0	0	0	70	12	532
2	MASTER BEDROOM	1 1	356	356	0	0	0	0	356	54	12	383
3	BEDROOM NO. 1	1 1	219	219	0	0	0	0	219	31	11	244
4	BEDROOM NO. 2	1 1	219	219	0	0	0	0	219	31	11	244
Zone	1 Total/Ave.			1,277	0	0	0	0	794	186	12	1,404
System	1 Total/Ave.			1,277	0	0	0	0	794	186	12	1,404
1	LIVING ROOM	1 1	483	483	0	0	0	0	0	70	12	532
2	MASTER BEDROOM	1 1	356	356	0	0	0	0	356	54	12	383
3	BEDROOM NO. 1	1 1	219	219	0	0	0	0	219	31	11	244
4	BEDROOM NO. 2	1 1	219	219	0	0	0	0	219	31	11	244
Zone	1 Total/Ave.			1,277	0	0	0	0	794	186	12	1,404
5	VESTIBULE	1 1	26	26	0	0	0	0	0	6	6	89
6	POWDER ROOM	1 1	26	26	0	0	0	0	0	6	6	89
7	KITCHEN, HALLWAY	1 1	140	140	0	0	0	0	0	24	15	138
8	DINING ROOM	1 1	241	241	0	0	0	0	0	38	13	257
9	MAIN HALLWAY	1 1	210	210	0	0	0	0	0	4	2	191
10	BATH NO. 2	1 1	53	53	0	0	0	0	53	10	8	114
11	BATH NO. 1	1 1	47	47	0	0	0	0	47	11	20	46
Zone	2 Total/Ave.			743	0	0	0	0	100	98	10	922
System	2 Total/Ave.			2,020	0	0	0	0	894	284	11	2,326
Building				3,297	0	0	0	0	1,688	470	11	3,729

ASHRAE 90 ANALYSIS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.041 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.114 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.093 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 2.27 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 9.35 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2
WALL & ROOF INSULATION

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.1	9	82	-5,176	7	306	38.6	0	0	0.0	0	0
5 - 10	0.2	9	82	-10,351	11	451	77.3	0	0	0.0	0	0
10 - 15	0.3	7	63	-15,527	19	787	115.9	0	0	0.0	0	0
15 - 20	0.5	1	8	-20,703	18	764	154.5	42	1,530	0.0	0	0
20 - 25	0.6	10	90	-25,878	21	911	193.1	0	0	0.0	0	0
25 - 30	0.7	22	197	-31,054	20	829	231.8	0	0	0.0	0	0
30 - 35	0.8	5	47	-36,230	5	200	270.4	0	0	0.0	0	0
35 - 40	0.9	6	50	-41,405	0	0	309.0	0	0	0.0	0	0
40 - 45	1.0	8	71	-46,581	0	0	347.6	0	0	0.0	0	0
45 - 50	1.2	8	73	-51,756	0	0	386.3	21	765	0.0	0	0
50 - 55	1.3	5	42	-56,932	0	0	424.9	0	0	0.0	0	0
55 - 60	1.4	4	40	-62,108	0	0	463.5	0	0	0.0	0	0
60 - 65	1.5	0	0	-67,283	0	0	502.1	0	0	0.0	0	0
65 - 70	1.6	0	0	-72,459	0	0	540.8	0	0	0.0	0	0
70 - 75	1.7	0	0	-77,635	0	0	579.4	0	0	0.0	0	0
75 - 80	1.8	0	0	-82,810	0	0	618.0	0	0	0.0	0	0
80 - 85	2.0	2	20	-87,986	0	0	656.7	0	0	0.0	0	0
85 - 90	2.1	1	11	-93,162	0	0	695.3	0	0	0.0	0	0
90 - 95	2.2	0	0	-98,337	0	0	733.9	0	0	0.0	0	0
95 - 100	2.3	3	31	-103,513	0	0	772.5	38	1,377	0.0	0	0
Hours Off	0.0	0	7,853	0	0	4,512	0.0	0	5,088	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 2
 WALL & ROOF INSULATION

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature	----- Zone Number -----		
Range (F)	1	1	2
Max. Temp.	78.8	94.1	93.3
Mo./Hr.	7 14	9 20	9 20
Day Type	1	1	1
	 Number of Hours		
Above 100	0	0	0
95 - 100	0	0	0
90 - 95	0	1,773	1,489
85 - 90	0	463	736
80 - 85	0	1,100	753
75 - 80	2,928	272	592
70 - 75	500	808	846
65 - 70	700	4,344	4,344
60 - 65	797	0	0
55 - 60	771	0	0
50 - 55	1,165	0	0
Below 50	1,899	0	0
Min. Temp.	39.0	67.9	67.9
Mo./Hr.	2 11	4 3	4 2
Day Type	5	2	2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 2
WALL & ROOF INSULATION

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	OIL (Therm)
Jan	909	2	228
Feb	821	2	231
March	920	2	150
April	798	2	59
May	469	2	0
June	564	5	0
July	1,226	5	0
Aug	798	5	0
Sept	447	5	0
Oct	442	2	0
Nov	878	2	93
Dec	903	2	187
Total	9,174	5	949

Building Energy Consumption = 38,290 (Btu/Sq Ft/Year)
Source Energy Consumption = 58,802 (Btu/Sq Ft/Year)

Floor Area = 3,297 (Sq Ft)

----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2
 WALL & ROOF INSULATION

ELEC	1	1	1	1	0	0	0	0	0	0	1	1	6
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	47	42	47	37	0	0	0	0	0	0	45	47	266
PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	372	336	372	297	0	0	0	0	0	0	360	372	2,109
PK	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	53	48	53	42	0	0	0	0	0	0	51	53	299
PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

UTILITY PEAK CHECKSUMS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 5.5 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1161	AIR-CLD COND COMP <15 TONS	3.8	68.77

Sub Total			3.8	68.77

Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	1.20

Sub Total			0.1	1.20

Sub Total			0.0	0.00

Miscellaneous

Lights			1.6	30.02

Base Utilities			0.0	0.00

Misc Equipment			0.0	0.00

Sub Total			1.6	30.02

Grand Total			5.5	100.00

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**          T R A C E    6 0 0    A N A L Y S I S          **  
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 259

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 16:27:39 1/18/94
Dataset Name: CB259 .TM

AIRFLOW - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- S Y S T E M S U M M A R Y -----

(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil.	Room
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Supply Airflow (Cfm)	Exhaust Airflow (Cfm)
1	PTAC	0	1,402	1,402	1,752	350	0	0
2	RAD	0	0	0	0	574	0	0
Totals		0	1,402	1,402	1,752	924	0	0

CAPACITY - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- S Y S T E M S U M M A R Y -----

(Design Capacity Quantities)

System Number	System Type	----- Cooling -----					----- Heating -----					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	PTAC	3.8	0.0	0.0	3.8	-82,287	0	0	0	0	0	-82,287
2	RAD	0.0	0.0	0.0	0.0	-117,644	0	0	0	0	0	-117,644
Totals		3.8	0.0	0.0	3.8	-199,931	0	0	0	0	0	-199,931

The building peaked at hour 16 month 7 with a capacity of 3.8 tons

ENGINEERING CHECKS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				----- Heating -----		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	PTAC	0.00	1.10	367.4	334.5	35.87	1.10	-64.44	1,277
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-58.24	2,020

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/16 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	12,423		12,423	27.12	*	0	0.00	*	0	-10,054	13.12
Glass Solar	5,337	0		5,337	11.65	*	5,622	19.26	*	0	0	0.00
Glass Cond	1,369	0		1,369	2.99	*	1,322	4.53	*	-6,693	-6,693	8.73
Wall Cond	9,756	545		10,301	22.49	*	10,104	34.62	*	-32,830	-35,533	46.37
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	13,429			13,429	29.32	*	5,575	19.10	*	-24,353	-24,353	31.78
Sub Total==>	29,891	12,968		42,859	93.56	*	22,623	77.51	*	-63,876	-76,633	100.00
Internal Loads						*			*			
Lights	1,809	0		1,809	3.95	*	1,823	6.25	*	0	0	0.00
People	940			940	2.05	*	475	1.63	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	2,749	0	0	2,749	6.00	*	2,298	7.87	*	0	0	0.00
Ceiling Load	5,635	-5,635		0	0.00	*	4,265	14.61	*	-4,354	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				199	0.44	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat PkUp		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	38,275	7,333	0	45,807	100.00	*	29,185	100.00	*	-68,231	-76,633	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	3.8	45.8	37.8	1,402	82.8	65.1	66.5	55.8	54.2	61.7	Part	1,277
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	794
Totals	3.8	45.8									Wall	1,589
												186 12

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	ENGINEERING CHECKS--			TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA			Type	Clg	Htg
Main Htg	-82.3	1,402	58.8	112.7	Infil	350	350	Clg Cfm/Sqft	1.10		SADB	55.9	112.7
Aux Htg	0.0	0	0.0	0.0	Supply	1,402	1,402	Clg Cfm/Ton	367.40		Plenum	82.8	59.8
Preheat	-0.0	1,402	59.8	55.7	Mincfm	0	0	Clg Sqft/Ton	334.53		Return	82.7	59.8
Reheat	0.0	0	0.0	0.0	Return	1,402	1,402	Clg Btuh/Sqft	35.87		Ret/OA	82.7	59.8
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	3		Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0		Fn MtrTD	0.0	0.0
Total	-82.3				Auxil	0	0	Htg Cfm/SqFt	1.10		Fn BldTD	0.0	0.0
								Htg Btuh/SqFt	-64.44		Fn Frict	0.1	0.0

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1

Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-8,992	7.64
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-10,233	-10,233	8.70
Wall Cond	0	0		0	0.00	*	0	0.00	*	-54,448	-58,430	49.67
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-39,989	-39,989	33.99
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-104,670	-117,644	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-14,707	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat PkUp		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-119,377	-117,644	100.00

-----COOLING COIL SELECTION-----

-----AREAS-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	894
Totals	0.0	0.0									Wall	2,610
												284
												11

-----HEATING COIL SELECTION-----

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA		Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Main Htg	-117.6	0	0.0	0.0	Infil	0	574	Clg Cfm/Ton	0.00	Plenum	0.0	54.4
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	47.4
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	47.4
Reheat	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
Total	-117.6				Auxil	0	0	Htg Btuh/Sqft	-58.24	Fn Frict	0.0	0.0

BUILDING U-VALUES - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	156.2	36.57
2	MASTER BEDROOM	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	160.0	38.17
3	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	165.3	39.33
4	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	165.3	39.33
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	160.4	37.96
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	160.4	37.96
1	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	156.2	36.57
2	MASTER BEDROOM	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	160.0	38.17
3	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	165.3	39.33
4	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	165.3	39.33
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	160.4	37.96
5	VESTIBULE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	472.6	105.88
6	POWDER ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	472.6	105.88
7	KITCHEN, HALLWAY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	140.0	33.02
8	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	151.5	35.53
9	MAIN HALLWAY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.400	0.568	129.8	30.78
10	BATH NO. 2	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	305.1	69.96
11	BATH NO. 1	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	146.0	35.10
Zone	2 Total/Ave.	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	176.3	41.07
System	2 Total/Ave.	0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	166.2	39.11
Building		0.000	0.000	0.000	0.000	0.232	0.550	0.563	0.400	0.568	164.0	38.66

BUILDING AREAS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G A R E A S -----													
Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	LIVING ROOM	1	1	483	483	0	0	0	0	0	70	12	532
2	MASTER BEDROOM	1	1	356	356	0	0	0	0	356	54	12	383
3	BEDROOM NO. 1	1	1	219	219	0	0	0	0	219	31	11	244
4	BEDROOM NO. 2	1	1	219	219	0	0	0	0	219	31	11	244
Zone	1 Total/Ave.				1,277	0	0	0	0	794	186	12	1,404
System	1 Total/Ave.				1,277	0	0	0	0	794	186	12	1,404
1	LIVING ROOM	1	1	483	483	0	0	0	0	0	70	12	532
2	MASTER BEDROOM	1	1	356	356	0	0	0	0	356	54	12	383
3	BEDROOM NO. 1	1	1	219	219	0	0	0	0	219	31	11	244
4	BEDROOM NO. 2	1	1	219	219	0	0	0	0	219	31	11	244
Zone	1 Total/Ave.				1,277	0	0	0	0	794	186	12	1,404
5	VESTIBULE	1	1	26	26	0	0	0	0	0	6	6	89
6	POWDER ROOM	1	1	26	26	0	0	0	0	0	6	6	89
7	KITCHEN, HALLWAY	1	1	140	140	0	0	0	0	0	24	15	138
8	DINING ROOM	1	1	241	241	0	0	0	0	0	38	13	257
9	MAIN HALLWAY	1	1	210	210	0	0	0	0	0	4	2	191
10	BATH NO. 2	1	1	53	53	0	0	0	0	53	10	8	114
11	BATH NO. 1	1	1	47	47	0	0	0	0	47	11	20	46
Zone	2 Total/Ave.				743	0	0	0	0	100	98	10	922
System	2 Total/Ave.				2,020	0	0	0	0	894	284	11	2,326
Building					3,297	0	0	0	0	1,688	470	11	3,729

ASHRAE 90 ANALYSIS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.232 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.417 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.364 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 18.58 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 10.72 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.2	3	42	-9,997	8	365	70.1	0	0	0.0	0	0
5 - 10	0.4	18	266	-19,993	13	591	140.2	0	0	0.0	0	0
10 - 15	0.6	7	108	-29,990	17	792	210.4	0	0	0.0	0	0
15 - 20	0.8	6	93	-39,986	15	706	280.5	42	1,530	0.0	0	0
20 - 25	1.0	14	215	-49,983	18	851	350.6	0	0	0.0	0	0
25 - 30	1.1	10	154	-59,979	24	1,095	420.7	0	0	0.0	0	0
30 - 35	1.3	8	122	-69,976	5	244	490.9	0	0	0.0	0	0
35 - 40	1.5	7	108	-79,972	0	0	561.0	0	0	0.0	0	0
40 - 45	1.7	14	204	-89,969	0	0	631.1	0	0	0.0	0	0
45 - 50	1.9	3	50	-99,965	0	0	701.2	21	765	0.0	0	0
50 - 55	2.1	2	31	-109,962	0	0	771.3	0	0	0.0	0	0
55 - 60	2.3	2	31	-119,958	0	0	841.5	0	0	0.0	0	0
60 - 65	2.5	1	20	-129,955	0	0	911.6	0	0	0.0	0	0
65 - 70	2.7	0	0	-139,951	0	0	981.7	0	0	0.0	0	0
70 - 75	2.9	0	0	-149,948	0	0	1,051.8	0	0	0.0	0	0
75 - 80	3.1	0	0	-159,944	0	0	1,122.0	0	0	0.0	0	0
80 - 85	3.2	1	20	-169,941	0	0	1,192.1	0	0	0.0	0	0
85 - 90	3.4	1	11	-179,938	0	0	1,262.2	0	0	0.0	0	0
90 - 95	3.6	0	0	-189,934	0	0	1,332.3	0	0	0.0	0	0
95 - 100	3.8	2	31	-199,931	0	0	1,402.4	38	1,377	0.0	0	0
Hours Off	0.0	0	7,254	0	0	4,116	0.0	0	5,088	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 3
 WEATHERSTRIP & CAULKING

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature	----- Zone Number -----		
Range	1	1	2
(F)			

Max. Temp.	79.6	92.4	91.5
Mo./Hr.	7 14	8 21	8 24
Day Type	1	1	1

	 Number of Hours		
Above 100	0	0	0
95 - 100	0	0	0
90 - 95	0	1,200	243
85 - 90	0	766	1,581
80 - 85	0	878	1,104
75 - 80	2,878	792	455
70 - 75	845	206	701
65 - 70	385	4,918	4,676
60 - 65	308	0	0
55 - 60	1,196	0	0
50 - 55	533	0	0
Below 50	2,615	0	0

Min. Temp.	35.6	67.9	67.9
Mo./Hr.	2 11	1 20	2 7
Day Type	5	1	2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	OIL
	Off Peak (kWh)	On Peak (kW)	
Jan	996	2	479
Feb	900	2	460
March	1,007	2	302
April	926	2	117
May	492	2	0
June	1,155	8	0
July	1,947	8	0
Aug	1,089	8	0
Sept	469	7	0
Oct	691	2	47
Nov	962	2	226
Dec	991	2	412
Total	11,625	8	2,044

Building Energy Consumption = 74,018 (Btu/Sq Ft/Year)
Source Energy Consumption = 101,351 (Btu/Sq Ft/Year)

Floor Area = 3,297 (Sq Ft)

----- EQUIPMENT ENERGY CONSUMPTION

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3
 WEATHERSTRIP & CAULKING

ELEC	2	2	2	2	0	0	0	0	0	1	2	2	13
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	88	79	88	79	0	0	0	0	0	39	85	88	544
PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	372	336	372	336	0	0	0	0	0	166	360	372	2,314
PK	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	98	89	98	89	0	0	0	0	0	44	95	98	611
PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1

UTILITY PEAK CHECKSUMS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 7.8 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percent Of Tot (%)

Cooling Equipment

1	EQ1161	AIR-CLD COND COMP <15 TONS	6.1	77.43

Sub Total			6.1	77.43

Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	1.53

Sub Total			0.1	1.53

Sub Total			0.0	0.00

Miscellaneous

Lights			1.6	21.04

Base Utilities			0.0	0.00

Misc Equipment			0.0	0.00

Sub Total			1.6	21.04

Grand Total			7.8	100.00

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**                                     **
**          T R A C E   6 0 0   A N A L Y S I S          **
**                                     **
**          by                **
**                                     **
*****
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 259

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 16:39:48 1/18/94
Dataset Name: CB259 .TM

AIRFLOW - ALTERNATIVE 4
COMBINED ECOS

----- S Y S T E M S U M M A R Y -----

(Design Airflow Quantities)

System Number	System Type	Main					Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)		
1	PTAC	0	664	664	950	286	0	0
2	RAD	0	0	0	0	470	0	0
Totals		0	664	664	950	756	0	0

CAPACITY - ALTERNATIVE 4
COMBINED ECOS

----- S Y S T E M S U M M A R Y -----

(Design Capacity Quantities)

System Number	System Type	Cooling					Heating					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	PTAC	2.0	0.0	0.0	2.0	-34,973	0	0	0	0	0	-34,973
2	RAD	0.0	0.0	0.0	0.0	-53,929	0	0	0	0	0	-53,929
Totals		2.0	0.0	0.0	2.0	-88,901	0	0	0	0	0	-88,901

The building peaked at hour 16 month 7 with a capacity of 2.0 tons

ENGINEERING CHECKS - ALTERNATIVE 4
COMBINED ECOS

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	PTAC	0.00	0.52	326.4	627.8	19.11	0.52	-27.39	1,277
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-26.70	2,020

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/16 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	2,338		2,338	9.58	*	0	0.00	*	0	-2,000	5.89
Glass Solar	5,337	0		5,337	21.87	*	5,677	34.25	*	0	0	0.00
Glass Cond	1,369	0		1,369	5.61	*	1,337	8.06	*	-6,693	-6,693	19.72
Wall Cond	1,415	118		1,534	6.28	*	1,427	8.61	*	-4,874	-5,317	15.67
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	10,987			10,987	45.01	*	4,644	28.02	*	-19,925	-19,925	58.71
Sub Total==>	19,109	2,457		21,566	88.35	*	13,085	78.93	*	-31,493	-33,936	100.00
Internal Loads						*			*			
Lights	1,809	0		1,809	7.41	*	1,819	10.97	*	0	0	0.00
People	940			940	3.85	*	470	2.83	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	2,749	0	0	2,749	11.26	*	2,288	13.81	*	0	0	0.00
Ceiling Load	1,547	-1,547		0	0.00	*	1,204	7.26	*	-1,244	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				94	0.39	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat PkUp		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	23,405	910	0	24,409	100.00	*	16,577	100.00	*	-32,737	-33,936	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	2.0	24.4	17.8	664 77.2 63.2 66.5	52.0 50.3 53.0	Part	1,277	
Aux Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	Roof	794	0 0
Totals	2.0	24.4				Wall	1,589	186 12

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	0	0	Clg Cfm/Sqft	0.52	SADB	52.1	113.3
Main Htg	-35.0	664	64.9	113.3	Infil	286	286	Clg Cfm/Ton	326.40	Plenum	77.1	65.6
Aux Htg	0.0	0	0.0	0.0	Supply	664	664	Clg Sqft/Ton	627.81	Return	77.2	65.6
Preheat	-0.0	664	65.6	51.9	Mincfm	0	0	Clg Btuh/Sqft	19.11	Ret/OA	77.2	65.6
Reheat	0.0	0	0.0	0.0	Return	664	664	No. People	3	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	0.52	Fn BldTD	0.0	0.0
Total	-35.0				Auxil	0	0	Htg Btuh/Sqft	-27.39	Fn Frict	0.1	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percent Of Tot (%)	*	Space Sensible (Btuh)	Percent Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percent Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	-2,174	4.03
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-10,233	-10,233	18.97
Wall Cond	0	0		0	0.00	*	0	0.00	*	-8,084	-8,803	16.32
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-32,718	-32,718	60.67
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-51,035	-53,929	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-2,984	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-54,019	-53,929	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf)	(%)
Main Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Part	2,020	
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	894	0 0
Totals	0.0	0.0				Wall	2,610	284 11

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-53.9	0	0.0	0.0	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	470	Clg Cfm/Ton	0.00	Plenum	0.0	65.0
Preheat	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	63.1
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	63.1
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-53.9				Rm Exh	0	0	Htg Cfm/SqFt	0.00	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/SqFt	-26.70	Fn Frict	0.0	0.0

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

BUILDING U-VALUES - ALTERNATIVE 4
COMBINED ECOS

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceill.		
1	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	158.9	37.10
2	MASTER BEDROOM	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	163.6	38.90
3	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	169.0	40.07
4	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	169.0	40.07
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	163.7	38.62
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	163.7	38.62
1	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	158.9	37.10
2	MASTER BEDROOM	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	163.6	38.90
3	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	169.0	40.07
4	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	169.0	40.07
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	163.7	38.62
5	VESTIBULE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	480.8	107.53
6	POWDER ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	480.8	107.53
7	KITCHEN, HALLWAY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	142.4	33.49
8	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	154.0	36.05
9	MAIN HALLWAY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.059	0.568	132.0	31.22
10	BATH NO. 2	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	311.3	71.20
11	BATH NO. 1	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	149.3	35.77
Zone	2 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	179.4	41.69
System	2 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	169.5	39.75
Building		0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.059	0.568	167.2	39.31

BUILDING AREAS - ALTERNATIVE 4
COMBINED ECOS

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate Flr Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	LIVING ROOM	1	1	483	483	0	0	0	0	70	12	532
2	MASTER BEDROOM	1	1	356	356	0	0	0	356	54	12	383
3	BEDROOM NO. 1	1	1	219	219	0	0	0	219	31	11	244
4	BEDROOM NO. 2	1	1	219	219	0	0	0	219	31	11	244
Zone	1 Total/Ave.			1,277	0	0	0	0	794	186	12	1,404
System	1 Total/Ave.			1,277	0	0	0	0	794	186	12	1,404
1	LIVING ROOM	1	1	483	483	0	0	0	0	70	12	532
2	MASTER BEDROOM	1	1	356	356	0	0	0	356	54	12	383
3	BEDROOM NO. 1	1	1	219	219	0	0	0	219	31	11	244
4	BEDROOM NO. 2	1	1	219	219	0	0	0	219	31	11	244
Zone	1 Total/Ave.			1,277	0	0	0	0	794	186	12	1,404
5	VESTIBULE	1	1	26	26	0	0	0	0	6	6	89
6	POWDER ROOM	1	1	26	26	0	0	0	0	6	6	89
7	KITCHEN, HALLWAY	1	1	140	140	0	0	0	0	24	15	138
8	DINING ROOM	1	1	241	241	0	0	0	0	38	13	257
9	MAIN HALLWAY	1	1	210	210	0	0	0	0	4	2	191
10	BATH NO. 2	1	1	53	53	0	0	0	53	10	8	114
11	BATH NO. 1	1	1	47	47	0	0	0	47	11	20	46
Zone	2 Total/Ave.			743	0	0	0	0	100	98	10	922
System	2 Total/Ave.			2,020	0	0	0	0	894	284	11	2,326
Building				3,297	0	0	0	0	1,688	470	11	3,729

ASHRAE 90 ANALYSIS - ALTERNATIVE 4
COMBINED ECOS

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.041 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.114 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.093 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 2.27 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 9.35 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 4
COMBINED ECOS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.1	13	148	-4,445	10	396	33.2	0	0	0.0	0	0
5 - 10	0.2	6	68	-8,890	11	450	66.4	0	0	0.0	0	0
10 - 15	0.3	8	85	-13,335	14	576	99.6	0	0	0.0	0	0
15 - 20	0.4	7	75	-17,780	19	769	132.8	42	1,530	0.0	0	0
20 - 25	0.5	7	81	-22,225	22	872	166.0	0	0	0.0	0	0
25 - 30	0.6	17	186	-26,670	20	791	199.2	0	0	0.0	0	0
30 - 35	0.7	5	54	-31,116	3	132	232.4	0	0	0.0	0	0
35 - 40	0.8	6	62	-35,561	0	0	265.6	0	0	0.0	0	0
40 - 45	0.9	4	40	-40,006	0	0	298.8	0	0	0.0	0	0
45 - 50	1.0	7	82	-44,451	0	0	332.0	21	765	0.0	0	0
50 - 55	1.1	10	108	-48,896	0	0	365.2	0	0	0.0	0	0
55 - 60	1.2	1	11	-53,341	0	0	398.4	0	0	0.0	0	0
60 - 65	1.3	4	40	-57,786	0	0	431.5	0	0	0.0	0	0
65 - 70	1.4	0	0	-62,231	0	0	464.7	0	0	0.0	0	0
70 - 75	1.5	0	0	-66,676	0	0	497.9	0	0	0.0	0	0
75 - 80	1.6	0	0	-71,121	0	0	531.1	0	0	0.0	0	0
80 - 85	1.7	0	0	-75,566	0	0	564.3	0	0	0.0	0	0
85 - 90	1.8	0	0	-80,011	0	0	597.5	0	0	0.0	0	0
90 - 95	1.9	0	0	-84,456	0	0	630.7	0	0	0.0	0	0
95 - 100	2.0	6	62	-88,901	0	0	663.9	38	1,377	0.0	0	0
Hours Off	0.0	0	7,658	0	0	4,774	0.0	0	5,088	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 4
 COMBINED ECOS

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature	----- Zone Number -----		
Range	1	1	2
(F)			

Max. Temp.	78.8	94.1	93.3
Mo./Hr.	7 14	9 20	9 20
Day Type	1	1	1

	 Number of Hours		
Above 100	0	0	0
95 - 100	0	0	0
90 - 95	0	1,773	1,489
85 - 90	0	497	838
80 - 85	0	1,094	703
75 - 80	2,928	339	630
70 - 75	590	713	863
65 - 70	656	4,344	4,232
60 - 65	1,019	0	0
55 - 60	673	0	0
50 - 55	1,226	0	0
Below 50	1,668	0	0

Min. Temp.	41.0	67.9	67.9
Mo./Hr.	2 10	3 20	4 4
Day Type	5	1	2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 4
COMBINED ECOS

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	OIL (Therm)
Jan	894	2	192
Feb	808	2	193
March	905	2	123
April	707	2	40
May	465	2	0
June	585	5	0
July	1,251	5	0
Aug	845	5	0
Sept	443	5	0
Oct	442	2	0
Nov	765	2	48
Dec	889	2	159
Total	9,000	5	755

Building Energy Consumption = 32,209 (Btu/Sq Ft/Year)
Source Energy Consumption = 52,050 (Btu/Sq Ft/Year)

Floor Area = 3,297 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4
COMBINED ECOS

ELEC	1	1	1	1	0	0	0	0	0	0	1	1	5
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ5240	BOILER FORCED DRAFT FAN												
ELEC	40	36	40	25	0	0	0	0	0	0	30	40	212
PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
1 EQ5307	BOILER CONTROLS												
ELEC	372	336	372	233	0	0	0	0	0	0	280	372	1,965
PK	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
1 EQ5040	FUEL OIL PUMP C.V.												
ELEC	45	41	45	28	0	0	0	0	0	0	34	45	238
PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

UTILITY PEAK CHECKSUMS - ALTERNATIVE 4
COMBINED ECOS

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 5.1 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1161	AIR-CLD COND COMP <15 TONS	3.4	66.42
Sub Total			3.4	66.42
Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	1.12
Sub Total			0.1	1.12
Sub Total			0.0	0.00

Miscellaneous

Lights	1.6	32.46
Base Utilities	0.0	0.00
Misc Equipment	0.0	0.00
Sub Total	1.6	32.46
Grand Total	5.1	100.00

*Building 311
(Typical for 312)*

Trace Input File

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LINE # -----

1 JOB - 1

2 01/ENERGY SAVINGS OPPORTUNITY STUDY

3 01/CARLISLE BARRACKS, PA

4 01/DEPARTMENT OF THE ARMY

5 01/BENATEC ASSOCIATES

6 01/BUILDING 311

7 08/CARLISLE

8 09/MAY/SEP////APR/OCT

9 10/CLTD-CLF

10 11///ZONE

11 LOAD - 1

12 19/1/BASE BUILDING

13 20/1/1/HALL/117/1/1/.8/.45/10.8//2

14 20/2/1/LIVING ROOM/188/1/1/.8/.45/10.8//2

15 20/3/1/FAMILY ROOM/255/1/1/.8/.45/10.8//2

16 20/4/1/BEDROOM NO. 1/175/1/1/0//10.8//2

17 20/5/1/BEDROOM NO. 2/189/1/1/0//10.8//2

18 20/6/1/SEWING ROOM/218/1/1/0//10.8//2

19 20/7/2/BATH/49/1/1/.8/.45/10.8//2

20 20/8/2/KITCHEN/218/1/1/.8/.45/10.8//2

21 20/9/2/DINING ROOM/184/1/1/.8/.45/10.8//2

22 20/10/2/BATH/49/1/1/0//10.8//2

23 20/11/2/BEDROOM NO. 3/184/1/1/0//10.8//2

24 20/12/2/HALL/141/1/1/0//10.8//2

25 20/13/2/BATH/39/1/1/0//10.8//2

26 21/M////CBLQTX////CBLQTX

27 22/4/1/YES////176

28 22/5/1/YES////176

29 22/6/1/YES////176

30 22/10/1/YES////176

31 22/11/1/YES////176

32 22/12/1/YES////176

33 22/13/1/YES////176

34 24/1/1/6/9.8//178/109

35 24/2/1/15/9.8//178/19

36 24/2/2/13/9.8//178/109

37 24/3/1/11/9.8//178/19

38 24/4/1/15/9.8//178/19

39 24/4/2/13/9.8//178/109

40 24/5/1/11/9.8//178/19

41 24/6/1/7/9.8//178/289

42 24/7/1/7/9.8//178/289

43 24/7/2/7/9.8//178/19

44 24/8/1/7/9.8//178/289

45 24/9/1/12/9.8//178/289

46 24/9/2/15/9.8//178/19

47 24/9/3/7/9.8//178/109

48 24/10/1/7/9.8//178/289

49 24/10/2/7/9.8//178/19

50 24/11/1/12/9.8//178/289

51 24/11/2/15/9.8//178/19

52 24/11/3/7/9.8//178/109

53 24/13/1/6/9.8//178/109

54 25/1/1/3.6/1/1/1.04/1

55 25/2/1/4/1.5/2/.55/.57

56 25/2/2/4/1.5/2/.55/.57

57 25/3/1/4.5/2.25/2/.55/.57

58 25/4/1/4/1.5/2/.55/.57

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LINE #	-----
59	25/5/1/4.5/2.25/2/.55/.57
60	25/6/1/4/1.5/1/.55/.57
61	25/7/1/3/1.25/1/.55/.57
62	25/8/1/3/1.25/1/.55/.57
63	25/9/1/4/1.5/2/.55/.57
64	25/9/2/4/1.5/2/.55/.57
65	25/9/3/3.6/1/1/1.04/1
66	25/10/1/4/1.5/1/.55/.57
67	25/11/1/4/1.5/2/.55/.57
68	25/11/2/4/1.5/2/.55/.57
69	25/11/3/4/1.5/1/.55/.57
70	25/13/1/4/1.5/1/.55/.57
71	26/M/CBLQP/CBLQL/OFF//OFF/CBLQCLG/OFF/OFF/OFF/OFF
72	27/M/502/SF-PERS/230/190/.5/WATT-SF/INCAND
73	29/1/////31/CFM-SF/.31/CFM-SF
74	29/2/////31/CFM-SF/.31/CFM-SF
75	29/3/////31/CFM-SF/.31/CFM-SF
76	29/4/////31/CFM-SF/.31/CFM-SF
77	29/5/////31/CFM-SF/.31/CFM-SF
78	29/6/////31/CFM-SF/.31/CFM-SF
79	29/7/////31/CFM-SF
80	29/8/////31/CFM-SF
81	29/9/////31/CFM-SF
82	29/10/////31/CFM-SF
83	29/11/////31/CFM-SF
84	29/12/////31/CFM-SF
85	29/13/////31/CFM-SF
86	SYSTEM - 1
87	39/1/BASE BUILDING
88	40/1/PTAC
89	41/1/1/1
90	42/1/.2
91	45/1/CBLQCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
92	40/2/RAD
93	41/2/1/2
94	45/2/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF
95	EQUIPMENT - 1
96	59/1/CARLISLE///BASE BUILDING
97	60/1/1/PKPLANT/1/1
98	62/1/EQ1161/8
99	65/1/1/2/2
100	67/1/EQ2102/1
101	69/1/EQ4003
102	LOAD - 2
103	19/2/WALL & ROOF INSULATION
104	20/1/1/HALL/117/1/1/.8/.45/10.8//2
105	20/2/1/LIVING ROOM/188/1/1/.8/.45/10.8//2
106	20/3/1/FAMILY ROOM/255/1/1/.8/.45/10.8//2
107	20/4/1/BEDROOM NO. 1/175/1/1/0//10.8//2
108	20/5/1/BEDROOM NO. 2/189/1/1/0//10.8//2
109	20/6/1/SEWING ROOM/218/1/1/0//10.8//2
110	20/7/2/BATH/49/1/1/.8/.45/10.8//2
111	20/8/2/KITCHEN/218/1/1/.8/.45/10.8//2
112	20/9/2/DINING ROOM/184/1/1/.8/.45/10.8//2
113	20/10/2/BATH/49/1/1/0//10.8//2
114	20/11/2/BEDROOM NO. 3/184/1/1/0//10.8//2
115	20/12/2/HALL/141/1/1/0//10.8//2
116	20/13/2/BATH/39/1/1/0//10.8//2

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LINE #	
117	21/M////CBLQTX///CBLQTX
118	22/4/1/YES////177
119	22/5/1/YES////177
120	22/6/1/YES////177
121	22/10/1/YES////177
122	22/11/1/YES////177
123	22/12/1/YES////177
124	22/13/1/YES////177
125	24/1/1/6/9.8//190/109
126	24/2/1/15/9.8//190/19
127	24/2/2/13/9.8//190/109
128	24/3/1/11/9.8//190/19
129	24/4/1/15/9.8//190/19
130	24/4/2/13/9.8//190/109
131	24/5/1/11/9.8//190/19
132	24/6/1/7/9.8//190/289
133	24/7/1/7/9.8//190/289
134	24/7/2/7/9.8//190/19
135	24/8/1/7/9.8//190/289
136	24/9/1/12/9.8//190/289
137	24/9/2/15/9.8//190/19
138	24/9/3/7/9.8//190/109
139	24/10/1/7/9.8//190/289
140	24/10/2/7/9.8//190/19
141	24/11/1/12/9.8//190/289
142	24/11/2/15/9.8//190/19
143	24/11/3/7/9.8//190/109
144	24/13/1/6/9.8//190/109
145	25/1/1/3.6/1/1/1.04/1
146	25/2/1/4/1.5/2/.55/.57
147	25/2/2/4/1.5/2/.55/.57
148	25/3/1/4.5/2.25/2/.55/.57
149	25/4/1/4/1.5/2/.55/.57
150	25/5/1/4.5/2.25/2/.55/.57
151	25/6/1/4/1.5/1/.55/.57
152	25/7/1/3/1.25/1/.55/.57
153	25/8/1/3/1.25/1/.55/.57
154	25/9/1/4/1.5/2/.55/.57
155	25/9/2/4/1.5/2/.55/.57
156	25/9/3/3.6/1/1/1.04/1
157	25/10/1/4/1.5/1/.55/.57
158	25/11/1/4/1.5/2/.55/.57
159	25/11/2/4/1.5/2/.55/.57
160	25/11/3/4/1.5/1/.55/.57
161	25/13/1/4/1.5/1/.55/.57
162	26/M/CBLQP/CBLQL/OFF//OFF/CBLQCLG/OFF/OFF/OFF/OFF
163	27/M/502/SF-PERS/230/190/.5/WATT-SF/INCAND
164	29/1///// .26/CFM-SF/.26/CFM-SF
165	29/2///// .26/CFM-SF/.26/CFM-SF
166	29/3///// .26/CFM-SF/.26/CFM-SF
167	29/4///// .26/CFM-SF/.26/CFM-SF
168	29/5///// .26/CFM-SF/.26/CFM-SF
169	29/6///// .26/CFM-SF/.26/CFM-SF
170	29/7///// .26/CFM-SF
171	29/8///// .26/CFM-SF
172	29/9///// .26/CFM-SF
173	29/10///// .26/CFM-SF
174	29/11///// .26/CFM-SF

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LINE #	-----
175	29/12////////.26/CFM-SF
176	29/13////////.26/CFM-SF
177	SYSTEM - 2
178	39/2/WALL & ROOF INSULATION
179	40/1/PTAC
180	41/1/1/1
181	42/1/.2
182	45/1/CBLQCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
183	40/2/RAD
184	41/2/1/2
185	45/2/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF
186	EQUIPMENT - 2
187	59/2/CARLISLE///WALL & ROOF INSULATION
188	60/1/1/PKPLANT/1/1
189	62/1/EQ1161/8
190	65/1/1//2/2
191	67/1/EQ2102/1
192	69/1/EQ4003
193	LOAD - 3
194	19/3/WEATHERSTRIP & CAULKING
195	20/1/1/HALL/117/1/1/.8/.45/10.8//2
196	20/2/1/LIVING ROOM/188/1/1/.8/.45/10.8//2
197	20/3/1/FAMILY ROOM/255/1/1/.8/.45/10.8//2
198	20/4/1/BEDROOM NO. 1/175/1/1/0//10.8//2
199	20/5/1/BEDROOM NO. 2/189/1/1/0//10.8//2
200	20/6/1/SEWING ROOM/218/1/1/0//10.8//2
201	20/7/2/BATH/49/1/1/.8/.45/10.8//2
202	20/8/2/KITCHEN/218/1/1/.8/.45/10.8//2
203	20/9/2/DINING ROOM/184/1/1/.8/.45/10.8//2
204	20/10/2/BATH/49/1/1/0//10.8//2
205	20/11/2/BEDROOM NO. 3/184/1/1/0//10.8//2
206	20/12/2/HALL/141/1/1/0//10.8//2
207	20/13/2/BATH/39/1/1/0//10.8//2
208	21/M////CBLQTX///CBLQTX
209	22/4/1/YES////176
210	22/5/1/YES////176
211	22/6/1/YES////176
212	22/10/1/YES////176
213	22/11/1/YES////176
214	22/12/1/YES////176
215	22/13/1/YES////176
216	24/1/1/6/9.8//178/109
217	24/2/1/15/9.8//178/19
218	24/2/2/13/9.8//178/109
219	24/3/1/11/9.8//178/19
220	24/4/1/15/9.8//178/19
221	24/4/2/13/9.8//178/109
222	24/5/1/11/9.8//178/19
223	24/6/1/7/9.8//178/289
224	24/7/1/7/9.8//178/289
225	24/7/2/7/9.8//178/19
226	24/8/1/7/9.8//178/289
227	24/9/1/12/9.8//178/289
228	24/9/2/15/9.8//178/19
229	24/9/3/7/9.8//178/109
230	24/10/1/7/9.8//178/289
231	24/10/2/7/9.8//178/19
232	24/11/1/12/9.8//178/289

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LINE #	
233	24/11/2/15/9.8//178/19
234	24/11/3/7/9.8//178/109
235	24/13/1/6/9.8//178/109
236	25/1/1/3.6/1/1/1.04/1
237	25/2/1/4/1.5/2/.55/.57
238	25/2/2/4/1.5/2/.55/.57
239	25/3/1/4.5/2.25/2/.55/.57
240	25/4/1/4/1.5/2/.55/.57
241	25/5/1/4.5/2.25/2/.55/.57
242	25/6/1/4/1.5/1/.55/.57
243	25/7/1/3/1.25/1/.55/.57
244	25/8/1/3/1.25/1/.55/.57
245	25/9/1/4/1.5/2/.55/.57
246	25/9/2/4/1.5/2/.55/.57
247	25/9/3/3.6/1/1/1.04/1
248	25/10/1/4/1.5/1/.55/.57
249	25/11/1/4/1.5/2/.55/.57
250	25/11/2/4/1.5/2/.55/.57
251	25/11/3/4/1.5/1/.55/.57
252	25/13/1/4/1.5/1/.55/.57
253	26/M/CBLQP/CBLQL/OFF//OFF/CBLQCLG/OFF/OFF/OFF/OFF
254	27/M/502/SF-PERS/230/190/.5/WATT-SF/INCAND
255	29/1////////.25/CFM-SF/.25/CFM-SF
256	29/2////////.25/CFM-SF/.25/CFM-SF
257	29/3////////.25/CFM-SF/.25/CFM-SF
258	29/4////////.25/CFM-SF/.25/CFM-SF
259	29/5////////.25/CFM-SF/.25/CFM-SF
260	29/6////////.25/CFM-SF/.25/CFM-SF
261	29/7////////.25/CFM-SF
262	29/8////////.25/CFM-SF
263	29/9////////.25/CFM-SF
264	29/10////////.25/CFM-SF
265	29/11////////.25/CFM-SF
266	29/12////////.25/CFM-SF
267	29/13////////.25/CFM-SF
268	SYSTEM - 3
269	39/3/WEATHERSTRIP & CAULKING
270	40/1/PTAC
271	41/1/1/1
272	42/1/.2
273	45/1/CBLQCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
274	40/2/RAD
275	41/2/1/2
276	45/2/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF
277	EQUIPMENT - 3
278	59/3/CARLISLE///WEATHERSTRIP & CAULKING
279	60/1/1/PKPLANT/1/1
280	62/1/EQ1161/8
281	65/1/1//2/2
282	67/1/EQ2102/1
283	69/1/EQ4003
284	LOAD - 4
285	19/4/COMBINED ECOS
286	20/1/1/HALL/117/1/1/.8/.45/10.8//2
287	20/2/1/LIVING ROOM/188/1/1/.8/.45/10.8//2
288	20/3/1/FAMILY ROOM/255/1/1/.8/.45/10.8//2
289	20/4/1/BEDROOM NO. 1/175/1/1/0//10.8//2
290	20/5/1/BEDROOM NO. 2/189/1/1/0//10.8//2

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LINE #	
291	20/6/1/SEWING ROOM/218/1/1/0//10.8//2
292	20/7/2/BATH/49/1/1/.8/.45/10.8//2
293	20/8/2/KITCHEN/218/1/1/.8/.45/10.8//2
294	20/9/2/DINING ROOM/184/1/1/.8/.45/10.8//2
295	20/10/2/BATH/49/1/1/0//10.8//2
296	20/11/2/BEDROOM NO. 3/184/1/1/0//10.8//2
297	20/12/2/HALL/141/1/1/0//10.8//2
298	20/13/2/BATH/39/1/1/0//10.8//2
299	21/M////CBLQTX//CBLQTX
300	22/4/1/YES////177
301	22/5/1/YES////177
302	22/6/1/YES////177
303	22/10/1/YES////177
304	22/11/1/YES////177
305	22/12/1/YES////177
306	22/13/1/YES////177
307	24/1/1/6/9.8//190/109
308	24/2/1/15/9.8//190/19
309	24/2/2/13/9.8//190/109
310	24/3/1/11/9.8//190/19
311	24/4/1/15/9.8//190/19
312	24/4/2/13/9.8//190/109
313	24/5/1/11/9.8//190/19
314	24/6/1/7/9.8//190/289
315	24/7/1/7/9.8//190/289
316	24/7/2/7/9.8//190/19
317	24/8/1/7/9.8//190/289
318	24/9/1/12/9.8//190/289
319	24/9/2/15/9.8//190/19
320	24/9/3/7/9.8//190/109
321	24/10/1/7/9.8//190/289
322	24/10/2/7/9.8//190/19
323	24/11/1/12/9.8//190/289
324	24/11/2/15/9.8//190/19
325	24/11/3/7/9.8//190/109
326	24/13/1/6/9.8//190/109
327	25/1/1/3.6/1/1/1.04/1
328	25/2/1/4/1.5/2/.55/.57
329	25/2/2/4/1.5/2/.55/.57
330	25/3/1/4.5/2.25/2/.55/.57
331	25/4/1/4/1.5/2/.55/.57
332	25/5/1/4.5/2.25/2/.55/.57
333	25/6/1/4/1.5/1/.55/.57
334	25/7/1/3/1.25/1/.55/.57
335	25/8/1/3/1.25/1/.55/.57
336	25/9/1/4/1.5/2/.55/.57
337	25/9/2/4/1.5/2/.55/.57
338	25/9/3/3.6/1/1/1.04/1
339	25/10/1/4/1.5/1/.55/.57
340	25/11/1/4/1.5/2/.55/.57
341	25/11/2/4/1.5/2/.55/.57
342	25/11/3/4/1.5/1/.55/.57
343	25/13/1/4/1.5/1/.55/.57
344	26/M/CBLQP/CBLQL/OFF//OFF/CBLQCLG/OFF/OFF/OFF/OFF
345	27/M/502/SF-PERS/230/190/.5/WATT-SF/INCAND
346	29/1/////20/CFM-SF/.20/CFM-SF
347	29/2/////20/CFM-SF/.20/CFM-SF
348	29/3/////20/CFM-SF/.20/CFM-SF

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LINE #	-----
349	29/4////////.20/CFM-SF/.20/CFM-SF
350	29/5////////.20/CFM-SF/.20/CFM-SF
351	29/6////////.20/CFM-SF/.20/CFM-SF
352	29/7////////.20/CFM-SF
353	29/8////////.20/CFM-SF
354	29/9////////.20/CFM-SF
355	29/10////////.20/CFM-SF
356	29/11////////.20/CFM-SF
357	29/12////////.20/CFM-SF
358	29/13////////.20/CFM-SF
359	SYSTEM - 4
360	39/4/COMBINED ECOS
361	40/1/PTAC
362	41/1/1/1
363	42/1/.2
364	45/1/CBLQCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
365	40/2/RAD
366	41/2/1/2
367	45/2/OFF/OFF/OFF/OFF/OFF/CBLQHTG/OFF/OFF/OFF/OFF
368	EQUIPMENT - 4
369	59/4/CARLISLE///COMBINED ECOS
370	60/1/1/PKPLANT/1/1
371	62/1/EQ1161/8
372	65/1/1//2/2
373	67/1/EQ2102/1
374	69/1/EQ4003

***Building 311
(Typical for 312)***

Trace Output File

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**          T R A C E    6 0 0    A N A L Y S I S          **  
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**          by          **  
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 311

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 9: 4:19 1/20/94
Dataset Name: CB311 .TM

AIRFLOW - ALTERNATIVE 1
 BASE BUILDING

----- S Y S T E M S U M M A R Y -----
 (Design Airflow Quantities)

System Number	System Type	Main					Auxil.	Room
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Supply Airflow (Cfm)	Exhaust Airflow (Cfm)
1	PTAC	0	1,512	1,512	2,065	553	0	0
2	RAD	0	0	0	0	1,215	0	0
Totals		0	1,512	1,512	2,065	1,768	0	0

CAPACITY - ALTERNATIVE 1
 BASE BUILDING

----- S Y S T E M S U M M A R Y -----
 (Design Capacity Quantities)

System Number	System Type	Cooling					Heating					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	PTAC	3.7	0.0	0.0	3.7	-61,780	0	0	0	0	0	-61,780
2	RAD	0.0	0.0	0.0	0.0	-130,219	0	0	0	0	0	-130,219
Totals		3.7	0.0	0.0	3.7	-191,998	0	0	0	0	0	-191,998

The building peaked at hour 16 month 7 with a capacity of 3.6 tons

ENGINEERING CHECKS - ALTERNATIVE 1
 BASE BUILDING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	PTAC	0.00	0.66	408.6	617.3	19.44	0.66	-27.05	2,284
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-32.46	4,012

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/16 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	6,822	0		6,822	15.37	*	6,644	20.18	*	-5,442	-5,442	8.89
Glass Solar	5,105	0		5,105	11.50	*	5,391	16.35	*	0	0	0.00
Glass Cond	1,277	0		1,277	2.88	*	1,271	3.86	*	-6,444	-6,444	10.53
Wall Cond	5,728	245		5,973	13.45	*	5,737	17.43	*	-10,355	-10,787	17.63
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	21,611			21,611	48.67	*	8,842	26.86	*	-38,508	-38,508	62.94
Sub Total==>	40,544	245		40,789	91.86	*	27,875	84.67	*	-60,749	-61,182	100.00
Internal Loads						*			*			
Lights	1,998	0		1,998	4.50	*	2,418	7.35	*	0	0	0.00
People	1,400			1,400	3.15	*	770	2.34	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	3,397	0	0	3,397	7.65	*	3,188	9.68	*	0	0	0.00
Ceiling Load	483	-483		0	0.00	*	1,859	5.65	*	-1,538	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				215	0.48	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	44,425	-239	0	44,401	100.00	*	32,922	100.00	*	-62,287	-61,182	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor		
Main Clg	3.7	44.4	31.1	75.3	63.4	70.7	54.9	53.5	60.3	Part	0	
Aux Clg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	1,164	0 0
Totals	3.7	44.4								Wall	1,784	172 10

-----HEATING COIL SELECTION-----

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	0	0	Clg Cfm/Sqft	0.66	SADB	55.0	105.9
Main Htg	-61.8	1,512	68.3	105.9	Infil	553	553	Clg Cfm/Ton	408.58	Plenum	75.8	67.2
Aux Htg	0.0	0	0.0	0.0	Supply	1,512	1,512	Clg Sqft/Ton	617.28	Return	75.3	67.7
Preheat	-0.0	1,512	67.7	54.9	Mincfm	0	0	Clg Btuh/Sqft	19.44	Ret/OA	75.3	67.7
Reheat	0.0	0	0.0	0.0	Return	1,512	1,512	No. People	5	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/SqFt	0.66	Fn BldTD	0.0	0.0
Total	-61.8				Auxil	0	0	Htg Btuh/SqFt	-27.05	Fn Frict	0.1	0.0

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-9,303	-9,303	7.14
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-12,241	-12,241	9.40
Wall Cond	0	0		0	0.00	*	0	0.00	*	-23,096	-24,041	18.46
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-84,633	-84,633	64.99
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-129,273	-130,219	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-8,978	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-138,251	-130,219	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Part	0	
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	1,990	0 0
Totals	0.0	0.0				Wall	3,920	326 8

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Main Htg	-130.2	0	0.0	0.0	Infil	0	1,215	Clg Cfm/Ton	0.00	Plenum	0.0	66.3
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	68.0
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Reheat	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/SqFt	0.00	Fn BldTD	0.0	0.0
Total	-130.2				Auxil	0	0	Htg Btuh/SqFt	-32.46	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

BUILDING U-VALUES - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	----- Room U-Values ----- (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	HALL	0.000	0.000	0.000	0.000	0.000	1.040	1.086	0.105	0.549	10.3	4.58
2	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	17.8	6.19
3	FAMILY ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	9.2	4.34
4	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	25.1	7.97
5	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	16.0	6.04
6	SEWING ROOM	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	14.5	5.71
Zone 1	Total/Ave.	0.000	0.000	0.000	0.000	0.073	0.570	0.584	0.105	0.549	15.3	5.77
System 1	Total/Ave.	0.000	0.000	0.000	0.000	0.073	0.570	0.584	0.105	0.549	15.3	5.77
1	HALL	0.000	0.000	0.000	0.000	0.000	1.040	1.086	0.105	0.549	10.3	4.58
2	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	17.8	6.19
3	FAMILY ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	9.2	4.34
4	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	25.1	7.97
5	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	16.0	6.04
6	SEWING ROOM	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	14.5	5.71
Zone 1	Total/Ave.	0.000	0.000	0.000	0.000	0.073	0.570	0.584	0.105	0.549	15.3	5.77
7	BATH	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	30.0	8.80
8	KITCHEN	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	8.8	4.26
9	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.614	0.631	0.105	0.549	20.7	6.81
10	BATH	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	35.4	10.18
11	BEDROOM NO. 3	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	26.4	8.25
12	HALL	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	12.0	5.17
13	BATH	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	23.8	7.70
Zone 2	Total/Ave.	0.000	0.000	0.000	0.000	0.073	0.573	0.587	0.105	0.549	19.0	6.55
System 2	Total/Ave.	0.000	0.000	0.000	0.000	0.073	0.572	0.586	0.105	0.549	16.9	6.10
Building		0.000	0.000	0.000	0.000	0.073	0.571	0.585	0.105	0.549	16.3	5.98

BUILDING AREAS - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G A R E A S -----													
Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	HALL	1	2	117	234	0	0	0	0	0	7	6	110
2	LIVING ROOM	1	2	188	376	0	0	0	0	0	48	9	501
3	FAMILY ROOM	1	2	255	510	0	0	0	0	0	41	19	175
4	BEDROOM NO. 1	1	2	175	350	0	0	0	0	350	24	4	525
5	BEDROOM NO. 2	1	2	189	378	0	0	0	0	378	41	19	175
6	SEWING ROOM	1	2	218	436	0	0	0	0	436	12	9	125
Zone	1 Total/Ave.				2,284	0	0	0	0	1,164	172	10	1,611
System	1 Total/Ave.				2,284	0	0	0	0	1,164	172	10	1,611
1	HALL	1	2	117	234	0	0	0	0	0	7	6	110
2	LIVING ROOM	1	2	188	376	0	0	0	0	0	48	9	501
3	FAMILY ROOM	1	2	255	510	0	0	0	0	0	41	19	175
4	BEDROOM NO. 1	1	2	175	350	0	0	0	0	350	24	4	525
5	BEDROOM NO. 2	1	2	189	378	0	0	0	0	378	41	19	175
6	SEWING ROOM	1	2	218	436	0	0	0	0	436	12	9	125
Zone	1 Total/Ave.				2,284	0	0	0	0	1,164	172	10	1,611
7	BATH	1	2	49	98	0	0	0	0	0	8	3	267
8	KITCHEN	1	2	218	436	0	0	0	0	0	8	5	130
9	DINING ROOM	1	2	184	368	0	0	0	0	0	55	8	611
10	BATH	1	2	49	98	0	0	0	0	98	12	4	262
11	BEDROOM NO. 3	1	2	184	368	0	0	0	0	368	60	9	606
12	HALL	1	2	141	282	0	0	0	0	282	0	0	0
13	BATH	1	2	39	78	0	0	0	0	78	12	10	106
Zone	2 Total/Ave.				1,728	0	0	0	0	826	154	7	1,982
System	2 Total/Ave.				4,012	0	0	0	0	1,990	326	8	3,594
Building					6,296	0	0	0	0	3,154	499	9	5,205

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BASE BUILDING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.073 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.145 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.120 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTvr) = 5.54 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTvw) = 11.71 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BASE BUILDING

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.2	7	62	-9,600	5	263	75.6	0	0	0.0	0	0
5 - 10	0.4	3	30	-19,200	10	473	151.2	0	0	0.0	0	0
10 - 15	0.6	4	39	-28,800	16	762	226.8	0	0	0.0	0	0
15 - 20	0.7	7	62	-38,400	15	703	302.4	42	1,530	0.0	0	0
20 - 25	0.9	8	72	-48,000	18	874	377.9	0	0	0.0	0	0
25 - 30	1.1	11	98	-57,599	16	764	453.5	0	0	0.0	0	0
30 - 35	1.3	18	156	-67,199	13	624	529.1	0	0	0.0	0	0
35 - 40	1.5	10	85	-76,799	7	357	604.7	0	0	0.0	0	0
40 - 45	1.7	9	76	-86,399	0	0	680.3	0	0	0.0	0	0
45 - 50	1.9	11	98	-95,999	0	0	755.9	21	765	0.0	0	0
50 - 55	2.0	3	31	-105,599	0	0	831.5	0	0	0.0	0	0
55 - 60	2.2	2	20	-115,199	0	0	907.1	0	0	0.0	0	0
60 - 65	2.4	0	0	-124,799	0	0	982.7	0	0	0.0	0	0
65 - 70	2.6	3	31	-134,399	0	0	1,058.2	0	0	0.0	0	0
70 - 75	2.8	0	0	-143,999	0	0	1,133.8	0	0	0.0	0	0
75 - 80	3.0	0	0	-153,599	0	0	1,209.4	0	0	0.0	0	0
80 - 85	3.1	0	0	-163,199	0	0	1,285.0	0	0	0.0	0	0
85 - 90	3.3	0	0	-172,798	0	0	1,360.6	0	0	0.0	0	0
90 - 95	3.5	0	0	-182,398	0	0	1,436.2	0	0	0.0	0	0
95 - 100	3.7	3	31	-191,998	0	0	1,511.8	38	1,377	0.0	0	0
Hours Off	0.0	0	7,869	0	0	3,940	0.0	0	5,088	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
 BASE BUILDING

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature	----- Zone Number -----		
Range	1	1	2
(F)			

Max. Temp.	81.6	100.9	102.1
Mo./Hr.	7 14	7 21	7 21
Day Type	1	1	1

	 Number of Hours		
Above 100	0	75	120
95 - 100	0	1,050	916
90 - 95	0	1,051	1,072
85 - 90	0	514	618
80 - 85	0	802	845
75 - 80	2,633	180	101
70 - 75	1,007	0	0
65 - 70	49	5,088	5,088
60 - 65	567	0	0
55 - 60	918	0	0
50 - 55	550	0	0
Below 50	3,036	0	0
Min. Temp.	31.7	67.9	67.9
Mo./Hr.	2 9	1 8	2 9
Day Type	4	2	1

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
BASE BUILDING

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	HOT WTR	HOT W DMND
	Off Peak (kWh)	On Peak (kW)	On Peak (Therm)	On Peak (Thrm/hr)
Jan	835	3	423	1
Feb	755	3	424	1
March	856	3	284	1
April	805	3	132	0
May	898	8	0	0
June	1,327	9	0	0
July	1,839	9	0	0
Aug	1,323	9	0	0
Sept	855	9	0	0
Oct	845	3	106	0
Nov	805	3	199	1
Dec	825	3	352	1
Total	11,966	9	1,919	1

Building Energy Consumption = 36,973 (Btu/Sq Ft/Year)
Source Energy Consumption = 60,110 (Btu/Sq Ft/Year)

Floor Area = 6,296 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION

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PAGE 11

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UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
BASE BUILDING

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 9.2 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percent Of Tot (%)

Cooling Equipment

1	EQ1161	AIR-CLD COND COMP <15 TONS	5.9	64.25
Sub Total			5.9	64.25
Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	1.41
Sub Total			0.1	1.41
Sub Total			0.0	0.00

Miscellaneous

	Lights		3.1	34.33
	Base Utilities		0.0	0.00
	Misc Equipment		0.0	0.00
Sub Total			3.1	34.33
Grand Total			9.2	100.00

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**          T R A C E    6 0 0    A N A L Y S I S          **  
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 311

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Reflectance: 0.20
Winter Ground Reflectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 9:18: 2 1/20/94
Dataset Name: CB311 .TM

AIRFLOW - ALTERNATIVE 2
WALL & ROOF INSULATION

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil.	Room
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)	Supply Airflow (Cfm)	Exhaust Airflow (Cfm)
1	PTAC	0	1,029	1,029	1,493	464	0	0
2	RAD	0	0	0	0	1,019	0	0
Totals		0	1,029	1,029	1,493	1,483	0	0

CAPACITY - ALTERNATIVE 2
WALL & ROOF INSULATION

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

		----- Cooling -----				----- Heating -----						
		Main Sys.	Aux. Sys.	Opt. Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
System	System	Capacity	Capacity	Capacity	Totals	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Totals
Number	Type	(Tons)	(Tons)	(Tons)	(Tons)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)
	1 PTAC	2.7	0.0	0.0	2.7	-45,675	0	0	0	0	0	-45,675
	2 RAD	0.0	0.0	0.0	0.0	-96,917	0	0	0	0	0	-96,917
Totals		2.7	0.0	0.0	2.7	-142,591	0	0	0	0	0	-142,591

The building peaked at hour 16 month 7 with a capacity of 2.6 tons

ENGINEERING CHECKS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				----- Heating -----		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	PTAC	0.00	0.45	379.2	841.5	14.26	0.45	-20.00	2,284
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-24.16	4,012

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/16 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	2,564	0		2,564	7.87	*	2,707	11.52	*	-2,211	-2,211	4.87
Glass Solar	5,093	0		5,093	15.64	*	4,901	20.85	*	0	0	0.00
Glass Cond	1,317	0		1,317	4.04	*	1,337	5.69	*	-6,444	-6,444	14.19
Wall Cond	2,413	100		2,513	7.71	*	2,229	9.48	*	-4,267	-4,446	9.79
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	17,522			17,522	53.79	*	7,648	32.54	*	-32,297	-32,297	71.14
Sub Total==>	28,909	100		29,009	89.06	*	18,823	80.07	*	-45,219	-45,399	100.00
Internal Loads						*			*			
Lights	2,008	0		2,008	6.16	*	2,842	12.09	*	0	0	0.00
People	1,408			1,408	4.32	*	813	3.46	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	3,416	0	0	3,416	10.49	*	3,655	15.55	*	0	0	0.00
Ceiling Load	234	-234		0	0.00	*	1,030	4.38	*	-830	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				146	0.45	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	32,560	-135	0	32,571	100.00	*	23,507	100.00	*	-46,050	-45,399	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	2.7	32.6	22.1	1,029	75.2	63.3	70.3	53.9	52.5	57.9	2,284	
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	
Totals	2.7	32.6									1,784	172 10

-----AREAS-----

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-45.7	1,029	68.3	109.1	Vent	0	0	Clg Cfm/Sqft	0.45	SADB	54.0	109.1	
Aux Htg	0.0	0	0.0	0.0	Infil	464	464	Clg Cfm/Ton	379.22	Plenum	75.4	67.6	
Preheat	-0.0	1,029	67.8	53.9	Supply	1,029	1,029	Clg Sqft/Ton	841.48	Return	75.1	67.8	
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	14.26	Ret/OA	75.1	67.8	
Humidif	0.0	0	0.0	0.0	Return	1,029	1,029	No. People	5	Runarnd	75.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	-45.7				Rm Exh	0	0	Htg Cfm/Sqft	0.45	Fn BldTD	0.0	0.0	
					Auxil	0	0	Htg Btuh/Sqft	-20.00	Fn Frict	0.1	0.0	

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-3,780	-3,780	3.90
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-12,241	-12,241	12.63
Wall Cond	0	0		0	0.00	*	0	0.00	*	-9,517	-9,913	10.23
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-70,983	-70,983	73.24
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-96,521	-96,917	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-3,949	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-100,469	-96,917	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf) (%)
Main Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Part	4,012
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	1,990 0 0
Totals	0.0	0.0				Wall	3,920 326 8

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-96.9	0	0.0	0.0	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	1,019	Clg Cfm/Ton	0.00	Plenum	0.0	67.3
Preheat	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-96.9				Rm Exh	0	0	Htg Cfm/SqFt	0.00	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/SqFt	-24.16	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

BUILDING U-VALUES - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Part.	ExFlr	Room U-Values (Btu/hr/sqft/F)							Room Mass (lb/ sqft)	Room Capac. (8tu/ sqft/F)
				Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	HALL	0.000	0.000	0.000	0.000	0.000	1.040	1.086	0.043	0.549	8.6	4.25
2	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	13.2	5.26
3	FAMILY ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	8.0	4.10
4	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	20.8	7.13
5	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	15.4	5.91
6	SEWING ROOM	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	14.5	5.70
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.570	0.584	0.043	0.549	13.3	5.38
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.570	0.584	0.043	0.549	13.3	5.38
1	HALL	0.000	0.000	0.000	0.000	0.000	1.040	1.086	0.043	0.549	8.6	4.25
2	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	13.2	5.26
3	FAMILY ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	8.0	4.10
4	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	20.8	7.13
5	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	15.4	5.91
6	SEWING ROOM	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	14.5	5.70
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.570	0.584	0.043	0.549	13.3	5.38
7	BATH	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	20.4	6.89
8	KITCHEN	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	7.7	4.05
9	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.614	0.631	0.043	0.549	14.9	5.65
10	BATH	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	27.0	8.51
11	BEDROOM NO. 3	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	21.6	7.30
12	HALL	0.000	0.000	0.000	0.000	0.030	0.000	0.000	0.000	0.000	13.0	5.37
13	BATH	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	20.1	6.95
Zone	2 Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.573	0.587	0.043	0.549	15.4	5.84
System	2 Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.572	0.586	0.043	0.549	14.2	5.58
Building		0.000	0.000	0.000	0.000	0.030	0.571	0.585	0.043	0.549	13.9	5.50

BUILDING AREAS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate Flr Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Sk1 /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /W1 (%)	Net Wall Area (sqft)
1	HALL	1 2	117	234	0	0	0	0	0	7	6	110
2	LIVING ROOM	1 2	188	376	0	0	0	0	0	48	9	501
3	FAMILY ROOM	1 2	255	510	0	0	0	0	0	41	19	175
4	BEDROOM NO. 1	1 2	175	350	0	0	0	0	350	24	4	525
5	BEDROOM NO. 2	1 2	189	378	0	0	0	0	378	41	19	175
6	SEWING ROOM	1 2	218	436	0	0	0	0	436	12	9	125
Zone	1 Total/Ave.			2,284	0	0	0	0	1,164	172	10	1,611
System	1 Total/Ave.			2,284	0	0	0	0	1,164	172	10	1,611
1	HALL	1 2	117	234	0	0	0	0	0	7	6	110
2	LIVING ROOM	1 2	188	376	0	0	0	0	0	48	9	501
3	FAMILY ROOM	1 2	255	510	0	0	0	0	0	41	19	175
4	BEDROOM NO. 1	1 2	175	350	0	0	0	0	350	24	4	525
5	BEDROOM NO. 2	1 2	189	378	0	0	0	0	378	41	19	175
6	SEWING ROOM	1 2	218	436	0	0	0	0	436	12	9	125
Zone	1 Total/Ave.			2,284	0	0	0	0	1,164	172	10	1,611
7	BATH	1 2	49	98	0	0	0	0	0	8	3	267
8	KITCHEN	1 2	218	436	0	0	0	0	0	8	5	130
9	DINING ROOM	1 2	184	368	0	0	0	0	0	55	8	611
10	BATH	1 2	49	98	0	0	0	0	98	12	4	262
11	BEDROOM NO. 3	1 2	184	368	0	0	0	0	368	60	9	606
12	HALL	1 2	141	282	0	0	0	0	282	0	0	0
13	BATH	1 2	39	78	0	0	0	0	78	12	10	106
Zone	2 Total/Ave.			1,728	0	0	0	0	826	154	7	1,982
System	2 Total/Ave.			4,012	0	0	0	0	1,990	326	8	3,594
Building				6,296	0	0	0	0	3,154	499	9	5,205

ASHRAE 90 ANALYSIS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.030 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.089 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.068 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTvr) = 1.68 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTvw) = 9.22 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2
WALL & ROOF INSULATION

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.1	6	58	-7,130	7	309	51.5	0	0	0.0	0	0
5 - 10	0.3	14	131	-14,259	10	469	102.9	0	0	0.0	0	0
10 - 15	0.4	6	53	-21,389	18	864	154.4	0	0	0.0	0	0
15 - 20	0.5	3	28	-28,518	14	640	205.9	42	1,530	0.0	0	0
20 - 25	0.7	4	42	-35,648	18	842	257.3	0	0	0.0	0	0
25 - 30	0.8	10	92	-42,777	16	757	308.8	0	0	0.0	0	0
30 - 35	0.9	16	154	-49,907	14	678	360.3	0	0	0.0	0	0
35 - 40	1.1	5	47	-57,036	4	179	411.7	0	0	0.0	0	0
40 - 45	1.2	8	77	-64,166	0	0	463.2	0	0	0.0	0	0
45 - 50	1.4	13	121	-71,296	0	0	514.7	21	765	0.0	0	0
50 - 55	1.5	6	56	-78,425	0	0	566.1	0	0	0.0	0	0
55 - 60	1.6	2	20	-85,555	0	0	617.6	0	0	0.0	0	0
60 - 65	1.8	2	20	-92,684	0	0	669.0	0	0	0.0	0	0
65 - 70	1.9	0	0	-99,814	0	0	720.5	0	0	0.0	0	0
70 - 75	2.0	3	31	-106,943	0	0	772.0	0	0	0.0	0	0
75 - 80	2.2	0	0	-114,073	0	0	823.4	0	0	0.0	0	0
80 - 85	2.3	0	0	-121,202	0	0	874.9	0	0	0.0	0	0
85 - 90	2.4	0	0	-128,332	0	0	926.4	0	0	0.0	0	0
90 - 95	2.6	0	0	-135,462	0	0	977.8	0	0	0.0	0	0
95 - 100	2.7	3	31	-142,591	0	0	1,029.3	38	1,377	0.0	0	0
Hours Off	0.0	0	7,799	0	0	4,022	0.0	0	5,088	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 2
 WALL & ROOF INSULATION

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature Range (F)	----- Zone Number -----		
	1	1	2
Max. Temp.	80.8	105.3	106.5
Mo./Hr.	7 14	8 21	8 21
Day Type	1	1	1
	 Number of Hours		
Above 100	0	1,268	1,256
95 - 100	0	1,050	1,128
90 - 95	0	492	360
85 - 90	0	276	497
80 - 85	0	334	431
75 - 80	2,720	252	0
70 - 75	952	34	0
65 - 70	85	5,054	5,088
60 - 65	578	0	0
55 - 60	996	0	0
50 - 55	491	0	0
Below 50	2,938	0	0
Min. Temp.	33.2	67.9	67.9
Mo./Hr.	2 9	4 1	2 17
Day Type	4	2	2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 2
 WALL & ROOF INSULATION

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	HOT WTR	HOT W DMND
	Off Peak (kWh)	On Peak (kW)	On Peak (Therm)	On Peak (Thrm/hr)
Jan	835	3	302	1
Feb	754	3	309	1
March	855	3	203	0
April	804	3	92	0
May	880	3	0	0
June	1,231	7	0	0
July	1,647	8	0	0
Aug	1,236	7	0	0
Sept	838	7	0	0
Oct	844	3	60	0
Nov	804	3	136	0
Dec	824	3	247	0
Total	11,554	8	1,350	1

Building Energy Consumption = 27,713 (Btu/Sq Ft/Year)
 Source Energy Consumption = 47,391 (Btu/Sq Ft/Year)

Floor Area = 6,296 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION

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PAGE 23

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UTILITY PEAK CHECKSUMS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 7.6 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percent Of Tot (%)

Cooling Equipment

1	EQ1161	AIR-CLD COND COMP <15 TONS	4.4	57.63
Sub Total			4.4	57.63
Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	1.15
Sub Total			0.1	1.15
Sub Total			0.0	0.00

Miscellaneous

	Lights		3.1	41.22
	Base Utilities		0.0	0.00
	Misc Equipment		0.0	0.00
Sub Total			3.1	41.22
Grand Total			7.6	100.00

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ENERGY SAVINGS OPPORTUNITY STUDY

CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 311

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 9:31:59 1/20/94
Dataset Name: CB311 .TM

AIRFLOW - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	Main					Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)		
1	PTAC	0	1,411	1,411	1,857	446	0	0
2	RAD	0	0	0	0	980	0	0
Totals		0	1,411	1,411	1,857	1,426	0	0

CAPACITY - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	Cooling					Heating					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	PTAC	3.4	0.0	0.0	3.4	-54,391	0	0	0	0	0	-54,391
2	RAD	0.0	0.0	0.0	0.0	-113,838	0	0	0	0	0	-113,838
Totals		3.4	0.0	0.0	3.4	-168,229	0	0	0	0	0	-168,229

The building peaked at hour 16 month 7 with a capacity of 3.3 tons

ENGINEERING CHECKS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	PTAC	0.00	0.62	418.3	677.3	17.72	0.62	-23.81	2,284
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-28.37	4,012

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/16 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	6,822	0		6,822	16.86	*	6,644	21.23	*	-5,442	-5,442	10.13
Glass Solar	5,105	0		5,105	12.62	*	5,381	17.19	*	0	0	0.00
Glass Cond	1,277	0		1,277	3.16	*	1,271	4.06	*	-6,444	-6,444	11.99
Wall Cond	5,728	244		5,972	14.76	*	5,737	18.33	*	-10,355	-10,787	20.08
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	17,694			17,694	43.72	*	7,130	22.78	*	-31,055	-31,055	57.80
Sub Total==>	36,627	244		36,871	91.11	*	26,164	83.59	*	-53,296	-53,728	100.00
Internal Loads						*			*			
Lights	1,998	0		1,998	4.94	*	2,418	7.73	*	0	0	0.00
People	1,400			1,400	3.46	*	770	2.46	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	3,397	0	0	3,397	8.40	*	3,188	10.19	*	0	0	0.00
Ceiling Load	517	-517		0	0.00	*	1,949	6.23	*	-1,613	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				201	0.50	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	40,542	-273	0	40,470	100.00	*	31,301	100.00	*	-54,909	-53,728	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	3.4	40.5	29.3	75.4 62.9 68.2	54.5 53.1 59.5	2,284		
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	3.4	40.5				1,164	0	0
						1,784	172	10

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg Cfm/Sqft	0.62	SADB	54.6	103.8
Main Htg	-54.4	1,411	68.3	103.8	Infil	446	446	Clg Cfm/Ton	418.35	Plenum	75.8	67.1
Aux Htg	0.0	0	0.0	0.0	Supply	1,411	1,411	Clg Sqft/Ton	677.25	Return	75.3	67.6
Preheat	-0.0	1,411	67.6	54.5	Mincfm	0	0	Clg Btuh/Sqft	17.72	Ret/OA	75.3	67.6
Reheat	0.0	0	0.0	0.0	Return	1,411	1,411	No. People	5	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/SqFt	0.62	Fn BldTD	0.0	0.0
Total	-54.4				Auxil	0	0	Htg Btuh/SqFt	-23.81	Fn Frict	0.1	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-9,303	-9,303	8.17
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-12,241	-12,241	10.75
Wall Cond	0	0		0	0.00	*	0	0.00	*	-23,096	-24,041	21.12
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-68,253	-68,253	59.96
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-112,893	-113,838	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-8,978	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-121,871	-113,838	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf)	(%)
Main Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Part	0	
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	1,990	0 0
Totals	0.0	0.0				Wall	3,920	326 8

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-113.8	0	0.0	0.0	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	980	Clg Cfm/Ton	0.00	Plenum	0.0	66.3
Preheat	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-113.8				Rm Exh	0	0	Htg Cfm/SqFt	0.00	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/SqFt	-28.37	Fn Frict	0.0	0.0

BUILDING U-VALUES - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	HALL	0.000	0.000	0.000	0.000	0.000	1.040	1.086	0.105	0.549	10.3	4.58
2	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	17.8	6.19
3	FAMILY ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	9.2	4.34
4	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	25.1	7.97
5	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	16.0	6.04
6	SEWING ROOM	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	14.5	5.71
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.073	0.570	0.584	0.105	0.549	15.3	5.77
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.073	0.570	0.584	0.105	0.549	15.3	5.77
1	HALL	0.000	0.000	0.000	0.000	0.000	1.040	1.086	0.105	0.549	10.3	4.58
2	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	17.8	6.19
3	FAMILY ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	9.2	4.34
4	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	25.1	7.97
5	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	16.0	6.04
6	SEWING ROOM	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	14.5	5.71
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.073	0.570	0.584	0.105	0.549	15.3	5.77
7	BATH	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	30.0	8.80
8	KITCHEN	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.105	0.549	8.8	4.26
9	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.614	0.631	0.105	0.549	20.7	6.81
10	BATH	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	35.4	10.18
11	BEDROOM NO. 3	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	26.4	8.25
12	HALL	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	12.0	5.17
13	BATH	0.000	0.000	0.000	0.000	0.073	0.550	0.563	0.105	0.000	23.8	7.70
Zone	2 Total/Ave.	0.000	0.000	0.000	0.000	0.073	0.573	0.587	0.105	0.549	19.0	6.55
System	2 Total/Ave.	0.000	0.000	0.000	0.000	0.073	0.572	0.586	0.105	0.549	16.9	6.10
Building		0.000	0.000	0.000	0.000	0.073	0.571	0.585	0.105	0.549	16.3	5.98

BUILDING AREAS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
		Flr	Rm										
1	HALL	1	2	117	234	0	0	0	0	0	7	6	110
2	LIVING ROOM	1	2	188	376	0	0	0	0	0	48	9	501
3	FAMILY ROOM	1	2	255	510	0	0	0	0	0	41	19	175
4	BEDROOM NO. 1	1	2	175	350	0	0	0	0	350	24	4	525
5	BEDROOM NO. 2	1	2	189	378	0	0	0	0	378	41	19	175
6	SEWING ROOM	1	2	218	436	0	0	0	0	436	12	9	125
Zone	1 Total/Ave.				2,284	0	0	0	0	1,164	172	10	1,611
System	1 Total/Ave.				2,284	0	0	0	0	1,164	172	10	1,611
1	HALL	1	2	117	234	0	0	0	0	0	7	6	110
2	LIVING ROOM	1	2	188	376	0	0	0	0	0	48	9	501
3	FAMILY ROOM	1	2	255	510	0	0	0	0	0	41	19	175
4	BEDROOM NO. 1	1	2	175	350	0	0	0	0	350	24	4	525
5	BEDROOM NO. 2	1	2	189	378	0	0	0	0	378	41	19	175
6	SEWING ROOM	1	2	218	436	0	0	0	0	436	12	9	125
Zone	1 Total/Ave.				2,284	0	0	0	0	1,164	172	10	1,611
7	BATH	1	2	49	98	0	0	0	0	0	8	3	267
8	KITCHEN	1	2	218	436	0	0	0	0	0	8	5	130
9	DINING ROOM	1	2	184	368	0	0	0	0	0	55	8	611
10	BATH	1	2	49	98	0	0	0	0	98	12	4	262
11	BEDROOM NO. 3	1	2	184	368	0	0	0	0	368	60	9	606
12	HALL	1	2	141	282	0	0	0	0	282	0	0	0
13	BATH	1	2	39	78	0	0	0	0	78	12	10	106
Zone	2 Total/Ave.				1,728	0	0	0	0	826	154	7	1,982
System	2 Total/Ave.				4,012	0	0	0	0	1,990	326	8	3,594
Building					6,296	0	0	0	0	3,154	499	9	5,205

ASHRAE 90 ANALYSIS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.073 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.145 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.120 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTvr) = 5.54 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTvw) = 11.71 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.2	7	64	-8,411	5	251	70.5	0	0	0.0	0	0
5 - 10	0.3	5	50	-16,823	11	521	141.1	0	0	0.0	0	0
10 - 15	0.5	6	59	-25,234	14	654	211.6	0	0	0.0	0	0
15 - 20	0.7	7	69	-33,646	15	701	282.2	42	1,530	0.0	0	0
20 - 25	0.8	4	41	-42,057	19	903	352.7	0	0	0.0	0	0
25 - 30	1.0	5	51	-50,469	16	758	423.3	0	0	0.0	0	0
30 - 35	1.2	16	157	-58,880	13	604	493.8	0	0	0.0	0	0
35 - 40	1.3	16	150	-67,292	7	338	564.3	0	0	0.0	0	0
40 - 45	1.5	7	66	-75,703	0	0	634.9	0	0	0.0	0	0
45 - 50	1.7	15	143	-84,115	0	0	705.4	21	765	0.0	0	0
50 - 55	1.9	3	31	-92,526	0	0	776.0	0	0	0.0	0	0
55 - 60	2.0	2	20	-100,937	0	0	846.5	0	0	0.0	0	0
60 - 65	2.2	0	0	-109,349	0	0	917.1	0	0	0.0	0	0
65 - 70	2.4	0	0	-117,760	0	0	987.6	0	0	0.0	0	0
70 - 75	2.5	0	0	-126,172	0	0	1,058.1	0	0	0.0	0	0
75 - 80	2.7	3	31	-134,583	0	0	1,128.7	0	0	0.0	0	0
80 - 85	2.9	0	0	-142,995	0	0	1,199.2	0	0	0.0	0	0
85 - 90	3.0	0	0	-151,406	0	0	1,269.8	0	0	0.0	0	0
90 - 95	3.2	0	0	-159,818	0	0	1,340.3	0	0	0.0	0	0
95 - 100	3.4	3	31	-168,229	0	0	1,410.9	38	1,377	0.0	0	0
Hours Off	0.0	0	7,797	0	0	4,030	0.0	0	5,088	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 3
 WEATHERSTRIP & CAULKING

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Temperature	----- Zone Number -----		
Range	1	1	2
(F)			

Max. Temp.	81.5	100.9	102.1
Mo./Hr.	7 14	7 21	7 21
Day Type	1	1	1

	 Number of Hours		
Above 100	0	75	120
95 - 100	0	1,050	916
90 - 95	0	1,051	1,072
85 - 90	0	514	618
80 - 85	0	802	845
75 - 80	2,846	180	101
70 - 75	826	0	0
65 - 70	51	5,088	5,088
60 - 65	711	0	0
55 - 60	782	0	0
50 - 55	553	0	0
Below 50	2,991	0	0

Min. Temp.	32.5	67.9	67.9
Mo./Hr.	2 9	3 18	3 19
Day Type	4	1	1

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	HOT WTR	HOT W DMND
	Off Peak (kWh)	On Peak (kW)	On Peak (Therm)	On Peak (Thrm/hr)
Jan	835	3	369	1
Feb	754	3	367	1
March	856	3	243	1
April	804	3	106	0
May	894	8	0	0
June	1,354	9	0	0
July	1,817	9	0	0
Aug	1,338	8	0	0
Sept	852	8	0	0
Oct	845	3	88	0
Nov	805	3	173	0
Dec	825	3	309	1
Total	11,977	9	1,654	1

Building Energy Consumption = 32,766 (Btu/Sq Ft/Year)
Source Energy Consumption = 54,511 (Btu/Sq Ft/Year)

Floor Area = 6,296 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	833	753	854	803	843	824	823	854	803	843	803	823	9,857
	PK	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1161	AIR-CLD COND COMP <15 TONS												
	ELEC	0	0	0	0	0	363	742	326	0	0	0	0	1,430
	PK	0.0	0.0	0.0	0.0	4.0	4.5	4.7	4.5	4.4	0.0	0.0	0.0	4.7
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	0	38	75	34	0	0	0	0	146
	PK	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.2	0.0	0.0	0.0	0.4
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	0	81	127	74	0	0	0	0	282
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												
	ELEC	0	0	0	0	51	49	51	51	49	0	0	0	249
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1
1	EQ2102	PURCHASED DIST. HOT WATER												
	P HOTH2O	369	367	243	106	0	0	0	0	0	88	173	309	1,654
	PK	0.7	0.7	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.6	0.7
1	EQ5020	HEAT WATER CIRC. PUMP C.V.												

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UTILITY PEAK CHECKSUMS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 8.7 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1161	AIR-CLD COND COMP <15 TONS	5.4	62.28

Sub Total			5.4	62.28

Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	1.39

Sub Total			0.1	1.39

Sub Total			0.0	0.00

Miscellaneous

Lights			3.1	36.33

Base Utilities			0.0	0.00

Misc Equipment			0.0	0.00

Sub Total			3.1	36.33

Grand Total			8.7	100.00

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**          T R A C E    6 0 0    A N A L Y S I S          **  
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 311

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Reflectance: 0.20
Winter Ground Reflectance: 0.20

Air Density: 0.0742 (lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 9:46: 3 1/20/94
Dataset Name: C8311 .TM

AIRFLOW - ALTERNATIVE 4
COMBINED ECOS

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	Main					Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)		
1	PTAC	0	1,013	1,013	1,370	357	0	0
2	RAD	0	0	0	0	784	0	0
Totals		0	1,013	1,013	1,370	1,141	0	0

CAPACITY - ALTERNATIVE 4
COMBINED ECOS

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

System Number	System Type	Cooling					Heating					
		Main Sys. Capacity (Tons)	Aux. Sys. Capacity (Tons)	Opt. Vent Capacity (Tons)	Cooling Totals (Tons)	Main Sys. Capacity (Btuh)	Aux. Sys. Capacity (Btuh)	Preheat Capacity (Btuh)	Reheat Capacity (Btuh)	Humidif. Capacity (Btuh)	Opt. Vent Capacity (Btuh)	Heating Totals (Btuh)
1	PTAC	2.4	0.0	0.0	2.4	-38,237	0	0	0	0	0	-38,237
2	RAD	0.0	0.0	0.0	0.0	-80,536	0	0	0	0	0	-80,536
Totals		2.4	0.0	0.0	2.4	-118,773	0	0	0	0	0	-118,773

The building peaked at hour 16 month 7 with a capacity of 2.4 tons

ENGINEERING CHECKS - ALTERNATIVE 4
COMBINED ECOS

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	Cooling				Heating		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	PTAC	0.00	0.44	416.5	939.2	12.78	0.44	-16.74	2,284
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-20.07	4,012

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/16 * Mo/Hr: 7/16 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	2,707	0		2,707	9.28	*	2,661	12.24	*	-2,211	-2,211	5.83
Glass Solar	5,237	0		5,237	17.95	*	4,997	22.99	*	0	0	0.00
Glass Cond	1,287	0		1,287	4.41	*	1,328	6.11	*	-6,444	-6,444	16.98
Wall Cond	2,358	105		2,462	8.44	*	2,286	10.52	*	-4,267	-4,446	11.72
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	13,414			13,414	45.96	*	5,824	26.79	*	-24,844	-24,844	65.47
Sub Total==>	25,003	105		25,107	86.03	*	17,097	78.65	*	-37,766	-37,946	100.00
Internal Loads						*			*			
Lights	2,414	0		2,414	8.27	*	2,864	13.18	*	0	0	0.00
People	1,518			1,518	5.20	*	765	3.52	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	3,932	0	0	3,932	13.47	*	3,629	16.70	*	0	0	0.00
Ceiling Load	256	-256		0	0.00	*	1,012	4.65	*	-839	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				144	0.49	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	29,191	-152	0	29,184	100.00	*	21,738	100.00	*	-38,605	-37,946	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor		
Main Clg	2.4	29.2	20.8	1,013	75.2	63.3	70.1	55.2	53.5	59.9	Part	0
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	1,164
Totals	2.4	29.2									Wall	1,784

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	ENGINEERING CHECKS--			TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-38.2	1,013	68.3	103.0	Infil	357	357	Clg Cfm/Sqft	0.44	SADB	55.3	103.0	
Aux Htg	0.0	0	0.0	0.0	Supply	1,013	1,013	Clg Cfm/Ton	416.48	Plenum	75.4	67.6	
Preheat	-0.0	1,013	67.8	55.1	Mincfm	0	0	Clg Sqft/Ton	939.15	Return	75.2	67.8	
Reheat	0.0	0	0.0	0.0	Return	1,013	1,013	Clg Btuh/Sqft	12.78	Ret/OA	75.2	67.8	
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	5	Runarnd	75.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	-38.2				Auxil	0	0	Htg Cfm/Sqft	0.44	Fn BldTD	0.0	0.0	
								Htg Btuh/Sqft	-16.74	Fn Frict	0.1	0.0	

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****
Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-3,780	-3,780	4.69
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-12,241	-12,241	15.20
Wall Cond	0	0		0	0.00	*	0	0.00	*	-9,517	-9,913	12.31
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-54,602	-54,602	67.80
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-80,140	-80,536	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-3,949	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-84,089	-80,536	100.00

-----COOLING COIL SELECTION-----										-----AREAS-----		
	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	4,012	
Main Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0	
Aux Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	1,990	0 0
Totals	0.0	0.0								Wall	3,920	326 8

-----HEATING COIL SELECTION-----					-----AIRFLOWS (cfm)-----			-----ENGINEERING CHECKS-----		-----TEMPERATURES (F)-----		
	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Main Htg	-80.5	0	0.0	0.0	Infil	0	784	Clg Cfm/Ton	0.00	Plenum	0.0	67.3
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	68.0
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Reheat	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
Total	-80.5				Auxil	0	0	Htg Btuh/Sqft	-20.07	Fn Frict	0.0	0.0

BUILDING U-VALUES - ALTERNATIVE 4
COMBINED ECOS

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Part.	ExFlr	Room U-Values (Btu/hr/sqft/F)							Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
				Summr Skylt	Wintr Skylt	Summr Roof	Wintr Windo	Windo	Wall	Ceil.		
1	HALL	0.000	0.000	0.000	0.000	0.000	1.040	1.086	0.043	0.549	8.6	4.25
2	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	13.2	5.26
3	FAMILY ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	8.0	4.10
4	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	20.8	7.13
5	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	15.4	5.91
6	SEWING ROOM	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	14.5	5.70
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.570	0.584	0.043	0.549	13.3	5.38
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.570	0.584	0.043	0.549	13.3	5.38
1	HALL	0.000	0.000	0.000	0.000	0.000	1.040	1.086	0.043	0.549	8.6	4.25
2	LIVING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	13.2	5.26
3	FAMILY ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	8.0	4.10
4	BEDROOM NO. 1	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	20.8	7.13
5	BEDROOM NO. 2	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	15.4	5.91
6	SEWING ROOM	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	14.5	5.70
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.570	0.584	0.043	0.549	13.3	5.38
7	BATH	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	20.4	6.89
8	KITCHEN	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.043	0.549	7.7	4.05
9	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.614	0.631	0.043	0.549	14.9	5.65
10	BATH	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	27.0	8.51
11	BEDROOM NO. 3	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	21.6	7.30
12	HALL	0.000	0.000	0.000	0.000	0.030	0.000	0.000	0.000	0.000	13.0	5.37
13	BATH	0.000	0.000	0.000	0.000	0.030	0.550	0.563	0.043	0.000	20.1	6.95
Zone	2 Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.573	0.587	0.043	0.549	15.4	5.84
System	2 Total/Ave.	0.000	0.000	0.000	0.000	0.030	0.572	0.586	0.043	0.549	14.2	5.58
Building		0.000	0.000	0.000	0.000	0.030	0.571	0.585	0.043	0.549	13.9	5.50

BUILDING AREAS - ALTERNATIVE 4
COMBINED ECOS

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
		Flr	Rm										
1	HALL	1	2	117	234	0	0	0	0	0	7	6	110
2	LIVING ROOM	1	2	188	376	0	0	0	0	0	48	9	501
3	FAMILY ROOM	1	2	255	510	0	0	0	0	0	41	19	175
4	BEDROOM NO. 1	1	2	175	350	0	0	0	0	350	24	4	525
5	BEDROOM NO. 2	1	2	189	378	0	0	0	0	378	41	19	175
6	SEWING ROOM	1	2	218	436	0	0	0	0	436	12	9	125
Zone	1 Total/Ave.				2,284	0	0	0	0	1,164	172	10	1,611
System	1 Total/Ave.				2,284	0	0	0	0	1,164	172	10	1,611
1	HALL	1	2	117	234	0	0	0	0	0	7	6	110
2	LIVING ROOM	1	2	188	376	0	0	0	0	0	48	9	501
3	FAMILY ROOM	1	2	255	510	0	0	0	0	0	41	19	175
4	BEDROOM NO. 1	1	2	175	350	0	0	0	0	350	24	4	525
5	BEDROOM NO. 2	1	2	189	378	0	0	0	0	378	41	19	175
6	SEWING ROOM	1	2	218	436	0	0	0	0	436	12	9	125
Zone	1 Total/Ave.				2,284	0	0	0	0	1,164	172	10	1,611
7	BATH	1	2	49	98	0	0	0	0	0	8	3	267
8	KITCHEN	1	2	218	436	0	0	0	0	0	8	5	130
9	DINING ROOM	1	2	184	368	0	0	0	0	0	55	8	611
10	BATH	1	2	49	98	0	0	0	0	98	12	4	262
11	BEDROOM NO. 3	1	2	184	368	0	0	0	0	368	60	9	606
12	HALL	1	2	141	282	0	0	0	0	282	0	0	0
13	BATH	1	2	39	78	0	0	0	0	78	12	10	106
Zone	2 Total/Ave.				1,728	0	0	0	0	826	154	7	1,982
System	2 Total/Ave.				4,012	0	0	0	0	1,990	326	8	3,594
Building					6,296	0	0	0	0	3,154	499	9	5,205

ASHRAE 90 ANALYSIS - ALTERNATIVE 4
COMBINED ECOS

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.030 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.089 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.068 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 1.68 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 9.22 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 4
COMBINED ECOS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	0.1	6	62	-5,939	7	318	50.6	0	0	0.0	0	0
5 - 10	0.2	8	84	-11,877	12	565	101.3	0	0	0.0	0	0
10 - 15	0.4	7	73	-17,816	14	642	151.9	0	0	0.0	0	0
15 - 20	0.5	5	57	-23,755	14	636	202.6	42	1,530	0.0	0	0
20 - 25	0.6	2	16	-29,693	19	883	253.2	0	0	0.0	0	0
25 - 30	0.7	7	70	-35,632	15	698	303.9	0	0	0.0	0	0
30 - 35	0.9	17	180	-41,571	14	648	354.5	0	0	0.0	0	0
35 - 40	1.0	11	115	-47,509	4	181	405.1	0	0	0.0	0	0
40 - 45	1.1	11	120	-53,448	0	0	455.8	0	0	0.0	0	0
45 - 50	1.2	5	56	-59,387	0	0	506.4	21	765	0.0	0	0
50 - 55	1.3	11	121	-65,325	0	0	557.1	0	0	0.0	0	0
55 - 60	1.5	2	20	-71,264	0	0	607.7	0	0	0.0	0	0
60 - 65	1.6	2	20	-77,203	0	0	658.4	0	0	0.0	0	0
65 - 70	1.7	0	0	-83,141	0	0	709.0	0	0	0.0	0	0
70 - 75	1.8	0	0	-89,080	0	0	759.7	0	0	0.0	0	0
75 - 80	1.9	2	20	-95,019	0	0	810.3	0	0	0.0	0	0
80 - 85	2.1	1	11	-100,957	0	0	860.9	0	0	0.0	0	0
85 - 90	2.2	0	0	-106,896	0	0	911.6	0	0	0.0	0	0
90 - 95	2.3	0	0	-112,835	0	0	962.2	0	0	0.0	0	0
95 - 100	2.4	3	31	-118,773	0	0	1,012.9	38	1,377	0.0	0	0
Hours Off	0.0	0	7,704	0	0	4,189	0.0	0	5,088	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 4
 COMBINED ECOS

----- BUILDING TEMPERATURE PROFILES -----

Temperature Range (F)	Zone Number		
	1	1	2

Max. Temp.	80.7	105.3	106.5
Mo./Hr.	7 14	8 21	8 21
Day Type	1	1	1

	Number of Hours		
Above 100	0	1,268	1,256
95 - 100	0	1,050	1,128
90 - 95	0	492	360
85 - 90	0	276	497
80 - 85	0	334	431
75 - 80	2,903	252	0
70 - 75	769	119	0
65 - 70	314	4,969	5,088
60 - 65	575	0	0
55 - 60	955	0	0
50 - 55	374	0	0
Below 50	2,870	0	0

Min. Temp.	34.3	67.9	67.9
Mo./Hr.	2 10	3 19	1 23
Day Type	5	1	2

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 4
COMBINED ECOS

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC	DEMAND	HOT WTR	HOT W DMND
	Off Peak (kWh)	On Peak (kW)	On Peak (Therm)	On Peak (Thrm/hr)
Jan	834	3	249	0
Feb	754	3	251	0
March	855	3	162	0
April	804	3	65	0
May	880	3	0	0
June	1,266	7	0	0
July	1,636	7	0	0
Aug	1,254	7	0	0
Sept	838	7	0	0
Oct	844	3	37	0
Nov	804	3	110	0
Dec	824	3	204	0
Total	11,592	7	1,078	0

Building Energy Consumption = 23,411 (Btu/Sq Ft/Year)
Source Energy Consumption = 41,690 (Btu/Sq Ft/Year)

Floor Area = 6,296 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION

[illegible]

V 600
PAGE 47

[illegible]

UTILITY PEAK CHECKSUMS - ALTERNATIVE 4
COMBINED ECOS

----- U T I L I T Y P E A K C H E C K S U M S -----

Utility ELECTRIC DEMAND

Peak Value 7.2 (kW)
Yearly Time of Peak 16 (hr) 7 (mo)

Hour 16 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

1	EQ1161	AIR-CLD COND COMP <15 TONS	4.0	55.13

Sub Total			4.0	55.13

Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	1.20

Sub Total			0.1	1.20

Sub Total			0.0	0.00

Miscellaneous

Lights			3.1	43.66

Base Utilities			0.0	0.00

Misc Equipment			0.0	0.00

Sub Total			3.1	43.66

Grand Total			7.2	100.00

Building 313
Trace Input File

933702

CONTENTS OF : C:\JOBS\CB313.TM

LINE # -----

- 1 JOB - 1
- 2 01/ENERGY SAVINGS OPPORTUNITY STUDY
- 3 01/CARLISLE BARRACKS, PA
- 4 01/DEPARTMENT OF THE ARMY
- 5 01/BENATEC ASSOCIATES
- 6 01/BUILDING 313
- 7 08/CARLISLE
- 8 09/MAY/SEP///APR/OCT
- 9 10/CLTD-CLF
- 10 11///ZONE
- 11 LOAD - 1
- 12 19/1/BASE BUILDING
- 13 20/1/1/LIQUOR STORE/1073/1/2/0//10
- 14 20/2/2/RAD ONLY/2856/1/2/0//12
- 15 20/3/3/ATTIC/1354/1/1/0//10
- 16 20/4/4/OFFICES/1266/1/1/0//10
- 17 20/5/5/PARTY ROOMS/1748/1/1/1//15
- 18 20/6/6/LOUNGE/1564/1/1/1//12
- 19 20/7/7/MECH ROOM/469/1/2/0//10
- 20 20/8/8/LOBBY/1071/1/1/1//12
- 21 20/9/9/PRIVATE DINING/544/1/2/0//12
- 22 20/10/10/DINING ROOM/1537/1/1/1//12
- 23 20/11/11/BALL ROOM/4223/1/1/2//20
- 24 20/12/12/KITCHEN/1966/1/2/0//12
- 25 20/13/13/KITCHEN OFFICE/51/1/2/0//12
- 26 21/1/38/45/38//35/35//ROOM
- 27 21/2///CBOMTX///CBOMTX
- 28 21/3///CBOMTX///CBOMTX
- 29 21/4///CBOMTX///CBOMTX
- 30 21/5///CBOMTX///CBOMTX
- 31 21/6///CBOMTX///CBOMTX
- 32 21/8///CBOMTX///CBOMTX
- 33 21/9///CBOMTX///CBOMTX
- 34 21/10///CBOMTX///CBOMTX
- 35 21/11///CBOMTX///CBOMTX
- 36 21/12///CBOMTX///CBOMTX
- 37 21/13///CBOMTX///CBOMTX
- 38 22/2/1/NO/2015/1//119
- 39 22/2/2/NO/138/1//171
- 40 22/3/1/YES///171
- 41 22/4/1/YES///171
- 42 22/9/1/YES///119
- 43 22/12/1/YES///119
- 44 22/13/1/YES///119
- 45 24/2/1/21/11//127/30
- 46 24/2/2/39/11//127/120
- 47 24/2/3/46/11//127/210
- 48 24/2/4/117/11//127/300
- 49 24/3/1/94/9//128/30
- 50 24/3/2/29/9//128/120
- 51 24/3/3/31/9//128/210
- 52 24/4/1/43/9//170/120
- 53 24/4/2/30/9//128/30
- 54 24/4/3/21/9//128/120
- 55 24/4/4/52/9//128/210
- 56 24/5/1/14/14//127/210
- 57 24/5/2/16/14//127/300
- 58 24/6/1/31/11//170/30

CONTENTS OF : C:\JOBS\CB313.TM

LINE #	
59	24/6/2/21/11//170/120
60	24/6/3/53/11//170/210
61	24/8/1/51/11//170/120
62	24/9/1/16/11//127/30
63	24/9/2/34/11//127/120
64	24/10/1/29/11//170/120
65	24/10/2/31/11//170/210
66	24/12/1/45/11//127/30
67	25/2/2/4.75/3/1/.55/.57
68	25/2/4/72.8/1/4/.55/.57
69	25/3/1/2.2/1.6/3/.55/.57
70	25/3/2/2.2/1.6/1/.55/.57
71	25/4/1/4.75/3/4/.55/.57
72	25/4/3/2.2/1.6/1/.55/.57
73	25/4/4/2.2/1.6/3/.55/.57
74	25/5/1/80/1/1/.55/.57
75	25/5/2/72.8/1/1/.55/.57
76	25/6/2/6.5/2.5/3/.55/.57
77	25/6/3/6.5/2.5/6/.55/.57
78	25/8/1/6.25/3/4/.55/.57
79	25/9/1/6.5/2.5/3/.55/.57
80	25/9/2/5.25/2.25/2/.55/.57
81	25/10/1/6.5/2.5/3/.55/.57
82	25/10/2/6.5/2.5/4/.55/.57
83	26/1/OFF/OFF/OFF/OFF/OFF/AVAIL/OFF/OFF/OFF/OFF
84	26/2/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
85	26/3/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF
86	26/4/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF
87	26/5/CBOMP/CBOML/CBOMCLG/AVAIL/OFF/CBOMCLG/OFF/OFF/OFF/OFF
88	26/6/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF
89	26/7/OFF/OFF/CBOMFAN/AVAIL/OFF/OFF/OFF/OFF/CBOMFAN/OFF
90	26/8/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF
91	26/9/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF
92	26/10/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF
93	26/11/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF
94	26/12/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF
95	26/13/CBOMP/CBOML/OFF/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF
96	27/3/153/SF-PERS/255/325/1.35/WATT-SF
97	27/4/153/SF-PERS/255/325/1.35/WATT-SF
98	27/5/153/SF-PERS/255/325/1.35/WATT-SF
99	27/6/153/SF-PERS/255/325/1.35/WATT-SF
100	27/8/153/SF-PERS/255/325/1.35/WATT-SF
101	27/9/153/SF-PERS/255/325/1.35/WATT-SF
102	27/10/153/SF-PERS/255/325/1.35/WATT-SF
103	27/11/153/SF-PERS/255/325/1.35/WATT-SF
104	27/12/153/SF-PERS/255/325/1.35/WATT-SF
105	27/13/153/SF-PERS/255/325/1.35/WATT-SF
106	28/12/1/COOKING/48000/BUH/CBOMFAN/ELEC/90//80
107	29/1/////44/CFM-SF
108	29/2/////44/CFM-SF
109	29/3/450/CFM/450/CFM/.44/CFM-SF/.44/CFM-SF
110	29/4/235/CFM/235/CFM/.44/CFM-SF/.44/CFM-SF
111	29/5/1950/CFM///.44/CFM-SF/.44/CFM-SF
112	29/6/1600/CFM/1600/CFM/.44/CFM-SF/.44/CFM-SF
113	29/7/5220/CFM/5220/CFM/.44/CFM-SF/.44/CFM-SF
114	29/8/110/CFM///.44/CFM-SF/.44/CFM-SF
115	29/9/360/CFM/360/CFM/.44/CFM-SF/.44/CFM-SF
116	29/10/780/CFM/780/CFM/.44/CFM-SF/.44/CFM-SF

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LINE # -----

117 29/11/5040/CFM/5040/CFM/.44/CFM-SF/.44/CFM-SF

118 29/12/14400/CFM/14400/CFM///.44/CFM-SF

119 29/13/////44/CFM-SF

120 30/1

121 30/2/////////2945/CFM

122 30/3/1600/CFM/1600/CFM////200/CFM

123 30/4/2325/CFM/2325/CFM

124 30/5/3225/CFM

125 30/6/3315/CFM/3315/CFM////1000/CFM

126 30/7/////////5220/CFM

127 30/8/1100/CFM

128 30/9/1000/CFM/1000/CFM

129 30/10/2400/CFM/2400/CFM

130 30/11/11100/CFM/11100/CFM

131 30/12/18000/CFM/18000/CFM////15150/CFM

132 30/13/200/CFM

133 31/2/1/114/3//147/SINE-FIT/80/50

134 31/7/1/36/3//147/SINE-FIT/80/50

135 SYSTEM - 1

136 39/1/BASE BUILDING

137 40/1/PTAC

138 41/1/1/1

139 42/1/.2

140 44/1

141 45/1/AVAIL/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF

142 40/2/RAD

143 41/2/2/2

144 42/2////.125//.125

145 44/2

146 45/2/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF

147 40/3/SZ

148 41/3/3/3

149 42/3/1.75///.125//.125

150 44/3

151 45/3/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF

152 40/4/SZ

153 41/4/4/4

154 42/4/1.75

155 44/4

156 45/4/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF

157 40/5/VAV

158 41/5/5/5

159 42/5/2

160 44/5

161 45/5/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF

162 40/6/SZ

163 41/6/6/6

164 42/6/1.75///.19//.19

165 44/6

166 45/6/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF

167 40/7/SZ

168 41/7/7/7

169 42/7////.75//.75

170 44/7

171 45/7/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF

172 40/8/SZ

173 41/8/8/8

174 42/8/1.75

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LINE #	
175	44/8
176	45/8/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
177	40/9/SZ
178	41/9/9/9
179	42/9/.2
180	44/9
181	45/9/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
182	40/10/SZ
183	41/10/10/10
184	42/10/.4
185	44/10
186	45/10/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
187	40/11/SZ
188	41/11/11/11
189	42/11/2
190	44/11
191	45/11/CBOMCLG/OFF/OFF/OFF/OFF/OFF/CBOMHTG/CBOMCLG/OFF/OFF
192	40/12/SZ
193	41/12/12/12
194	42/12/2.75///.25//.25
195	44/12/NONE/////////60//HEAT
196	45/12/OFF/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
197	40/13/FC
198	41/13/13/13
199	42/13/.2
200	44/13
201	45/13/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
202	40/14/RAD
203	41/14/3/6/8/10
204	42/14
205	45/14/OFF/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
206	EQUIPMENT - 1
207	59/1/CARLISLE///BASE BUILDING
208	60/1/1/PKPLANT/1/1
209	60/2/2/BLKPLANT/3/6/8/8/13/13
210	60/3/3/PKPLANT/9/9
211	60/4/4/PKPLANT/10/10
212	60/5/5/BLKPLANT/11/11
213	62/1/EQ1161/1
214	62/2/EQ1100S/1/39.4/TONS
215	62/3/EQ1281/1
216	62/4/EQ1281/1
217	62/5/EQ1101L/1/52.7/TONS
218	63/2/3/HP
219	63/5/3/HP
220	65/1/1/2/6/11/11/14/14
221	65/2/2/9/10
222	65/3/3/12/12
223	67/1/EQ2102/1/35/FT-WATER
224	67/2/EQ2261/2
225	67/3/EQ2101/1
226	69/1/EQ4003
227	69/2
228	69/3/EQ4003///EQ4003//EQ4003
229	69/4/EQ4003
230	69/5/EQ4003
231	69/6/EQ4003///EQ4003//EQ4003
232	69/7

LINE # -----
233 69/8/EQ4003
234 69/9/EQ4003
235 69/10/EQ4003
236 69/11/EQ4003
237 69/12/EQ4003////EQ4003
238 69/13/EQ4003
239 LOAD - 2
240 19/2/WALL & ROOF INSULATION
241 20/1/1/LIQUOR STORE/1073/1/2/0//10
242 20/2/2/RAD ONLY/2856/1/2/0//12
243 20/3/3/ATTIC/1354/1/1/0//10
244 20/4/4/OFFICES/1266/1/1/0//10
245 20/5/5/PARTY ROOMS/1748/1/1/1//15
246 20/6/6/LOUNGE/1564/1/1/1//12
247 20/7/7/MECH ROOM/469/1/2/0//10
248 20/8/8/LOBBY/1071/1/1/1//12
249 20/9/9/PRIVATE DINING/544/1/2/0//12
250 20/10/10/DINING ROOM/1537/1/1/1//12
251 20/11/11/BALL ROOM/4223/1/1/2//20
252 20/12/12/KITCHEN/1966/1/2/0//12
253 20/13/13/KITCHEN OFFICE/51/1/2/0//12
254 21/1/38/45/38//38/38
255 21/2////CBOMTX//CBOMTX
256 21/3////CBOMTX//CBOMTX
257 21/4////CBOMTX//CBOMTX
258 21/5////CBOMTX//CBOMTX
259 21/6////CBOMTX//CBOMTX
260 21/8////CBOMTX//CBOMTX
261 21/9////CBOMTX//CBOMTX
262 21/10////CBOMTX//CBOMTX
263 21/11////CBOMTX//CBOMTX
264 21/12////CBOMTX//CBOMTX
265 21/13////CBOMTX//CBOMTX
266 22/2/1/NO/2015/1//119
267 22/2/2/NO/138/1//171
268 22/3/1/YES////171
269 22/4/1/YES////171
270 22/9/1/YES////119
271 22/12/1/YES////119
272 22/13/1/YES////119
273 24/2/1/21/11//127/30
274 24/2/2/39/11//127/120
275 24/2/3/46/11//127/210
276 24/2/4/117/11//127/300
277 24/3/1/94/9//117/30
278 24/3/2/29/9//117/120
279 24/3/3/31/9//117/210
280 24/4/1/43/9//183/120
281 24/4/2/30/9//117/30
282 24/4/3/21/9//117/120
283 24/4/4/52/9//117/210
284 24/5/1/14/14//127/210
285 24/5/2/16/14//127/300
286 24/6/1/31/11//183/30
287 24/6/2/21/11//183/120
288 24/6/3/53/11//183/210
289 24/8/1/51/11//183/120
290 24/9/1/16/11//127/30

LINE #	
291	24/9/2/34/11//127/120
292	24/10/1/29/11//183/120
293	24/10/2/31/11//183/210
294	24/12/1/45/11//127/30
295	25/2/2/4.75/3/1/.55/.57
296	25/2/4/72.8/1/4/.55/.57
297	25/3/1/2.2/1.6/3/.55/.57
298	25/3/2/2.2/1.6/1/.55/.57
299	25/4/1/4.75/3/4/.55/.57
300	25/4/3/2.2/1.6/1/.55/.57
301	25/4/4/2.2/1.6/3/.55/.57
302	25/5/1/80/1/1/.55/.57
303	25/5/2/72.8/1/1/.55/.57
304	25/6/2/6.5/2.5/3/.55/.57
305	25/6/3/6.5/2.5/6/.55/.57
306	25/8/1/6.25/3/4/.55/.57
307	25/9/1/6.5/2.5/3/.55/.57
308	25/9/2/5.25/2.25/2/.55/.57
309	25/10/1/6.5/2.5/3/.55/.57
310	25/10/2/6.5/2.5/4/.55/.57
311	26/1/OFF/OFF/OFF/AVAIL/OFF/AVAIL/OFF/OFF/OFF/OFF
312	26/2/OFF/OFF/OFF/AVAIL/OFF/OFF/OFF/OFF/CBOMFAN/OFF
313	26/3/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF
314	26/4/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF
315	26/5/CBOMP/CBOML/CBOMCLG/AVAIL/OFF/CBOMCLG/OFF/OFF/OFF/CFF
316	26/6/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF
317	26/7/OFF/OFF/CBOMFAN/AVAIL/OFF/OFF/OFF/OFF/CBOMFAN/OFF
318	26/8/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF
319	26/9/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF
320	26/10/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/CFF/OFF/OFF
321	26/11/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF
322	26/12/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF
323	26/13/CBOMP/CBOML/OFF/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF
324	27/3/153/SF-PERS/255/325/1.35/WATT-SF
325	27/4/153/SF-PERS/255/325/1.35/WATT-SF
326	27/5/153/SF-PERS/255/325/1.35/WATT-SF
327	27/6/153/SF-PERS/255/325/1.35/WATT-SF
328	27/8/153/SF-PERS/255/325/1.35/WATT-SF
329	27/9/153/SF-PERS/255/325/1.35/WATT-SF
330	27/10/153/SF-PERS/255/325/1.35/WATT-SF
331	27/11/153/SF-PERS/255/325/1.35/WATT-SF
332	27/12/153/SF-PERS/255/325/1.35/WATT-SF
333	27/13/153/SF-PERS/255/325/1.35/WATT-SF
334	28/12/1/COOKING/48000/BTUH/CBOMFAN/ELEC/90//80
335	29/1/////39/CFM-SF
336	29/2/////39/CFM-SF
337	29/3/450/CFM/450/CFM/.39/CFM-SF/.39/CFM-SF
338	29/4/235/CFM/235/CFM/.39/CFM-SF/.39/CFM-SF
339	29/5/1950/CFM///.39/CFM-SF/.39/CFM-SF
340	29/6/1600/CFM/1600/CFM/.39/CFM-SF/.39/CFM-SF
341	29/7/5220/CFM/5220/CFM/.39/CFM-SF/.39/CFM-SF
342	29/8/110/CFM///.39/CFM-SF/.39/CFM-SF
343	29/9/360/CFM/360/CFM/.39/CFM-SF/.39/CFM-SF
344	29/10/780/CFM/780/CFM/.39/CFM-SF/.39/CFM-SF
345	29/11/5040/CFM/5040/CFM/.39/CFM-SF/.39/CFM-SF
346	29/12/14400/CFM/14400/CFM///.39/CFM-SF
347	29/13/////39/CFM-SF
348	30/1

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LINE #	
349	30/2/////////2945/CFM
350	30/3/1600/CFM/1600/CFM////200/CFM
351	30/4/2325/CFM/2325/CFM
352	30/5/3225/CFM
353	30/6/3315/CFM/3315/CFM////1000/CFM
354	30/7/////////5220/CFM
355	30/8/1100/CFM
356	30/9/1000/CFM/1000/CFM
357	30/10/2400/CFM/2400/CFM
358	30/11/11100/CFM/11100/CFM
359	30/12/18000/CFM/18000/CFM////15150/CFM
360	30/13/200/CFM
361	31/2/1/114/3//147/SINE-FIT/80/50
362	31/7/1/36/3//147/SINE-FIT/80/50
363	SYSTEM - 2
364	39/2/WALL & ROOF INSULATION
365	40/1/PTAC
366	41/1/1/1
367	42/1/.2
368	44/1
369	45/1/AVAIL/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
370	40/2/RAD
371	41/2/2/2
372	42/2////.125//.125
373	44/2
374	45/2/OFF/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
375	40/3/SZ
376	41/3/3/3
377	42/3/1.75///.125//.125
378	44/3
379	45/3/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
380	40/4/SZ
381	41/4/4/4
382	42/4/1.75
383	44/4
384	45/4/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
385	40/5/VAV
386	41/5/5/5
387	42/5/2
388	44/5
389	45/5/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
390	40/6/SZ
391	41/6/6/6
392	42/6/1.75///.19//.19
393	44/6
394	45/6/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/CBOMCLG/OFF/OFF
395	40/7/SZ
396	41/7/7/7
397	42/7////.75//.75
398	44/7
399	45/7/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
400	40/8/SZ
401	41/8/8/8
402	42/8/1.75
403	44/8
404	45/8/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
405	40/9/SZ
406	41/9/9/9

LINE # -----

407 42/9/.2

408 44/9

409 45/9/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF

410 40/10/SZ

411 41/10/10/10

412 42/10/.4

413 44/10

414 45/10/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF

415 40/11/SZ

416 41/11/11/11

417 42/11/2

418 44/11

419 45/11/CBOMCLG/OFF/OFF/OFF/OFF/OFF/CBOMHTG/CBOMCLG/OFF/OFF

420 40/12/SZ

421 41/12/12/12

422 42/12/2.75///.25//.25

423 44/12/NONE/////60//HEAT

424 45/12/OFF/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF

425 40/13/FC

426 41/13/13/13

427 42/13/.2

428 44/13

429 45/13/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF

430 40/14/RAD

431 41/14/3/6/8/10

432 42/14

433 45/14/OFF/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF

434 EQUIPMENT - 2

435 59/2/CARLISLE///WALL & ROOF INSULATION

436 60/1/1/PKPLANT/1/1

437 60/2/2/BLKPLANT/3/6/8/8/13/13

438 60/3/3/PKPLANT/9/9

439 60/4/4/PKPLANT/10/10

440 60/5/5/BLKPLANT/11/11

441 62/1/EQ1161/1

442 62/2/EQ1100S/1/39.4/TONS

443 62/3/EQ1281/1

444 62/4/EQ1281/1

445 62/5/EQ1101L/1/52.7/TONS

446 63/2/3/HP

447 63/5/3/HP

448 65/1/1/2/6/11/11/14/14

449 65/2/2/9/10

450 65/3/3/12/12

451 67/1/EQ2102/1/35/FT-WATER

452 67/2/EQ2261/2

453 67/3/EQ2101/1

454 69/1/EQ4003

455 69/2

456 69/3/EQ4003///EQ4003//EQ4003

457 69/4/EQ4003

458 69/5/EQ4003

459 69/6/EQ4003///EQ4003//EQ4003

460 69/7

461 69/8/EQ4003

462 69/9/EQ4003

463 69/10/EQ4003

464 69/11/EQ4003

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LINE # -----

465 69/12/EQ4003/////EQ4003

466 69/13/EQ4003

467 LOAD - 3

468 19/3/WEATHERSTRIP & CAULKING

469 20/1/1/LIQUOR STORE/1073/1/2/0//10

470 20/2/2/RAD ONLY/2856/1/2/0//12

471 20/3/3/ATTIC/1354/1/1/0//10

472 20/4/4/OFFICES/1266/1/1/0//10

473 20/5/5/PARTY ROOMS/1748/1/1/1//15

474 20/6/6/LOUNGE/1564/1/1/1//12

475 20/7/7/MECH ROOM/469/1/2/0//10

476 20/8/8/LOBBY/1071/1/1/1//12

477 20/9/9/PRIVATE DINING/544/1/2/0//12

478 20/10/10/DINING ROOM/1537/1/1/1//12

479 20/11/11/BALL ROOM/4223/1/1/2//20

480 20/12/12/KITCHEN/1966/1/2/0//12

481 20/13/13/KITCHEN OFFICE/51/1/2/0//12

482 21/1/38/45/38//38/38

483 21/2////CBOMTX///CBOMTX

484 21/3////CBOMTX///CBOMTX

485 21/4////CBOMTX///CBOMTX

486 21/5////CBOMTX///CBOMTX

487 21/6////CBOMTX///CBOMTX

488 21/8////CBOMTX///CBOMTX

489 21/9////CBOMTX///CBOMTX

490 21/10////CBOMTX///CBOMTX

491 21/11////CBOMTX///CBOMTX

492 21/12////CBOMTX///CBOMTX

493 21/13////CBOMTX///CBOMTX

494 22/2/1/NO/2015/1//119

495 22/2/2/NO/138/1//171

496 22/3/1/YES////171

497 22/4/1/YES////171

498 22/9/1/YES////119

499 22/12/1/YES////119

500 22/13/1/YES////119

501 24/2/1/21/11//127/30

502 24/2/2/39/11//127/120

503 24/2/3/46/11//127/210

504 24/2/4/117/11//127/300

505 24/3/1/94/9//128/30

506 24/3/2/29/9//128/120

507 24/3/3/31/9//128/210

508 24/4/1/43/9//170/120

509 24/4/2/30/9//128/30

510 24/4/3/21/9//128/120

511 24/4/4/52/9//128/210

512 24/5/1/14/14//127/210

513 24/5/2/16/14//127/300

514 24/6/1/31/11//170/30

515 24/6/2/21/11//170/120

516 24/6/3/53/11//170/210

517 24/8/1/51/11//170/120

518 24/9/1/16/11//127/30

519 24/9/2/34/11//127/120

520 24/10/1/29/11//170/120

521 24/10/2/31/11//170/210

522 24/12/1/45/11//127/30

LINE # -----

523 25/2/2/4.75/3/1/.55/.57

524 25/2/4/72.8/1/4/.55/.57

525 25/3/1/2.2/1.6/3/.55/.57

526 25/3/2/2.2/1.6/1/.55/.57

527 25/4/1/4.75/3/4/.55/.57

528 25/4/3/2.2/1.6/1/.55/.57

529 25/4/4/2.2/1.6/3/.55/.57

530 25/5/1/80/1/1/.55/.57

531 25/5/2/72.8/1/1/.55/.57

532 25/6/2/6.5/2.5/3/.55/.57

533 25/6/3/6.5/2.5/6/.55/.57

534 25/8/1/6.25/3/4/.55/.57

535 25/9/1/6.5/2.5/3/.55/.57

536 25/9/2/5.25/2.25/2/.55/.57

537 25/10/1/6.5/2.5/3/.55/.57

538 25/10/2/6.5/2.5/4/.55/.57

539 26/1/OFF/OFF/OFF/AVAIL/OFF/AVAIL/OFF/OFF/OFF/OFF

540 26/2/OFF/OFF/OFF/AVAIL/OFF/OFF/OFF/OFF/CBOMFAN/OFF

541 26/3/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF

542 26/4/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

543 26/5/CBOMP/CBOML/CBOMCLG/AVAIL/OFF/CBOMCLG/OFF/OFF/OFF/OFF

544 26/6/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF

545 26/7/OFF/OFF/CBOMFAN/AVAIL/OFF/OFF/OFF/OFF/CBOMFAN/OFF

546 26/8/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

547 26/9/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

548 26/10/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

549 26/11/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

550 26/12/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF

551 26/13/CBOMP/CBOML/OFF/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

552 27/3/153/SF-PERS/255/325/1.35/WATT-SF

553 27/4/153/SF-PERS/255/325/1.35/WATT-SF

554 27/5/153/SF-PERS/255/325/1.35/WATT-SF

555 27/6/153/SF-PERS/255/325/1.35/WATT-SF

556 27/8/153/SF-PERS/255/325/1.35/WATT-SF

557 27/9/153/SF-PERS/255/325/1.35/WATT-SF

558 27/10/153/SF-PERS/255/325/1.35/WATT-SF

559 27/11/153/SF-PERS/255/325/1.35/WATT-SF

560 27/12/153/SF-PERS/255/325/1.35/WATT-SF

561 27/13/153/SF-PERS/255/325/1.35/WATT-SF

562 28/12/1/COOKING/48000/BTUH/CBOMFAN/ELEC/90//80

563 29/1/////42/CFM-SF

564 29/2/////42/CFM-SF

565 29/3/450/CFM/450/CFM/.42/CFM-SF/.42/CFM-SF

566 29/4/235/CFM/235/CFM/.42/CFM-SF/.42/CFM-SF

567 29/5/1950/CFM///.42/CFM-SF/.42/CFM-SF

568 29/6/1600/CFM/1600/CFM/.42/CFM-SF/.42/CFM-SF

569 29/7/5220/CFM/5220/CFM/.42/CFM-SF/.42/CFM-SF

570 29/8/110/CFM///.42/CFM-SF/.42/CFM-SF

571 29/9/360/CFM/360/CFM/.42/CFM-SF/.42/CFM-SF

572 29/10/780/CFM/780/CFM/.42/CFM-SF/.42/CFM-SF

573 29/11/5040/CFM/5040/CFM/.42/CFM-SF/.42/CFM-SF

574 29/12/14400/CFM/14400/CFM///.42/CFM-SF

575 29/13/////42/CFM-SF

576 30/1

577 30/2/////////2945/CFM

578 30/3/1600/CFM/1600/CFM/////200/CFM

579 30/4/2325/CFM/2325/CFM

580 30/5/3225/CFM

CONTENTS OF : C:\JOBS\CB313.TM

LINE #	
581	30/6/3315/CFM/3315/CFM/////1000/CFM
582	30/7/////////5220/CFM
583	30/8/1100/CFM
584	30/9/1000/CFM/1000/CFM
585	30/10/2400/CFM/2400/CFM
586	30/11/11100/CFM/11100/CFM
587	30/12/18000/CFM/18000/CFM/////15150/CFM
588	30/13/200/CFM
589	31/2/1/114/3//147/SINE-FIT/80/50
590	31/7/1/36/3//147/SINE-FIT/80/50
591	SYSTEM - 3
592	39/3/WEATHERSTRIP & CAULKING
593	40/1/PTAC
594	41/1/1/1
595	42/1/.2
596	44/1
597	45/1/AVAIL/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
598	40/2/RAD
599	41/2/2/2
600	42/2////.125//.125
601	44/2
602	45/2/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
603	40/3/SZ
604	41/3/3/3
605	42/3/1.75///.125//.125
606	44/3
607	45/3/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
608	40/4/SZ
609	41/4/4/4
610	42/4/1.75
611	44/4
612	45/4/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
613	40/5/VAV
614	41/5/5/5
615	42/5/2
616	44/5
617	45/5/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
618	40/6/SZ
619	41/6/6/6
620	42/6/1.75///.19//.19
621	44/6
622	45/6/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
623	40/7/SZ
624	41/7/7/7
625	42/7////.75//.75
626	44/7
627	45/7/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
628	40/8/SZ
629	41/8/8/8
630	42/8/1.75
631	44/8
632	45/8/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
633	40/9/SZ
634	41/9/9/9
635	42/9/.2
636	44/9
637	45/9/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
638	40/10/SZ

CONTENTS OF : C:\JOBS\CB313.TM

LINE # -----

639 41/10/10/10

640 42/10/.4

641 44/10

642 45/10/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF

643 40/11/SZ

644 41/11/11/11

645 42/11/2

646 44/11

647 45/11/CBOMCLG/OFF/OFF/OFF/OFF/OFF/CBOMHTG/CBOMCLG/OFF/OFF

648 40/12/SZ

649 41/12/12/12

650 42/12/2.75///.25//.25

651 44/12/NONE/////////60//HEAT

652 45/12/OFF/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF

653 40/13/FC

654 41/13/13/13

655 42/13/.2

656 44/13

657 45/13/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF

658 40/14/RAD

659 41/14/3/6/8/10

660 42/14

661 45/14/OFF/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF

662 EQUIPMENT - 3

663 59/3/CARLISLE///WEATHERSTRIP & CAULKING

664 60/1/1/PKPLANT/1/1

665 60/2/2/BLKPLANT/3/6/8/8/13/13

666 60/3/3/PKPLANT/9/9

667 60/4/4/PKPLANT/10/10

668 60/5/5/BLKPLANT/11/11

669 62/1/EQ1161/1

670 62/2/EQ1100S/1/39.4/TONS

671 62/3/EQ1281/1

672 62/4/EQ1281/1

673 62/5/EQ1101L/1/52.7/TONS

674 63/2/3/HP

675 63/5/3/HP

676 65/1/1/2/6/11/11/14/14

677 65/2/2//9/10

678 65/3/3//12/12

679 67/1/EQ2102/1/35/FT-WATER

680 67/2/EQ2261/2

681 67/3/EQ2101/1

682 69/1/EQ4003

683 69/2

684 69/3/EQ4003///EQ4003//EQ4003

685 69/4/EQ4003

686 69/5/EQ4003

687 69/6/EQ4003///EQ4003//EQ4003

688 69/7

689 69/8/EQ4003

690 69/9/EQ4003

691 69/10/EQ4003

692 69/11/EQ4003

693 69/12/EQ4003/////EQ4003

694 69/13/EQ4003

695 LOAD - 4

696 19/4/COMBINED ECOS

CONTENTS OF : C:\JOBS\CB313.TM

LINE #	
697	20/1/1/LIQUOR STORE/1073/1/2/0//10
698	20/2/2/RAD ONLY/2856/1/2/0//12
699	20/3/3/ATTIC/1354/1/1/0//10
700	20/4/4/OFFICES/1266/1/1/0//10
701	20/5/5/PARTY ROOMS/1748/1/1/1//15
702	20/6/6/LOUNGE/1564/1/1/1//12
703	20/7/7/MECH ROOM/469/1/2/0//10
704	20/8/8/LOBBY/1071/1/1/1//12
705	20/9/9/PRIVATE DINING/544/1/2/0//12
706	20/10/10/DINING ROOM/1537/1/1/1//12
707	20/11/11/BALL ROOM/4223/1/1/2//20
708	20/12/12/KITCHEN/1966/1/2/0//12
709	20/13/13/KITCHEN OFFICE/51/1/2/0//12
710	21/1/38/45/38//38/38
711	21/2///CBOMTX///CBOMTX
712	21/3///CBOMTX///CBOMTX
713	21/4///CBOMTX///CBOMTX
714	21/5///CBOMTX///CBOMTX
715	21/6///CBOMTX///CBOMTX
716	21/8///CBOMTX///CBOMTX
717	21/9///CBOMTX///CBOMTX
718	21/10///CBOMTX///CBOMTX
719	21/11///CBOMTX///CBOMTX
720	21/12///CBOMTX///CBOMTX
721	21/13///CBOMTX///CBOMTX
722	22/2/1/NO/2015/1//119
723	22/2/2/NO/138/1//171
724	22/3/1/YES///171
725	22/4/1/YES///171
726	22/9/1/YES///119
727	22/12/1/YES///119
728	22/13/1/YES///119
729	24/2/1/21/11//127/30
730	24/2/2/39/11//127/120
731	24/2/3/46/11//127/210
732	24/2/4/117/11//127/300
733	24/3/1/94/9//117/30
734	24/3/2/29/9//117/120
735	24/3/3/31/9//117/210
736	24/4/1/43/9//183/120
737	24/4/2/30/9//117/30
738	24/4/3/21/9//117/120
739	24/4/4/52/9//117/210
740	24/5/1/14/14//127/210
741	24/5/2/16/14//127/300
742	24/6/1/31/11//183/30
743	24/6/2/21/11//183/120
744	24/6/3/53/11//183/210
745	24/8/1/51/11//183/120
746	24/9/1/16/11//127/30
747	24/9/2/34/11//127/120
748	24/10/1/29/11//183/120
749	24/10/2/31/11//183/210
750	24/12/1/45/11//127/30
751	25/2/2/4.75/3/1/.55/.57
752	25/2/4/72.8/1/4/.55/.57
753	25/3/1/2.2/1.6/3/.55/.57
754	25/3/2/2.2/1.6/1/.55/.57

CONTENTS OF : C:\JOBS\CB313.TM

LINE # -----

755 25/4/1/4.75/3/4/.55/.57

756 25/4/3/2.2/1.6/1/.55/.57

757 25/4/4/2.2/1.6/3/.55/.57

758 25/5/1/80/1/1/.55/.57

759 25/5/2/72.8/1/1/.55/.57

760 25/6/2/6.5/2.5/3/.55/.57

761 25/6/3/6.5/2.5/6/.55/.57

762 25/8/1/6.25/3/4/.55/.57

763 25/9/1/6.5/2.5/3/.55/.57

764 25/9/2/5.25/2.25/2/.55/.57

765 25/10/1/6.5/2.5/3/.55/.57

766 25/10/2/6.5/2.5/4/.55/.57

767 26/1/OFF/OFF/OFF/AVAIL/OFF/AVAIL/OFF/OFF/OFF/OFF

768 26/2/OFF/OFF/OFF/AVAIL/OFF/OFF/OFF/OFF/CBOMFAN/OFF

769 26/3/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF

770 26/4/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

771 26/5/CBOMP/CBOML/CBOMCLG/AVAIL/OFF/CBOMCLG/OFF/OFF/OFF/OFF

772 26/6/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF

773 26/7/OFF/OFF/CBOMFAN/AVAIL/OFF/OFF/OFF/OFF/CBOMFAN/OFF

774 26/8/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

775 26/9/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

776 26/10/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

777 26/11/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

778 26/12/CBOMP/CBOML/CBOMFAN/AVAIL/OFF/CBOMFAN/OFF/OFF/CBOMFAN/OFF

779 26/13/CBOMP/CBOML/OFF/AVAIL/OFF/CBOMFAN/OFF/OFF/OFF/OFF

780 27/3/153/SF-PERS/255/325/1.35/WATT-SF

781 27/4/153/SF-PERS/255/325/1.35/WATT-SF

782 27/5/153/SF-PERS/255/325/1.35/WATT-SF

783 27/6/153/SF-PERS/255/325/1.35/WATT-SF

784 27/8/153/SF-PERS/255/325/1.35/WATT-SF

785 27/9/153/SF-PERS/255/325/1.35/WATT-SF

786 27/10/153/SF-PERS/255/325/1.35/WATT-SF

787 27/11/153/SF-PERS/255/325/1.35/WATT-SF

788 27/12/153/SF-PERS/255/325/1.35/WATT-SF

789 27/13/153/SF-PERS/255/325/1.35/WATT-SF

790 28/12/1/COOKING/48000/BTQH/CBOMFAN/ELEC/90//80

791 29/1///// .36/CFM-SF

792 29/2///// .36/CFM-SF

793 29/3/450/CFM/450/CFM/.36/CFM-SF/.36/CFM-SF

794 29/4/235/CFM/235/CFM/.36/CFM-SF/.36/CFM-SF

795 29/5/1950/CFM///.36/CFM-SF/.36/CFM-SF

796 29/6/1600/CFM/1600/CFM/.36/CFM-SF/.36/CFM-SF

797 29/7/5220/CFM/5220/CFM/.36/CFM-SF/.36/CFM-SF

798 29/8/110/CFM///.36/CFM-SF/.36/CFM-SF

799 29/9/360/CFM/360/CFM/.36/CFM-SF/.36/CFM-SF

800 29/10/780/CFM/780/CFM/.36/CFM-SF/.36/CFM-SF

801 29/11/5040/CFM/5040/CFM/.36/CFM-SF/.36/CFM-SF

802 29/12/14400/CFM/14400/CFM///.36/CFM-SF

803 29/13///// .36/CFM-SF

804 30/1

805 30/2/////////2945/CFM

806 30/3/1600/CFM/1600/CFM/////200/CFM

807 30/4/2325/CFM/2325/CFM

808 30/5/3225/CFM

809 30/6/3315/CFM/3315/CFM/////1000/CFM

810 30/7/////////5220/CFM

811 30/8/1100/CFM

812 30/9/1000/CFM/1000/CFM

CONTENTS OF : C:\JOBS\CB313.TM

LINE #	
813	30/10/2400/CFM/2400/CFM
814	30/11/11100/CFM/11100/CFM
815	30/12/18000/CFM/18000/CFM////15150/CFM
816	30/13/200/CFM
817	31/2/1/114/3//147/SINE-FIT/80/50
818	31/7/1/36/3//147/SINE-FIT/80/50
819	SYSTEM - 4
820	39/4/COMBINED ECOS
821	40/1/PTAC
822	41/1/1/1
823	42/1/.2
824	44/1
825	45/1/AVAIL/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
826	40/2/RAD
827	41/2/2/2
828	42/2////.125//.125
829	44/2
830	45/2/OFF/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
831	40/3/SZ
832	41/3/3/3
833	42/3/1.75////.125//.125
834	44/3
835	45/3/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
836	40/4/SZ
837	41/4/4/4
838	42/4/1.75
839	44/4
840	45/4/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
841	40/5/VAV
842	41/5/5/5
843	42/5/2
844	44/5
845	45/5/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
846	40/6/SZ
847	41/6/6/6
848	42/6/1.75////.19//.19
849	44/6
850	45/6/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/CBOMCLG/OFF/OFF
851	40/7/SZ
852	41/7/7/7
853	42/7////.75//.75
854	44/7
855	45/7/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
856	40/8/SZ
857	41/8/8/8
858	42/8/1.75
859	44/8
860	45/8/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
861	40/9/SZ
862	41/9/9/9
863	42/9/.2
864	44/9
865	45/9/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
866	40/10/SZ
867	41/10/10/10
868	42/10/.4
869	44/10
870	45/10/CBOMCLG/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF

CONTENTS OF : C:\JOBS\CB313.TM

LINE #	
871	40/11/SZ
872	41/11/11/11
873	42/11/2
874	44/11
875	45/11/CBOMCLG/OFF/OFF/OFF/OFF/OFF/CBOMHTG/CBOMCLG/OFF/OFF
876	40/12/SZ
877	41/12/12/12
878	42/12/2.75///.25//.25
879	44/12/NONE/////////60//HEAT
880	45/12/OFF/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
881	40/13/FC
882	41/13/13/13
883	42/13/.2
884	44/13
885	45/13/CBOMCLG/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF/OFF
886	40/14/RAD
887	41/14/3/6/8/10
888	42/14
889	45/14/OFF/OFF/OFF/OFF/OFF/CBOMHTG/OFF/OFF/OFF/OFF
890	EQUIPMENT - 4
891	59/4/CARLISLE///COMBINED ECOS
892	60/1/1/PKPLANT/1/1
893	60/2/2/BLKPLANT/3/6/8/8/13/13
894	60/3/3/PKPLANT/9/9
895	60/4/4/PKPLANT/10/10
896	60/5/5/BLKPLANT/11/11
897	62/1/EQ1161/1
898	62/2/EQ1100S/1/39.4/TONS
899	62/3/EQ1281/1
900	62/4/EQ1281/1
901	62/5/EQ1101L/1/52.7/TONS
902	63/2/3/HP
903	63/5/3/HP
904	65/1/1/2/6/11/11/14/14
905	65/2/2/9/10
906	65/3/3/12/12
907	67/1/EQ2102/1/35/FT-WATER
908	67/2/EQ2261/2
909	67/3/EQ2101/1
910	69/1/EQ4003
911	69/2
912	69/3/EQ4003///EQ4003//EQ4003
913	69/4/EQ4003
914	69/5/EQ4003
915	69/6/EQ4003///EQ4003//EQ4003
916	69/7
917	69/8/EQ4003
918	69/9/EQ4003
919	69/10/EQ4003
920	69/11/EQ4003
921	69/12/EQ4003////EQ4003
922	69/13/EQ4003

Building 313
Trace Output File

933702

```
*****  
*****  
**  
**          TRACE    600  ANALYSIS          **  
**  
**          by          **  
**  
*****  
*****
```

ENERGY SAVINGS OPPORTUNITY STUDY

CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 313

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 17:34:11 2/ 1/94
Dataset Name: CB313 .TM

AIRFLOW - ALTERNATIVE 1
 BASE BUILDING

----- S Y S T E M S U M M A R Y -----
 (Design Airflow Quantities)

System Number	System Type	Main					Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)		
1	PTAC	0	0	0	0	0	0	0
2	RAD	0	0	0	0	1,079	0	0
3	SZ	450	1,600	1,600	2,210	1,060	0	200
4	SZ	235	2,325	2,325	2,903	813	0	0
5	VAV	896	896	0	1,081	1,081	0	0
6	SZ	1,600	3,315	3,315	3,823	2,108	0	1,000
7	SZ	5,220	5,220	5,220	5,220	5,220	0	5,220
8	SZ	110	1,100	1,100	1,347	357	0	0
9	SZ	360	1,000	1,000	1,242	602	0	0
10	SZ	780	2,400	2,400	2,690	1,070	0	0
11	SZ	5,040	11,100	11,100	11,100	5,040	0	0
12	SZ	14,400	18,000	18,000	18,218	14,618	0	15,150
13	FC	0	200	200	200	0	0	0
14	RAD	0	0	0	0	2,660	0	0
Totals		29,091	47,157	46,260	50,035	35,709	0	21,570

CAPACITY - ALTERNATIVE 1
BASE BUILDING

----- SYSTEM SUMMARY -----
(Design Capacity Quantities)

		Cooling				Heating						
System	System	Main Sys.	Aux. Sys.	Opt. Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
Number	Type	Capacity	Capacity	Capacity	Totals	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Totals
		(Tons)	(Tons)	(Tons)	(Tons)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)
1	PTAC	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0
2	RAD	0.0	0.0	0.0	0.0	-99,354	0	0	0	0	0	-99,354
3	SZ	5.4	0.0	0.0	5.4	-69,193	0	-9,357	0	0	0	-69,193
4	SZ	4.5	0.0	0.0	4.5	-68,486	0	0	0	0	0	-68,486
5	VAV	4.2	0.0	0.0	4.2	-19,289	0	-47,267	0	0	0	-66,556
6	SZ	6.3	0.0	0.0	6.3	-62,801	0	-105,768	0	0	0	-62,801
7	SZ	18.8	0.0	0.0	18.8	-280	0	-403,238	0	0	0	-280
8	SZ	2.1	0.0	0.0	2.1	-30,557	0	0	0	0	0	-30,557
9	SZ	1.7	0.0	0.0	1.7	-22,333	0	-22,271	0	0	0	-22,333
10	SZ	3.5	0.0	0.0	3.5	-36,313	0	-51,943	0	0	0	-36,313
11	SZ	11.0	0.0	0.0	11.0	-1,208	0	-395,931	0	0	0	-1,208
12	SZ	36.5	0.0	0.0	36.5	-21,334	0	-1,047,061	0	0	0	-21,334
13	FC	0.0	0.0	0.0	0.0	-116	0	-1,117	0	0	0	-116
14	RAD	0.0	0.0	0.0	0.0	-308,782	0	0	0	0	0	-308,782
Totals		94.1	0.0	0.0	94.1	-740,045	0	-2,083,953	0	0	0	-787,312

The building peaked at hour 14 month 7 with a capacity of 94.1 tons

ENGINEERING CHECKS - ALTERNATIVE 1
BASE BUILDING

----- ENGINEERING CHECKS -----

			Percent	Cooling				Heating		Floor Area
System Number	Main/Auxiliary	System Type	Outside Air	Cfm/Sq Ft	Cfm/Ton	Sq Ft/Ton	Btuh/Sq Ft	Cfm/Sq Ft	Btuh/Sq Ft	
1	Main	PTAC	0.00	0.00	1,088.5	*****	0.00	0.00	0.00	1,073
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-34.79	2,856
3	Main	SZ	28.13	1.18	299.0	253.0	47.42	1.18	-51.10	1,354
4	Main	SZ	10.11	1.84	512.2	278.9	43.02	1.84	-54.10	1,266
5	Main	VAV	100.00	0.51	213.6	416.5	28.81	0.00	-38.08	1,748
6	Main	SZ	48.27	2.12	523.8	247.1	48.56	2.12	-40.15	1,564
7	Main	SZ	99.99	11.13	278.3	25.0	479.87	11.13	-0.60	469
8	Main	SZ	10.00	1.03	524.2	510.4	23.51	1.03	-28.53	1,071
9	Main	SZ	36.00	1.84	571.6	311.0	38.59	1.84	-41.05	544
10	Main	SZ	32.50	1.56	679.7	435.3	27.57	1.56	-23.63	1,537
11	Main	SZ	45.41	2.63	1,012.0	385.0	31.17	2.63	-0.29	4,223
12	Main	SZ	80.00	9.16	493.1	53.9	222.81	9.16	-10.85	1,966
13	Main	FC	0.00	3.92	4,658.1	1,187.8	10.10	3.92	-2.28	51
14	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-33.99	9,084

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/15 * Mo/Hr: 7/15 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WE/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	97.45	*	0	100.00	*	0	0	104.68
Sub Total==>	0	0		0	97.45	*	0	100.00	*	0	0	104.68
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	2.55	*		0.00	*		0	-4.68
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	100.00	*	0	100.00	*	0	0	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf) (%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor	1,073
Main Clg	0.0	0.0	0.0	38.1 30.7 15.4	27.9 24.9 15.2	Part	0
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	0 0 0
Totals	0.0	0.0				Wall	0 0 0

-----HEATING COIL SELECTION-----

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	28.0	35.1
Main Htg	-0.0	0	35.1	35.1	Infil	0	0	Clg Cfm/Ton	1088.50	Plenum	38.0	35.0
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	*****	Return	38.0	35.0
Preheat	-0.0	0	35.1	28.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	38.0	35.0
Reheat	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	38.0	35.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
Total	0.0				Auxil	0	0	Htg Btuh/Sqft	0.00	Fn Frict	0.1	0.0

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-4,950	-4,950	4.98
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-11,004	-11,004	11.08
Wall Cond	0	0		0	0.00	*	0	0.00	*	-7,345	-7,345	7.39
Partition	0			0	0.00	*	0	0.00	*	-885	-885	0.89
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-75,170	-75,170	75.66
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-99,354	-99,354	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-99,354	-99,354	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Entering DB/WB/HR Deg F	Entering DB/WB/HR Grains	Leaving DB/WB/HR Deg F	Leaving DB/WB/HR Deg F	Leaving DB/WB/HR Grains	Gross Total	Glass (sf)	(%)
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	Floor	2,856	
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	Part	342	
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Totals	0.0	0.0								Roof	2,153	0 0
										Wall	2,453	305 12

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-99.4	0	0.0	0.0	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	1,079	Clg Cfm/Ton	0.00	Plenum	0.0	68.0
Preheat	0.0	0	0.0	0.0	Supply	0	0	Clg Sft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-99.4				Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	-34.79	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 3 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,507	0		3,507	5.46	*	4,332	13.49	*	-3,592	-3,592	5.19
Glass Solar	408	0		408	0.64	*	310	0.96	*	0	0	0.00
Glass Cond	101	0		101	0.16	*	104	0.32	*	-507	-507	0.73
Wall Cond	11,593	0		11,593	18.06	*	11,912	37.08	*	-22,621	-22,621	32.69
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	23,834			23,834	37.12	*	9,424	29.34	*	-42,473	-42,473	61.38
Sub Total==>	39,445	0		39,445	61.43	*	26,081	81.19	*	-69,193	-69,193	100.00
Internal Loads						*			*			
Lights	4,429	0		4,429	6.90	*	5,365	16.70	*	0	0	0.00
People	700			700	1.09	*	677	2.11	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,129	0	0	5,129	7.99	*	6,042	18.81	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	17,587	27.39	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				2,048	3.19	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	-0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	44,574	0	0	64,210	100.00	*	32,123	100.00	*	-69,193	-69,193	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf) (%)
Main Clg	5.4	64.2	40.3	1,600 79.4 66.9 81.7	55.4 54.0 61.5	1,354	
Aux Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	0	
Opt Vent	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	0	
Totals	5.4	64.2				1,354	0 0
						1,386	14 1

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling cfm	Heating cfm	Clg % OA	28.1	Type	Clg	Htg
Main Htg	-69.2	1,600	68.0	107.7	Vent	450	0	Clg Cfm/Sqft	1.18	SADB	56.6	107.7
Aux Htg	0.0	0	0.0	0.0	Infil	610	610	Clg Cfm/Ton	299.02	Plenum	75.0	68.0
Preheat	-9.4	1,600	50.0	55.4	Supply	1,600	1,600	Clg Sqft/Ton	253.05	Return	75.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	47.42	Ret/OA	79.4	68.0
Humidif	0.0	0	0.0	0.0	Return	1,600	1,600	No. People	9	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	450	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Total	-69.2				Rm Exh	200	0	Htg Cfm/Sqft	1.18	Fn BldTD	0.2	0.0
					Auxil	0	0	Htg Btuh/Sqft	-51.10	Fn Frict	0.7	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 4 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct	Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot	Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)	(Btuh)	(Btuh)	(%)
Envelope Loads											
Skylite Solr	0	0		0	0.00		0	0.00	0	0	0.00
Skylite Cond	0	0		0	0.00		0	0.00	0	0	0.00
Roof Cond	3,258	0		3,258	5.98		3,977	11.56	-3,358	-3,358	4.90
Glass Solar	3,128	0		3,128	5.74		2,417	7.03	0	0	0.00
Glass Cond	504	0		504	0.93		512	1.49	-2,561	-2,561	3.74
Wall Cond	11,116	0		11,116	20.41		12,962	37.69	-22,301	-22,301	32.56
Partition	0			0	0.00		0	0.00	0	0	0.00
Exposed Floor	0			0	0.00		0	0.00	0	0	0.00
Infiltration	20,447			20,447	37.54		8,934	25.98	-40,266	-40,266	58.79
Sub Total==>	38,453	0		38,453	70.60		28,803	83.74	-68,486	-68,486	100.00
Internal Loads											
Lights	4,025	0		4,025	7.39		4,958	14.42	0	0	0.00
People	703			703	1.29		633	1.84	0	0	0.00
Misc	0	0	0	0	0.00		0	0.00	0	0	0.00
Sub Total==>	4,727	0	0	4,727	8.68		5,591	16.26	0	0	0.00
Ceiling Load	0	0		0	0.00		0	0.00	0	0	0.00
Outside Air	0	0	0	8,311	15.26		0	0.00	0	0	0.00
Sup. Fan Heat				2,976	5.46			0.00		0	0.00
Ret. Fan Heat		0		0	0.00			0.00		0	0.00
Duct Heat Pkup		0		0	0.00			0.00		0	0.00
OV/UNDR Sizing	0			0	0.00		0	0.00	0	0	0.00
Exhaust Heat		0	0	0	0.00			0.00		0	0.00
Terminal Bypass		0	0	0	0.00			0.00		0	0.00
Grand Total==>	43,180	0	0	54,467	100.00		34,394	100.00	-68,486	-68,486	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	4.5	54.5	39.1	76.6 65.9 80.7	60.2 58.5 72.6	Part	1,266	
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	1,266	0 0
Totals	4.5	54.5				Wall	1,314	71 5

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	10.1	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	235	0	Clg Cfm/Sqft	1.84	SADB	61.4	95.1
Main Htg	-68.5	2,325	68.0	95.1	Infil	578	578	Clg Cfm/Ton	512.24	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	2,325	2,325	Clg Sqft/Ton	278.92	Return	75.0	68.0
Preheat	-0.0	2,325	61.5	60.2	Mincfm	0	0	Clg Btuh/Sqft	43.02	Ret/OA	76.6	68.0
Reheat	0.0	0	0.0	0.0	Return	2,325	2,325	No. People	8	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	235	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	1.84	Fn BldTD	0.2	0.0
Total	-68.5				Auxil	0	0	Htg Btuh/Sqft	-54.10	Fn Frict	0.7	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 5 Block VAV - VARIABLE AIR VOLUME

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	4,737	0		4,737	9.40	*	8,710	42.05	*	0	0	0.00
Glass Cond	1,101	0		1,101	2.19	*	1,126	5.44	*	-5,505	-5,505	28.54
Wall Cond	207	24		231	0.46	*	210	1.01	*	-818	-914	4.74
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	7,983			7,983	15.85	*	2,856	13.79	*	-12,871	-12,871	66.73
Sub Total==>	14,027	24		14,052	27.90	*	12,901	62.29	*	-19,193	-19,289	100.00
Internal Loads												
Lights	5,718	0		5,718	11.35	*	6,926	33.44	*	0	0	0.00
People	904			904	1.79	*	874	4.22	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	6,622	0	0	6,622	13.15	*	7,800	37.66	*	0	0	0.00
Ceiling Load	3	-3		0	0.00	*	9	0.04	*	-95	0	0.00
Outside Air	0	0	0	28,750	57.08	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				947	1.88	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat PkUp		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		-4	0	-4	-0.01	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	-0.00	*		0.00	*		0	0.00
Grand Total==>	20,653	17	0	50,366	100.00	*	20,710	100.00	*	-19,289	-19,289	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	4.2	50.4	27.6	666	90.5	74.3	105.0	52.5	51.3	55.8	Part	1,748
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	0
Totals	4.2	50.4									Wall	420
												153 36

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	ENGINEERING CHECKS--			TEMPERATURES (F)---		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % OA	100.0		Type	Clg	Htg
Main Htg	-19.3	0	0.0	0.0	Vent	896	0	Clg Cfm/Sqft	0.51		SADB	53.8	68.1
Aux Htg	0.0	0	0.0	0.0	Infil	185	185	Clg Cfm/Ton	213.55		Plenum	75.0	67.8
Preheat	-47.3	896	4.0	52.5	Supply	896	0	Clg Sqft/Ton	416.47		Return	75.0	67.8
Reheat	-0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	28.81		Ret/OA	90.5	4.0
Humidif	0.0	0	0.0	0.0	Return	896	0	No. People	11		Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	896	0	Htg % OA	0.0		Fn MtrTD	0.3	0.0
Total	-66.6				Rm Exh	0	0	Htg Cfm/Sqft	0.00		Fn BldTD	0.2	0.0
					Auxil	0	0	Htg Btuh/Sqft	-38.08		Fn Frict	0.7	0.0

System 6 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	5,265	0		5,265	6.93	*	5,850	21.17	*	0	0	0.00
Glass Cond	1,038	0		1,038	1.37	*	1,030	3.73	*	-5,269	-5,269	8.39
Wall Cond	5,136	537		5,672	7.47	*	6,044	21.88	*	-20,041	-22,138	35.25
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	13,035			13,035	17.16	*	7,853	28.42	*	-35,394	-35,394	56.36
Sub Total==>	24,473	537		25,010	32.93	*	20,776	75.20	*	-60,704	-62,801	100.00
Internal Loads												
Lights	4,972	0		4,972	6.55	*	5,981	21.65	*	0	0	0.00
People	861			861	1.13	*	782	2.83	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,833	0	0	5,833	7.68	*	6,763	24.48	*	0	0	0.00
Ceiling Load	75	-75		0	0.00	*	88	0.32	*	-253	0	0.00
Outside Air	0	0	0	41,038	54.04	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				4,243	5.59	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat PkUp		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	-0.00
Exhaust Heat		-181	0	-181	-0.24	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	30,381	281	0	75,943	100.00	*	27,627	100.00	*	-60,957	-62,801	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf) (%)
Main Clg	6.3	75.9	57.1	3,315	82.6	71.0	98.4	66.2	64.6	91.2	Floor	1,564
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	6.3	75.9									Roof	0
											Wall	1,155
												146 13

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA			Type	Clg	Htg
Main Htg	-62.8	3,315	67.5	84.9	Infil	508	508	Clg Cfm/Sqft	2.12		SADB	67.3	84.9
Aux Htg	0.0	0	0.0	0.0	Supply	3,315	3,315	Clg Cfm/Ton	523.82		Plenum	75.2	67.5
Preheat	-105.8	3,315	36.8	66.2	Mincfm	0	0	Clg Sqft/Ton	247.13		Return	75.2	67.5
Reheat	0.0	0	0.0	0.0	Return	2,823	3,315	Clg Btuh/Sqft	48.56		Ret/OA	82.6	67.5
Humidif	0.0	0	0.0	0.0	Exhaust	1,108	0	No. People	10		Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	1,000	0	Htg % OA	0.0		Fn MtrTD	0.3	0.0
Total	-62.8				Auxil	0	0	Htg Cfm/Sqft	2.12		Fn BldTD	0.2	0.0
								Htg Btuh/Sqft	-40.15		Fn Frict	0.7	0.0

System 7 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/15 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	78			78	0.03	*	78	99.95	*	-280	-280	99.98
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.02	*	0	0	0.02
Sub Total==>	78	0		78	0.03	*	78	99.97	*	-280	-280	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	224,979	99.97	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.03	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	78	0	0	225,057	100.00	*	78	100.00	*	-280	-280	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	18.8	225.1	88.1	90.5 74.3 105.0	75.0 62.7 67.5	469		
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	108		
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	18.8	225.1				0	0	0

-----AREAS-----

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	100.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	5,220	0	Clg Cfm/Sqft	11.13	SADB	75.0	68.0
Main Htg	-0.3	5,220	68.0	68.0	Infil	0	0	Clg Cfm/Ton	278.34	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	5,220	5,220	Clg Sqft/Ton	25.01	Return	75.0	68.0
Preheat	-403.2	5,220	4.0	75.0	Mincfm	0	0	Clg Btuh/Sqft	479.87	Ret/OA	90.5	68.0
Reheat	0.0	0	0.0	0.0	Return	0	5,220	No. People	0	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	5,220	0	Htg Cfm/SqFt	11.13	Fn BldTD	0.0	0.0
Total	-0.3				Auxil	0	0	Htg Btuh/SqFt	-0.60	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 8 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	3,300	0	0	3,300	13.10	*	2,400	15.40	*	0	0	0.00
Glass Cond	532	0	0	532	2.11	*	536	3.44	*	-2,702	-2,702	8.84
Wall Cond	3,316	349	0	3,666	14.56	*	4,055	26.03	*	-9,647	-10,663	34.90
Partition	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	8,511	0	0	8,511	33.80	*	3,814	24.48	*	-17,191	-17,191	56.26
Sub Total==>	15,660	349	0	16,009	63.57	*	10,805	69.35	*	-29,541	-30,557	100.00
Internal Loads												
Lights	3,405	0	0	3,405	13.52	*	4,145	26.60	*	0	0	0.00
People	594	0	0	594	2.36	*	536	3.44	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	3,999	0	0	3,999	15.88	*	4,681	30.04	*	0	0	0.00
Ceiling Load	77	-77	0	0	0.00	*	94	0.61	*	-224	0	0.00
Outside Air	0	0	0	3,793	15.06	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				1,408	5.59	*		0.00	*		0	0.00
Ret. Fan Heat		0	0	0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0	0	0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	-0.00	*	0	-0.00	*	0	0	0.00
Exhaust Heat		-27	0	-27	-0.11	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	19,736	245	0	25,182	100.00	*	15,580	100.00	*	-29,765	-30,557	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf) (%)
Main Clg	2.1	25.2	1,100	76.8 66.1 21.8	60.8 59.0 73.9	1,071	
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0	
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0	
Totals	2.1	25.2				561	75 13

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling cfm	Heating cfm	Clg % OA	10.0	Type	Clg Htg
Main Htg	-30.6	1,100	67.3	92.9	Vent	110	0	Clg Cfm/Sqft	1.03	SADB	62.0 92.9
Aux Htg	0.0	0	0.0	0.0	Infil	247	247	Clg Cfm/Ton	524.18	Plenum	75.2 67.3
Preheat	-0.0	1,100	61.0	60.8	Supply	1,100	1,100	Clg Sqft/Ton	510.36	Return	75.2 67.3
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	23.51	Ret/OA	76.8 67.3
Humidif	0.0	0	0.0	0.0	Return	1,100	1,100	No. People	7	Runarnd	75.0 68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	110	0	Htg % OA	0.0	Fn MtrTD	0.3 0.0
Total	-30.6				Rm Exh	0	0	Htg Cfm/Sqft	1.03	Fn BldTD	0.2 0.0
					Auxil	0	0	Htg Btuh/Sqft	-28.53	Fn Frict	0.7 0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 9 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/15 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)		Space Sensible (Btuh)	Perct Of Tot (%)		Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	1,065	0	0	1,065	5.08	*	1,232	11.99	*	-1,238	-1,238	5.54
Glass Solar	2,026	0	0	2,026	9.65	*	1,882	18.31	*	0	0	0.00
Glass Cond	514	0	0	514	2.45	*	541	5.27	*	-2,607	-2,607	11.67
Wall Cond	485	0	0	485	2.31	*	516	5.02	*	-1,633	-1,633	7.31
Partition	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	5,917	0	0	5,917	28.19	*	4,214	41.00	*	-16,854	-16,854	75.47
Sub Total==>	10,007	0	0	10,007	47.67	*	8,384	81.58	*	-22,333	-22,333	100.00
Internal Loads												
Lights	1,729	0	0	1,729	8.24	*	1,729	16.83	*	0	0	0.00
People	311	0	0	311	1.48	*	163	1.59	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	2,040	0	0	2,040	9.72	*	1,893	18.42	*	0	0	0.00
Ceiling Load	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	8,802	41.93	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				142	0.68	*		0.00	*		0	0.00
Ret. Fan Heat		0	0	0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0	0	0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0	0	0	0	-0.00	*	0	-0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	12,048	0	0	20,992	100.00	*	10,277	100.00	*	-22,333	-22,333	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor Part ExFlr Roof Wall	Glass (sf) (%)
Main Clg	1.7	21.0	1,000	80.6 70.3 97.9	65.4 64.4 91.6	544	
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0	
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0	
Totals	1.7	21.0				550	72 13

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling cfm	Heating cfm	Clg % OA	36.0	Type	Clg Htg
Main Htg	-22.3	1,000	68.0	88.5	Vent	360	0	Clg Cfm/Sqft	1.84	SADB	65.6 88.5
Aux Htg	0.0	0	0.0	0.0	Infil	242	242	Clg Cfm/Ton	571.64	Plenum	75.0 68.0
Preheat	-22.3	1,000	45.0	65.4	Supply	1,000	1,000	Clg Sqft/Ton	310.97	Return	75.0 68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	38.59	Ret/OA	80.6 68.0
Humidif	0.0	0	0.0	0.0	Return	1,000	1,000	No. People	4	Runarnd	75.0 68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	360	0	Htg % OA	0.0	Fn MtrTD	0.0 0.0
Total	-22.3				Rm Exh	0	0	Htg Cfm/Sqft	1.84	Fn BldTD	0.0 0.0
					Auxil	0	0	Htg Btuh/Sqft	-41.05	Fn Frict	0.1 0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 10 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	4,550	0		4,550	10.74	*	4,777	23.12	*	0	0	0.00
Glass Cond	807	0		807	1.90	*	820	3.97	*	-4,098	-4,098	11.28
Wall Cond	3,085	343		3,428	8.09	*	3,726	18.03	*	-10,789	-11,990	33.02
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	7,395			7,395	17.45	*	4,487	21.72	*	-20,225	-20,225	55.70
Sub Total==>	15,837	343		16,181	38.19	*	13,810	66.83	*	-35,112	-36,313	100.00
Internal Loads												
Lights	4,886	0		4,886	11.53	*	6,020	29.13	*	0	0	0.00
People	853			853	2.01	*	769	3.72	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,739	0	0	5,739	13.55	*	6,788	32.85	*	0	0	0.00
Ceiling Load	54	-54		0	0.00	*	65	0.32	*	-189	0	0.00
Outside Air	0	0	0	19,864	46.88	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				683	1.61	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	-0.00
Exhaust Heat		-94	0	-94	-0.22	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	21,631	195	0	42,372	100.00	*	20,663	100.00	*	-35,301	-36,313	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	1,537	
Main Clg	3.5	42.4	32.8	2,400	80.1	69.9	96.5	66.8	65.0	92.1	Part	0
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	0 0 0
Totals	3.5	42.4									Wall	660 114 17

-----HEATING COIL SELECTION-----

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	32.5	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	780	0	Clg Cfm/Sqft	1.56	SADB	67.1	81.5
Main Htg	-36.3	2,400	67.6	81.5	Infil	290	290	Clg Cfm/Ton	679.69	Plenum	75.1	67.6
Aux Htg	0.0	0	0.0	0.0	Supply	2,400	2,400	Clg Sqft/Ton	435.28	Return	75.1	67.6
Preheat	-51.9	2,400	46.9	66.8	Mincfm	0	0	Clg Btuh/Sqft	27.57	Ret/OA	80.1	67.6
Reheat	0.0	0	0.0	0.0	Return	2,400	2,400	No. People	10	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	780	0	Htg % OA	0.0	Fn MtrTD	0.1	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	1.56	Fn BldTD	0.0	0.0
Total	-36.3				Auxil	0	0	Htg Btuh/Sqft	-23.63	Fn Frict	0.1	0.0

System 11 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/22 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 79 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	0	0	60.74
Sub Total==>	0	0		0	0.00	*	0	0.00	*	0	0	60.74
Internal Loads												
Lights	13,815	0		13,815	10.50	*	18,290	76.69	*	0	0	0.00
People	2,183			2,183	1.66	*	5,560	23.31	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	15,998	0	0	15,998	12.15	*	23,851	100.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	99,839	75.85	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				15,787	11.99	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	39.26
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	15,998	0	0	131,624	100.00	*	23,851	100.00	*	0	0	100.00

-----COOLING COIL SELECTION-----

-----AREAS-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	4,223	
Main Clg	11.0	131.6	115.8	11,100	82.0	71.6	102.7	71.7	68.4	101.9	Part	0
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	0 0
Totals	11.0	131.6									Wall	0 0

-----HEATING COIL SELECTION-----

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	45.4	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	5,040	0	Clg Cfm/Sqft	2.63	SADB	73.0	68.1
Main Htg	-1.2	11,100	68.0	68.1	Infil	0	0	Clg Cfm/Ton	1011.97	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	11,100	11,100	Clg Sqft/Ton	385.00	Return	75.0	68.0
Preheat	-395.9	11,100	38.9	71.7	Mincfm	0	0	Clg Btuh/Sqft	31.17	Ret/OA	82.0	68.0
Reheat	0.0	0	0.0	0.0	Return	11,100	11,100	No. People	28	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	5,040	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	2.63	Fn BldTD	0.2	0.0
Total	-1.2				Auxil	0	0	Htg Btuh/Sqft	-0.29	Fn Frict	0.7	0.0

System 12 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/20 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 83 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,816	0	0	3,816	0.87	*	4,109	7.20	*	-4,473	-4,473	20.96
Glass Solar	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	384	0	0	384	0.09	*	481	0.84	*	-1,693	-1,693	7.94
Partition	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Exposed floor	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0	0	0	0	0.00	*	0	0.00	*	-15,169	-15,169	71.10
Sub Total==>	4,199	0	0	4,199	0.96	*	4,591	8.04	*	-21,334	-21,334	100.00
Internal Loads												
Lights	6,341	0	0	6,341	1.45	*	8,153	14.28	*	0	0	0.00
People	1,049	0	0	1,049	0.24	*	2,032	3.56	*	0	0	0.00
Misc	9,082	32,486	3,840	45,408	10.37	*	8,467	14.83	*	0	0	0.00
Sub Total==>	16,472	32,486	3,840	52,798	12.05	*	18,651	32.66	*	0	0	0.00
Ceiling Load	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	311,339	71.07	*	0	0.00	*	0	0	0.00
Sup. Fan Heat	0	0	0	35,840	8.18	*	0	0.00	*	0	0	0.00
Ret. Fan Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Duct Heat Pkup	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
OV/UNDR Sizing	33,869	0	0	33,869	7.73	*	33,869	59.30	*	0	0	0.00
Exhaust Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Terminal Bypass	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Grand Total==>	54,540	32,486	3,840	438,045	100.00	*	57,111	100.00	*	-21,334	-21,334	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total Floor	Glass (sf) (%)
Main Clg	36.5	438.0	364.3	18,000	89.5 73.8 103.6	70.3 67.4 99.0	1,966
Aux Clg	0.0	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0
Opt Vent	0.0	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0
Totals	36.5	438.0	364.3	18,000	89.5 73.8 103.6	70.3 67.4 99.0	1,966

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling (cfm)	Heating (cfm)	Clg % OA	80.0	Type	Clg	Htg
Main Htg	-21.3	18,000	68.0	69.1	Vent	14,400	0	Clg Cfm/Sqft	9.16	SADB	72.1	69.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	218	Clg Cfm/Ton	493.10	Plenum	75.0	68.0
Preheat	-1,047.1	18,000	16.8	70.3	Supply	18,000	18,000	Clg Sqft/Ton	53.86	Return	85.5	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	222.81	Ret/OA	89.5	68.0
Humidif	0.0	0	0.0	0.0	Return	2,850	18,000	No. People	13	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.5	0.0
Total	-21.3	18,000	68.0	69.1	Rm Exh	15,150	0	Htg Cfm/Sqft	9.16	Fn BldTD	0.3	0.0
					Auxil	0	0	Htg Btuh/Sqft	-10.85	Fn Frict	1.0	0.0

System 13 Block FC - FAN COIL

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/20 * Mo/Hr: 7/20 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 83/ 70/ 91.0 * OADB: 83 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	108	0		108	20.93	*	108	28.50	*	-116	-116	99.94
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	0	0	0.06
Sub Total==>	108	0		108	20.94	*	108	28.50	*	-116	-116	100.00
Internal Loads												
Lights	216	0		216	41.96	*	216	57.12	*	0	0	0.00
People	163			163	31.58	*	54	14.37	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	379	0	0	379	73.54	*	271	71.50	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				28	5.52	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	-0.00	*		0.00	*		0	0.00
Grand Total==>	487	0	0	515	100.00	*	378	100.00	*	-116	-116	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	0.0	0.5	0.4	200	75.1	69.0	99.8	73.2	68.3	99.1	Part	51
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	51
Totals	0.0	0.5									Wall	0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % DA	0.0	Type	Clg	Htg
Main Htg	-0.1	200	68.0	68.5	Vent	0	0	Clg Cfm/Sqft	3.92	SADB	73.3	68.5
Aux Htg	0.0	0	0.0	0.0	Infil	0	0	Clg Cfm/Ton	4658.06	Plenum	75.0	68.0
Preheat	-1.1	200	68.0	73.1	Supply	200	200	Clg Sqft/Ton	1187.81	Return	75.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	10.10	Ret/OA	75.0	68.0
Humidif	0.0	0	0.0	0.0	Return	200	200	No. People	0	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % DA	0.0	Fn MtrTD	0.0	0.0
Total	-0.1				Rm Exh	0	0	Htg Cfm/Sqft	3.92	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	-2.28	Fn Frict	0.1	0.0

System 14 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-8,187	-8,187	2.65
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-23,248	-23,248	7.53
Wall Cond	0	0		0	0.00	*	0	0.00	*	-87,852	-92,073	29.82
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-185,274	-185,274	60.00
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-304,561	-308,782	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-10,917	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-315,479	-308,782	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F	Entering DB/WB/HR Deg F	Entering DB/WB/HR Grains	Leaving DB/WB/HR Deg F	Leaving DB/WB/HR Deg F	Leaving DB/WB/HR Grains	Gross Total Floor	Glass (sf)	(%)
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	9,094		
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0		
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0		
Totals	0.0	0.0								3,164	0	0
										6,046	645	11

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-308.8	0	0.0	0.0	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	2,660	Clg Cfm/Ton	0.00	Plenum	0.0	65.7
Preheat	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	65.6
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	65.6
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-308.8				Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	-33.99	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

BUILDING U-VALUES - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Part.	ExFlr	Room U-Values (Btu/hr/sqft/F)							Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
				Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	LIQUOR STORE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
2	RAD ONLY	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
Zone	2 Total/Ave.	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
System	2 Total/Ave.	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
3	ATTIC	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.258	0.000	22.6	8.52
Zone	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.258	0.000	22.6	8.52
System	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.258	0.000	22.6	8.52
4	OFFICES	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.280	0.000	55.0	15.45
Zone	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.280	0.000	55.0	15.45
System	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.280	0.000	55.0	15.45
5	PARTY ROOMS	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
Zone	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
System	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
6	LOUNGE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	91.7	22.48
Zone	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	91.7	22.48
System	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	91.7	22.48
7	MECH ROOM	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
Zone	7 Total/Ave.	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
System	7 Total/Ave.	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
8	LOBBY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	66.3	16.91
Zone	8 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	66.3	16.91
System	8 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	66.3	16.91
9	PRIVATE DINING	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
Zone	9 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
System	9 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
10	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	53.3	14.05
Zone	10 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	53.3	14.05
System	10 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	53.3	14.05
11	BALL ROOM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
Zone	11 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
System	11 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
12	KITCHEN	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
Zone	12 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
System	12 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
13	KITCHEN OFFICE	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
Zone	13 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
System	13 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
3	ATTIC	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.258	0.000	22.6	8.52
Zone	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.258	0.000	22.6	8.52
4	OFFICES	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.280	0.000	55.0	15.45
Zone	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.280	0.000	55.0	15.45
5	PARTY ROOMS	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
Zone	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
6	LOUNGE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	91.7	22.48
Zone	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	91.7	22.48
8	LOBBY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	66.3	16.91

BUILDING U-VALUES - ALTERNATIVE 1
 BASE BUILDING

----- B U I L D I N G U - V A L U E S -----

		----- Room U-Values ----- (Btu/hr/sqft/F)									Room	Room
Room				Summr	Wintr		Summr	Wintr			Mass	Capac.
Number	Description	Part.	ExFlr	Skylt	Skylt	Roof	Windo	Windo	Wall	Ceil.	(lb/ sqft)	(8tu/ sqft/F)
Zone	8 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	66.3	16.91
9	PRIVATE DINING	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
Zone	9 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
10	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	53.3	14.05
Zone	10 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	53.3	14.05
System	14 Total/Ave.	0.000	0.000	0.000	0.000	0.040	0.550	0.563	0.267	0.317	52.0	13.93
Building		0.144	0.000	0.000	0.000	0.039	0.550	0.563	0.225	0.317	48.2	12.57

BUILDING AREAS - ALTERNATIVE 1
BASE BUILDING

BUILDING AREAS

Room Number	Description	Number of Duplicate Flr Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	LIQUOR STORE	1 1	1,073	1,073	0	0	0	0	0	0	0	0
Zone	1 Total/Ave.			1,073	0	0	0	0	0	0	0	0
System	1 Total/Ave.			1,073	0	0	0	0	0	0	0	0
2	RAD ONLY	1 1	2,856	2,856	342	0	0	0	2,153	305	12	2,148
Zone	2 Total/Ave.			2,856	342	0	0	0	2,153	305	12	2,148
System	2 Total/Ave.			2,856	342	0	0	0	2,153	305	12	2,148
3	ATTIC	1 1	1,354	1,354	0	0	0	0	1,354	14	1	1,372
Zone	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
System	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
4	OFFICES	1 1	1,266	1,266	0	0	0	0	1,266	71	5	1,243
Zone	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
System	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
5	PARTY ROOMS	1 1	1,748	1,748	0	0	0	0	0	153	36	267
Zone	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
System	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
6	LOUNGE	1 1	1,564	1,564	0	0	0	0	0	146	13	1,009
Zone	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
System	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
7	MECH ROOM	1 1	469	469	108	0	0	0	0	0	0	0
Zone	7 Total/Ave.			469	108	0	0	0	0	0	0	0
System	7 Total/Ave.			469	108	0	0	0	0	0	0	0
8	LOBBY	1 1	1,071	1,071	0	0	0	0	0	75	13	486
Zone	8 Total/Ave.			1,071	0	0	0	0	0	75	13	486
System	8 Total/Ave.			1,071	0	0	0	0	0	75	13	486
9	PRIVATE DINING	1 1	544	544	0	0	0	0	544	72	13	478
Zone	9 Total/Ave.			544	0	0	0	0	544	72	13	478
System	9 Total/Ave.			544	0	0	0	0	544	72	13	478
10	DINING ROOM	1 1	1,537	1,537	0	0	0	0	0	114	17	546
Zone	10 Total/Ave.			1,537	0	0	0	0	0	114	17	546
System	10 Total/Ave.			1,537	0	0	0	0	0	114	17	546
11	BALL ROOM	1 1	4,223	4,223	0	0	0	0	0	0	0	0
Zone	11 Total/Ave.			4,223	0	0	0	0	0	0	0	0
System	11 Total/Ave.			4,223	0	0	0	0	0	0	0	0
12	KITCHEN	1 1	1,966	1,966	0	0	0	0	1,966	0	0	495
Zone	12 Total/Ave.			1,966	0	0	0	0	1,966	0	0	495
System	12 Total/Ave.			1,966	0	0	0	0	1,966	0	0	495
13	KITCHEN OFFICE	1 1	51	51	0	0	0	0	51	0	0	0
Zone	13 Total/Ave.			51	0	0	0	0	51	0	0	0
System	13 Total/Ave.			51	0	0	0	0	51	0	0	0
3	ATTIC	1 1	1,354	1,354	0	0	0	0	1,354	14	1	1,372
Zone	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
4	OFFICES	1 1	1,266	1,266	0	0	0	0	1,266	71	5	1,243
Zone	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
5	PARTY ROOMS	1 1	1,748	1,748	0	0	0	0	0	153	36	267
Zone	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
6	LOUNGE	1 1	1,564	1,564	0	0	0	0	0	146	13	1,009
Zone	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
8	LOBBY	1 1	1,071	1,071	0	0	0	0	0	75	13	486

BUILDING AREAS - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
		Fir	Rm										
Zone	8 Total/Ave.				1,071	0	0	0	0	0	75	13	486
	9 PRIVATE DINING	1	1	544	544	0	0	0	0	544	72	13	478
Zone	9 Total/Ave.				544	0	0	0	0	544	72	13	478
	10 DINING ROOM	1	1	1,537	1,537	0	0	0	0	0	114	17	546
Zone	10 Total/Ave.				1,537	0	0	0	0	0	114	17	546
System	14 Total/Ave.				9,084	0	0	0	0	3,164	645	11	5,401
Building					28,806	450	0	0	0	10,498	1,596	11	13,444

ASHRAE 90 ANALYSIS - ALTERNATIVE 1
BASE BUILDING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.039 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.260 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.169 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 2.10 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 13.34 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1
BASE BUILDING

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	4.7	84	5,228	-141,200	30	1,122	2,357.8	29	2,555	0.0	0	0
5 - 10	9.4	3	171	-282,400	23	858	4,715.7	0	0	0.0	0	0
10 - 15	14.1	5	319	-423,600	28	1,019	7,073.5	0	0	0.0	0	0
15 - 20	18.8	4	239	-564,800	6	222	9,431.3	0	0	0.0	0	0
20 - 25	23.5	2	142	-706,000	13	481	11,789.2	0	0	0.0	0	0
25 - 30	28.2	2	106	-847,199	0	0	14,147.0	0	0	0.0	0	0
30 - 35	32.9	0	0	-988,399	0	0	16,504.8	0	0	0.0	0	0
35 - 40	37.6	0	0	-1,129,599	0	0	18,862.6	0	0	0.0	0	0
40 - 45	42.3	0	0	-1,270,799	0	0	21,220.5	0	0	0.0	0	0
45 - 50	47.0	0	0	-1,411,999	0	0	23,578.3	0	0	0.0	0	0
50 - 55	51.7	0	0	-1,553,199	0	0	25,936.1	0	0	0.0	0	0
55 - 60	56.4	0	0	-1,694,399	0	0	28,294.0	0	0	0.0	0	0
60 - 65	61.1	0	0	-1,835,599	0	0	30,651.8	0	0	0.0	0	0
65 - 70	65.8	0	0	-1,976,799	0	0	33,009.6	0	0	0.0	0	0
70 - 75	70.5	0	0	-2,117,999	0	0	35,367.5	0	0	0.0	0	0
75 - 80	75.3	0	0	-2,259,199	0	0	37,725.3	0	0	0.0	0	0
80 - 85	80.0	0	0	-2,400,399	0	0	40,083.1	0	0	0.0	0	0
85 - 90	84.7	0	0	-2,541,598	0	0	42,440.9	71	6,205	0.0	0	0
90 - 95	89.4	0	0	-2,682,799	0	0	44,798.8	0	0	0.0	0	0
95 - 100	94.1	0	0	-2,823,999	0	0	47,156.6	0	0	0.0	0	0
Hours Off	0.0	0	2,555	0	0	5,058	0.0	0	0	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
BASE BUILDING

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----																				
Temperature Range (F)	----- Zone Number -----																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	3	4	5	6	8	9	
Max. Temp.	35.0	92.3	78.8	78.8	79.9	79.2	71.2	79.4	78.5	79.5	79.9	96.7	80.0	103.3	103.4	161.7	103.3	111.9	115.3	
Mo./Hr.	1 1	8 22	7 24	7 1	7 5	7 5	9 16	7 5	7 24	7 5	6 5	7 15	7 5	7 22	8 22	8 22	8 23	8 22	8 22	
Day Type	1	1	1	2	1	1	4	1	1	1	2	1	1	1	1	1	1	1	1	
..... Number of Hours																				
Above 100	0	0	0	0	0	0	0	0	0	0	0	0	0	245	590	4,196	1,086	2,544	2,640	
95 - 100	0	0	0	0	0	0	0	0	0	0	0	0	0	1,052	1,198	135	1,134	384	288	
90 - 95	0	868	0	0	0	0	0	0	0	0	0	138	0	975	1,026	85	708	87	48	
85 - 90	0	1,276	0	0	0	0	0	0	0	0	0	778	0	770	288	163	36	338	196	
80 - 85	0	784	0	0	0	0	0	0	0	0	0	1,174	0	630	498	812	465	611	315	
75 - 80	0	131	2,439	3,113	3,672	3,020	0	3,672	2,657	3,317	2,801	820	4,107	0	72	520	683	337	597	
70 - 75	0	766	866	559	0	652	1,563	0	1,011	406	658	213	4,653	0	102	1,167	219	211	102	
65 - 70	0	4,393	3,839	3,944	3,362	3,024	3,387	1,289	3,563	3,863	443	889	0	3,769	3,950	1,652	4,080	3,950	3,923	
60 - 65	0	542	844	936	1,360	1,464	3,810	895	1,441	1,141	695	847	0	696	828	30	349	298	651	
55 - 60	0	0	536	208	366	600	0	581	88	33	782	576	0	446	208	0	0	0	0	
50 - 55	0	0	236	0	0	0	0	1,239	0	0	872	620	0	177	0	0	0	0	0	
Below 50	8,760	0	0	0	0	0	0	1,084	0	0	2,509	2,705	0	0	0	0	0	0	0	
Min. Temp.	35.0	62.4	50.4	57.1	55.5	55.4	60.2	43.0	58.3	59.6	33.9	30.2	67.9	55.0	57.1	63.5	62.8	63.1	60.8	
Mo./Hr.	1 1	2 6	2 6	2 6	2 11	2 9	3 20	2 10	2 6	2 8	2 10	2 8	1 6	1 5	2 6	1 6	2 6	2 6	2 6	
Day Type	1	1	4	4	5	5	5	5	5	5	4	4	1	1	4	1	4	4	1	

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 1
BASE BUILDING

----- BUILDING TEMPERATURE PROFILES -----

Range 10
(F)
Max. Temp. 114.7
Mo./Hr. 8 23
Day Type 1

	Number of Hours
Above 100	2,910
95 - 100	18
90 - 95	297
85 - 90	515
80 - 85	476
75 - 80	200
70 - 75	855
65 - 70	3,253
60 - 65	236
55 - 60	0
50 - 55	0
Below 50	0

Min. Temp. 63.4
Mo./Hr. 2 6
Day Type 4

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 1
 BASE BUILDING

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	STEAM On Peak (Therm)	HOT WTR On Peak (Therm)	STEAM DMND On Peak (Thrm/hr)	HOT W DMND On Peak (Thrm/hr)
Jan	56,442	112	106	1,433	0	5
Feb	50,966	112	96	1,453	0	5
March	53,970	115	106	844	0	5
April	48,332	124	102	274	0	5
May	46,342	139	0	0	0	0
June	51,504	149	0	0	0	0
July	61,924	157	0	0	0	0
Aug	53,759	150	0	0	0	0
Sept	45,451	143	0	0	0	0
Oct	49,089	116	79	133	0	4
Nov	49,879	131	102	455	0	5
Dec	55,712	112	106	1,165	0	5
Total	623,371	157	697	5,758	0	5

Building Energy Consumption = 96,268 (Btu/Sq Ft/Year)
 Source Energy Consumption = 251,476 (Btu/Sq Ft/Year)

Floor Area = 28,806 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BASE BUILDING

EQUIPMENT ENERGY CONSUMPTION

[illegible]

	ELEC	0	0	0	268	832	1330	1572	1387	984	740	89	0	7,203
	PK	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0
2	EQ5303													
	ELEC	0	0	0	27	84	134	158	139	99	74	9	0	724
	PK	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.3
3	EQ1281													
	ELEC	1076	974	1041	910	0	85	319	83	0	638	1038	1027	7,192
	PK	2.2	2.2	2.2	2.2	0.0	1.2	1.9	1.2	0.7	2.2	2.2	2.2	2.2
3	EQ5215													
	ELEC	0	0	0	0	0	13	47	13	0	0	0	0	73
	PK	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.3
3	EQ5308													
	ELEC	59	53	53	51	0	18	37	19	0	42	51	56	438
	PK	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3	EQ5350													
	ELEC	14	12	7	0	0	0	0	0	0	0	6	14	53
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	EQ1281													
	ELEC	1990	1779	2102	1123	0	279	810	342	23	794	1711	2018	12,970
	PK	4.5	4.5	4.5	4.5	0.5	2.4	3.6	2.5	1.9	4.5	4.5	4.5	4.5
4	EQ5215													
	ELEC	0	0	0	0	0	42	121	52	4	0	0	0	219
	PK	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.4	0.3	0.1	0.0	0.0	0.5
4	EQ5308													
	ELEC	56	53	53	40	0	24	50	30	10	24	51	53	443
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
4	EQ5350													
	ELEC	28	25	14	0	0	0	0	0	0	0	12	28	108
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	EQ1101L													
	ELEC	0	0	0	0	229	1279	3311	1357	201	0	0	0	6,378
	PK	0.0	0.0	0.0	0.0	22.4	23.2	24.0	23.3	22.5	0.0	0.0	0.0	24.0
5	EQ5200													
	ELEC	0	0											

	0	0	0	0	0	0	0	0	0	0	0	0	0
ELEC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PK													
3 EQ4003													
ELEC	650	587	650	629	650	629	650	650	629	650	629	650	7,649
PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
3 EQ4003													
ELEC	10	9	10	10	10	10	10	10	10	10	10	10	120
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 EQ4003													
ELEC	5	4	5	4	5	4	5	5	4	5	4	5	53
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 EQ4003													
ELEC	944	853	944	914	944	914	944	944	914	944	914	944	11,114
PK	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
5 EQ4003													
ELEC	0	0	34	142	112	154	189	164	120	174	92	0	1,182
PK	0.0	0.0	0.3	0.8	0.6	0.6	0.7	0.6	0.6	0.8	0.7	0.1	0.8
6 EQ4003													
ELEC	1346	1216	1346	1302	1346	1302	1346	1346	1302	1346	1302	1346	15,847
PK	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
6 EQ4003													
ELEC	45	43	47	44	55	48	46	48	48	40	41	43	548
PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
6 EQ4003													
ELEC	45	41	45	44	45	44	45	45	44	45	44	45	531
PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
8 EQ4003													
ELEC	447	403	447	432	447	432	447	447	432	447	432	447	5,258
PK	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
9 EQ4003													
ELEC	45	41	45	44	45	44	45	45	44	45	44	45	531
PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10 EQ4003													
ELEC	217	196	217	210	217	210	217	217	210	217	210	217	2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1
BASE BUILDING

ELEC	1025	926	1025	992	1025	992	1025	1025	992	1025	992	1025	12,070
PK	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
13 EQ4003	FC CENTRIF. FAN C.V.												
ELEC	9	8	9	9	9	9	9	9	9	9	9	9	106
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 EQ2102	PURCHASED DIST. HOT WATER												
P HOTH2O	1433	1453	844	274	0	0	0	0	0	133	455	1165	5,758
PK	5.3	5.3	5.3	4.8	0.0	0.0	0.0	0.0	0.0	3.6	5.0	5.3	5.3
1 EQ5020	HEAT WATER CIRC. PUMP C.V.												
ELEC	504	455	504	172	0	0	0	0	0	116	236	504	2,490
PK	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
2 EQ2261	ELECTRIC RADIATION												
ELEC	9055	8179	6502	3110	0	0	0	0	0	2020	4277	8355	41,499
PK	17.2	17.2	17.2	17.2	0.0	0.0	0.0	0.0	0.0	17.2	17.2	17.2	17.2
3 EQ2101	PURCHASED DISTRICT STEAM												
P STEAM	106	96	106	102	0	0	0	0	0	79	102	106	697
PK	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4
3 EQ5020	HEAT WATER CIRC. PUMP C.V.												
ELEC	6	6	6	6	0	0	0	0	0	5	6	6	40
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 EQ5061	CONDENSATE RETURN PUMP												
ELEC	12	11	12	12	0	0	0	0	0	9	12	12	82
PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1

UTILITY PEAK CHECKSUMS - ALTERNATIVE 1
 BASE BUILDING

----- UTILITY PEAK CHECKSUMS -----

Utility ELECTRIC DEMAND

Peak Value 157.3 (kW)
 Yearly Time of Peak 17 (hr) 7 (mo)

Hour 17 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

2	EQ1100S	AIR-CLD RECIP 25-45 TONS	35.8	22.74
3	EQ1001	TRANE HT-PMP W-DEMAND DEFROST	1.9	1.19
4	EQ1201	TRANE HT-PMP W-DEMAND DEFROST	3.7	2.38
5	EQ1101L	HR AIR-CLD RECIP >15 TONS	28.1	17.87

Sub Total			69.5	44.18

Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.0	0.00
3		SUMMATION OF FAN ELECTRICAL DEMAND	1.3	0.80
4		SUMMATION OF FAN ELECTRICAL DEMAND	1.8	1.14
5		SUMMATION OF FAN ELECTRICAL DEMAND	0.6	0.41
6		SUMMATION OF FAN ELECTRICAL DEMAND	2.7	1.74
8		SUMMATION OF FAN ELECTRICAL DEMAND	0.8	0.54
9		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	0.05
10		SUMMATION OF FAN ELECTRICAL DEMAND	0.4	0.26
11		SUMMATION OF FAN ELECTRICAL DEMAND	9.5	6.04
12		SUMMATION OF FAN ELECTRICAL DEMAND	23.5	14.95
13		SUMMATION OF FAN ELECTRICAL DEMAND	0.0	0.01

Sub Total			40.8	25.94

Sub Total			0.0	0.00

Miscellaneous

Lights			33.0	20.94
Base Utilities			0.0	0.00
Misc Equipment			14.1	8.94
Sub Total			47.0	29.88

Grand Total			157.3	100.00


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**          T R A C E    6 0 0    A N A L Y S I S          **  
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 313

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Relectance: 0.20
Winter Ground Relectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 18:27:35 2/ 1/94
Dataset Name: CB313 .TM

AIRFLOW - ALTERNATIVE 2
WALL & ROOF INSULATION

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)		
1	PTAC	0	0	0	0	0	0	0
2	RAD	0	0	0	0	957	0	0
3	SZ	450	1,600	1,600	2,141	991	0	200
4	SZ	235	2,325	2,325	2,837	747	0	0
5	VAV	892	892	0	1,056	1,056	0	0
6	SZ	1,600	3,315	3,315	3,765	2,050	0	1,000
7	SZ	5,220	5,220	5,220	5,220	5,220	0	5,220
8	SZ	110	1,100	1,100	1,319	329	0	0
9	SZ	360	1,000	1,000	1,215	574	0	0
10	SZ	780	2,400	2,400	2,657	1,037	0	0
11	SZ	5,040	11,100	11,100	11,100	5,040	0	0
12	SZ	14,400	18,000	18,000	18,193	14,593	0	15,150
13	FC	0	200	200	200	0	0	0
14	RAD	0	0	0	0	2,358	0	0
Totals		29,087	47,152	46,260	49,703	34,952	0	21,570

CAPACITY - ALTERNATIVE 2
WALL & ROOF INSULATION

----- SYSTEM SUMMARY -----
(Design Capacity Quantities)

Cooling						Heating						
System	Main Sys.	Aux. Sys.	Sys. Opt.	Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
Number	Type	Capacity (Tons)	Capacity (Tons)	Capacity (Tons)	Totals (Tons)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Totals (Btuh)
1	PTAC	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0
2	RAD	0.0	0.0	0.0	0.0	-90,812	0	0	0	0	0	-90,812
3	SZ	3.7	0.0	0.0	3.7	-46,846	0	-19,630	0	0	0	-46,846
4	SZ	3.2	0.0	0.0	3.2	-46,228	0	-8,086	0	0	0	-46,228
5	VAV	4.1	0.0	0.0	4.1	-17,826	0	-47,250	0	0	0	-65,076
6	SZ	5.4	0.0	0.0	5.4	-40,382	0	-111,002	0	0	0	-40,382
7	SZ	18.8	0.0	0.0	18.8	-280	0	-403,238	0	0	0	-280
8	SZ	1.6	0.0	0.0	1.6	-19,742	0	-2,048	0	0	0	-19,742
9	SZ	1.7	0.0	0.0	1.7	-20,417	0	-22,742	0	0	0	-20,417
10	SZ	3.1	0.0	0.0	3.1	-24,051	0	-55,065	0	0	0	-24,051
11	SZ	11.0	0.0	0.0	11.0	-1,208	0	-395,931	0	0	0	-1,208
12	SZ	36.5	0.0	0.0	36.5	-19,611	0	-1,047,061	0	0	0	-19,611
13	FC	0.0	0.0	0.0	0.0	-116	0	-1,117	0	0	0	-116
14	RAD	0.0	0.0	0.0	0.0	-215,486	0	0	0	0	0	-215,486
Totals		89.0	0.0	0.0	89.0	-543,003	0	-2,113,169	0	0	0	-590,253

The building peaked at hour 14 month 7 with a capacity of 89.0 tons

ENGINEERING CHECKS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- ENGINEERING CHECKS -----

			Percent	Cooling				Heating		Floor Area Sq Ft
System	Main/ Auxiliary	System Type	Outside Air	Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	PTAC	0.00	0.00	1,088.5	*****	0.00	0.00	0.00	1,073
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-31.80	2,856
3	Main	SZ	28.13	1.18	436.9	369.7	32.46	1.18	-34.60	1,354
4	Main	SZ	10.11	1.84	736.5	401.0	29.92	1.84	-36.51	1,266
5	Main	VAV	100.00	0.51	218.0	427.3	28.08	0.00	-37.23	1,748
6	Main	SZ	48.27	2.12	612.1	288.8	41.55	2.12	-25.82	1,564
7	Main	SZ	99.99	11.13	278.3	25.0	479.87	11.13	-0.60	469
8	Main	SZ	10.00	1.03	683.5	665.5	18.03	1.03	-18.43	1,071
9	Main	SZ	36.00	1.84	578.1	314.5	38.16	1.84	-37.53	544
10	Main	SZ	32.50	1.56	780.9	500.1	23.99	1.56	-15.65	1,537
11	Main	SZ	45.41	2.63	1,012.0	385.0	31.17	2.63	-0.29	4,223
12	Main	SZ	80.00	9.16	493.1	53.9	222.81	9.16	-9.97	1,966
13	Main	FC	0.00	3.92	4,658.1	1,187.8	10.10	3.92	-2.28	51
14	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-23.72	9,084

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/15 * Mo/Hr: 7/15 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	97.45	*	0	100.00	*	0	0	104.25
Sub Total==>	0	0		0	97.45	*	0	100.00	*	0	0	104.25
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	2.55	*		0.00	*		0	-4.25
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	100.00	*	0	100.00	*	0	0	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	1,073
Main Clg	0.0	0.0	0.0	0	38.1	30.7	15.4	27.9	24.9	15.2	Part	0
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	0 0
Totals	0.0	0.0									Wall	0 0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % OA	0.0	Type	Clg	Htg
Main Htg	-0.0	0	38.1	38.1	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	28.0	38.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	0	Clg Cfm/Ton	1088.50	Plenum	38.0	38.0
Preheat	-0.0	0	38.1	28.0	Supply	0	0	Clg Sqft/Ton	*****	Return	38.0	38.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	38.0	38.0
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	38.0	38.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	0.0				Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	0.00	Fn Frict	0.1	0.0

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-4,950	-4,950	5.45
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-11,004	-11,004	12.12
Wall Cond	0	0		0	0.00	*	0	0.00	*	-7,345	-7,345	8.09
Partition	0			0	0.00	*	0	0.00	*	-885	-885	0.98
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-66,628	-66,628	73.37
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-90,812	-90,812	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-90,812	-90,812	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Part	2,856	
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	342	
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	0	
Totals	0.0	0.0				Wall	2,153	0 0
							2,453	305 12

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % DA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Main Htg	-90.8	0	0.0	0.0	Infil	0	957	Clg Cfm/Ton	0.00	Plenum	0.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	68.0
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/DA	0.0	68.0
Reheat	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % DA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
Total	-90.8				Auxil	0	0	Htg Btuh/Sqft	-31.80	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 3 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,507	0		3,507	7.98	*	4,332	19.83	*	-3,592	-3,592	7.67
Glass Solar	408	0		408	0.93	*	310	1.42	*	0	0	0.00
Glass Cond	101	0		101	0.23	*	104	0.47	*	-507	-507	1.08
Wall Cond	2,526	0		2,526	5.75	*	2,710	12.40	*	-5,100	-5,100	10.89
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	16,497			16,497	37.53	*	8,353	38.23	*	-37,646	-37,646	80.36
Sub Total==>	23,040	0		23,040	52.42	*	15,808	72.35	*	-46,846	-46,846	100.00
Internal Loads						*			*			
Lights	4,429	0		4,429	10.08	*	5,365	24.55	*	0	0	0.00
People	700			700	1.59	*	677	3.10	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,129	0	0	5,129	11.67	*	6,042	27.65	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	13,733	31.25	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				2,048	4.66	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	28,170	0	0	43,951	100.00	*	21,850	100.00	*	-46,846	-46,846	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf) (%)
Main Clg	3.7	44.0	30.1	1,600	79.4	68.6	90.7	61.3	60.5	79.6	Floor	1,354
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	3.7	44.0									Roof	1,354
											Wall	1,386

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % OA	28.1		Type	Clg	Htg
Main Htg	-46.8	1,600	68.0	94.9	Vent	450	0	Clg Cfm/Sqft	1.18		SADB	62.5	94.9
Aux Htg	0.0	0	0.0	0.0	Infil	541	541	Clg Cfm/Ton	436.85		Plenum	75.0	68.0
Preheat	-19.6	1,600	50.0	61.3	Supply	1,600	1,600	Clg Sqft/Ton	369.68		Return	75.0	68.0
Reheat	0.0	0	0.0	0.0	MinCFM	0	0	Clg Btuh/Sqft	32.46		Ret/OA	79.4	68.0
Humidif	0.0	0	0.0	0.0	Return	1,600	1,600	No. People	9		Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	450	0	Htg % OA	0.0		Fn MtrTD	0.3	0.0
Total	-46.8				Rm Exh	200	0	Htg Cfm/Sqft	1.18		Fn BldTD	0.2	0.0
					Auxil	0	0	Htg Btuh/Sqft	-34.60		Fn Frict	0.7	0.0

System 4 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct	Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot	Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)	(Btuh)	(Btuh)	(%)
Envelope Loads											
Skylite Solr	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Skylite Cond	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Roof Cond	3,258	0	0	3,258	8.60	*	3,972	17.26	-3,358	-3,358	7.26
Glass Solar	3,056	0	0	3,056	8.07	*	2,417	10.50	0	0	0.00
Glass Cond	504	0	0	504	1.33	*	512	2.23	-2,561	-2,561	5.54
Wall Cond	2,165	0	0	2,165	5.71	*	2,663	11.57	-4,618	-4,618	9.99
Partition	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Exposed Floor	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Infiltration	14,531	0	0	14,531	38.36	*	7,919	34.41	-35,691	-35,691	77.21
Sub Total==>	23,515	0	0	23,515	62.07	*	17,482	75.96	-46,228	-46,228	100.00
Internal Loads											
Lights	4,025	0	0	4,025	10.62	*	4,900	21.29	0	0	0.00
People	703	0	0	703	1.85	*	633	2.75	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Sub Total==>	4,727	0	0	4,727	12.48	*	5,533	24.04	0	0	0.00
Ceiling Load	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Outside Air	0	0	0	6,664	17.59	*	0	0.00	0	0	0.00
Sup. Fan Heat	0	0	0	2,976	7.86	*	0	0.00	0	0	0.00
Ret. Fan Heat	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Duct Heat Pkup	0	0	0	0	0.00	*	0	0.00	0	0	0.00
OV/UNDR Sizing	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Exhaust Heat	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Terminal Bypass	0	0	0	0	0.00	*	0	0.00	0	0	0.00
Grand Total==>	28,243	0	0	37,883	100.00	*	23,015	100.00	-46,228	-46,228	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	3.2	37.9	29.0	76.6 67.6 89.9	64.7 62.8 85.1	1,266		
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	3.2	37.9				1,314	71	5

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	10.1	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	235	0	Clg Cfm/Sqft	1.84	SADB	65.9	86.3
Main Htg	-46.2	2,325	68.0	86.3	Infil	512	512	Clg Cfm/Ton	736.49	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	2,325	2,325	Clg Sqft/Ton	401.03	Return	75.0	68.0
Preheat	-8.1	2,325	61.5	64.7	MinCFM	0	0	Clg Btuh/Sqft	29.92	Ret/OA	76.6	68.0
Reheat	0.0	0	0.0	0.0	Return	2,325	2,325	No. People	8	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	235	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/SqFt	1.84	Fn BldTD	0.2	0.0
Total	-46.2				Auxil	0	0	Htg Btuh/SqFt	-36.51	Fn Frict	0.7	0.0

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 5 Block VAV - VARIABLE AIR VOLUME

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	4,737	0		4,737	9.65	*	8,710	42.72	*	0	0	0.00
Glass Cond	1,101	0		1,101	2.24	*	1,126	5.52	*	-5,505	-5,505	30.88
Wall Cond	207	24		231	0.47	*	210	1.03	*	-818	-914	5.12
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	7,075			7,075	14.41	*	2,531	12.42	*	-11,408	-11,408	64.00
Sub Total==>	13,120	24		13,144	26.78	*	12,577	61.69	*	-17,731	-17,826	100.00
Internal Loads												
Lights	5,718	0		5,718	11.65	*	6,926	33.98	*	0	0	0.00
People	904			904	1.84	*	874	4.29	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	6,622	0	0	6,622	13.49	*	7,800	38.26	*	0	0	0.00
Ceiling Load	3	-3		0	0.00	*	9	0.04	*	-95	0	0.00
Outside Air	0	0	0	28,391	57.84	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				935	1.90	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat PkUp		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		-4	0	-4	-0.01	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	-0.00	*		0.00	*		0	0.00
Grand Total==>	19,746	17	0	49,088	100.00	*	20,386	100.00	*	-17,826	-17,826	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf) (%)
Main Clg	4.1	49.1	27.1	657	90.5	74.3	105.0	52.7	51.7	56.9	Floor	1,749
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	4.1	49.1									Roof	0 0 0
											Wall	420 153 36

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	100.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	892	0	Clg Cfm/Sqft	0.51	SADB	54.0	68.1
Main Htg	-17.8	0	0.0	0.0	Infil	164	164	Clg Cfm/Ton	218.01	Plenum	75.0	67.8
Aux Htg	0.0	0	0.0	0.0	Supply	892	0	Clg Sqft/Ton	427.31	Return	75.0	67.8
Preheat	-47.2	892	4.0	52.7	Mincfm	0	0	Clg Btuh/Sqft	28.08	Ret/OA	90.5	4.0
Reheat	-0.0	0	0.0	0.0	Return	892	0	No. People	11	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	892	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/SqFt	0.00	Fn BldTD	0.2	0.0
Total	-65.1				Auxil	0	0	Htg Btuh/SqFt	-37.23	Fn Frict	0.7	0.0

System 6 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	5,265	0		5,265	8.10	*	5,850	27.08	*	0	0	0.00
Glass Cond	1,038	0		1,038	1.60	*	1,030	4.77	*	-5,269	-5,269	13.05
Wall Cond	920	97		1,017	1.57	*	984	4.55	*	-3,385	-3,741	9.27
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	10,478			10,478	16.12	*	6,961	32.22	*	-31,372	-31,372	77.69
Sub Total==>	17,701	97		17,798	27.39	*	14,824	68.62	*	-40,025	-40,382	100.00
Internal Loads												
Lights	4,900	0		4,900	7.54	*	5,981	27.69	*	0	0	0.00
People	861			861	1.32	*	782	3.62	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,761	0	0	5,761	8.86	*	6,763	31.31	*	0	0	0.00
Ceiling Load	14	-14		0	0.00	*	15	0.07	*	-43	0	0.00
Outside Air	0	0	0	37,218	57.27	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				4,243	6.53	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	-0.00	*	0	-0.00	*	0	0	0.00
Exhaust Heat		-32	0	-32	-0.05	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	23,476	52	0	64,989	100.00	*	21,602	100.00	*	-40,068	-40,382	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	5.4	65.0	51.5	3,315	82.5	71.3	100.2	67.8	65.9	95.1	Part	1,564
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	0
Totals	5.4	65.0									Wall	1,155
												146 13

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F	Vent	1,600	0	Clg % OA	48.3	Type	Clg	Htg
Main Htg	-40.4	3,315	67.9	79.1	Infil	450	450	Clg Cfm/Sqft	2.12	SAOB	69.0	79.1
Aux Htg	0.0	0	0.0	0.0	Supply	3,315	3,315	Clg Cfm/Ton	612.11	Plenum	75.0	67.9
Preheat	-111.0	3,315	37.1	67.8	Mincfm	0	0	Clg Sqft/Ton	288.79	Return	75.0	67.9
Reheat	0.0	0	0.0	0.0	Return	2,765	3,315	Clg Btuh/Sqft	41.55	Ret/OA	82.5	67.9
Humidif	0.0	0	0.0	0.0	Exhaust	1,050	0	No. People	10	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	1,000	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Total	-40.4				Auxil	0	0	Htg Cfm/SqFt	2.12	Fn BldTD	0.2	0.0
								Htg Btuh/SqFt	-25.82	Fn Frict	0.7	0.0

System 7 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/15 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	78			78	0.03	*	78	99.95	*	-280	-280	99.98
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.02	*	0	0	0.02
Sub Total==>	78	0		78	0.03	*	78	99.97	*	-280	-280	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	224,979	99.97	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.03	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	78	0	0	225,057	100.00	*	78	100.00	*	-280	-280	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	18.8	225.1	88.1	5,220 90.5 74.3 105.0	75.0 62.7 67.5	469		
Aux Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	Part	108	
Opt Vent	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Totals	18.8	225.1				Roof	0	0 0
						Wall	0	0 0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	100.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	5,220	0	Clg Cfm/Sqft	11.13	SADB	75.0	68.0
Main Htg	-0.3	5,220	68.0	68.0	Infil	0	0	Clg Cfm/Ton	278.34	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	5,220	5,220	Clg Sqft/Ton	25.01	Return	75.0	68.0
Preheat	-403.2	5,220	4.0	75.0	Mincfm	0	0	Clg Btuh/Sqft	479.87	Ret/OA	90.5	68.0
Reheat	0.0	0	0.0	0.0	Return	0	5,220	No. People	0	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	5,220	0	Htg Cfm/Sqft	11.13	Fn BldTD	0.0	0.0
Total	-0.3				Auxil	0	0	Htg Btuh/Sqft	-0.60	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 8 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/12 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 87 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	3,225	0		3,225	16.70	*	4,275	33.65	*	0	0	0.00
Glass Cond	532	0		532	2.76	*	392	3.08	*	-2,702	-2,702	13.69
Wall Cond	545	58		603	3.12	*	507	3.99	*	-1,629	-1,802	9.13
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	6,354			6,354	32.90	*	2,809	22.11	*	-15,238	-15,238	77.18
Sub Total==>	10,656	58		10,714	55.48	*	7,983	62.83	*	-19,569	-19,742	100.00
Internal Loads						*			*			
Lights	3,405	0		3,405	17.63	*	3,997	31.46	*	0	0	0.00
People	594			594	3.08	*	714	5.62	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	3,999	0	0	3,999	20.71	*	4,711	37.08	*	0	0	0.00
Ceiling Load	13	-13		0	0.00	*	12	0.09	*	-38	0	0.00
Outside Air	0	0	0	3,195	16.54	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				1,408	7.29	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	-0.00	*	0	-0.00	*	0	0	0.00
Exhaust Heat		-5	0	-5	-0.02	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	14,668	41	0	19,311	100.00	*	12,706	100.00	*	-19,607	-19,742	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf) (%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor	1,071
Main Clg	1.6	19.3	15.0	1,100 76.6 67.5 89.0	63.2 62.3 84.8	Part	0
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	0 0 0
Totals	1.6	19.3				Wall	561 75 13

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	10.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	110	0	Clg Cfm/Sqft	1.03	SADB	64.4	84.4
Main Htg	-19.7	1,100	67.9	84.4	Infil	219	219	Clg Cfm/Ton	683.54	Plenum	75.0	67.9
Aux Htg	0.0	0	0.0	0.0	Supply	1,100	1,100	Clg Sqft/Ton	665.52	Return	75.0	67.9
Preheat	-2.0	1,100	61.5	63.2	Mincfm	0	0	Clg Btuh/Sqft	18.03	Ret/OA	76.6	67.9
Reheat	0.0	0	0.0	0.0	Return	1,100	1,100	No. People	7	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	110	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	1.03	Fn BldTD	0.2	0.0
Total	-19.7				Auxil	0	0	Htg Btuh/Sqft	-18.43	Fn Frict	0.7	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 9 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/43/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	1,065	0		1,065	5.13	*	1,386	14.14	*	-1,238	-1,238	6.06
Glass Solar	2,026	0		2,026	9.76	*	1,665	16.98	*	0	0	0.00
Glass Cond	514	0		514	2.47	*	514	5.24	*	-2,607	-2,607	12.77
Wall Cond	485	0		485	2.34	*	574	5.86	*	-1,633	-1,633	8.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	5,408			5,408	26.05	*	3,315	33.80	*	-14,939	-14,939	73.17
Sub Total==>	9,498	0		9,498	45.76	*	7,453	76.01	*	-20,417	-20,417	100.00
Internal Loads						*			*			
Lights	1,729	0		1,729	8.33	*	2,080	21.22	*	0	0	0.00
People	311			311	1.50	*	272	2.77	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	2,040	0	0	2,040	9.83	*	2,352	23.99	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	9,076	43.73	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				142	0.69	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat PkUp		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	-0.00	*	0	-0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	11,539	0	0	20,757	100.00	*	9,806	100.00	*	-20,417	-20,417	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf) (%)
Main Clg	1.7	20.8	15.8	1,000	80.6	70.2	97.2	65.9	64.3	90.5	Floor	544
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	1.7	20.8									Roof	544
											Wall	550
												72 13

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	36.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	360	0	Clg Cfm/Sqft	1.84	SADB	66.0	86.8
Main Htg	-20.4	1,000	68.0	86.8	Infil	214	214	Clg Cfm/Ton	578.11	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	1,000	1,000	Clg Sqft/Ton	314.49	Return	75.0	68.0
Preheat	-22.7	1,000	45.0	65.9	Mincfm	0	0	Clg Btuh/Sqft	38.16	Ret/OA	80.6	68.0
Reheat	0.0	0	0.0	0.0	Return	1,000	1,000	No. People	4	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	360	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/SqFt	1.84	Fn BldTD	0.0	0.0
Total	-20.4				Auxil	0	0	Htg Btuh/SqFt	-37.53	Fn Frict	0.1	0.0

System 10 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****
Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	4,550	0		4,550	12.34	*	4,777	28.15	*	0	0	0.00
Glass Cond	807	0		807	2.19	*	820	4.83	*	-4,098	-4,098	17.04
Wall Cond	552	62		614	1.67	*	601	3.54	*	-1,822	-2,026	8.42
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	6,080			6,080	16.49	*	3,978	23.43	*	-17,927	-17,927	74.54
Sub Total==>	11,989	62		12,051	32.68	*	10,175	59.95	*	-23,847	-24,051	100.00
Internal Loads						*			*			
Lights	4,886	0		4,886	13.25	*	6,020	35.46	*	0	0	0.00
People	853			853	2.31	*	769	4.53	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,739	0	0	5,739	15.56	*	6,788	39.99	*	0	0	0.00
Ceiling Load	10	-10		0	0.00	*	11	0.06	*	-32	0	0.00
Outside Air	0	0	0	18,423	49.96	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				683	1.85	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	-0.00
Exhaust Heat		-17	0	-17	-0.05	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	17,738	35	0	36,879	100.00	*	16,974	100.00	*	-23,879	-24,051	100.00

-----COOLING COIL SELECTION-----										-----AREAS-----		
	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	3.1	36.9	29.5	2,400	80.1	70.2	98.3	68.2	66.0	94.9	Part	0
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	0 0
Totals	3.1	36.9									Wall	660 114 17

-----HEATING COIL SELECTION-----					-----AIRFLOWS (cfm)-----			--ENGINEERING CHECKS--		--TEMPERATURES (F)---		
	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	32.5	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	780	0	Clg Cfm/Sqft	1.56	SAOB	68.5	77.1
Main Htg	-24.1	2,400	67.9	77.1	Infil	257	257	Clg Cfm/Ton	780.93	Plenum	75.0	67.9
Aux Htg	0.0	0	0.0	0.0	Supply	2,400	2,400	Clg Sqft/Ton	500.12	Return	75.0	67.9
Preheat	-55.1	2,400	47.2	68.2	Mincfm	0	0	Clg Btuh/Sqft	23.99	Ret/OA	80.1	67.9
Reheat	0.0	0	0.0	0.0	Return	2,400	2,400	No. People	10	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	780	0	Htg % OA	0.0	Fn MtrTD	0.1	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/SqFt	1.56	Fn BldTD	0.0	0.0
Total	-24.1				Auxil	0	0	Htg Btuh/SqFt	-15.65	Fn Frict	0.1	0.0

System 11 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/22 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 79 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	0	0	60.74
Sub Total==>	0	0		0	0.00	*	0	0.00	*	0	0	60.74
Internal Loads												
Lights	13,815	0		13,815	10.50	*	18,290	76.69	*	0	0	0.00
People	2,183			2,183	1.66	*	5,560	23.31	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	15,998	0	0	15,998	12.15	*	23,851	100.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	99,839	75.85	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				15,787	11.99	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	39.26
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	15,998	0	0	131,624	100.00	*	23,851	100.00	*	0	0	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	4,223	
Main Clg	11.0	131.6	115.8	11,100	82.0	71.6	102.7	71.7	68.4	101.9	Part	0
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	0 0 0
Totals	11.0	131.6									Wall	0 0 0

-----HEATING COIL SELECTION-----

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	45.4	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	5,040	0	Clg Cfm/Sqft	2.63	SADB	73.0	68.1
Main Htg	-1.2	11,100	68.0	68.1	Infil	0	0	Clg Cfm/Ton	1011.97	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	11,100	11,100	Clg Sqft/Ton	385.00	Return	75.0	68.0
Preheat	-395.9	11,100	38.9	71.7	Mincfm	0	0	Clg Btuh/Sqft	31.17	Ret/OA	82.0	68.0
Reheat	0.0	0	0.0	0.0	Return	11,100	11,100	No. People	28	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	5,040	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	2.63	Fn BldTD	0.2	0.0
Total	-1.2				Auxil	0	0	Htg Btuh/Sqft	-0.29	Fn Frict	0.7	0.0

System 12 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****
Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/20 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 83 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,816	0		3,816	0.87	*	4,109	7.20	*	-4,473	-4,473	22.81
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	384	0		384	0.09	*	481	0.84	*	-1,693	-1,693	8.63
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-13,445	-13,445	68.56
Sub Total==>	4,199	0		4,199	0.96	*	4,591	8.04	*	-19,610	-19,610	100.00
Internal Loads												
Lights	6,341	0		6,341	1.45	*	8,153	14.28	*	0	0	0.00
People	1,049			1,049	0.24	*	2,032	3.56	*	0	0	0.00
Misc	9,082	32,486	3,840	45,408	10.37	*	8,467	14.83	*	0	0	0.00
Sub Total==>	16,472	32,486	3,840	52,798	12.05	*	18,651	32.66	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	311,339	71.07	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				35,840	8.18	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	33,869			33,869	7.73	*	33,869	59.30	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	54,540	32,486	3,840	438,045	100.00	*	57,111	100.00	*	-19,611	-19,611	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	36.5	438.0	364.3	18,000 89.5 73.8 103.6	70.3 67.4 99.0	Part	1,966	
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	1,966	0 0
Totals	36.5	438.0				Wall	495	0 0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	80.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	14,400	0	Clg Cfm/Sqft	9.16	SADB	72.1	69.0
Main Htg	-19.6	18,000	68.0	69.0	Infil	0	193	Clg Cfm/Ton	493.10	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	18,000	18,000	Clg Sqft/Ton	53.86	Return	85.5	68.0
Preheat	-1,047.1	18,000	16.8	70.3	Mincfm	0	0	Clg Btuh/Sqft	222.81	Ret/OA	89.5	68.0
Reheat	0.0	0	0.0	0.0	Return	2,850	18,000	No. People	13	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.5	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	15,150	0	Htg Cfm/Sqft	9.16	Fn BldTD	0.3	0.0
Total	-19.6				Auxil	0	0	Htg Btuh/Sqft	-9.97	Fn Frict	1.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 13 Block FC - FAN COIL

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/20 * Mo/Hr: 7/20 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 83/ 70/ 91.0 * OADB: 83 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	108	0		108	20.93	*	108	28.50	*	-116	-116	99.94
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	0	0	0.06
Sub Total==>	108	0		108	20.94	*	108	28.50	*	-116	-116	100.00
Internal Loads						*			*			
Lights	216	0		216	41.96	*	216	57.12	*	0	0	0.00
People	163			163	31.58	*	54	14.37	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	379	0	0	379	73.54	*	271	71.50	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				28	5.52	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	-0.00	*		0.00	*		0	0.00
Grand Total==>	487	0	0	515	100.00	*	378	100.00	*	-116	-116	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	51	
Main Clg	0.0	0.5	200	75.1	69.0	99.8	73.2	68.3	99.1	Part	0	
Aux Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	51	0 0
Totals	0.0	0.5								Wall	0	0 0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F	Vent	0	0	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-0.1	200	68.0	68.5	Infil	0	0	Clg Cfm/Sqft	3.92	SADB	73.3	68.5
Aux Htg	0.0	0	0.0	0.0	Supply	200	200	Clg Cfm/Ton	4658.06	Plenum	75.0	68.0
Preheat	-1.1	200	68.0	73.1	Mincfm	0	0	Clg Sqft/Ton	1187.81	Return	75.0	68.0
Reheat	0.0	0	0.0	0.0	Return	200	200	Clg Btuh/Sqft	10.10	Ret/OA	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	0	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-0.1				Auxil	0	0	Htg Cfm/Sqft	3.92	Fn BldTD	0.0	0.0
								Htg Btuh/Sqft	-2.28	Fn Frict	0.1	0.0

System 14 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-8,187	-8,187	3.80
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-23,248	-23,248	10.79
Wall Cond	0	0		0	0.00	*	0	0.00	*	-19,007	-19,830	9.20
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-164,220	-164,220	76.21
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-214,662	-215,486	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-8,387	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-223,050	-215,486	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf)	(%)
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	Floor	9,084	
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	Part	0	
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Totals	0.0	0.0								Roof	3,164	0 0
										Wall	6,046	645 11

-----HEATING COIL SELECTION-----

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA		Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent							
Main Htg	-215.5	0	0.0	0.0	Infil	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Supply	0	2,358	Clg Cfm/Ton	0.00	Plenum	0.0	67.6
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Sqft/Ton	0.00	Return	0.0	67.6
Reheat	0.0	0	0.0	0.0	Return	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	67.6
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-215.5				Auxil	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
								Htg Btuh/Sqft	-23.72	Fn Frict	0.0	0.0

BUILDING U-VALUES - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Part.	ExFlr	Room U-Values (Btu/hr/sqft/F)							Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
				Summr Skylt	Wintr Skylt	Summr Roof	Wintr Windo	Windo	Wall	Ceil.		
1	LIQUOR STORE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
2	RAD ONLY	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
Zone	2 Total/Ave.	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
System	2 Total/Ave.	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
3	ATTIC	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	23.3	8.65
Zone	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	23.3	8.65
System	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	23.3	8.65
4	OFFICES	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	56.1	15.68
Zone	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	56.1	15.68
System	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	56.1	15.68
5	PARTY ROOMS	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
Zone	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
System	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
6	LOUNGE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	93.3	22.79
Zone	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	93.3	22.79
System	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	93.3	22.79
7	MECH ROOM	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
Zone	7 Total/Ave.	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
System	7 Total/Ave.	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
8	LOBBY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	67.4	17.13
Zone	8 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	67.4	17.13
System	8 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	67.4	17.13
9	PRIVATE DINING	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
Zone	9 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
System	9 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
10	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	54.2	14.22
Zone	10 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	54.2	14.22
System	10 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	54.2	14.22
11	BALL ROOM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
Zone	11 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
System	11 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
12	KITCHEN	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
Zone	12 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
System	12 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
13	KITCHEN OFFICE	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
Zone	13 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
System	13 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
3	ATTIC	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	23.3	8.65
Zone	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	23.3	8.65
4	OFFICES	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	56.1	15.68
Zone	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	56.1	15.68
5	PARTY ROOMS	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
Zone	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
6	LOUNGE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	93.3	22.79
Zone	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	93.3	22.79
8	LOBBY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	67.4	17.13

BUILDING U-VALUES - ALTERNATIVE 2
 WALL & ROOF INSULATION

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
Zone 8	Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	67.4	17.13
Zone 9	PRIVATE DINING	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
Zone 9	Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
Zone 10	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	54.2	14.22
Zone 10	Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	54.2	14.22
System 14	Total/Ave.	0.000	0.000	0.000	0.000	0.040	0.550	0.563	0.057	0.317	52.8	14.09
Building		0.144	0.000	0.000	0.000	0.039	0.550	0.563	0.057	0.317	48.7	12.67

BUILDING AREAS - ALTERNATIVE 2
WALL & ROOF INSULATION

BUILDING AREAS

Room Number	Description	Number of Duplicate Flr Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	LIQUOR STORE	1 1	1,073	1,073	0	0	0	0	0	0	0	0
Zone	1 Total/Ave.			1,073	0	0	0	0	0	0	0	0
System	1 Total/Ave.			1,073	0	0	0	0	0	0	0	0
2	RAD ONLY	1 1	2,856	2,856	342	0	0	0	2,153	305	12	2,148
Zone	2 Total/Ave.			2,856	342	0	0	0	2,153	305	12	2,148
System	2 Total/Ave.			2,856	342	0	0	0	2,153	305	12	2,148
3	ATTIC	1 1	1,354	1,354	0	0	0	0	1,354	14	1	1,372
Zone	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
System	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
4	OFFICES	1 1	1,266	1,266	0	0	0	0	1,266	71	5	1,243
Zone	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
System	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
5	PARTY ROOMS	1 1	1,748	1,748	0	0	0	0	0	153	36	267
Zone	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
System	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
6	LOUNGE	1 1	1,564	1,564	0	0	0	0	0	146	13	1,009
Zone	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
System	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
7	MECH ROOM	1 1	469	469	108	0	0	0	0	0	0	0
Zone	7 Total/Ave.			469	108	0	0	0	0	0	0	0
System	7 Total/Ave.			469	108	0	0	0	0	0	0	0
8	LOBBY	1 1	1,071	1,071	0	0	0	0	0	75	13	486
Zone	8 Total/Ave.			1,071	0	0	0	0	0	75	13	486
System	8 Total/Ave.			1,071	0	0	0	0	0	75	13	486
9	PRIVATE DINING	1 1	544	544	0	0	0	0	544	72	13	478
Zone	9 Total/Ave.			544	0	0	0	0	544	72	13	478
System	9 Total/Ave.			544	0	0	0	0	544	72	13	478
10	DINING ROOM	1 1	1,537	1,537	0	0	0	0	0	114	17	546
Zone	10 Total/Ave.			1,537	0	0	0	0	0	114	17	546
System	10 Total/Ave.			1,537	0	0	0	0	0	114	17	546
11	BALL ROOM	1 1	4,223	4,223	0	0	0	0	0	0	0	0
Zone	11 Total/Ave.			4,223	0	0	0	0	0	0	0	0
System	11 Total/Ave.			4,223	0	0	0	0	0	0	0	0
12	KITCHEN	1 1	1,966	1,966	0	0	0	0	1,966	0	0	495
Zone	12 Total/Ave.			1,966	0	0	0	0	1,966	0	0	495
System	12 Total/Ave.			1,966	0	0	0	0	1,966	0	0	495
13	KITCHEN OFFICE	1 1	51	51	0	0	0	0	51	0	0	0
Zone	13 Total/Ave.			51	0	0	0	0	51	0	0	0
System	13 Total/Ave.			51	0	0	0	0	51	0	0	0
3	ATTIC	1 1	1,354	1,354	0	0	0	0	1,354	14	1	1,372
Zone	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
4	OFFICES	1 1	1,266	1,266	0	0	0	0	1,266	71	5	1,243
Zone	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
5	PARTY ROOMS	1 1	1,748	1,748	0	0	0	0	0	153	36	267
Zone	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
6	LOUNGE	1 1	1,564	1,564	0	0	0	0	0	146	13	1,009
Zone	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
8	LOBBY	1 1	1,071	1,071	0	0	0	0	0	75	13	486

BUILDING AREAS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skf /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
		Flr	Rm										
Zone 8	Total/Ave.				1,071	0	0	0	0	0	75	13	486
9	PRIVATE DINING	1	1	544	544	0	0	0	0	544	72	13	478
Zone 9	Total/Ave.				544	0	0	0	0	544	72	13	478
10	DINING ROOM	1	1	1,537	1,537	0	0	0	0	0	114	17	546
Zone 10	Total/Ave.				1,537	0	0	0	0	0	114	17	546
System 14	Total/Ave.				9,084	0	0	0	0	3,164	645	11	5,401
Building					28,806	450	0	0	0	10,498	1,596	11	13,444

ASHRAE 90 ANALYSIS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.039 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.109 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.080 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 2.10 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 9.95 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2
WALL & ROOF INSULATION

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	4.5	86	5,335	-132,809	31	1,084	2,357.6	29	2,555	0.0	0	0
5 - 10	8.9	2	109	-265,617	44	1,563	4,715.2	0	0	0.0	0	0
10 - 15	13.4	5	316	-398,426	12	419	7,072.8	0	0	0.0	0	0
15 - 20	17.8	4	240	-531,234	14	487	9,430.4	0	0	0.0	0	0
20 - 25	22.3	3	205	-664,043	0	0	11,788.0	0	0	0.0	0	0
25 - 30	26.7	0	0	-796,852	0	0	14,145.6	0	0	0.0	0	0
30 - 35	31.2	0	0	-929,660	0	0	16,503.2	0	0	0.0	0	0
35 - 40	35.6	0	0	-1,062,469	0	0	18,860.8	0	0	0.0	0	0
40 - 45	40.1	0	0	-1,195,278	0	0	21,218.4	0	0	0.0	0	0
45 - 50	44.5	0	0	-1,328,086	0	0	23,576.0	0	0	0.0	0	0
50 - 55	49.0	0	0	-1,460,895	0	0	25,933.7	0	0	0.0	0	0
55 - 60	53.4	0	0	-1,593,704	0	0	28,291.3	0	0	0.0	0	0
60 - 65	57.9	0	0	-1,726,512	0	0	30,648.9	0	0	0.0	0	0
65 - 70	62.3	0	0	-1,859,321	0	0	33,006.5	0	0	0.0	0	0
70 - 75	66.8	0	0	-1,992,130	0	0	35,364.1	0	0	0.0	0	0
75 - 80	71.2	0	0	-2,124,938	0	0	37,721.7	0	0	0.0	0	0
80 - 85	75.7	0	0	-2,257,747	0	0	40,079.3	0	0	0.0	0	0
85 - 90	80.1	0	0	-2,390,556	0	0	42,436.9	71	6,205	0.0	0	0
90 - 95	84.6	0	0	-2,523,364	0	0	44,794.5	0	0	0.0	0	0
95 - 100	89.0	0	0	-2,656,172	0	0	47,152.1	0	0	0.0	0	0
Hours Off	0.0	0	2,555	0	0	5,207	0.0	0	0	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 2
WALL & ROOF INSULATION

----- BUILDING TEMPERATURE PROFILES -----

Temperature Range (F)	Zone Number																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	3	4	5	6	8	9
Max. Temp.	38.0	92.3	78.7	78.4	79.9	78.5	71.2	78.6	78.5	78.7	79.9	96.7	80.0	121.9	119.3	161.8	126.4	140.6	115.3
Mo./Hr.	1 1	8 22	7 24	7 24	7 4	7 5	9 16	7 4	7 4	7 4	6 5	7 15	7 5	8 22	8 22	8 22	9 22	9 22	8 22
Day Type	1	1	1	1	1	1	4	1	1	1	2	1	1	1	1	1	5	3	1
..... Number of Hours																			
Above 100	0	0	0	0	0	0	0	0	0	0	0	0	0	2,944	2,892	4,271	2,815	3,457	2,640
95 - 100	0	0	0	0	0	0	0	0	0	0	0	0	0	120	36	145	443	162	288
90 - 95	0	868	0	0	0	0	0	0	0	0	0	138	0	124	131	32	224	229	48
85 - 90	0	1,276	0	0	0	0	0	0	0	0	0	778	0	196	163	474	276	108	200
80 - 85	0	784	0	0	0	0	0	0	0	0	0	1,174	0	288	386	846	198	700	379
75 - 80	0	136	2,636	3,300	3,672	3,011	0	3,672	2,775	3,277	2,801	820	4,107	17	496	424	668	265	545
70 - 75	0	829	1,027	372	0	661	1,563	0	897	480	658	213	4,653	197	147	1,222	297	931	111
65 - 70	0	4,432	3,680	4,299	3,722	2,489	3,387	1,881	3,415	2,982	443	884	0	3,804	3,787	1,343	3,780	2,880	3,979
60 - 65	0	435	1,083	789	1,279	1,005	3,810	507	1,553	1,385	695	852	0	800	722	3	59	28	570
55 - 60	0	0	334	0	87	1,068	0	1,333	120	636	782	576	0	270	0	0	0	0	0
50 - 55	0	0	0	0	0	526	0	903	0	0	872	615	0	0	0	0	0	0	0
Below 50	8,760	0	0	0	0	0	0	464	0	0	2,509	2,710	0	0	0	0	0	0	0
Min. Temp.	38.0	62.9	55.5	60.4	57.8	51.1	60.2	46.3	57.8	55.4	33.9	30.1	67.9	55.5	60.4	64.0	64.6	64.8	61.4
Mo./Hr.	1 1	2 6	2 6	2 6	2 11	2 10	3 20	2 8	2 6	2 10	2 10	2 8	1 6	2 6	2 6	1 6	2 6	2 6	2 6
Day Type	1	1	1	1	5	5	5	5	5	5	4	4	1	1	1	1	1	1	1

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 2
WALL & ROOF INSULATION

----- B U I L D I N G T E M P E R A T U R E P R O F I L E S -----

Range 10
(F)

Max. Temp. 146.7
Mo./Hr. 9 22
Day Type 3

	 Number of Hours
Above 100	3,606
95 - 100	232
90 - 95	106
85 - 90	640
80 - 85	323
75 - 80	229
70 - 75	841
65 - 70	2,775
60 - 65	8
55 - 60	0
50 - 55	0
Below 50	0

Min. Temp. 64.9
Mo./Hr. 2 6
Day Type 4

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 2
WALL & ROOF INSULATION

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	STEAM On Peak (Therm)	HOT WTR On Peak (Therm)	STEAM DMND On Peak (Thrm/hr)	HOT W DMND On Peak (Thrm/hr)
Jan	53,808	108	97	918	0	4
Feb	49,572	107	88	966	0	4
March	52,736	118	97	515	0	4
April	47,724	120	94	164	0	3
May	46,335	139	0	0	0	0
June	50,555	147	0	0	0	0
July	60,524	154	0	0	0	0
Aug	52,763	147	0	0	0	0
Sept	45,350	143	0	0	0	0
Oct	48,930	121	73	45	0	2
Nov	48,857	121	94	258	0	3
Dec	53,668	107	97	691	0	4
Total	609,021	154	641	3,557	0	4

Building Energy Consumption = 86,826 (Btu/Sq Ft/Year)
Source Energy Consumption = 236,211 (Btu/Sq Ft/Year)

Floor Area = 28,806 (Sq Ft)

----- EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	15067	13609	15067	14581	15067	14581	15067	15067	14581	15067	14581	15067	177,399
	PK	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0
1	MISC LD													
	ELEC	7412	6694	7412	7173	7412	7173	7412	7412	7173	7412	7173	7412	87,266
	PK	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1161	AIR-CLD COND COMP <15 TONS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ1100S	AIR-CLD RECIP 25-45 TONS												
	ELEC	0	0	0	250	977	3963	8347	4394	1294	909	53	0	20,186
	PK	0.0	0.0	20.2	20.2	22.0	24.2	28.3	24.6	22.2	20.2	20.2	0.0	28.3
2	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	10	67	277	598	306	88	38	2	0	1,385
	PK	0.0	0.0	0.1	0.2	0.5	1.8	2.3	1.8	1.4	0.5	0.1	0.0	2.3
2	EQ5001	CHILLED WATER PUMP C.V.												

	ELEC	0	0	0	292	898	1306	1572	1375	984	892	89	0	7,409
	PK	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0
2	EQ5303													
	ELEC	0	0	0	29	90	131	158	138	99	90	9	0	745
	PK	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.3
3	EQ1281													
	ELEC	972	967	1030	826	0	87	315	85	0	594	995	989	6,759
	PK	2.2	2.2	2.2	2.2	0.0	1.2	1.8	1.2	0.8	2.2	2.2	2.2	2.2
3	EQ5215													
	ELEC	0	0	0	0	0	13	47	13	0	0	0	0	73
	PK	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.3
3	EQ5308													
	ELEC	53	48	53	51	0	18	39	21	0	41	51	53	427
	PK	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3	EQ5350													
	ELEC	14	12	7	0	0	0	0	0	0	0	6	14	53
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	EQ1281													
	ELEC	1727	1541	1830	924	0	232	664	279	17	664	1315	1756	10,948
	PK	3.9	3.9	3.9	3.9	0.0	2.1	3.2	2.2	1.8	3.9	3.9	3.9	3.9
4	EQ5215													
	ELEC	0	0	0	0	0	35	99	42	3	0	0	0	179
	PK	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.3	0.1	0.0	0.0	0.4
4	EQ5308													
	ELEC	53	48	53	32	0	23	46	27	7	23	43	53	406
	PK	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
4	EQ5350													
	ELEC	25	21	12	0	0	0	0	0	0	0	11	25	94
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	EQ1101L													
	ELEC	0	0	0	0	229	1279	3311	1357	201	0	0	0	6,378
	PK	0.0	0.0	0.0	0.0	22.4	23.2	24.0	23.3	22.5	0.0	0.0	0.0	24.0
5	EQ5200													
	ELEC	0	0	0										

[illegible]

	ELEC	1025	926	1025	992	1025	992	1025	992	1025	992	1025	12,070
	PK	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
13	EQ4003												
	ELEC	9	8	9	9	9	9	9	9	9	9	9	106
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ2102												
	P HOTW20	918	966	515	164	0	0	0	0	45	258	691	3,557
	PK	3.7	3.7	3.7	3.3	0.0	0.0	0.0	0.0	1.9	2.7	3.6	3.7
1	EQ5020												
	ELEC	441	399	441	151	0	0	0	0	70	182	441	2,125
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8
2	EQ2261												
	ELEC	6866	6202	5605	2755	0	0	0	0	1781	3751	6677	33,637
	PK	13.0	13.0	13.0	13.0	0.0	0.0	0.0	0.0	13.0	13.0	13.0	13.0
3	EQ2101												
	P STEAM	97	88	97	94	0	0	0	0	73	94	97	641
	PK	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4
3	EQ5020												
	ELEC	6	5	6	6	0	0	0	0	5	6	6	40
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5061												
	ELEC	12	11	12	12	0	0	0	0	9	12	12	82
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1

UTILITY PEAK CHECKSUMS - ALTERNATIVE 2
WALL & ROOF INSULATION

----- UTILITY PEAK CHECKSUMS -----

Utility ELECTRIC DEMAND

Peak Value 153.7 (kW)
Yearly Time of Peak 17 (hr) 7 (mo)

Hour 17 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Perct Of Tot (%)

Cooling Equipment

2	EQ1100S	AIR-CLD RECIP 25-45 TONS	32.7	21.29
3	EQ1281	TRANE HT-PMP W-DEMAND DEFROST	1.8	1.17
4	EQ1281	TRANE HT-PMP W-DEMAND DEFROST	3.2	2.11
5	EQ1101L	HR AIR-CLD RECIP >15 TONS	28.1	18.29

Sub Total			65.9	42.86

Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.0	0.00
3		SUMMATION OF FAN ELECTRICAL DEMAND	1.3	0.82
4		SUMMATION OF FAN ELECTRICAL DEMAND	1.8	1.17
5		SUMMATION OF FAN ELECTRICAL DEMAND	0.6	0.42
6		SUMMATION OF FAN ELECTRICAL DEMAND	2.7	1.78
8		SUMMATION OF FAN ELECTRICAL DEMAND	0.8	0.55
9		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	0.06
10		SUMMATION OF FAN ELECTRICAL DEMAND	0.4	0.27
11		SUMMATION OF FAN ELECTRICAL DEMAND	9.5	6.18
12		SUMMATION OF FAN ELECTRICAL DEMAND	23.5	15.30
13		SUMMATION OF FAN ELECTRICAL DEMAND	0.0	0.01

Sub Total			40.8	26.55

Sub Total			0.0	0.00

Miscellaneous

Lights			33.0	21.44
Base Utilities			0.0	0.00
Misc Equipment			14.1	9.15
Sub Total			47.0	30.59

Grand Total			153.7	100.00

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**          T R A C E    6 0 0    A N A L Y S I S          **
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 313

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Reflectance: 0.20
Winter Ground Reflectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 19:21:43 2/ 1/94
Dataset Name: C8313 .TM

AIRFLOW - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- S Y S T E M S U M M A R Y -----
(Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)		
1	PTAC	0	0	0	0	0	0	0
2	RAD	0	0	0	0	1,030	0	0
3	SZ	450	1,600	1,600	2,182	1,032	0	200
4	SZ	235	2,325	2,325	2,877	787	0	0
5	VAV	895	895	0	1,071	1,071	0	0
6	SZ	1,600	3,315	3,315	3,900	2,085	0	1,000
7	SZ	5,220	5,220	5,220	5,220	5,220	0	5,220
8	SZ	110	1,100	1,100	1,336	346	0	0
9	SZ	360	1,000	1,000	1,231	591	0	0
10	SZ	780	2,400	2,400	2,677	1,057	0	0
11	SZ	5,040	11,100	11,100	11,100	5,040	0	0
12	SZ	14,400	18,000	13,000	18,208	14,608	0	15,150
13	FC	0	200	200	200	0	0	0
14	RAD	0	0	0	0	2,539	0	0
Totals		29,090	47,155	45,260	49,902	35,406	0	21,570

CAPACITY - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- S Y S T E M S U M M A R Y -----
(Design Capacity Quantities)

Cooling						Heating						
System	System	Main Sys.	Aux. Sys.	Opt. Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
Number	Type	Capacity	Capacity	Capacity	Totals	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Totals
		(Tons)	(Tons)	(Tons)	(Tons)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(Btuh)
	1 PTAC	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0
	2 RAD	0.0	0.0	0.0	0.0	-95,937	0	0	0	0	0	-95,937
	3 SZ	5.3	0.0	0.0	5.3	-67,262	0	-9,786	0	0	0	-67,262
	4 SZ	4.5	0.0	0.0	4.5	-66,656	0	0	0	0	0	-66,656
	5 VAV	4.2	0.0	0.0	4.2	-18,704	0	-47,261	0	0	0	-65,965
	6 SZ	6.3	0.0	0.0	6.3	-61,192	0	-106,125	0	0	0	-61,192
	7 SZ	18.8	0.0	0.0	18.8	-529	0	-403,238	0	0	0	-280
	8 SZ	2.1	0.0	0.0	2.1	-29,775	0	0	0	0	0	-29,775
	9 SZ	1.7	0.0	0.0	1.7	-21,566	0	-22,463	0	0	0	-21,566
	10 SZ	3.5	0.0	0.0	3.5	-35,394	0	-52,147	0	0	0	-35,394
	11 SZ	11.0	0.0	0.0	11.0	-1,208	0	-395,931	0	0	0	-1,208
	12 SZ	36.5	0.0	0.0	36.5	-20,645	0	-1,047,061	0	0	0	-20,645
	13 FC	0.0	0.0	0.0	0.0	-116	0	-1,117	0	0	0	-116
	14 RAD	0.0	0.0	0.0	0.0	-300,361	0	0	0	0	0	-300,361
Totals		93.7	0.0	0.0	93.7	-719,695	0	-2,085,127	0	0	0	-766,356

The building peaked at hour 14 month 7 with a capacity of 93.7 tons

ENGINEERING CHECKS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- E N G I N E E R I N G C H E C K S -----

System Number	Main/ Auxiliary	System Type	Percent Outside Air	----- Cooling -----				--- Heating ---		Floor Area Sq Ft
				Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	PTAC	0.00	0.00	1,088.5	*****	0.00	0.00	0.00	1,073
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-33.59	2,856
3	Main	SZ	28.13	1.18	304.4	257.6	46.59	1.18	-49.68	1,354
4	Main	SZ	10.11	1.84	521.2	283.8	42.28	1.84	-52.65	1,266
5	Main	VAV	100.00	0.51	215.3	420.7	28.52	0.00	-37.74	1,748
6	Main	SZ	48.27	2.12	528.3	249.3	48.14	2.12	-39.13	1,564
7	Main	SZ	99.99	11.13	278.3	25.0	479.87	11.13	-0.60	469
8	Main	SZ	10.00	1.03	532.5	518.4	23.15	1.03	-27.80	1,071
9	Main	SZ	36.00	1.84	579.4	315.2	38.07	1.84	-39.64	544
10	Main	SZ	32.50	1.56	685.4	438.9	27.34	1.56	-23.03	1,537
11	Main	SZ	45.41	2.63	1,012.0	385.0	31.17	2.63	-0.29	4,223
12	Main	SZ	80.00	9.16	493.1	53.9	222.81	9.16	-10.50	1,966
13	Main	FC	0.00	3.92	4,658.1	1,187.8	10.10	3.92	-2.28	51
14	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-33.06	9,084

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/15 * Mo/Hr: 7/15 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	97.45	*	0	100.00	*	0	0	104.25
Sub Total==>	0	0		0	97.45	*	0	100.00	*	0	0	104.25
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	2.55	*		0.00	*		0	-4.25
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	100.00	*	0	100.00	*	0	0	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf) (%)
Main Clg	0.0	0.0	0.0	0	38.1	30.7	15.4	27.9	24.9	15.2	Floor	1,073
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	0.0	0.0									Roof	0 0 0
											Wall	0 0 0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % OA	0.0	Type	Clg	Htg	
Main Htg	-0.0	0	38.1	38.1	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	28.0	38.1	
Aux Htg	0.0	0	0.0	0.0	Infil	0	0	Clg Cfm/Ton	1088.50	Plenum	38.0	38.0	
Preheat	-0.0	0	38.1	28.0	Supply	0	0	Clg Sqft/Ton	*****	Return	38.0	38.0	
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	38.0	38.0	
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	38.0	38.0	
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0	
Total	0.0				Rm Exh	0	0	Htg Cfm/SqFt	0.00	Fn BldTD	0.0	0.0	
					Auxil	0	0	Htg Btuh/SqFt	0.00	Fn Frict	0.1	0.0	

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-4,950	-4,950	5.16
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-11,004	-11,004	11.47
Wall Cond	0	0		0	0.00	*	0	0.00	*	-7,345	-7,345	7.66
Partition	0			0	0.00	*	0	0.00	*	-885	-885	0.92
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-71,753	-71,753	74.79
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-95,937	-95,937	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-95,937	-95,937	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total		
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	Part	ExFlr
Main Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	2,856	342	0
Aux Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0			
Opt Vent	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	2,153		
Totals	0.0	0.0								2,453	305	12

-----AREAS-----

-----HEATING COIL SELECTION-----					-----AIRFLOWS (cfm)-----			--ENGINEERING CHECKS--		--TEMPERATURES (F)---		
	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Main Htg	-95.9	0	0.0	0.0	Infil	0	1,030	Clg Cfm/Ton	0.00	Plenum	0.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	68.0
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Reheat	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/SqFt	0.00	Fn BldTD	0.0	0.0
Total	-95.9				Auxil	0	0	Htg Btuh/SqFt	-33.59	Fn Frict	0.0	0.0

System 3 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens. + Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,507	0		3,507	5.56	*	4,332	13.67	*	-3,592	-3,592	5.34
Glass Solar	408	0		408	0.65	*	310	0.98	*	0	0	0.00
Glass Cond	101	0		101	0.16	*	104	0.33	*	-507	-507	0.75
Wall Cond	11,593	0		11,593	18.38	*	11,912	37.58	*	-22,621	-22,621	33.63
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	22,724			22,724	36.02	*	8,995	28.38	*	-40,542	-40,542	60.27
Sub Total==>	38,335	0		38,335	60.77	*	25,653	80.94	*	-67,262	-67,262	100.00
Internal Loads												
Lights	4,429	0		4,429	7.02	*	5,365	16.93	*	0	0	0.00
People	700			700	1.11	*	677	2.14	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,129	0	0	5,129	8.13	*	6,042	19.06	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	17,566	27.85	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				2,048	3.25	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	-0.00	*	0	-0.00	*	0	0	-0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	43,464	0	0	63,079	100.00	*	31,695	100.00	*	-67,262	-67,262	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf) (%)
Main Clg	5.3	63.1	39.9	1,600	79.4	66.9	81.7	55.6	54.2	62.1	Floor	1,354
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	5.3	63.1									Roof	1,354
											Wall	1,386
												14 1

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	28.1	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	450	0	Clg Cfm/Sqft	1.18	SADB	56.8	106.6
Main Htg	-67.3	1,600	68.0	106.6	Infil	582	582	Clg Cfm/Ton	304.38	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	1,600	1,600	Clg Sqft/Ton	257.58	Return	75.0	68.0
Preheat	-9.8	1,600	50.0	55.6	Mincfm	0	0	Clg Btuh/Sqft	46.59	Ret/OA	79.4	68.0
Reheat	0.0	0	0.0	0.0	Return	1,600	1,600	No. People	9	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	450	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	200	0	Htg Cfm/SqFt	1.18	Fn BldTD	0.2	0.0
Total	-67.3				Auxil	0	0	Htg Btuh/SqFt	-49.68	Fn Frict	0.7	0.0

System 4 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/DB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,258	0		3,258	6.09	*	3,977	11.70	*	-3,358	-3,358	5.04
Glass Solar	3,128	0		3,128	5.84	*	2,417	7.11	*	0	0	0.00
Glass Cond	504	0		504	0.94	*	512	1.51	*	-2,561	-2,561	3.84
Wall Cond	11,116	0		11,116	20.77	*	12,962	38.14	*	-22,301	-22,301	33.46
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	19,511			19,511	36.45	*	8,528	25.09	*	-38,436	-38,436	57.66
Sub Total==>	37,517	0		37,517	70.09	*	28,397	83.55	*	-66,656	-66,656	100.00
Internal loads						*			*			
Lights	4,025	0		4,025	7.52	*	4,958	14.59	*	0	0	0.00
People	703			703	1.31	*	633	1.86	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	4,727	0	0	4,727	8.83	*	5,591	16.45	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	8,308	15.52	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				2,976	5.56	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	-0.00	*	0	-0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	42,245	0	0	53,529	100.00	*	33,988	100.00	*	-66,656	-66,656	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/DB/HR	Leaving DB/DB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	4.5	53.5	38.7	76.6 65.9 80.7	60.4 58.7 73.0	1,266		
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	4.5	53.5				1,266	0	0
						1,314	71	5

-----AREAS-----

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	10.1	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F								
Main Htg	-66.7	2,325	68.0	94.3	Vent	235	0	Clg Cfm/Sqft	1.84	SAOB	61.6	94.3
Aux Htg	0.0	0	0.0	0.0	Infil	552	552	Clg Cfm/Ton	521.21	Plenum	75.0	68.0
Preheat	-0.0	2,325	61.5	60.4	Supply	2,325	2,325	Clg Sqft/Ton	283.81	Return	75.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	42.28	Ret/OA	76.6	68.0
Humidif	0.0	0	0.0	0.0	Return	2,325	2,325	No. People	8	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	235	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Total	-66.7				Rm Exh	0	0	Htg Cfm/SqFt	1.84	Fn 8ldTD	0.2	0.0
					Auxil	0	0	Htg Btuh/SqFt	-52.65	Fn Frict	0.7	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 5 Block VAV - VARIABLE AIR VOLUME

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00		0	0.00		0	0	0.00
Skylite Cond	0	0		0	0.00		0	0.00		0	0	0.00
Roof Cond	0	0		0	0.00		0	0.00		0	0	0.00
Glass Solar	4,737	0		4,737	9.50		8,710	42.32		0	0	0.00
Glass Cond	1,101	0		1,101	2.21		1,126	5.47		-5,505	-5,505	29.43
Wall Cond	207	24		231	0.46		210	1.02		-818	-914	4.88
Partition	0			0	0.00		0	0.00		0	0	0.00
Exposed Floor	0			0	0.00		0	0.00		0	0	0.00
Infiltration	7,620			7,620	15.22		2,720	13.24		-12,285	-12,285	65.68
Sub Total==>	13,664	24		13,689	27.46		12,771	62.05		-18,608	-18,704	100.00
Internal Loads												
Lights	5,718	0		5,718	11.47		6,926	33.66		0	0	0.00
People	904			904	1.81		874	4.25		0	0	0.00
Misc	0	0	0	0	0.00		0	0.00		0	0	0.00
Sub Total==>	6,622	0	0	6,622	13.28		7,800	37.90		0	0	0.00
Ceiling Load	3	-3		0	0.00		9	0.04		-95	0	0.00
Outside Air	0	0	0	28,607	57.38		0	0.00		0	0	0.00
Sup. Fan Heat				942	1.89			0.00			0	0.00
Ret. Fan Heat		0		0	0.00			0.00			0	0.00
Duct Heat Pkup		0		0	0.00			0.00			0	0.00
OV/UNDR Sizing	0			0	0.00		0	0.00		0	0	0.00
Exhaust Heat		-4	0	-4	-0.01			0.00			0	0.00
Terminal Bypass		0	0	0	-0.00			0.00			0	0.00
Grand Total==>	20,290	17	0	49,856	100.00		20,581	100.00		-18,704	-18,704	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	4.2	49.9	27.4	66.2 90.5 74.3 105.0	52.6 51.4 56.3	1,748		
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	4.2	49.9				420	153	36

-----AREAS-----

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	100.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F								
Main Htg	-18.7	0	0.0	0.0	Vent	895	0	Clg Cfm/Sqft	0.51	SADB	53.9	68.1
Aux Htg	0.0	0	0.0	0.0	Infil	176	176	Clg Cfm/Ton	215.31	Plenum	75.0	67.8
Preheat	-47.3	895	4.0	52.6	Supply	895	0	Clg Sqft/Ton	420.74	Return	75.0	67.8
Reheat	-0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	28.52	Ret/OA	90.5	4.0
Humidif	0.0	0	0.0	0.0	Return	895	0	No. People	11	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	895	0	Htg % OA	0.0	Fn MtrID	0.3	0.0
Total	-66.0				Rm Exh	0	0	Htg Cfm/SqFt	0.00	Fn BldID	0.2	0.0
					Auxil	0	0	Htg Btuh/SqFt	-37.74	Fn Frict	0.7	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

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***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****
Peaked at Time ==>           Mo/Hr: 7/14           *           Mo/Hr: 7/17           *           Mo/Hr: 13/ 1
Outside Air ==>           OADB/WB/HR: 91/ 74/105.0   *           OADB: 89           *           OADB: 4
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	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Percent Of Tot (%)	*	Space Sensible (Btuh)	Percent Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Percent Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	5,265	0		5,265	6.99	*	5,850	21.45	*	0	0	0.00
Glass Cond	1,038	0		1,038	1.38	*	1,030	3.78	*	-5,269	-5,269	8.61
Wall Cond	5,136	537		5,672	7.53	*	6,044	22.16	*	-20,041	-22,138	36.18
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	12,429			12,429	16.51	*	7,496	27.49	*	-33,785	-33,785	55.21
Sub Total==>	23,867	537		24,404	32.41	*	20,419	74.88	*	-59,095	-61,192	100.00
Internal Loads						*			*			
Lights	4,972	0		4,972	6.60	*	5,981	21.93	*	0	0	0.00
People	861			861	1.14	*	782	2.87	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,833	0	0	5,833	7.75	*	6,763	24.80	*	0	0	0.00
Ceiling Load	75	-75		0	0.00	*	88	0.32	*	-253	0	0.00
Outside Air	0	0	0	40,895	54.44	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				4,243	5.64	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	-0.00	*	0	-0.00	*	0	0	0.00
Exhaust Heat		-179	0	-179	-0.24	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
						*			*			
Grand Total==>	29,775	283	0	75,296	100.00	*	27,271	100.00	*	-59,348	-61,192	100.00

-----COOLING COIL SELECTION-----											-----AREAS-----		
	Total Capacity (Tons)	(Mbh)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
					Deg F	Deg F	Grains	Deg F	Deg F	Grains			
Main Clg	6.3	75.3	56.7	3,315	32.6	71.0	98.4	66.3	64.6	91.4	Floor	1,564	
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0	
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Totals	6.3	75.3									Roof	0	0 0
											Wall	1,155	146 13

-----HEATING COIL SELECTION-----					-----AIRFLOWS (cfm)-----			--ENGINEERING CHECKS--		--TEMPERATURES (F)---		
	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	48.3	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	1,600	0	Clg Cfm/Sqft	2.12	SADB	67.4	84.5
Main Htg	-61.2	3,315	67.5	84.5	Infil	485	485	Clg Cfm/Ton	528.31	Plenum	75.2	67.5
Aux Htg	0.0	0	0.0	0.0	Supply	3,315	3,315	Clg Sqft/Ton	249.26	Return	75.2	67.5
Preheat	-106.1	3,315	36.8	66.3	Mincfm	0	0	Clg Btuh/Sqft	48.14	Ret/OA	82.6	67.5
Reheat	0.0	0	0.0	0.0	Return	2,800	3,315	No. People	10	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	1,085	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	1,000	0	Htg Cfm/SqFt	2.12	Fn BldTD	0.2	0.0
Total	-61.2				Auxil	0	0	Htg Btuh/SqFt	-39.13	Fn Frict	0.7	0.0

System 7 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/15 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)		Space Sensible (Btuh)	Perct Of Tot (%)		Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	78			78	0.03	*	78	99.95	*	-280	-280	99.98
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.02	*	0	0	0.02
Sub Total==>	78	0		78	0.03	*	78	99.97	*	-280	-280	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	224,979	99.97	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.03	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	78	0	0	225,057	100.00	*	78	100.00	*	-280	-280	100.00

-----COOLING COIL SELECTION-----

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR Deg F Deg F Grains	Leaving DB/WB/HR Deg F Deg F Grains	Gross Total	Glass (sf)	(%)
Main Clg	18.8	225.1	88.1	90.5 74.3 105.0	75.0 62.7 67.5	Floor	469	
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Part	108	
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Totals	18.8	225.1				Roof	0	0 0
						Wall	0	0 0

-----HEATING COIL SELECTION-----

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type	Cooling	Heating	Clg % OA	100.0	Type	Clg	Htg
Main Htg	-0.3	5,220	68.0	68.0	Vent	5,220	0	Clg Cfm/Sqft	11.13	SADB	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Infil	0	0	Clg Cfm/Ton	278.34	Plenum	75.0	68.0
Preheat	-403.2	5,220	4.0	75.0	Supply	5,220	5,220	Clg Sqft/Ton	25.01	Return	75.0	68.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	479.87	Ret/OA	90.5	68.0
Humidif	0.0	0	0.0	0.0	Return	0	5,220	No. People	0	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-0.3				Rm Exh	5,220	0	Htg Cfm/SqFt	11.13	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/SqFt	-0.60	Fn Frict	0.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 8 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	3,300	0	0	3,300	13.31	*	2,400	15.58	*	0	0	0.00
Glass Cond	532	0	0	532	2.15	*	536	3.48	*	-2,702	-2,702	9.07
Wall Cond	3,316	349	0	3,666	14.79	*	4,055	26.32	*	-9,647	-10,663	35.81
Partition	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	8,122	0	0	8,122	32.76	*	3,641	23.63	*	-16,410	-16,410	55.11
Sub Total==>	15,270	349	0	15,619	63.00	*	10,632	69.01	*	-28,759	-29,775	100.00
Internal Loads												
Lights	3,405	0	0	3,405	13.73	*	4,145	26.90	*	0	0	0.00
People	594	0	0	594	2.40	*	536	3.48	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	3,999	0	0	3,999	16.13	*	4,681	30.38	*	0	0	0.00
Ceiling Load	77	-77	0	0	0.00	*	94	0.61	*	-224	0	0.00
Outside Air	0	0	0	3,792	15.29	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				1,408	5.68	*		0.00	*		0	0.00
Ret. Fan Heat		0	0	0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0	0	0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		-27	0	-27	-0.11	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	19,346	245	0	24,791	100.00	*	15,407	100.00	*	-28,984	-29,775	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	2.1	24.8	18.4	1,100 76.8 66.1 81.9	61.0 59.2 74.2	Part	1,071	
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	0	0 0
Totals	2.1	24.8				Wall	561	75 13

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	10.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F				Clg Cfm/Sqft	1.03	SAOB	62.1	92.2
Main Htg	-29.8	1,100	67.3	92.2	Vent	110	0	Clg Cfm/Ton	532.45	Plenum	75.2	67.3
Aux Htg	0.0	0	0.0	0.0	Supply	1,100	1,100	Clg Sqft/Ton	518.41	Return	75.2	67.3
Preheat	-0.0	1,100	61.0	61.0	Mincfm	0	0	Clg Btuh/Sqft	23.15	Ret/OA	76.8	67.3
Reheat	0.0	0	0.0	0.0	Return	1,100	1,100	No. People	7	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	110	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	1.03	Fn BldTD	0.2	0.0
Total	-29.8				Auxil	0	0	Htg Btuh/Sqft	-27.80	Fn Frict	0.7	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 9 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/15 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	1,065	0		1,065	5.14	*	1,232	12.21	*	-1,238	-1,238	5.74
Glass Solar	2,026	0		2,026	9.79	*	1,882	18.66	*	0	0	0.00
Glass Cond	514	0		514	2.48	*	541	5.37	*	-2,607	-2,607	12.09
Wall Cond	485	0		485	2.34	*	516	5.11	*	-1,633	-1,633	7.57
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	5,643			5,643	27.25	*	4,022	39.88	*	-16,088	-16,088	74.60
Sub Total==>	9,733	0		9,733	47.00	*	8,192	81.23	*	-21,566	-21,566	100.00
Internal Loads						*			*			
Lights	1,729	0		1,729	8.35	*	1,729	17.15	*	0	0	0.00
People	311			311	1.50	*	163	1.62	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	2,040	0	0	2,040	9.85	*	1,893	18.77	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	8,794	42.46	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				142	0.69	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	-0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	11,774	0	0	20,710	100.00	*	10,085	100.00	*	-21,566	-21,566	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf) (%)
Main Clg	1.7	20.7	16.1	1,000	80.6	70.3	97.9	65.6	64.5	91.7	Floor	544
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	1.7	20.7									Roof	544
											Wall	550
												72 13

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA	36.0	Type	Clg	Htg
Main Htg	-21.6	1,000	68.0	87.8	Infil	231	231	Clg Cfm/Sqft	1.84	SADB	65.7	87.8
Aux Htg	0.0	0	0.0	0.0	Supply	1,000	1,000	Clg Cfm/Ton	579.43	Plenum	75.0	68.0
Preheat	-22.5	1,000	45.0	65.6	Mincfm	0	0	Clg Sqft/Ton	315.21	Return	75.0	68.0
Reheat	0.0	0	0.0	0.0	Return	1,000	1,000	Clg Btuh/Sqft	38.07	Ret/OA	80.6	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	360	0	No. People	4	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-21.6				Auxil	0	0	Htg Cfm/Sqft	1.84	Fn BldTD	0.0	0.0
								Htg Btuh/Sqft	-39.64	Fn Frict	0.1	0.0

System 10 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	4,550	0		4,550	10.83	*	4,777	23.35	*	0	0	0.00
Glass Cond	807	0		807	1.92	*	820	4.01	*	-4,098	-4,098	11.58
Wall Cond	3,085	343		3,428	8.16	*	3,726	18.21	*	-10,789	-11,990	33.88
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	7,055			7,055	16.79	*	4,283	20.94	*	-19,306	-19,306	54.55
Sub Total==>	15,497	343		15,840	37.70	*	13,606	66.50	*	-34,193	-35,394	100.00
Internal Loads												
Lights	4,886	0		4,886	11.63	*	6,020	29.42	*	0	0	0.00
People	853			853	2.03	*	769	3.76	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,739	0	0	5,739	13.66	*	6,788	33.18	*	0	0	0.00
Ceiling Load	54	-54		0	0.00	*	65	0.32	*	-189	0	0.00
Outside Air	0	0	0	19,852	47.24	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				633	1.62	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	-0.00	*	0	-0.00	*	0	0	0.00
Exhaust Heat		-94	0	-94	-0.22	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	21,290	195	0	42,020	100.00	*	20,459	100.00	*	-34,382	-35,394	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS-----		
	(Tons)	(Mbh)	(Mbh)	{cfm}	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf) (%)
Main Clg	3.5	42.0	32.6	2,400	80.1	69.9	96.5	66.9	65.0	92.2	Floor	1,537
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	3.5	42.0									Roof	0 0 0
											Wall	660 114 17

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--			--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F				Clg % OA	32.5	Type	Clg	Htg	
Main Htg	-35.4	2,400	67.6	81.2	Vent	780	0	Clg Cfm/Sqft	1.56	SADB	67.2	81.2	
Aux Htg	0.0	0	0.0	0.0	Infil	277	277	Clg Cfm/Ton	685.39	Plenum	75.1	67.6	
Preheat	-52.1	2,400	46.9	66.9	Supply	2,400	2,400	Clg Sqft/Ton	438.93	Return	75.1	67.6	
Reheat	0.0	0	0.0	0.0	MinCFM	0	0	Clg Btuh/Sqft	27.34	Ret/OA	80.1	67.6	
Humidif	0.0	0	0.0	0.0	Return	2,400	2,400	No. People	10	Runarnd	75.0	68.0	
Opt Vent	0.0	0	0.0	0.0	Exhaust	780	0	Htg % OA	0.0	Fn MtrTD	0.1	0.0	
Total	-35.4				Rm Exh	0	0	Htg Cfm/Sqft	1.56	Fn BldTD	0.0	0.0	
					Auxil	0	0	Htg Btuh/Sqft	-23.03	Fn Frict	0.1	0.0	

System 11 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/22 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 79 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	0	0	60.74
Sub Total==>	0	0		0	0.00	*	0	0.00	*	0	0	60.74
Internal Loads												
Lights	13,815	0		13,815	10.50	*	18,290	76.69	*	0	0	0.00
People	2,183			2,183	1.66	*	5,560	23.31	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	15,998	0	0	15,998	12.15	*	23,851	100.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	99,839	75.85	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				15,787	11.99	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	39.26
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	15,998	0	0	131,624	100.00	*	23,851	100.00	*	0	0	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf) (%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor	
Main Clg	11.0	131.6	11,100	82.0 71.6 102.7	71.7 68.4 101.9	4,223	
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0	
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0	0 0
Totals	11.0	131.6				0	0 0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	45.4	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent							
Main Htg	-1.2	11,100	68.0	68.1	Infil	5,040	0	Clg Cfm/Sqft	2.63	SAOB	73.0	68.1
Aux Htg	0.0	0	0.0	0.0	Supply	11,100	11,100	Clg Cfm/Ton	1011.97	Plenum	75.0	68.0
Preheat	-395.9	11,100	38.9	71.7	Mincfm	0	0	Clg Sqft/Ton	385.00	Return	75.0	68.0
Reheat	0.0	0	0.0	0.0	Return	11,100	11,100	Clg Btuh/Sqft	31.17	Ret/OA	82.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	5,040	0	No. People	28	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Total	-1.2				Auxil	0	0	Htg Cfm/Sqft	2.63	Fn BldTD	0.2	0.0
								Htg Btuh/Sqft	-0.29	Fn Frict	0.7	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 12 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/20 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 83 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,816	0		3,816	0.87	*	4,109	7.20	*	-4,473	-4,473	21.66
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	384	0		384	0.09	*	481	0.84	*	-1,693	-1,693	8.20
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-14,479	-14,479	70.14
Sub Total==>	4,199	0		4,199	0.96	*	4,591	8.04	*	-20,645	-20,645	100.00
Internal Loads												
Lights	6,341	0		6,341	1.45	*	8,153	14.28	*	0	0	0.00
People	1,049			1,049	0.24	*	2,032	3.56	*	0	0	0.00
Misc	9,082	32,486	3,840	45,408	10.37	*	8,467	14.83	*	0	0	0.00
Sub Total==>	16,472	32,486	3,840	52,798	12.05	*	18,651	32.66	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	311,339	71.07	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				35,840	8.18	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	33,869			33,869	7.73	*	33,869	59.30	*	0	0	-0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	54,540	32,486	3,840	438,045	100.00	*	57,111	100.00	*	-20,645	-20,645	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf) (%)
Main Clg	36.5	438.0	364.3	18,000	89.5	73.8	103.6	70.3	67.4	99.0	Floor	1,966
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	36.5	438.0									Roof	1,966
											Wall	495

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA	80.0	Type	Clg	Htg
Main Htg	-20.6	18,000	68.0	69.1	Infil	0	208	Clg Cfm/Sqft	9.16	SADB	72.1	69.1
Aux Htg	0.0	0	0.0	0.0	Supply	18,000	18,000	Clg Cfm/Ton	493.10	Plenum	75.0	68.0
Preheat	-1,047.1	18,000	16.8	70.3	Mincfm	0	0	Clg Sqft/Ton	53.86	Return	85.5	68.0
Reheat	0.0	0	0.0	0.0	Return	2,850	18,000	Clg Btuh/Sqft	222.81	Ret/OA	89.5	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	13	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	15,150	0	Htg % OA	0.0	Fn MtrTD	0.5	0.0
Total	-20.6				Auxil	0	0	Htg Cfm/Sqft	9.16	Fn BldTD	0.3	0.0
								Htg Btuh/Sqft	-10.50	Fn Frict	1.0	0.0

System 13 Block FC - FAN COIL

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/20 * Mo/Hr: 7/20 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 83/ 70/ 91.0 * OADB: 83 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	108	0		108	20.93	*	108	28.50	*	-116	-116	99.94
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	0	0	0.06
Sub Total==>	108	0		108	20.94	*	108	28.50	*	-116	-116	100.00
Internal Loads												
Lights	216	0		216	41.96	*	216	57.12	*	0	0	0.00
People	163			163	31.58	*	54	14.37	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	379	0	0	379	73.54	*	271	71.50	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				28	5.52	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	-0.00	*		0.00	*		0	0.00
Grand Total==>	487	0	0	515	100.00	*	378	100.00	*	-116	-116	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	
Main Clg	0.0	0.5	0.4	200	75.1	69.0	99.8	73.2	68.3	99.1	Part	51
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	51
Totals	0.0	0.5									Wall	0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg % OA		Type	Clg	Htg
Main Htg	-0.1	200	68.0	68.5	Infil	0	0	Clg Cfm/Sqft	3.92	SADB	73.3	68.5
Aux Htg	0.0	0	0.0	0.0	Supply	200	200	Clg Cfm/Ton	4658.06	Plenum	75.0	68.0
Preheat	-1.1	200	68.0	73.1	Mincfm	0	0	Clg Sft/Ton	1187.81	Return	75.0	68.0
Reheat	0.0	0	0.0	0.0	Return	200	200	Clg Btuh/Sqft	10.10	Ret/OA	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Mo. People	0	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-0.1				Auxil	0	0	Htg Cfm/SqFt	3.92	Fn BldTD	0.0	0.0
								Htg Btuh/SqFt	-2.28	Fn Frict	0.1	0.0

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***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****
Peaked at Time ==>           Mo/Hr: 0/ 0           *           Mo/Hr: 0/ 0           *           Mo/Hr: 13/ 1
Outside Air ==>           OADB/WB/HR: 0/ 0/ 0.0       *           OADB: 0           *           OADB: 4
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	Space Sens.+Lat. (Btuh)	Ret. Air Sensible (Btuh)	Ret. Air Latent (Btuh)	Net Total (Btuh)	Perct Of Tot (%)	*	Space Sensible (Btuh)	Perct Of Tot (%)	*	Space Peak Space Sens (Btuh)	Coil Peak Tot Sens (Btuh)	Perct Of Tot (%)
Envelope Loads						*			*			
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-8,187	-8,187	2.73
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-23,248	-23,248	7.74
Wall Cond	0	0		0	0.00	*	0	0.00	*	-87,852	-92,073	30.65
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-176,853	-176,853	58.88
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-296,140	-300,361	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-10,917	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
						*			*			
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-307,057	-300,361	100.00

-AREAS-

	Total Capacity (Tons)	Sens Cap. (Mbh)	Coil Airfl (cfm)	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf)	(%)
	(Mbh)			Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor		
Main Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	9,084	
Aux Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	3,164	0 0
Totals	0.0	0.0								Wall	6,046	645 11

--TEMPERATURES (F)---

	Capacity (Mbh)	Coil Airfl (cfm)	Ent Deg F	Lvg Deg F	Type Vent	Cooling 0	Heating 0	Clg % OA Clg Cfm/Sqft	0.0 0.00	Type SADB	Clg 0.0	Htg 68.1
Main Htg	-300.4	0	0.0	0.0	Infil	0	2,539	Clg Cfm/Ton	0.00	Plenum	0.0	65.7
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Sqft/Ton	0.00	Return	0.0	65.6
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	65.6
Reheat	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	0.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/SqFt	0.00	Fn BldTD	0.0	0.0
Total	-300.4				Auxil	0	0	Htg Btuh/SqFt	-33.06	Fn Frict	0.0	0.0

BUILDING U-VALUES - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Part.	ExFlr	Room U-Values (Btu/hr/sqft/F)							Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
				Summr Skylt	Wintr Skylt	Summr Roof	Wintr Windo	Windo	Wall	Ceil.		
1	LIQUOR STORE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
2	RAD ONLY	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
Zone	2 Total/Ave.	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
System	2 Total/Ave.	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
3	ATTIC	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.258	0.000	22.6	8.52
Zone	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.258	0.000	22.6	8.52
System	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.258	0.000	22.6	8.52
4	OFFICES	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.280	0.000	55.0	15.45
Zone	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.280	0.000	55.0	15.45
System	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.280	0.000	55.0	15.45
5	PARTY ROOMS	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
Zone	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
System	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
6	LOUNGE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	91.7	22.48
Zone	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	91.7	22.48
System	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	91.7	22.48
7	MECH ROOM	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
Zone	7 Total/Ave.	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
System	7 Total/Ave.	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
8	LOBBY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	66.3	16.91
Zone	8 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	66.3	16.91
System	8 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	66.3	16.91
9	PRIVATE DINING	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
Zone	9 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
System	9 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
10	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	53.3	14.05
Zone	10 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	53.3	14.05
System	10 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	53.3	14.05
11	BALL ROOM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
Zone	11 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
System	11 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
12	KITCHEN	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
Zone	12 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
System	12 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
13	KITCHEN OFFICE	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
Zone	13 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
System	13 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
3	ATTIC	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.258	0.000	22.6	8.52
Zone	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.258	0.000	22.6	8.52
4	OFFICES	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.280	0.000	55.0	15.45
Zone	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.280	0.000	55.0	15.45
5	PARTY ROOMS	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
Zone	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
6	LOUNGE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	91.7	22.48
Zone	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	91.7	22.48
8	LOBBY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	66.3	16.91

BUILDING U-VALUES - ALTERNATIVE 3
 WEATHERSTRIP & CAULKING

----- B U I L D I N G U - V A L U E S -----

		Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
Room Number	Description	Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
Zone	8 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	66.3	16.91
9	PRIVATE DINING	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
Zone	9 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
10	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	53.3	14.05
Zone	10 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.343	0.317	53.3	14.05
System	14 Total/Ave.	0.000	0.000	0.000	0.000	0.040	0.550	0.563	0.267	0.317	52.0	13.93
Building		0.144	0.000	0.000	0.000	0.039	0.550	0.563	0.225	0.317	48.2	12.57

BUILDING AREAS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- B U I L D I N G A R E A S -----

Room Number	Description	Number of Duplicate Flr Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
1	LIQUOR STORE	1 1	1,073	1,073	0	0	0	0	0	0	0	0
Zone	1 Total/Ave.			1,073	0	0	0	0	0	0	0	0
System	1 Total/Ave.			1,073	0	0	0	0	0	0	0	0
2	RAD ONLY	1 1	2,856	2,856	342	0	0	0	2,153	305	12	2,148
Zone	2 Total/Ave.			2,856	342	0	0	0	2,153	305	12	2,148
System	2 Total/Ave.			2,856	342	0	0	0	2,153	305	12	2,148
3	ATTIC	1 1	1,354	1,354	0	0	0	0	1,354	14	1	1,372
Zone	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
System	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
4	OFFICES	1 1	1,266	1,266	0	0	0	0	1,266	71	5	1,243
Zone	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
System	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
5	PARTY ROOMS	1 1	1,748	1,748	0	0	0	0	0	153	36	267
Zone	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
System	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
6	LOUNGE	1 1	1,564	1,564	0	0	0	0	0	146	13	1,009
Zone	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
System	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
7	MECH ROOM	1 1	469	469	108	0	0	0	0	0	0	0
Zone	7 Total/Ave.			469	108	0	0	0	0	0	0	0
System	7 Total/Ave.			469	108	0	0	0	0	0	0	0
8	LOBBY	1 1	1,071	1,071	0	0	0	0	0	75	13	486
Zone	8 Total/Ave.			1,071	0	0	0	0	0	75	13	486
System	8 Total/Ave.			1,071	0	0	0	0	0	75	13	486
9	PRIVATE DINING	1 1	544	544	0	0	0	0	544	72	13	478
Zone	9 Total/Ave.			544	0	0	0	0	544	72	13	478
System	9 Total/Ave.			544	0	0	0	0	544	72	13	478
10	DINING ROOM	1 1	1,537	1,537	0	0	0	0	0	114	17	546
Zone	10 Total/Ave.			1,537	0	0	0	0	0	114	17	546
System	10 Total/Ave.			1,537	0	0	0	0	0	114	17	546
11	BALL ROOM	1 1	4,223	4,223	0	0	0	0	0	0	0	0
Zone	11 Total/Ave.			4,223	0	0	0	0	0	0	0	0
System	11 Total/Ave.			4,223	0	0	0	0	0	0	0	0
12	KITCHEN	1 1	1,966	1,966	0	0	0	0	1,966	0	0	495
Zone	12 Total/Ave.			1,966	0	0	0	0	1,966	0	0	495
System	12 Total/Ave.			1,966	0	0	0	0	1,966	0	0	495
13	KITCHEN OFFICE	1 1	51	51	0	0	0	0	51	0	0	0
Zone	13 Total/Ave.			51	0	0	0	0	51	0	0	0
System	13 Total/Ave.			51	0	0	0	0	51	0	0	0
3	ATTIC	1 1	1,354	1,354	0	0	0	0	1,354	14	1	1,372
Zone	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
4	OFFICES	1 1	1,266	1,266	0	0	0	0	1,266	71	5	1,243
Zone	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
5	PARTY ROOMS	1 1	1,748	1,748	0	0	0	0	0	153	36	267
Zone	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
6	LOUNGE	1 1	1,564	1,564	0	0	0	0	0	146	13	1,009
Zone	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
8	LOBBY	1 1	1,071	1,071	0	0	0	0	0	75	13	486

BUILDING AREAS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

BUILDING AREAS

Room Number	Description	Number of Duplicate		Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Skl /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /Wl (%)	Net Wall Area (sqft)
		Flr	Rm										
Zone	8 Total/Ave.				1,071	0	0	0	0	0	75	13	486
	9 PRIVATE DINING	1	1	544	544	0	0	0	0	544	72	13	478
Zone	9 Total/Ave.				544	0	0	0	0	544	72	13	478
	10 DINING ROOM	1	1	1,537	1,537	0	0	0	0	0	114	17	546
Zone	10 Total/Ave.				1,537	0	0	0	0	0	114	17	546
System	14 Total/Ave.				9,084	0	0	0	0	3,164	645	11	5,401
Building					28,806	450	0	0	0	10,498	1,596	11	13,444

ASHRAE 90 ANALYSIS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.039 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.260 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.169 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 2.10 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 13.34 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	4.7	84	5,210	-140,211	30	1,117	2,357.7	29	2,555	0.0	0	0
5 - 10	9.4	3	189	-280,422	26	950	4,715.5	0	0	0.0	0	0
10 - 15	14.1	5	323	-420,633	25	932	7,073.2	0	0	0.0	0	0
15 - 20	18.7	4	235	-560,844	6	226	9,431.0	0	0	0.0	0	0
20 - 25	23.4	3	167	-701,056	13	477	11,788.7	0	0	0.0	0	0
25 - 30	28.1	1	81	-841,267	0	0	14,146.4	0	0	0.0	0	0
30 - 35	32.8	0	0	-981,478	0	0	16,504.2	0	0	0.0	0	0
35 - 40	37.5	0	0	-1,121,689	0	0	18,861.9	0	0	0.0	0	0
40 - 45	42.2	0	0	-1,261,900	0	0	21,219.7	0	0	0.0	0	0
45 - 50	46.9	0	0	-1,402,111	0	0	23,577.4	0	0	0.0	0	0
50 - 55	51.5	0	0	-1,542,322	0	0	25,935.1	0	0	0.0	0	0
55 - 60	56.2	0	0	-1,682,533	0	0	28,292.9	0	0	0.0	0	0
60 - 65	60.9	0	0	-1,822,745	0	0	30,650.6	0	0	0.0	0	0
65 - 70	65.6	0	0	-1,962,956	0	0	33,008.4	0	0	0.0	0	0
70 - 75	70.3	0	0	-2,103,167	0	0	35,366.1	0	0	0.0	0	0
75 - 80	75.0	0	0	-2,243,378	0	0	37,723.9	0	0	0.0	0	0
80 - 85	79.7	0	0	-2,383,589	0	0	40,081.6	0	0	0.0	0	0
85 - 90	84.3	0	0	-2,523,800	0	0	42,439.3	71	6,205	0.0	0	0
90 - 95	89.0	0	0	-2,664,012	0	0	44,797.1	0	0	0.0	0	0
95 - 100	93.7	0	0	-2,804,223	0	0	47,154.8	0	0	0.0	0	0
Hours Off	0.0	0	2,555	0	0	5,058	0.0	0	0	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- BUILDING TEMPERATURE PROFILES -----																				
Temperature Range (F)	Zone Number																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	3	4	5	6	8	9	
Max. Temp.	38.0	92.3	78.8	78.8	79.9	79.2	71.2	79.4	78.5	79.5	79.9	96.7	80.0	103.3	103.4	161.7	103.3	111.9	115.3	
Mo./Hr.	1 1	8 22	7 24	7 24	7 5	7 5	9 16	7 5	7 24	7 5	6 5	7 15	7 5	7 22	8 22	8 22	8 23	8 22	8 22	
Day Type	1	1	1	1	1	1	4	1	1	1	2	1	1	1	1	1	1	1	1	
..... Number of Hours																				
Above 100	0	0	0	0	0	0	0	0	0	0	0	0	0	245	590	4,206	1,086	2,562	2,640	
95 - 100	0	0	0	0	0	0	0	0	0	0	0	0	0	1,052	1,198	150	1,134	366	288	
90 - 95	0	868	0	0	0	0	0	0	0	0	0	138	0	975	1,026	60	708	87	48	
85 - 90	0	1,276	0	0	0	0	0	0	0	0	0	778	0	770	288	255	36	372	196	
80 - 85	0	784	0	0	0	0	0	0	0	0	0	1,174	0	630	498	899	482	603	332	
75 - 80	0	131	2,474	3,122	3,672	3,029	0	3,672	2,732	3,327	2,801	820	4,107	0	72	444	674	321	584	
70 - 75	0	800	858	550	0	643	1,563	0	949	413	658	213	4,653	0	153	1,188	246	313	108	
65 - 70	0	4,421	3,817	3,964	3,518	2,985	3,387	1,448	3,497	3,794	443	884	0	3,785	3,942	1,536	4,076	3,838	3,922	
60 - 65	0	480	859	916	1,363	1,459	3,810	736	1,493	1,185	695	852	0	700	789	22	318	298	642	
55 - 60	0	0	544	208	207	644	0	670	98	41	782	576	0	454	204	0	0	0	0	
50 - 55	0	0	208	0	0	0	0	1,238	0	0	872	615	0	149	0	0	0	0	0	
Below 50	8,760	0	0	0	0	0	0	996	0	0	2,509	2,710	0	0	0	0	0	0	0	
Min. Temp.	38.0	62.6	50.8	57.4	56.4	55.2	60.2	43.4	58.1	59.4	33.9	30.2	67.9	55.0	57.4	63.7	62.9	63.3	61.1	
Mo./Hr.	1 1	2 6	2 6	2 6	2 11	2 9	3 20	2 8	2 6	2 9	2 10	2 8	1 6	1 5	2 6	1 6	2 6	2 6	2 6	
Day Type	1	1	4	4	5	5	5	5	5	5	4	4	1	1	4	1	4	4	1	

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- BUILDING TEMPERATURE PROFILES -----

Range 10
(F)

Max. Temp. 114.7
Mo./Hr. 8 22
Day Type 1

	 Number of Hours
Above 100	2,928
95 - 100	0
90 - 95	332
85 - 90	502
80 - 85	499
75 - 80	171
70 - 75	936
65 - 70	3,193
60 - 65	199
55 - 60	0
50 - 55	0
Below 50	0

Min. Temp. 63.5
Mo./Hr. 2 6
Day Type 4

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 3
 WEATHERSTRIP & CAULKING

----- MONTHLY ENERGY CONSUMPTION -----

Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	STEAM On Peak (Therm)	HOT WTR On Peak (Therm)	STEAM DMND On Peak (Thrm/hr)	HOT W DMND On Peak (Thrm/hr)
Jan	56,133	112	102	1,383	0	5
Feb	50,686	112	92	1,401	0	5
March	53,675	112	102	809	0	5
April	48,350	123	99	259	0	5
May	46,454	139	0	0	0	0
June	51,525	149	0	0	0	0
July	61,924	157	0	0	0	0
Aug	53,777	150	0	0	0	0
Sept	45,492	143	0	0	0	0
Oct	49,041	116	77	127	0	3
Nov	49,777	122	99	436	0	5
Dec	55,531	112	102	1,124	0	5
Total	622,366	157	675	5,539	0	5

Building Energy Consumption = 95,311 (Btu/Sq Ft/Year)
 Source Energy Consumption = 250,003 (Btu/Sq Ft/Year)

Floor Area = 28,806 (Sq Ft)

EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	15067	13609	15067	14581	15067	14581	15067	15067	14581	15067	14581	15067	177,399
	PK	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0
1	MISC LD													
	ELEC	7412	6694	7412	7173	7412	7173	7412	7412	7173	7412	7173	7412	87,266
	PK	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1161	AIR-CLD COND COMP 15 TONS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5303	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ1100S	AIR-CLD RECIP 25-45 TONS												
	ELEC	0	0	0	237	1090	4791	9463	5257	1415	809	50	0	23,111
	PK	0.0	0.0	20.2	20.2	22.1	26.1	30.8	26.5	22.5	20.2	20.2	0.0	30.8
2	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	9	75	336	711	368	96	35	2	0	1,631
	PK	0.0	0.0	0.1	0.3	0.9	2.1	2.7	2.1	1.6	0.7	0.2	0.0	2.7
2	EQ5001	CHILLED WATER PUMP C.V.												

ELEC	0	0	0	343	898	1330	1572	1387	984	740	89	0	7,344
PK	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0
2	EQ5303	CONTROLS											
ELEC	0	0	0	35	90	134	158	139	99	74	9	0	739
PK	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.3
3	EQ1281	TRANE HT-PMP W-DEMAND DEFROST											
ELEC	1054	956	1027	886	0	86	317	84	0	624	1021	1005	7,062
PK	2.2	2.2	2.2	2.2	0.0	1.2	1.8	1.2	0.7	2.2	2.2	2.2	2.2
3	EQ5215	CONDENSER FANS											
ELEC	0	0	0	0	0	13	47	13	0	0	0	0	73
PK	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.3
3	EQ5308	CONTROLS											
ELEC	59	53	53	51	0	18	37	20	0	42	51	56	441
PK	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3	EQ5350	HEAT PUMP DEMAND DEFROST CYCLE											
ELEC	14	12	7	0	0	0	0	0	0	0	6	14	53
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	EQ1281	TRANE HT-PMP W-DEMAND DEFROST											
ELEC	1973	1761	2085	1124	0	281	808	344	26	778	1667	2001	12,847
PK	4.4	4.4	4.4	4.4	0.5	2.4	3.5	2.5	1.9	4.4	4.4	4.4	4.4
4	EQ5215	CONDENSER FANS											
ELEC	0	0	0	0	0	42	121	52	4	0	0	0	219
PK	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.4	0.3	0.1	0.0	0.0	0.5
4	EQ5308	CONTROLS											
ELEC	56	50	53	37	0	26	50	30	10	24	49	53	439
PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
4	EQ5350	HEAT PUMP DEMAND DEFROST CYCLE											
ELEC	28	24	14	0	0	0	0	0	0	0	12	28	107
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	EQ1101L	HR AIR-CLD RECIP >15 TONS											
ELEC	0	0	0	0	229	1279	3311	1357	201	0	0	0	6,378
PK	0.0	0.0	0.0	0.0	22.4	23.2	24.0	23.3	22.5	0.0	0.0	0.0	24.0
5	EQ5200	CONDENSER FANS											
ELEC	0	0	0	0	20	109	277	115	17	0	0	0	538
PK	0.0	0.0	0.0	0.0	0.8	1.0	1.4	1.0	1.0	0.0	0		

	0	0	0	0	0	0	0	0	0	0	0	0	0
ELEC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PK													
3 EQ4003													
ELEC	650	587	650	629	650	629	650	650	629	650	629	650	7,649
PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
3 EQ4003													
ELEC	10	9	10	10	10	10	10	10	10	10	10	10	120
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 EQ4003													
ELEC	5	4	5	4	5	4	5	5	4	5	4	5	53
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 EQ4003													
ELEC	944	853	944	914	944	914	944	944	914	944	914	944	11,114
PK	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
5 EQ4003													
ELEC	0	0	39	147	115	155	190	166	123	177	97	2	1,211
PK	0.1	0.0	0.3	0.8	0.6	0.6	0.7	0.6	0.6	0.8	0.7	0.2	0.8
6 EQ4003													
ELEC	1346	1216	1346	1302	1346	1302	1346	1346	1302	1346	1302	1346	15,847
PK	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
6 EQ4003													
ELEC	45	43	46	43	54	47	45	47	47	40	41	42	537
PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
6 EQ4003													
ELEC	45	41	45	44	45	44	45	45	44	45	44	45	531
PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
8 EQ4003													
ELEC	447	403	447	432	447	432	447	447	432	447	432	447	5,258
PK	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
9 EQ4003													
ELEC	45	41	45	44	45	44	45	45	44	45	44	45	531
PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10 EQ4003													
ELEC	217	196	217	210	217	210	217	217	210	217	210	217	2

[illegible]

UTILITY PEAK CHECKSUMS - ALTERNATIVE 3
WEATHERSTRIP & CAULKING

----- UTILITY PEAK CHECKSUMS -----

Utility ELECTRIC DEMAND

Peak Value 157.1 (kW)
Yearly Time of Peak 17 (hr) 7 (mo)

Hour 17 Month 7

Eqp. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percent Of Tot (%)

Cooling Equipment

2	EQ1100S	AIR-CLD RECIP 25-45 TONS	35.6	22.66
3	EQ1281	TRANE HT-PHP W-DEMAND DEFROST	1.8	1.17
4	EQ1281	TRANE HT-PHP W-DEMAND DEFROST	3.7	2.36
5	EQ1101L	HR AIR-CLD RECIP >15 TONS	28.1	17.90

Sub Total			69.3	44.10

Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.0	0.00
3		SUMMATION OF FAN ELECTRICAL DEMAND	1.3	0.80
4		SUMMATION OF FAN ELECTRICAL DEMAND	1.8	1.14
5		SUMMATION OF FAN ELECTRICAL DEMAND	0.6	0.41
6		SUMMATION OF FAN ELECTRICAL DEMAND	2.7	1.74
8		SUMMATION OF FAN ELECTRICAL DEMAND	0.8	0.54
9		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	0.05
10		SUMMATION OF FAN ELECTRICAL DEMAND	0.4	0.26
11		SUMMATION OF FAN ELECTRICAL DEMAND	9.5	6.05
12		SUMMATION OF FAN ELECTRICAL DEMAND	23.5	14.97
13		SUMMATION OF FAN ELECTRICAL DEMAND	0.0	0.01

Sub Total			40.8	25.98

Sub Total			0.0	0.00

Miscellaneous

Lights			33.0	20.97
Base Utilities			0.0	0.00
Misc Equipment			14.1	8.95
Sub Total			47.0	29.93

Grand Total			157.1	100.00

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**          T R A C E    6 0 0    A N A L Y S I S          **  
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ENERGY SAVINGS OPPORTUNITY STUDY
CARLISLE BARRACKS, PA
DEPARTMENT OF THE ARMY
BENATEC ASSOCIATES
BUILDING 313

Weather File Code: CARLISLE
Location: ENERGY SAVINGS OPPORTUNITY STUDY
Latitude: 40.2 (deg)
Longitude: 77.2 (deg)
Time Zone: 5
Elevation: 475 (ft)
Barometric Pressure: 29.2 (in. Hg)

Summer Clearness Number: 1.00
Winter Clearness Number: 1.00
Summer Design Dry Bulb: 92 (F)
Summer Design Wet Bulb: 72 (F)
Winter Design Dry Bulb: 4 (F)
Summer Ground Reflectance: 0.20
Winter Ground Reflectance: 0.20

Air Density: 0.0742 (Lbm/cuft)
Air Specific Heat: 0.2444 (Btu/lbm/F)
Density-Specific Heat Prod: 1.0882 (Btu-min./hr/cuft/F)
Latent Heat Factor: 4,790.2 (Btu-min./hr/cuft)
Enthalpy Factor: 4.4519 (Lb-min./hr/cuft)

Design Simulation Period: May To September
System Simulation Period: January To December
Cooling Load Methodology: CLTD/CLF (Transfer Function Method)

Time/Date Program was Run: 20:16:38 2/ 1/94
Dataset Name: C8313 .TM

AIRFLOW - ALTERNATIVE 4
 COMBINED ECOS

----- S Y S T E M S U M M A R Y -----
 (Design Airflow Quantities)

System Number	System Type	----- Main -----					Auxil. Supply Airflow (Cfm)	Room Exhaust Airflow (Cfm)
		Outside Airflow (Cfm)	Cooling Airflow (Cfm)	Heating Airflow (Cfm)	Return Airflow (Cfm)	Exhaust Airflow (Cfm)		
1	PTAC	0	0	0	0	0	0	0
2	RAD	0	0	0	0	883	0	0
3	SZ	450	1,600	1,600	2,099	949	0	200
4	SZ	235	2,325	2,325	2,798	708	0	0
5	VAV	916	916	0	1,067	1,067	0	0
6	SZ	1,600	3,315	3,315	3,731	2,016	0	1,000
7	SZ	5,220	5,220	5,220	5,220	5,220	0	5,220
8	SZ	110	1,100	1,100	1,302	312	0	0
9	SZ	360	1,000	1,000	1,198	558	0	0
10	SZ	780	2,400	2,400	2,638	1,018	0	0
11	SZ	5,040	11,100	11,100	11,100	5,040	0	0
12	SZ	14,400	18,000	18,000	18,178	14,578	0	15,150
13	FC	0	200	200	200	0	0	0
14	RAD	0	0	0	0	2,177	0	0
Totals		29,111	47,176	46,260	49,531	34,525	0	21,570

CAPACITY - ALTERNATIVE 4
COMBINED ECOS

----- SYSTEM SUMMARY -----
(Design Capacity Quantities)

Cooling					Heating						
System	Main Sys.	Aux. Sys.	Opt. Vent	Cooling	Main Sys.	Aux. Sys.	Preheat	Reheat	Humidif.	Opt. Vent	Heating
Number	Type	Capacity (Tons)	Capacity (Tons)	Capacity (Tons)	Totals (Tons)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Capacity (Btuh)	Totals (Btuh)
1	PTAC	0.0	0.0	0.0	0.0	0	0	0	0	0	0
2	RAD	0.0	0.0	0.0	0.0	-85,687	0	0	0	0	-85,687
3	SZ	3.5	0.0	0.0	3.5	-43,950	0	-20,273	0	0	-43,950
4	SZ	3.1	0.0	0.0	3.1	-43,482	0	-8,695	0	0	-43,482
5	VAV	4.1	0.0	0.0	4.1	-16,949	0	-49,245	0	0	-66,194
6	SZ	5.3	0.0	0.0	5.3	-37,969	0	-111,537	0	0	-37,969
7	SZ	18.8	0.0	0.0	18.8	-280	0	-403,238	0	0	-280
8	SZ	1.6	0.0	0.0	1.6	-18,570	0	-2,264	0	0	-18,570
9	SZ	1.7	0.0	0.0	1.7	-19,268	0	-22,997	0	0	-19,268
10	SZ	3.0	0.0	0.0	3.0	-22,672	0	-55,371	0	0	-22,672
11	SZ	11.0	0.0	0.0	11.0	-1,208	0	-395,931	0	0	-1,208
12	SZ	36.5	0.0	0.0	36.5	-18,576	0	-1,047,061	0	0	-18,576
13	FC	0.0	0.0	0.0	0.0	-116	0	-1,117	0	0	-116
14	RAD	0.0	0.0	0.0	0.0	-202,853	0	0	0	0	-202,853
Totals		88.6	0.0	0.0	88.6	-511,579	0	-2,117,729	0	0	-560,824

The building peaked at hour 14 month 7 with a capacity of 88.6 tons

ENGINEERING CHECKS - ALTERNATIVE 4
COMBINED ECOS

----- ENGINEERING CHECKS -----

			Percent	Cooling				Heating		Floor Area Sq Ft
System	Main/ Auxiliary	System Type	Outside Air	Cfm/ Sq Ft	Cfm/ Ton	Sq Ft /Ton	Btuh/ Sq Ft	Cfm/ Sq Ft	Btuh/ Sq Ft	
1	Main	PTAC	0.00	0.00	1,088.5	*****	0.00	0.00	0.00	1,073
2	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-30.00	2,856
3	Main	SZ	28.13	1.18	451.4	382.0	31.42	1.18	-32.46	1,354
4	Main	SZ	10.11	1.84	759.4	413.5	29.02	1.84	-34.35	1,266
5	Main	VAV	100.00	0.52	223.4	426.5	28.14	0.00	-37.87	1,748
6	Main	SZ	48.27	2.12	620.5	292.7	40.99	2.12	-24.28	1,564
7	Main	SZ	99.99	11.13	278.3	25.0	479.87	11.13	-0.60	469
8	Main	SZ	10.00	1.03	700.0	681.5	17.61	1.03	-17.34	1,071
9	Main	SZ	36.00	1.84	591.0	321.5	37.33	1.84	-35.42	544
10	Main	SZ	32.50	1.56	791.1	506.7	23.68	1.56	-14.75	1,537
11	Main	SZ	45.41	2.63	1,012.0	385.0	31.17	2.63	-0.29	4,223
12	Main	SZ	80.00	9.16	493.1	53.9	222.81	9.16	-9.45	1,966
13	Main	FC	0.00	3.92	4,658.1	1,187.8	10.10	3.92	-2.28	51
14	Main	RAD	0.00	0.00	0.0	0.0	0.00	0.00	-22.33	9,084

System 1 Peak PTAC - PACKAGED TERMINAL AIR COND.

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****
Peaked at Time ==> Mo/Hr: 7/15 * Mo/Hr: 7/15 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 73/ 98.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	97.45	*	0	100.00	*	0	0	104.25
Sub Total==>	0	0		0	97.45	*	0	100.00	*	0	0	104.25
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	2.55	*		0.00	*		0	-4.25
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	100.00	*	0	100.00	*	0	0	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf)	(%)
Main Clg	0.0	0.0	0.0	0	38.1	30.7	15.4	27.9	24.9	15.2	Floor	1,073
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	0.0	0.0									Roof	0
											Wall	0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	AIRFLOWS (cfm)		--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F	Type	Cooling	Heating	Clg % OA		Type	Clg	Htg
Main Htg	-0.0	0	38.1	38.1	Vent	0	0	Clg Cfm/Sqft	0.0	SADB	28.0	38.1
Aux Htg	0.0	0	0.0	0.0	Infil	0	0	Clg Cfm/Ton	1088.50	Plenum	38.0	38.0
Preheat	-0.0	0	38.1	28.0	Supply	0	0	Clg Sqft/Ton	*****	Return	38.0	38.0
Reheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Btuh/Sqft	0.00	Ret/OA	38.0	38.0
Humidif	0.0	0	0.0	0.0	Return	0	0	No. People	0	Runarnd	38.0	38.0
Opt Vent	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	0.0				Rm Exh	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
					Auxil	0	0	Htg Btuh/Sqft	0.00	Fn Frict	0.1	0.0

System 2 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-4,950	-4,950	5.78
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-11,004	-11,004	12.84
Wall Cond	0	0		0	0.00	*	0	0.00	*	-7,345	-7,345	8.57
Partition	0			0	0.00	*	0	0.00	*	-885	-885	1.03
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-61,503	-61,503	71.78
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-85,687	-85,687	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-85,687	-85,687	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	Part	ExFlr
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	2,856	342	0
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0		
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	2,153	0	0
Totals	0.0	0.0								2,453	305	12

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	AIRFLOWS (cfm)		--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F	Vent	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-85.7	0	0.0	0.0	Infil	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Supply	0	883	Clg Cfm/Ton	0.00	Plenum	0.0	68.0
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Sqft/Ton	0.00	Return	0.0	68.0
Reheat	0.0	0	0.0	0.0	Return	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-85.7				Auxil	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
								Htg Btuh/Sqft	-30.00	Fn Frict	0.0	0.0

System 3 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> DADB: 74/HR: 91/ 74/105.0 * DADB: 89 * DADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,507	0		3,507	8.25	*	4,332	20.43	*	-3,592	-3,592	8.17
Glass Solar	408	0		408	0.96	*	310	1.46	*	0	0	0.00
Glass Cond	101	0		101	0.24	*	104	0.49	*	-507	-507	1.15
Wall Cond	2,526	0		2,526	5.94	*	2,710	12.78	*	-5,100	-5,100	11.61
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	15,152			15,152	35.62	*	7,710	36.36	*	-34,750	-34,750	79.07
Sub Total==>	21,695	0		21,695	51.00	*	15,166	71.51	*	-43,950	-43,950	100.00
Internal Loads												
Lights	4,429	0		4,429	10.41	*	5,365	25.30	*	0	0	0.00
People	700			700	1.65	*	677	3.19	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,129	0	0	5,129	12.06	*	6,042	28.49	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	13,665	32.12	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				2,048	4.81	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkwp		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	-0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	26,825	0	0	42,537	100.00	*	21,208	100.00	*	-43,950	-43,950	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf)	(%)
Main Clg	3.5	42.5	1,600	79.4	68.7	90.8	61.6	60.8	80.4	Floor	1,354	
Aux Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0	
Opt Vent	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Totals	3.5	42.5								Roof	1,354	0 0
										Wall	1,386	14 1

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	28.1	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	450	0	Clg Cfm/Sqft	1.18	SADB	62.8	93.2
Main Htg	-43.9	1,600	68.0	93.2	Infil	499	499	Clg Cfm/Ton	451.37	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	1,600	1,600	Clg Sqft/Ton	381.97	Return	75.0	68.0
Preheat	-20.3	1,600	50.0	61.6	Mincfm	0	0	Clg Btuh/Sqft	31.42	Ret/OA	79.4	68.0
Reheat	0.0	0	0.0	0.0	Return	1,600	1,600	No. People	9	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	450	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	200	0	Htg Cfm/Sqft	1.18	Fn BldTD	0.2	0.0
Total	-43.9				Auxil	0	0	Htg Btuh/Sqft	-32.46	Fn Frict	0.7	0.0

System 4 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WS/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,258	0	0	3,258	8.87	*	3,972	17.73	*	-3,358	-3,358	7.72
Glass Solar	3,056	0	0	3,056	8.32	*	2,417	10.79	*	0	0	0.00
Glass Cond	504	0	0	504	1.37	*	512	2.29	*	-2,561	-2,561	5.89
Wall Cond	2,165	0	0	2,165	5.89	*	2,663	11.88	*	-4,618	-4,618	10.62
Partition	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	13,397	0	0	13,397	36.46	*	7,310	32.62	*	-32,945	-32,945	75.77
Sub Total==>	22,381	0	0	22,381	60.92	*	16,873	75.31	*	-43,482	-43,482	100.00
Internal Loads												
Lights	4,025	0	0	4,025	10.96	*	4,900	21.87	*	0	0	0.00
People	703	0	0	703	1.91	*	633	2.83	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	4,727	0	0	4,727	12.87	*	5,533	24.69	*	0	0	0.00
Ceiling Load	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	6,655	18.12	*	0	0.00	*	0	0	0.00
Sup. Fan Heat	0	0	0	2,976	8.10	*	0	0.00	*	0	0	0.00
Ret. Fan Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Duct Heat PkUp	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
OV/UNDR Sizing	0	0	0	0	-0.00	*	0	-0.00	*	0	0	-0.00
Exhaust Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Terminal Bypass	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Grand Total==>	27,108	0	0	36,740	100.00	*	22,406	100.00	*	-43,482	-43,482	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	3.1	36.7	2,325	76.6 67.6 90.0	65.0 63.0 85.5	1,266		
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	3.1	36.7				1,314	71	5

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	10.1	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	235	0	Clg Cfm/Sqft	1.84	SAOB	66.1	85.2
Main Htg	-43.5	2,325	68.0	85.2	Infil	473	473	Clg Cfm/Ton	759.39	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	2,325	2,325	Clg Sqft/Ton	413.50	Return	75.0	68.0
Preheat	-8.7	2,325	61.5	65.0	Mincfm	0	0	Clg Btuh/Sqft	29.02	Ret/OA	76.6	68.0
Reheat	0.0	0	0.0	0.0	Return	2,325	2,325	No. People	8	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	235	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	1.84	Fn BldTD	0.2	0.0
Total	-43.5				Auxil	0	0	Htg Btuh/Sqft	-34.35	Fn Frict	0.7	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

--TEMPERATURES (F)---

System 6 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	5,265	0		5,265	8.21	*	5,850	27.77	*	0	0	0.00
Glass Cond	1,038	0		1,038	1.62	*	1,030	4.89	*	-5,269	-5,269	13.88
Wall Cond	920	97		1,017	1.59	*	984	4.67	*	-3,385	-3,741	9.85
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	9,657			9,657	15.06	*	6,425	30.50	*	-28,959	-28,959	76.27
Sub Total==>	16,880	97		16,977	26.48	*	14,289	67.83	*	-37,612	-37,969	100.00
Internal Loads						*			*			
Lights	4,900	0		4,900	7.64	*	5,981	28.39	*	0	0	0.00
People	861			861	1.34	*	782	3.71	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,761	0	0	5,761	8.99	*	6,763	32.10	*	0	0	0.00
Ceiling Load	14	-14		0	0.00	*	15	0.07	*	-43	0	0.00
Outside Air	0	0	0	37,161	57.96	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				4,243	6.62	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		-31	0	-31	-0.05	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	22,655	52	0	64,112	100.00	*	21,067	100.00	*	-37,655	-37,969	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS-----		
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf)	(%)
Main Clg	5.3	64.1	3,315	82.5	71.3	100.2	68.0	66.0	95.3	Floor	1,564	
Aux Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0	
Opt Vent	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Totals	5.3	64.1								Roof	0	0
										Wall	1,155	146 13

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	48.3	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	1,600	0	Clg Cfm/Sqft	2.12	SADB	69.2	78.4
Main Htg	-38.0	3,315	67.9	78.4	Infil	416	416	Clg Cfm/Ton	620.48	Plenum	75.0	67.9
Aux Htg	0.0	0	0.0	0.0	Supply	3,315	3,315	Clg Sqft/Ton	292.74	Return	75.0	67.9
Preheat	-111.5	3,315	37.1	68.0	Mincfm	0	0	Clg Btuh/Sqft	40.99	Ret/OA	82.5	67.9
Reheat	0.0	0	0.0	0.0	Return	2,731	3,315	No. People	10	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	1,016	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	1,000	0	Htg Cfm/SqFt	2.12	Fn BldTD	0.2	0.0
Total	-38.0				Auxil	0	0	Htg Btuh/SqFt	-24.28	Fn Frict	0.7	0.0

System 7 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****
Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/15 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 91 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	78			78	0.03	*	78	99.95	*	-280	-280	99.98
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.02	*	0	0	0.02
Sub Total==>	78	0		78	0.03	*	78	99.97	*	-280	-280	100.00
Internal Loads						*			*			
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	224,979	99.97	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.03	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	78	0	0	225,057	100.00	*	78	100.00	*	-280	-280	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor	469	
Main Clg	18.8	225.1	88.1	5,220 90.5 74.3 105.0	75.0 62.7 67.5	Part	108	
Aux Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	Roof	0	0 0
Totals	18.8	225.1				Wall	0	0 0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	100.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	5,220	0	Clg Cfm/Sqft	11.13	SADB	75.0	68.0
Main Htg	-0.3	5,220	68.0	68.0	Infil	0	0	Clg Cfm/Ton	278.34	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	5,220	5,220	Clg Sqft/Ton	25.01	Return	75.0	68.0
Preheat	-403.2	5,220	4.0	75.0	Mincfm	0	0	Clg Btuh/Sqft	479.87	Ret/OA	90.5	68.0
Reheat	0.0	0	0.0	0.0	Return	0	5,220	No. People	0	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	5,220	0	Htg Cfm/Sqft	11.13	Fn BldTD	0.0	0.0
Total	-0.3				Auxil	0	0	Htg Btuh/Sqft	-0.60	Fn Frict	0.0	0.0

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 8 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/12 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 87 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	3,225	0		3,225	17.10	*	4,275	34.23	*	0	0	0.00
Glass Cond	532	0		532	2.82	*	392	3.14	*	-2,702	-2,702	14.55
Wall Cond	545	58		603	3.20	*	507	4.06	*	-1,629	-1,802	9.71
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	5,888			5,888	31.22	*	2,593	20.76	*	-14,066	-14,066	75.74
Sub Total==>	10,190	58		10,248	54.34	*	7,767	62.19	*	-18,397	-18,570	100.00
Internal Loads												
Lights	3,405	0		3,405	18.06	*	3,997	32.00	*	0	0	0.00
People	594			594	3.15	*	714	5.72	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	3,999	0	0	3,999	21.21	*	4,711	37.72	*	0	0	0.00
Ceiling Load	13	-13		0	0.00	*	12	0.10	*	-38	0	0.00
Outside Air	0	0	0	3,207	17.01	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				1,408	7.47	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	-0.00	*	0	-0.00	*	0	0	0.00
Exhaust Heat		-5	0	-5	-0.02	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	14,202	41	0	18,858	100.00	*	12,490	100.00	*	-18,435	-18,570	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	1.6	18.9	1,100	76.6 67.4 88.8	63.4 62.4 84.9	Part	1,071	
Aux Clg	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	0	0 0
Totals	1.6	18.9				Wall	561	75 13

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	10.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent			Clg Cfm/Sqft	1.03	SADB	64.6	83.4
Main Htg	-18.6	1,100	67.9	83.4	Infil	202	202	Clg Cfm/Ton	699.97	Plenum	75.0	67.9
Aux Htg	0.0	0	0.0	0.0	Supply	1,100	1,100	Clg Sqft/Ton	681.51	Return	75.0	67.9
Preheat	-2.3	1,100	61.5	63.4	Mincfm	0	0	Clg Btuh/Sqft	17.61	Ret/OA	76.6	67.9
Reheat	0.0	0	0.0	0.0	Return	1,100	1,100	No. People	7	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	110	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	1.03	Fn BldTD	0.2	0.0
Total	-18.6				Auxil	0	0	Htg Btuh/Sqft	-17.34	Fn Frict	0.7	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 9 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	1,065	0		1,065	5.25	*	1,386	14.52	*	-1,238	-1,238	6.42
Glass Solar	2,026	0		2,026	9.98	*	1,665	17.43	*	0	0	0.00
Glass Cond	514	0		514	2.53	*	514	5.38	*	-2,607	-2,607	13.53
Wall Cond	485	0		485	2.39	*	574	6.01	*	-1,633	-1,633	8.48
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	4,979			4,979	24.52	*	3,060	32.03	*	-13,790	-13,790	71.57
Sub Total==>	9,070	0		9,070	44.67	*	7,198	75.37	*	-19,268	-19,268	100.00
Internal Loads												
Lights	1,729	0		1,729	8.52	*	2,080	21.78	*	0	0	0.00
People	311			311	1.53	*	272	2.85	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	2,040	0	0	2,040	10.05	*	2,352	24.63	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	-0.00	*	0	0	0.00
Outside Air	0	0	0	9,053	44.59	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				142	0.70	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	-0.00	*	0	-0.00	*	0	0	-0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	11,110	0	0	20,306	100.00	*	9,551	100.00	*	-19,268	-19,268	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf) (%)
Main Clg	1.7	20.3	15.5	1,000	80.6	70.2	97.3	66.1	64.5	90.9	Floor	544
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0
Totals	1.7	20.3									Roof	544
											Wall	550
												72 13

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	36.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	360	0	Clg Cfm/Sqft	1.84	SADB	66.2	85.7
Main Htg	-19.3	1,000	68.0	85.7	Infil	198	198	Clg Cfm/Ton	590.96	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	1,000	1,000	Clg Sqft/Ton	321.48	Return	75.0	68.0
Preheat	-23.0	1,000	45.0	66.1	Mincfm	0	0	Clg Btuh/Sqft	37.33	Ret/OA	80.6	68.0
Reheat	0.0	0	0.0	0.0	Return	1,000	1,000	No. People	4	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	360	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	1.84	Fn BldTD	0.0	0.0
Total	-19.3				Auxil	0	0	Htg Btuh/Sqft	-35.42	Fn Frict	0.1	0.0

System 10 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/17 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/MR: 91/ 74/105.0 * OADB: 89 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	4,550	0		4,550	12.50	*	4,777	28.66	*	0	0	0.00
Glass Cond	807	0		807	2.22	*	820	4.92	*	-4,098	-4,098	18.07
Wall Cond	552	62		614	1.69	*	601	3.60	*	-1,822	-2,026	8.94
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	5,610			5,610	15.41	*	3,672	22.03	*	-16,548	-16,548	72.99
Sub Total==>	11,520	62		11,581	31.81	*	9,869	59.21	*	-22,468	-22,672	100.00
Internal Loads						*			*			
Lights	4,886	0		4,886	13.42	*	6,020	36.11	*	0	0	0.00
People	853			853	2.34	*	769	4.61	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	5,739	0	0	5,739	15.77	*	6,788	40.72	*	0	0	0.00
Ceiling Load	10	-10		0	0.00	*	11	0.06	*	-32	0	0.00
Outside Air	0	0	0	18,417	50.59	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				683	1.88	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	-0.00
Exhaust Heat		-17	0	-17	-0.05	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	17,269	35	0	36,404	100.00	*	16,668	100.00	*	-22,500	-22,672	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor	1,537	
Main Clg	3.0	36.4	29.1	2,400 80.1 70.2 98.3	68.4 66.0 95.0	Part	0	
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0	
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	Roof	0	0 0
Totals	3.0	36.4				Wall	660	114 17

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	32.5	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	780	0	Clg Cfm/Sqft	1.56	SADB	68.6	76.6
Main Htg	-22.7	2,400	67.9	76.6	Infil	238	238	Clg Cfm/Ton	791.13	Plenum	75.0	67.9
Aux Htg	0.0	0	0.0	0.0	Supply	2,400	2,400	Clg Sqft/Ton	506.65	Return	75.0	67.9
Preheat	-55.4	2,400	47.2	68.4	Mincfm	0	0	Clg Btuh/Sqft	23.68	Ret/OA	80.1	67.9
Reheat	0.0	0	0.0	0.0	Return	2,400	2,400	No. People	10	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	780	0	Htg % OA	0.0	Fn MtrTD	0.1	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	1.56	Fn BldTD	0.0	0.0
Total	-22.7				Auxil	0	0	Htg Btuh/Sqft	-14.75	Fn Frict	0.1	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 11 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/22 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 79 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	0	0	60.74
Sub Total==>	0	0		0	0.00	*	0	0.00	*	0	0	60.74
Internal Loads						*			*			
Lights	13,815	0		13,815	10.50	*	18,290	76.69	*	0	0	0.00
People	2,183			2,183	1.66	*	5,560	23.31	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	15,998	0	0	15,998	12.15	*	23,851	100.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	99,839	75.85	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				15,787	11.99	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkup		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	39.28
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	15,998	0	0	131,624	100.00	*	23,851	100.00	*	0	0	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf) (%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor	4,223
Main Clg	11.0	131.6	115.8	11,100 82.0 71.6 102.7	71.7 68.4 101.9	Part	0
Aux Clg	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	ExFlr	0
Opt Vent	0.0	0.0	0.0	0 0.0 0.0 0.0	0.0 0.0 0.0	Roof	0 0 0
Totals	11.0	131.6				Wall	0 0 0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	45.4	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	5,040	0	Clg Cfm/Sqft	2.63	SADB	73.0	68.1
Main Htg	-1.2	11,100	68.0	68.1	Infil	0	0	Clg Cfm/Ton	1011.97	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	11,100	11,100	Clg Sqft/Ton	385.00	Return	75.0	68.0
Preheat	-395.9	11,100	38.9	71.7	Mincfm	0	0	Clg Btuh/Sqft	31.17	Ret/OA	82.0	68.0
Reheat	0.0	0	0.0	0.0	Return	11,100	11,100	No. People	28	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	5,040	0	Htg % OA	0.0	Fn MtrTD	0.3	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg Cfm/Sqft	2.63	Fn BldTD	0.2	0.0
Total	-1.2				Auxil	0	0	Htg Btuh/Sqft	-0.29	Fn Frict	0.7	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 12 Peak SZ - SINGLE ZONE

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****
Peaked at Time ==> Mo/Hr: 7/14 * Mo/Hr: 7/20 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 91/ 74/105.0 * OADB: 83 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	3,816	0	0	3,816	0.87	*	4,109	7.20	*	-4,473	-4,473	24.08
Glass Solar	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	384	0	0	384	0.09	*	481	0.84	*	-1,693	-1,693	9.11
Partition	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0	0	0	0	0.00	*	0	0.00	*	-12,411	-12,411	66.81
Sub Total==>	4,199	0	0	4,199	0.96	*	4,591	8.04	*	-18,576	-18,576	100.00
Internal Loads												
Lights	6,341	0	0	6,341	1.45	*	8,153	14.28	*	0	0	0.00
People	1,049	0	0	1,049	0.24	*	2,032	3.56	*	0	0	0.00
Misc	9,082	32,486	3,840	45,408	10.37	*	8,467	14.83	*	0	0	0.00
Sub Total==>	16,472	32,486	3,840	52,798	12.05	*	18,651	32.66	*	0	0	0.00
Ceiling Load	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	311,339	71.07	*	0	0.00	*	0	0	0.00
Sup. Fan Heat	0	0	0	35,840	8.18	*	0	0.00	*	0	0	0.00
Ret. Fan Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Duct Heat Pkwo	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
OV/UNDR Sizing	33,869	0	0	33,869	7.73	*	33,869	59.30	*	0	0	0.00
Exhaust Heat	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Terminal Bypass	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Grand Total==>	54,540	32,486	3,840	438,045	100.00	*	57,111	100.00	*	-18,576	-18,576	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR	Leaving DB/WB/HR	Gross Total	Glass (sf)	(%)
	(Tons)	(Mbh)	(cfm)	Deg F Deg F Grains	Deg F Deg F Grains	Floor		
Main Clg	36.5	438.0	364.3	18,000 89.5 73.8 103.6	70.3 67.4 99.0	1,966		
Aux Clg	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Opt Vent	0.0	0.0	0.0	0.0 0.0 0.0	0.0 0.0 0.0	0		
Totals	36.5	438.0				1,966		
						495		

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	Cooling	Heating	Clg % OA	80.0	Type	Clg	Htg
	(Mbh)	(cfm)	Deg F	Deg F	Vent	14,400	0	Clg Cfm/Sqft	9.16	SADB	72.1	68.9
Main Htg	-18.6	18,000	68.0	68.9	Infil	0	178	Clg Cfm/Ton	493.10	Plenum	75.0	68.0
Aux Htg	0.0	0	0.0	0.0	Supply	18,000	18,000	Clg Sqft/Ton	53.86	Return	85.5	68.0
Preheat	-1,047.1	18,000	16.8	70.3	Mincfm	0	0	Clg Btuh/Sqft	222.81	Ret/OA	89.5	68.0
Reheat	0.0	0	0.0	0.0	Return	2,850	18,000	No. People	13	Runarnd	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	Htg % OA	0.0	Fn MtrTD	0.5	0.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	15,150	0	Htg Cfm/Sqft	9.16	Fn BldTD	0.3	0.0
Total	-18.6				Auxil	0	0	Htg Btuh/Sqft	-9.45	Fn Frict	1.0	0.0

-----AIRFLOWS (cfm)-----

-----ENGINEERING CHECKS-----

-----TEMPERATURES (F)-----

System 13 Block FC - FAN COIL

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****
Peaked at Time ==> Mo/Hr: 7/20 * Mo/Hr: 7/20 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 83/ 70/ 91.0 * OADB: 83 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Perct		Space	Perct		Space Peak	Coil Peak	Perct
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	108	0		108	20.93	*	108	28.50	*	-116	-116	99.94
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Wall Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	0	0	0.06
Sub Total==>	108	0		108	20.94	*	108	28.50	*	-116	-116	100.00
Internal Loads						*			*			
Lights	216	0		216	41.96	*	216	57.12	*	0	0	0.00
People	163			163	31.58	*	54	14.37	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	379	0	0	379	73.54	*	271	71.50	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				28	5.52	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat Pkwp		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	-0.00	*		0.00	*		0	0.00
Grand Total==>	487	0	0	515	100.00	*	378	100.00	*	-116	-116	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			Gross Total	Glass (sf) (%)	
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Floor	51	
Main Clg	0.0	0.5	200	75.1	69.0	99.8	73.2	68.3	99.1	Part	0	
Aux Clg	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Opt Vent	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Roof	51	0 0
Totals	0.0	0.5								Wall	0	0 0

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	AIRFLOWS (cfm)		--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F	Vent	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-0.1	200	68.0	68.5	Infil	0	0	Clg Cfm/Sqft	3.92	SADB	73.3	68.5
Aux Htg	0.0	0	0.0	0.0	Supply	200	200	Clg Cfm/Ton	4658.06	Plenum	75.0	68.0
Preheat	-1.1	200	68.0	73.1	Mincfm	0	0	Clg Sqft/Ton	1187.81	Return	75.0	68.0
Reheat	0.0	0	0.0	0.0	Return	200	200	Clg Btuh/Sqft	10.10	Ret/OA	75.0	68.0
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	0	Runarnd	75.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-0.1				Auxil	0	0	Htg Cfm/Sqft	3.92	Fn BldTD	0.0	0.0
								Htg Btuh/Sqft	-2.28	Fn Frict	0.1	0.0

System 14 Block RAD - RADIATION

***** COOLING COIL PEAK ***** CLG SPACE PEAK ***** HEATING COIL PEAK *****

Peaked at Time ==> Mo/Hr: 0/ 0 * Mo/Hr: 0/ 0 * Mo/Hr: 13/ 1
Outside Air ==> OADB/WB/HR: 0/ 0/ 0.0 * OADB: 0 * OADB: 4

	Space	Ret. Air	Ret. Air	Net	Percent		Space	Percent		Space Peak	Coil Peak	Percent
	Sens.+Lat.	Sensible	Latent	Total	Of Tot		Sensible	Of Tot		Space Sens	Tot Sens	Of Tot
	(Btuh)	(Btuh)	(Btuh)	(Btuh)	(%)		(Btuh)	(%)		(Btuh)	(Btuh)	(%)
Envelope Loads												
Skylite Solr	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Skylite Cond	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Roof Cond	0	0		0	0.00	*	0	0.00	*	-8,187	-8,187	4.04
Glass Solar	0	0		0	0.00	*	0	0.00	*	0	0	0.00
Glass Cond	0	0		0	0.00	*	0	0.00	*	-23,248	-23,248	11.46
Wall Cond	0	0		0	0.00	*	0	0.00	*	-19,007	-19,830	9.78
Partition	0			0	0.00	*	0	0.00	*	0	0	0.00
Exposed Floor	0			0	0.00	*	0	0.00	*	0	0	0.00
Infiltration	0			0	0.00	*	0	0.00	*	-151,588	-151,588	74.73
Sub Total==>	0	0		0	0.00	*	0	0.00	*	-202,030	-202,853	100.00
Internal Loads												
Lights	0	0		0	0.00	*	0	0.00	*	0	0	0.00
People	0			0	0.00	*	0	0.00	*	0	0	0.00
Misc	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sub Total==>	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Ceiling Load	0	0		0	0.00	*	0	0.00	*	-8,387	0	0.00
Outside Air	0	0	0	0	0.00	*	0	0.00	*	0	0	0.00
Sup. Fan Heat				0	0.00	*		0.00	*		0	0.00
Ret. Fan Heat		0		0	0.00	*		0.00	*		0	0.00
Duct Heat PkUp		0		0	0.00	*		0.00	*		0	0.00
OV/UNDR Sizing	0			0	0.00	*	0	0.00	*	0	0	0.00
Exhaust Heat		0	0	0	0.00	*		0.00	*		0	0.00
Terminal Bypass		0	0	0	0.00	*		0.00	*		0	0.00
Grand Total==>	0	0	0	0	0.00	*	0	0.00	*	-210,418	-202,853	100.00

-----COOLING COIL SELECTION-----

	Total Capacity	Sens Cap.	Coil Airfl	Entering DB/WB/HR			Leaving DB/WB/HR			AREAS		
	(Tons)	(Mbh)	(cfm)	Deg F	Deg F	Grains	Deg F	Deg F	Grains	Gross Total	Glass (sf)	(%)
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	Floor	9,084	
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	Part	0	
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	ExFlr	0	
Totals	0.0	0.0								Roof	3,164	0 0
										Wall	6,046	645 11

-----HEATING COIL SELECTION-----

	Capacity	Coil Airfl	Ent	Lvg	Type	AIRFLOWS (cfm)		--ENGINEERING CHECKS--		--TEMPERATURES (F)--		
	(Mbh)	(cfm)	Deg F	Deg F	Vent	Cooling	Heating	Clg % OA	0.0	Type	Clg	Htg
Main Htg	-202.9	0	0.0	0.0	Infil	0	0	Clg Cfm/Sqft	0.00	SADB	0.0	68.1
Aux Htg	0.0	0	0.0	0.0	Supply	0	0	Clg Cfm/Ton	0.00	Plenum	0.0	67.6
Preheat	0.0	0	0.0	0.0	Mincfm	0	0	Clg Sqft/Ton	0.00	Return	0.0	67.6
Reheat	0.0	0	0.0	0.0	Return	0	0	Clg Btuh/Sqft	0.00	Ret/OA	0.0	67.6
Humidif	0.0	0	0.0	0.0	Exhaust	0	0	No. People	0	Runarnd	0.0	68.0
Opt Vent	0.0	0	0.0	0.0	Rm Exh	0	0	Htg % OA	0.0	Fn MtrTD	0.0	0.0
Total	-202.9				Auxil	0	0	Htg Cfm/Sqft	0.00	Fn BldTD	0.0	0.0
								Htg Btuh/Sqft	-22.33	Fn Frict	0.0	0.0

BUILDING U-VALUES - ALTERNATIVE 4
COMBINED ECOS

----- B U I L D I N G U - V A L U E S -----												
Room Number	Description	Part.	ExFlr	Room U-Values (Btu/hr/sqft/F)							Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
				Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
1	LIQUOR STORE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
Zone	1 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
System	1 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.3	2.67
2	RAD ONLY	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
Zone	2 Total/Ave.	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
System	2 Total/Ave.	0.144	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	101.9	22.83
3	ATTIC	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	23.3	8.65
Zone	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	23.3	8.65
System	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	23.3	8.65
4	OFFICES	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	56.1	15.68
Zone	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	56.1	15.68
System	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	56.1	15.68
5	PARTY ROOMS	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
Zone	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
System	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
6	LOUNGE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	93.3	22.79
Zone	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	93.3	22.79
System	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	93.3	22.79
7	MECH ROOM	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
Zone	7 Total/Ave.	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
System	7 Total/Ave.	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	68.1	15.93
8	LOBBY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	67.4	17.13
Zone	8 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	67.4	17.13
System	8 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	67.4	17.13
9	PRIVATE DINING	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
Zone	9 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
System	9 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
10	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	54.2	14.22
Zone	10 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	54.2	14.22
System	10 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	54.2	14.22
11	BALL ROOM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
Zone	11 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
System	11 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317	6.2	3.70
12	KITCHEN	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
Zone	12 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
System	12 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.053	0.000	40.1	9.02
13	KITCHEN OFFICE	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
Zone	13 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
System	13 Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	22.2	5.22
3	ATTIC	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	23.3	8.65
Zone	3 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	23.3	8.65
4	OFFICES	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	56.1	15.68
Zone	4 Total/Ave.	0.000	0.000	0.000	0.000	0.041	0.550	0.563	0.058	0.000	56.1	15.68
5	PARTY ROOMS	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
Zone	5 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.053	0.317	17.0	6.01
6	LOUNGE	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	93.3	22.79
Zone	6 Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	93.3	22.79
8	LOBBY	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	67.4	17.13

BUILDING U-VALUES - ALTERNATIVE 4
COMBINED ECOS

----- B U I L D I N G U - V A L U E S -----

Room Number	Description	Room U-Values (Btu/hr/sqft/F)									Room Mass (lb/ sqft)	Room Capac. (Btu/ sqft/F)
		Part.	ExFlr	Summr Skylt	Wintr Skylt	Roof	Summr Windo	Wintr Windo	Wall	Ceil.		
Zone 8	Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	67.4	17.13
9	PRIVATE DINING	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
Zone 9	Total/Ave.	0.000	0.000	0.000	0.000	0.036	0.550	0.563	0.053	0.000	84.6	18.47
10	DINING ROOM	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	54.2	14.22
Zone 10	Total/Ave.	0.000	0.000	0.000	0.000	0.000	0.550	0.563	0.058	0.317	54.2	14.22
System 14	Total/Ave.	0.000	0.000	0.000	0.000	0.040	0.550	0.563	0.057	0.317	52.8	14.09
Building		0.144	0.000	0.000	0.000	0.039	0.550	0.563	0.057	0.317	48.7	12.67

BUILDING AREAS - ALTERNATIVE 4
COMBINED ECOS

BUILDING AREAS

Room Number	Description	Number of Duplicate Flr Rm	Floor Area/Dupl Room (sqft)	Total Floor Area (sqft)	Partition Area (sqft)	Exposed Floor Area (sqft)	Skylight Area (sqft)	Sk1 /Rf (%)	Net Roof Area (sqft)	Window Area (sqft)	Win /W1 (%)	Net Wall Area (sqft)
1	LIQUOR STORE	1	1	1,073	1,073	0	0	0	0	0	0	0
Zone	1 Total/Ave.			1,073	0	0	0	0	0	0	0	0
System	1 Total/Ave.			1,073	0	0	0	0	0	0	0	0
2	RAD ONLY	1	1	2,856	2,856	342	0	0	2,153	305	12	2,148
Zone	2 Total/Ave.			2,856	342	0	0	0	2,153	305	12	2,148
System	2 Total/Ave.			2,856	342	0	0	0	2,153	305	12	2,148
3	ATTIC	1	1	1,354	1,354	0	0	0	1,354	14	1	1,372
Zone	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
System	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
4	OFFICES	1	1	1,266	1,266	0	0	0	1,266	71	5	1,243
Zone	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
System	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
5	PARTY ROOMS	1	1	1,748	1,748	0	0	0	0	153	36	267
Zone	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
System	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
6	LOUNGE	1	1	1,564	1,564	0	0	0	0	146	13	1,009
Zone	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
System	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
7	MECH ROOM	1	1	469	469	108	0	0	0	0	0	0
Zone	7 Total/Ave.			469	108	0	0	0	0	0	0	0
System	7 Total/Ave.			469	108	0	0	0	0	0	0	0
8	LOBBY	1	1	1,071	1,071	0	0	0	0	75	13	486
Zone	8 Total/Ave.			1,071	0	0	0	0	0	75	13	486
System	8 Total/Ave.			1,071	0	0	0	0	0	75	13	486
9	PRIVATE DINING	1	1	544	544	0	0	0	544	72	13	478
Zone	9 Total/Ave.			544	0	0	0	0	544	72	13	478
System	9 Total/Ave.			544	0	0	0	0	544	72	13	478
10	DINING ROOM	1	1	1,537	1,537	0	0	0	0	114	17	546
Zone	10 Total/Ave.			1,537	0	0	0	0	0	114	17	546
System	10 Total/Ave.			1,537	0	0	0	0	0	114	17	546
11	BALL ROOM	1	1	4,223	4,223	0	0	0	0	0	0	0
Zone	11 Total/Ave.			4,223	0	0	0	0	0	0	0	0
System	11 Total/Ave.			4,223	0	0	0	0	0	0	0	0
12	KITCHEN	1	1	1,966	1,966	0	0	0	1,966	0	0	495
Zone	12 Total/Ave.			1,966	0	0	0	0	1,966	0	0	495
System	12 Total/Ave.			1,966	0	0	0	0	1,966	0	0	495
13	KITCHEN OFFICE	1	1	51	51	0	0	0	51	0	0	0
Zone	13 Total/Ave.			51	0	0	0	0	51	0	0	0
System	13 Total/Ave.			51	0	0	0	0	51	0	0	0
3	ATTIC	1	1	1,354	1,354	0	0	0	1,354	14	1	1,372
Zone	3 Total/Ave.			1,354	0	0	0	0	1,354	14	1	1,372
4	OFFICES	1	1	1,266	1,266	0	0	0	1,266	71	5	1,243
Zone	4 Total/Ave.			1,266	0	0	0	0	1,266	71	5	1,243
5	PARTY ROOMS	1	1	1,748	1,748	0	0	0	0	153	36	267
Zone	5 Total/Ave.			1,748	0	0	0	0	0	153	36	267
6	LOUNGE	1	1	1,564	1,564	0	0	0	0	146	13	1,009
Zone	6 Total/Ave.			1,564	0	0	0	0	0	146	13	1,009
8	LOBBY	1	1	1,071	1,071	0	0	0	0	75	13	486

BUILDING AREAS - ALTERNATIVE 4
COMBINED ECOS

----- B U I L D I N G A R E A S -----												
Room		Number of		Floor	Total	Exposed		Skl	Net Roof	Window	Win-	Net Wall
Number	Description	Flr	Rm	Area/Dupl Room (sqft)	Floor Area (sqft)	Partition Area (sqft)	Floor Area (sqft)					
Zone	8 Total/Ave.				1,071	0	0	0	0	75	13	486
	9 PRIVATE DINING	1	1	544	544	0	0	0	544	72	13	478
Zone	9 Total/Ave.				544	0	0	0	544	72	13	478
	10 DINING ROOM	1	1	1,537	1,537	0	0	0	0	114	17	546
Zone	10 Total/Ave.				1,537	0	0	0	0	114	17	546
System	14 Total/Ave.				9,084	0	0	0	3,164	645	11	5,401
Building					28,806	450	0	0	10,498	1,596	11	13,444

ASHRAE 90 ANALYSIS - ALTERNATIVE 4
COMBINED ECOS

----- A S H R A E 9 0 A N A L Y S I S -----

Overall Roof U-Value = 0.039 (Btu/Hr/Sq Ft/F)
Overall Wall U-Value = 0.109 (Btu/Hr/Sq Ft/F)
Overall Building U-Value = 0.080 (Btu/Hr/Sq Ft/F)

Roof Overall Thermal Transfer Value (OTTVr) = 2.10 (Btu/Hr/Sq Ft)
Wall Overall Thermal Transfer Value (OTTVw) = 9.95 (Btu/Hr/Sq Ft)

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 4
COMBINED ECOS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (cfm)	Hours (%)	Hours	Cap. (cfm)	Hours (%)	Hours
0 - 5	4.4	85	5,304	-131,465	32	1,120	2,358.8	29	2,555	0.0	0	0
5 - 10	8.9	2	140	-262,931	45	1,611	4,717.6	0	0	0.0	0	0
10 - 15	13.3	5	312	-394,396	11	403	7,076.4	0	0	0.0	0	0
15 - 20	17.7	4	244	-525,862	12	419	9,435.2	0	0	0.0	0	0
20 - 25	22.2	3	205	-657,327	0	0	11,794.0	0	0	0.0	0	0
25 - 30	26.6	0	0	-788,792	0	0	14,152.8	0	0	0.0	0	0
30 - 35	31.0	0	0	-920,258	0	0	16,511.6	0	0	0.0	0	0
35 - 40	35.4	0	0	-1,051,723	0	0	18,870.3	0	0	0.0	0	0
40 - 45	39.9	0	0	-1,183,189	0	0	21,229.1	0	0	0.0	0	0
45 - 50	44.3	0	0	-1,314,654	0	0	23,587.9	0	0	0.0	0	0
50 - 55	48.7	0	0	-1,446,120	0	0	25,946.7	0	0	0.0	0	0
55 - 60	53.2	0	0	-1,577,585	0	0	28,305.5	0	0	0.0	0	0
60 - 65	57.6	0	0	-1,709,050	0	0	30,664.3	0	0	0.0	0	0
65 - 70	62.0	0	0	-1,840,516	0	0	33,023.1	0	0	0.0	0	0
70 - 75	66.5	0	0	-1,971,981	0	0	35,381.9	0	0	0.0	0	0
75 - 80	70.9	0	0	-2,103,447	0	0	37,740.7	0	0	0.0	0	0
80 - 85	75.3	0	0	-2,234,912	0	0	40,099.5	0	0	0.0	0	0
85 - 90	79.8	0	0	-2,366,377	0	0	42,458.3	71	6,205	0.0	0	0
90 - 95	84.2	0	0	-2,497,843	0	0	44,817.1	0	0	0.0	0	0
95 - 100	88.6	0	0	-2,629,308	0	0	47,175.9	0	0	0.0	0	0
Hours Off	0.0	0	2,555	0	0	5,207	0.0	0	0	0.0	0	8,760

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 4
COMBINED ECOS

----- BUILDING TEMPERATURE PROFILES -----																				
Temperature Range (F)	Zone Number																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	3	4	5	6	8	9	
Max. Temp.	38.0	92.3	78.7	78.5	80.0	78.5	71.2	78.6	78.5	78.8	79.9	96.7	80.0	121.9	119.3	161.8	126.4	140.8	115.3	
Mo./Hr.	1 1	8 22	7 24	7 1	7 5	7 4	9 16	7 4	7 3	7 5	6 5	7 15	7 5	8 22	8 22	8 22	9 22	9 22	8 22	
Day Type	1	1	1	2	1	1	4	1	1	1	2	1	1	1	1	1	5	3	1	
..... Number of Hours																				
Above 100	0	0	0	0	0	0	0	0	0	0	0	0	0	2,944	2,928	4,331	2,844	3,497	2,640	
95 - 100	0	0	0	0	0	0	0	0	0	0	0	0	0	120	0	85	462	180	288	
90 - 95	0	868	0	0	0	0	0	0	0	0	0	138	0	124	136	147	245	223	52	
85 - 90	0	1,276	0	0	0	0	0	0	0	0	0	778	0	214	196	618	267	184	213	
80 - 85	0	784	0	0	0	0	0	0	0	0	0	1,174	0	270	552	675	138	683	431	
75 - 80	0	136	2,744	3,373	3,672	3,036	0	3,672	2,823	3,321	2,801	820	4,107	34	316	686	859	289	488	
70 - 75	0	948	928	299	0	636	1,563	51	849	436	658	213	4,653	308	193	1,076	245	800	189	
65 - 70	0	4,343	3,690	4,334	3,961	2,379	3,387	1,973	3,330	2,836	443	858	0	3,734	3,792	1,139	3,672	2,899	3,903	
60 - 65	0	405	1,102	754	1,100	989	3,810	585	1,603	1,333	695	878	0	776	647	3	28	5	556	
55 - 60	0	0	296	0	27	1,078	0	1,271	155	778	782	576	0	236	0	0	0	0	0	
50 - 55	0	0	0	0	0	642	0	936	0	6	872	615	0	0	0	0	0	0	0	
Below 50	8,760	0	0	0	0	0	0	272	0	0	2,509	2,710	0	0	0	0	0	0	0	
Min. Temp.	38.0	63.2	56.2	60.9	59.2	50.6	60.2	47.2	57.4	55.0	33.9	30.1	67.9	56.2	60.9	64.3	64.8	65.0	61.8	
Mo./Hr.	1 1	2 6	2 6	2 6	2 11	2 10	3 20	2 8	2 7	2 10	2 10	2 8	1 6	2 6	2 6	1 6	2 6	2 6	2 6	
Day Type	1	1	1	1	5	5	5	5	5	5	4	4	1	1	1	1	4	4	1	

BUILDING TEMPERATURE PROFILES - ALTERNATIVE 4
COMBINED ECOS

----- BUILDING TEMPERATURE PROFILES -----

Range 10
 (F)

Max. Temp. 146.8
 Mo./Hr. 9 22
 Day Type 3

	 Number of Hours
Above 100	3,649
95 - 100	204
90 - 95	167
85 - 90	618
80 - 85	418
75 - 80	96
70 - 75	1,189
65 - 70	2,419
60 - 65	0
55 - 60	0
50 - 55	0
Below 50	0

Min. Temp. 65.1
 Mo./Hr. 2 6
 Day Type 4

MONTHLY ENERGY CONSUMPTION - ALTERNATIVE 4
 COMBINED ECOS

----- MONTHLY ENERGY CONSUMPTION -----						
Month	ELEC Off Peak (kWh)	DEMAND On Peak (kW)	STEAM On Peak (Therm)	HOT WTR On Peak (Therm)	STEAM DMND On Peak (Thrm/hr)	HOT W DMND On Peak (Thrm/hr)
Jan	53,363	107	92	839	0	3
Feb	48,170	107	83	883	0	3
March	52,401	114	92	455	0	3
April	47,662	123	89	141	0	3
May	46,412	139	0	0	0	0
June	50,596	146	0	0	0	0
July	60,511	153	0	0	0	0
Aug	52,776	147	0	0	0	0
Sept	45,409	143	0	0	0	0
Oct	48,977	121	69	39	0	2
Nov	48,656	118	89	229	0	2
Dec	53,308	107	92	624	0	3
Total	608,241	153	607	3,209	0	3

Building Energy Consumption = 85,314 (8tu/Sq Ft/Year)
 Source Energy Consumption = 233,883 (8tu/Sq Ft/Year)

Floor Area = 28,806 (Sq Ft)

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	15067	13609	15067	14581	15067	14581	15067	15067	14581	15067	14581	15067	177,399
	PK	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0
1	MISC LD													
	ELEC	7412	6694	7412	7173	7412	7173	7412	7412	7173	7412	7173	7412	87,266
	PK	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTW20	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ1161		AIR-CLD COND COMP <15 TONS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5200		CONDENSER FANS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5303		CONTROLS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ1100S		AIR-CLD RECIP 25-45 TONS											
	ELEC	0	0	0	274	1031	3979	8338	4398	1338	966	50	0	20,375
	PK	0.0	0.0	20.2	20.2	22.0	24.1	28.1	24.4	22.2	20.2	20.2	0.0	28.1
2	EQ5200		CONDENSER FANS											
	ELEC	0	0	0	11	70	278	594	306	91	40	2	0	1,392
	PK	0.0	0.0	0.1	0.2	0.5	1.7	2.3	1.8	1.5	0.5	0.1	0.0	2.3
2	EQ5001		CHILLED WATER PUMP C.V.											

	ELEC	0	0	0	307	910	1318	1572	1375	984	981	89	0	7,538
	PK	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0
2	EQ5303	CONTROLS												
	ELEC	0	0	0	31	91	133	158	138	99	99	9	0	758
	PK	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.3
3	EQ1281	TRANE HT-PMP W-DEMAND DEFROST												
	ELEC	951	848	1007	805	0	89	312	86	0	578	973	967	6,617
	PK	2.1	2.1	2.1	2.1	0.0	1.1	1.7	1.1	0.7	2.1	2.1	2.1	2.1
3	EQ5215	CONDENSER FANS												
	ELEC	0	0	0	0	0	13	46	13	0	0	0	0	73
	PK	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.2
3	EQ5308	CONTROLS												
	ELEC	53	48	53	51	0	18	39	21	0	41	51	53	427
	PK	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3	EQ5350	HEAT PUMP DEMAND DEFROST CYCLE												
	ELEC	14	12	7	0	0	0	0	0	0	0	6	14	52
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	EQ1281	TRANE HT-PMP W-DEMAND DEFROST												
	ELEC	1705	1521	1806	939	0	234	662	281	22	648	1288	1734	10,837
	PK	3.8	3.8	3.8	3.8	0.0	2.1	3.1	2.2	1.7	3.8	3.8	3.8	3.8
4	EQ5215	CONDENSER FANS												
	ELEC	0	0	0	0	0	35	99	42	3	0	0	0	180
	PK	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.3	0.1	0.0	0.0	0.4
4	EQ5308	CONTROLS												
	ELEC	53	48	53	34	0	24	46	27	8	23	45	53	412
	PK	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
4	EQ5350	HEAT PUMP DEMAND DEFROST CYCLE												
	ELEC	24	21	12	0	0	0	0	0	0	0	11	24	93
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	EQ1101L	HR AIR-CLD RECIP >15 TONS												
	ELEC	0	0	0	0	229	1279	3311	1357	201	0	0	0	6,378
	PK	0.0	0.0	0.0	0.0	22.4	23.2	24.0	23.3	22.5	0.0	0.0	0.0	24.0
5	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	20	109	277	115	17	0	0	0	538
	PK	0.0	0.0	0.0	0.0	0.8	1.0	1.4	1.0	1.0	0.0	0.0	0.0	1.4
5	EQ5001	CHILLED WATER PUMP C.V.												
	ELEC	0	0	0	0	262	626	1110	728	254	0	0	0	2,980
	PK	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	0.0	0.0	3.0
5	EQ5303	CONTROLS												
	ELEC	0	0	0	0	26	63	112	73	26	0	0	0	360
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.3
1	EQ4003	FC CENTRIF. FAN C.V.												

	0	0	0	0	0	0	0	0	0	0	0	0	0
ELEC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PK													
3 EQ4003													
ELEC	650	587	650	629	650	629	650	650	629	650	629	650	7,649
PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
3 EQ4003													
ELEC	10	9	10	10	10	10	10	10	10	10	10	10	119
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 EQ4003													
ELEC	5	4	5	4	5	4	5	5	4	5	4	5	53
PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 EQ4003													
ELEC	944	853	944	914	944	914	944	944	914	944	914	944	11,114
PK	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
5 EQ4003													
ELEC	0	0	55	167	126	164	197	175	133	195	115	10	1,338
PK	0.2	0.1	0.7	0.8	0.6	0.6	0.8	0.6	0.6	0.8	0.8	0.2	0.8
6 EQ4003													
ELEC	1346	1216	1346	1302	1346	1302	1346	1346	1302	1346	1302	1346	15,847
PK	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
6 EQ4003													
ELEC	42	40	43	41	50	44	43	44	44	38	38	40	506
PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
6 EQ4003													
ELEC	45	41	45	44	45	44	45	45	44	45	44	45	531
PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
8 EQ4003													
ELEC	447	403	447	432	447	432	447	447	432	447	432	447	5,258
PK	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
9 EQ4003													
ELEC	45	41	45	44	45	44	45	45	44	45	44	45	531
PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10 EQ4003													
ELEC	217	196	217	210	217	210	217	217	210	217	210	217	

[illegible]

UTILITY PEAK CHECKSUMS - ALTERNATIVE 4
COMBINED ECOS

----- UTILITY PEAK CHECKSUMS -----

Utility ELECTRIC DEMAND

Peak Value 153.4 (kW)
Yearly Time of Peak 17 (hr) 7 (mo)

Hour 17 Month 7

Eq. Ref. Num.	Equipment Code Name	Equipment Description	Utility Demand (kW)	Percent Of Tot (%)

Cooling Equipment

2	EQ1100S	AIR-CLD RECIP 25-45 TONS	32.5	21.18
3	EQ1281	TRANE HT-PMP W-DEMAND DEFROST	1.8	1.15
4	EQ1281	TRANE HT-PMP W-DEMAND DEFROST	3.2	2.08
5	EQ1101L	HR AIR-CLD RECIP >15 TONS	28.1	18.33

Sub Total			65.6	42.75

Sub Total			0.0	0.00

Air Moving Equipment

1		SUMMATION OF FAN ELECTRICAL DEMAND	0.0	0.00
3		SUMMATION OF FAN ELECTRICAL DEMAND	1.3	0.82
4		SUMMATION OF FAN ELECTRICAL DEMAND	1.8	1.17
5		SUMMATION OF FAN ELECTRICAL DEMAND	0.7	0.43
6		SUMMATION OF FAN ELECTRICAL DEMAND	2.7	1.78
8		SUMMATION OF FAN ELECTRICAL DEMAND	0.8	0.55
9		SUMMATION OF FAN ELECTRICAL DEMAND	0.1	0.06
10		SUMMATION OF FAN ELECTRICAL DEMAND	0.4	0.27
11		SUMMATION OF FAN ELECTRICAL DEMAND	9.5	6.19
12		SUMMATION OF FAN ELECTRICAL DEMAND	23.5	15.33
13		SUMMATION OF FAN ELECTRICAL DEMAND	0.0	0.01

Sub Total			40.8	26.61

Sub Total			0.0	0.00

Miscellaneous

Lights			33.0	21.48
Base Utilities			0.0	0.00
Misc Equipment			14.1	9.17
Sub Total			47.0	30.65

Grand Total			153.4	100.00